

**SOUTHERN WINDS OFFSHORE WIND
PROJECT**

Summary of Impacts Report

FINAL

November 2022

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Acknowledgement of Country

Umwelt would like to acknowledge the traditional custodians of the country on which we work and pay respect to their cultural heritage, beliefs, and continuing relationship with the land. We pay our respect to the Elders – past, present, and future.

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Abbreviations

Abbreviation	Description
AAASS	Atlas of Australian Acid Sulfate Soils
AADT	Annual Average Daily Traffic
AEP	Annual Exceedance Probability
ARIS	Australian Soil Resource Information System
AUCHD	Australasian Underwater Cultural Heritage Database
BFE	BlueFloat Energy
BIA	Biologically Important Area
BMO	Bushfire Management Overlay
CASS	Coastal Acid Sulfate Soil
CD	Conservation dependent
CR	Critically endangered
CHL	Commonwealth Heritage List
CHMP	Cultural Heritage Management Plan
CHS	Cultural heritage sensitivity
DAWE	Commonwealth Department of Agriculture, Water and Environment (now DCCEEW)
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DDO	Design and Development Overlay
DELWP	Victorian Department of Environment, Land, Water and Planning
DoT	Department of Transport
EE Act	Environment Effects Act 1978
EES	Environment Effects Statement
EMF	Electromagnetic field
EN	Endangered
EPA	Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
ESO	Environmental Significance Overlay
EVC	Ecological Vegetation Class
FFG Act	Flora and Fauna Guarantee Act 1988
FO	Floodway Overlay

Abbreviation	Description
FZ	Farming Zone
GDE	Groundwater Dependent Ecosystem
GW	Gigawatts
ha	Hectares
Heritage Act	Heritage Act 2017
HV	Heritage Victoria
HVP	Hancock Victorian Plantations
IPA	Indigenous Protected Area
ILUA	Indigenous Land Use Agreement
KEF	Key Ecological Feature
km	Kilometres
kV	Kilovolt
LAT	Lowest Astronomical Tide
LDAD	Low density artefact distribution
LGA	Local Government Area
LUAA	Land Use Activity Agreement
LUAR	Land Use Activity Regime
LSIO	Land Subject to Inundation Overlay
m	Metres
MNES	Matters of National Environmental Significance
MP	Member of Parliament
MW	Megawatt
NHL	National Heritage List
NM	Nautical Mile
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
NTV	Native Title Vision
OD	Over dimensional
OEI Act	Offshore Electricity Infrastructure Act 2021
PCRZ	Public Conservation and Resource Zone
PMST	Protected Matters Search Tool
PPRZ	Public Park and Recreation Zone

Abbreviation	Description
PUZ	Public Use Zone
RAP	Registered Aboriginal Party
RE	Renewable Energy
REZ	Renewable Energy Zone
RLZ	Rural Living Zone
RNTBC	Registered Native Title Body Corporate
SCO	Specific Controls Overlay
SRO	State Resource Overlay
SUZ	Special Use Zone
TEC	Threatened Ecological Community
TRZ	Transport Zone
TZ	Township Zone
VAHR	Victorian Aboriginal Heritage Register
VHD	Victorian Heritage Database
VHI	Victorian Heritage Inventory
VHR	Victorian Heritage Register
VU	Vulnerable
UCH Act	Underwater Cultural Heritage Act 2018

Glossary

Term	Definition
Aboriginal Places	Aboriginal cultural heritage sites registered on the Victorian Aboriginal Heritage Register.
Area of cultural heritage sensitivity (CHS)	An area in which Aboriginal cultural heritage is or is likely to be present which has not already been subject to significant ground disturbance. A more thorough definition of cultural heritage sensitivity can be found in the Aboriginal Heritage Regulations (2018).
Artefact	Any object made or modified by a human culture, e.g., stone tools, farming equipment.
Artefact Scatter	Artefact scatters are places indicating an occupation site and may be found out in the open landscape or in the topsoil of a rock shelter.
Benthic	Relating to the area at the bottom of a body of water, such as the seabed. Includes surface sediments and organisms that inhabit the area.
Biologically Important Area	A Biologically Important Area (BIA) is an indication that an area has a high level of importance for a species, either threatened or migratory under the EPBC Act. BIAs are typically areas where aggregations of individuals of a species are known to display biologically important behaviour such as breeding, foraging, resting, or migrating.
Bioregion	Bioregions are a landscape-scale approach to classifying the environment using attributes such as climate, geomorphology, geology, soils, and vegetation.
Bottom fixed turbine	A bottom-fixed turbine is mounted on a structure fixed into the seabed.
Coastal upwelling	Coastal upwelling is an oceanographic process involving wind drive motion of dense, cooler, and usually nutrient-rich water from deep water being brought up to the ocean surface.
Commonwealth Waters	Any waters beyond State Waters, between 3 nautical miles and 200 nautical miles from the low water mark of the coastline.
Earth Feature	Aboriginal earth features are a type of Aboriginal Place recorded on ACHRIS, including soil deposits and mounds.
Economic Exclusive Zone	The area beyond the Territorial Sea extending up to 200 nautical miles from the low water mark of the coastline (Commonwealth Waters).
Groundwater dependent ecosystems	Ecosystems that require access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain their communities of plants and animals, ecological processes and ecosystem services.
Ichthyofauna	Fish that are indigenous to a particular region.
Indigenous Land Use Agreement	An Indigenous Land Use Agreement (ILUA) is a voluntary agreement between native title parties and other people or bodies about the use and management of areas of land and/or waters.
Hub Height	The distance from the ground to the middle of a wind turbines rotor.
Key ecological feature	Elements of the Commonwealth marine environment that are considered to be of regional important for either a region's biodiversity or its ecosystem function and integrity.
Midden	An occupation site where Aboriginal people left the remains of their meals. At some sites, substantial deposits grew over generations of use of the same area and can be many metres deep.

Term	Definition
Matters of national environmental significance	There are nine matters of national environmental significance protected under the EPBC Act – world heritage properties, national heritage places, wetlands of international importance (Ramsar wetlands), nationally threatened species and ecological communities, migratory species, Commonwealth marine areas, the Great Barrier Reef Marine Park, nuclear actions and a water resource in relation to coal seam gas development and large coal mining development.
Native Title	Native title is the legal recognition in Australian law that some Aboriginal and Torres Strait Islander people continue to hold rights and interests in land and water.
Object Collection	An Aboriginal Place recorded on the Victorian Heritage Register consisting of Aboriginal objects located in a safe place.
Remnant vegetation	Natural vegetation that still exists or is representative of the natural ecosystem in an area.
Rotor diameter	The cross-sectional dimension of the circle swept by wind turbine blades.
Scarred Tree	A tree that displays evidence that Aboriginal people removed its bark or wood.
Significant ground disturbance	Disturbance of the topsoil or surface rock layer of the ground or waterway by machinery in the course of grading, excavating, digging, dredging or deep ripping (60 cm or deeper).
Silcrete	A silica-rich, fine-grained, sedimentary rock that is excellent for the creation of stone tools due to its flaking qualities.
State Waters	Waters from the low water mark along the coastline up to three nautical miles seaward.
Territorial Sea	The belt of water extending up to 12 nautical miles from the low water mark of the coastline (Commonwealth Waters).

Executive Summary

This report summarises potential impacts that may result from the construction, operation, and decommissioning of the Southern Winds Offshore Wind Project (the Project). This report also identifies preliminary design constraints which will inform the Project design and assist in avoiding or mitigating potential impacts. The outcomes of this report inform the Project's planning and environmental approval strategy and recommended 'next steps' for the Project. Key environmental and planning risks have been identified that may affect the timing, approvals, design, or other elements critical to the Project viability and delivery success.

The preliminary assessments are based on a Study Area which extends up to 5 kilometres (km) from the offshore Project Area (representing the built footprint of the Project) and 2.5 km from the onshore Project Area.

Marine

The Preliminary Desktop Marine Environmental Assessment (BMT 2022) identified the key marine values within the Study Area and the potential for the Project to impact on these values. The offshore wind turbines, most of the cabling and the offshore substations are located within Commonwealth Waters (marine area).

The BMT report identified the Project has potential to impact on the following matters of national environmental significance (MNES) protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) within the marine environment:

- Nationally listed threatened species
- Migratory species
- Commonwealth marine areas.

The following threatened and migratory marine fauna (listed under the EPBC Act and/or the *Flora and Fauna Guarantee Act 1988* (FFG Act)) are likely to occur within the Study Area:

- 12 whale, dolphin, and seal species
- 3 turtle species
- 34 shark and fish species
- 13 marine benthic species.

The marine environment within the Study Area is nominated as a Biologically Important Area (BIA) for several species, including White Shark *Carcharodon carcharias*, Pygmy Blue Whale *Balaenoptera musculus breviceuda*, Southern Right Whale *Eubalaena australia*, and several Albatross species. The Study Area is located within the Bonney Coast Upwelling Key Ecological Feature (KEF), a seasonal upwelling that brings cold nutrient rich water to the sea surface and is a high productivity area. This in turn attracts a high diversity of species.

The Discovery Bay Marine National Park is located within the Study Area (but not intersected by the Project) and is recognised as an important habitat for commercial fish, including tuna and mackerel (Director of National Parks, 2013), and is a key migratory area for whales, including humpback, fin, blue and sei whales. The Study Area also intersects with the South Australian Lower South East Marine Park, however no infrastructure will be located within the park. The marine environment also supports a range of recreational activities including fishing, diving, and boating, as well as commercial fisheries. Port MacDonnell in South Australia houses Australia's largest rock lobster fishing fleet.

Potential key construction related impacts are associated with pile driving required for installation of the offshore turbine foundations, which has potential to result in noise impacts on listed threatened and migratory marine fauna, as well as potential to remove or damage sensitive habitats and generate sediment plumes and turbidity, impacting on light sensitive habitats or fauna species. Construction works also have the potential to disturb contaminated or acidic sediments, as well as result in spills or uncontrolled release of fuels, oils, or chemicals which could impact on water quality.

Key operation related impacts that have the potential to occur include noise, vibration, electromagnetic interference (EMI) and lighting impacts on marine fauna behaviour, turbine collision for marine avifauna, vessel strike with marine fauna (particularly large slow-moving species such as whales), localised changes to hydrodynamic processes and exclusion zones around offshore wind turbines impacting on recreational users of the area.

Biodiversity

The Preliminary Desktop Biodiversity and Constraints Assessment (Biosis 2022) identified the key biodiversity values within the Study Area and the potential for the Project to impact on these values.

The Project is located within three Bioregions: Bridgewater, Glenelg Plain and the Victorian Volcanic Plain. A total of 26 ecological vegetation classes (EVCs) are modelled to occur within the Study Area. These EVCs include a range of forest, woodland, wetland, and scrub communities.

The Biosis report identified the Project has potential to impact on the following MNES protected under the EPBC Act:

- Nationally listed threatened species and communities
- Migratory Species
- Ramsar wetlands
- Commonwealth marine areas.

The following threatened terrestrial flora and fauna species (listed under the EPBC Act and/or the FFG Act) have a medium to high likelihood of occurring within the Study Area:

- 99 threatened flora species
- 16 terrestrial bird species
- 34 shorebird species
- 24 terrestrial and aquatic fauna species
- 17 seabird species.

An additional 38 migratory bird species listed under the EPBC Act were also identified as having a medium to high likelihood of occurring within the Study Area. Eight threatened ecological communities are also modelled to occur within the Study Area, including six listed under the EPBC Act and two listed under the FFG Act.

The Glenelg Estuary and Discovery Bay Ramsar Wetlands site provides habitat for nationally and internationally threatened flora and fauna. Bridgewater Lakes form part of the Glenelg Estuary and Discovery Bay Ramsar Wetlands site and is considered a site of state significance as they comprise one of the longest freshwater coastal lake systems in Victoria. The Piccanninnie Ponds Karst Wetlands Ramsar Wetlands site is located to the north of the offshore Project Area on the South Australian coast and is outside the Study Area however it, and supports a number of wetland bird species that have potential to be impacted by the Project.

Potential key construction related impacts are associated with native vegetation removal and the potential loss or fragmentation of habitat for threatened flora and fauna species during the construction of the onshore cabling, transition joint bays and overhead transmission lines (if required). Construction may also result in indirect impacts such as sedimentation from ground disturbance works which may alter habitat conditions in the downstream Glenelg Estuary and Discovery Bay Ramsar Wetlands.

Operation of the Project has potential for threatened and migratory bird species colliding with turbines which may result in injury or mortality. The construction and operation of the Project also has the potential to impact on the ecological character of both aforementioned nearby Ramsar sites, as well as potentially introduce pests or weeds that may impact on native vegetation and/or threatened species and ecological communities.

Social

The Barwon South West Region offers a number of regional support opportunities for development of the renewables sector, including continued growth in wind farm construction and wind turbine development centred around Portland. Tourism is a key industry for the Shire of Glenelg in Victoria and the District Council of Grant and City of Mount Gambier in South Australia, with almost a million tourists visiting the Great South Coast and Limestone Coast regions every year.

The Project has potential to result in social impacts during construction, operation, and decommissioning. Potential key construction related impacts are associated with disruptions to recreational and tourism activities due to reduced access and amenity impacts (visual, noise, traffic) and impacts on the availability and affordability of short-term accommodation during construction. Operation of the Project has the potential to impact on local tourism due to the perceived industrialisation of the landscape from onshore overhead transmission line and offshore wind turbines. In addition, it has the potential to impact on visitor experiences and change the sense of place for coastal communities along the Great South Coast and Limestone Coast.

The Project has potential to generate local and regional benefits, including generating employment and procurement of local businesses/services.

Hydrology

Both onshore transmission line options intersect with Wattle Hill Creek and Surry River and their tributaries. The catchment system for Surry River generally drains towards the north-east, and the catchment system for Wattle Hill Creek drains generally towards the south-east.

There are low, moderate, and high potential groundwater dependent ecosystems mapped within the onshore Study Area for both transmission line options. Surry River has the potential to spread out into a floodplain approximately 1 km wide, while it is expected that flows within Wattle Hill Creek and other tributaries would be relatively contained within the channels.

Soil erosion and sedimentation from construction and decommissioning activities such as trenching or vegetation removal has the potential to impact on the water quality of nearby watercourses and sensitive waterbodies. The presence of Project infrastructure such as access tracks, may increase flood risk or alter drainage flow paths on nearby properties during operation. The discharge of stormwater from the Project Area during operation also has the potential to result in adverse impacts on receiving surface water and groundwater environments.

Cultural heritage

A total of 365 registered Aboriginal places are located within the Study Area. The types of sites include artefact scatters, earth features, shell middens, low density artefact distributions (LDADs), object collections, and an Aboriginal historical place.

There are multiple registered non-Aboriginal cultural heritage values within the onshore Study Area, including seven sites on the Victorian Heritage Register, 20 sites on the Victorian Heritage Inventory, and 13 sites on the Glenelg Planning Scheme Heritage Overlay. There are also six shipwrecks within the Study Area, five located offshore and one located onshore. The Study Area is also likely to contain a range of non-registered cultural heritage material, both Aboriginal and non-Aboriginal.

Disturbance causing activities associated with construction works with the cabling, transition joint bays and transmission lines have potential to disturb registered and non-registered Aboriginal places within the onshore and offshore Study Area resulting in significant impacts on cultural heritage values. Offshore construction works also have potential to impact on the identified registered shipwrecks as well as unidentified relics including aircraft.

Land use

Land uses within the onshore Study Area are predominantly agriculture and forestry plantation, with areas of conservation reserves. There are several areas of public land that intersect with the onshore Study Area (especially transmission line route option 2), comprising parks, reserves, Indigenous protected areas, plantations and permanent streams. The onshore components of the Project are subject to the provisions of the Glenelg Planning Scheme, with majority of the Study Area located within the Farming Zone, Rural Conservation Zone and the Public Conservation and Resource Zone.

The Project has potential to impact on existing land uses within the Study Area during construction, operation and decommissioning. Project works have potential to result in disturbance and/or disruption to existing land uses, including potential disruption (temporary or permanent) to public land uses and public infrastructure such as conservation and recreation reserves. Project infrastructure during operation may result in land use changes that are incompatible or inconsistent with existing land uses and local and/or regional policy, or future land uses for public and private land.

Landscape and visual

The offshore wind farm component of the Project will be visible from several public and private viewpoints along the Victorian and South Australian coastline.

The coastline of the onshore Study Area where subsea cabling option 2 crosses the shoreline is affected by the Significant Landscape Overlay (Schedule 2 - Bridgewater Lakes and Surrounds) under the Glenelg Planning Scheme. This schedule recognises the Bridgewater Lakes as being of State significance for its outstanding visual and scenic qualities. The Discovery Bay Coast, Cape Bridgewater and Cape Nelson are classified as landscapes of State significance in the *Coastal Spaces Landscapes Assessment Study* (Department of Sustainability and Environment, 2006).

Construction of the Project has potential to result in temporary visual impacts on surrounding public open space and/or sensitive receptors during construction and decommissioning of the Project. Operation of the Project has the potential to result in visual impacts from overhead transmission lines, onshore transition joint bays, and offshore wind turbines on public open space and/or sensitive receptors.

Cumulative visual impacts on the Discovery Bay and Portland coastline may also result from the Project and other offshore wind farms in the region.

Coastal issues and soils

There is potential for coastal acid sulfate soils to be present within the onshore Study Area at the landing location of subsea cabling option 2. The landing point of subsea cabling option 1 is not mapped as having potential for acid sulfate soils to be present. The remainder of the onshore Study Area is considered to have a low probability of containing acid sulfate soils. Most of the onshore Study Area is used for agriculture and forestry, which are generally considered to be a low risk of contamination.

Construction activities such as excavation and trenching have potential to disturb acid sulfate soils and/or sediments resulting in potential impacts on the surrounding environment, such as leaching of acidic water into soil and groundwater. Prolonged excavations and stockpiling of acid sulfate soils exposed to rainfall could result in acidic surface water runoff, and inappropriate handling of acid sulfate soils could also impact on human health.

Air quality, noise and vibration

Background noise levels are anticipated to be low in areas of agricultural land and land used for conservation and recreation, whilst higher levels may be experienced near townships like Portland and industrial areas near the Portland Aluminium Smelter and the Port of Portland. Few sensitive receptors (dwellings) lie in close proximity to the Project Area.

Construction and decommissioning of the Project has the potential to generate air emissions and dust from onshore construction works and exhaust emissions from vehicles, barges, and support vessels resulting in potential impacts on nearby sensitive receptors and local air quality. Noise and vibration from construction activities that exceeds guidelines/ threshold levels has potential to impact on sensitive receptors (such as dwellings and public open space). Operation and maintenance activities may also generate air emissions and noise and vibration, resulting in impacts on sensitive receptors.

Transport

The local road network within the onshore Study Area is a combination of State and Council managed roads. Five main arterial roads intersect with the Study Area - Portland-Nelson Road, Bridgewater Road, Henty Highway, Madeira Packet Road and Princes Highway. Two public bus routes also intersect the Study Area, with transmission line option 2 intersecting the inner horizontal surface of the Portland Airport Obstacle Limitation Surface of the Portland Airport in the onshore Study Area.

Construction vehicles have the potential to result in changes to normal traffic and transport conditions, including increased traffic, increased safety risk and impacts on the operation of public transport. Road closures and changes/disruptions to connectivity of the local road network, such as restricted access or requirements for intersection upgrades for over-dimensional vehicles, may also occur during construction works. Operation and maintenance activities also have the potential to result in changes to normal traffic and transport conditions.

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1.0 Introduction

1.1 Background

Umwelt (Australia) Pty Ltd (Umwelt) has been engaged by BlueFloat Energy (BFE) to prepare preliminary environmental assessments to characterise the existing conditions of the Project Area, and identify potential impacts associated with Southern Winds Offshore Wind Project (the Project).

This report summarises potential impacts that may result from the construction, operation, and decommissioning of the Project. The following desktop technical assessments have been undertaken to inform this summary of impacts report:

- Preliminary Desktop Marine Environmental Assessment (BMT, 2022)
- Preliminary Desktop Biodiversity Constraints Assessment (Biosis, 2022)
- Social Risks and Opportunities Analysis (Umwelt, 2022)
- Preliminary Desktop Cultural Hydrology Constraints Assessment (Umwelt, 2022)
- Preliminary Cultural Heritage Constraints Assessment (Umwelt, 2022).

This report also identifies potential impacts associated with landscape and visual, land use, coastal issues and soils, air quality, onshore noise and vibration and transport.

The outcomes summarised in this report identify a suite of preliminary design constraints which can be used to inform the Project design and assist in avoiding or mitigating potential impacts, as well as informing the Project's planning and environmental approval strategy and identifying recommended 'next steps' for the Project. This includes a list of the further environmental assessments expected to be required to support Project assessments and approvals. Key environmental and planning risks have also been identified that may affect the timing, approvals, design, or other elements critical to the Project viability and delivery success.

1.2 Project Description

The Project is located approximately 8-20 kilometres (km) off the coastline between Cape Douglas in South Australia and Nelson in Victoria, approximately 60 km west of Portland. **Figure 1.1** shows the Project Area which contains the offshore and onshore components of the Project, including the transmission line route, associated with its construction, operation and decommissioning.

Within the Project Area, the Project involves 77 'bottom-fixed' wind turbines¹, two offshore substations and associated infrastructure with the capacity to generate up to 1.155 gigawatts (GW) of electricity. The wind turbines will have a capacity between 15 MW and 20 MW, hub heights between 165 m and 190 m and rotor diameters of 250 m to 275 m.

¹ A bottom-fixed turbine is mounted on a structure fixed into the seabed.

Two potential subsea cable and onshore transmission routes are being considered from the offshore substations to the grid connection:

- Option 1 proposes subsea export cables to travel southeast from the offshore substations for approximately 72 km, landing near the north west corner of the Narrawong Coastal Reserve, approximately 1.5 km from the Portland Aluminium Smelter. The subsea cables would be connected to onshore cables in a transition joint bay. The onshore cables would then continue to the existing switchyard at the smelter site (connecting in via a new onshore substation located adjacent to the Portland Aluminium Smelter switchyard).
- Option 2 proposes subsea export cables to travel southeast from the more easterly offshore substation for approximately 42 km, landing near the south-eastern corner of the Glenelg Estuary and Discovery Bay Ramsar site at Cape Bridgewater (avoiding the Discovery Bay Marine National Park). The subsea cables would be connected to onshore cables in a transition joint bay. The onshore cables would then continue underground or overhead north-east through Gorae West for approximately 29 km to the existing Heywood Terminal Station (connecting in via a new onshore substation located adjacent to the terminal station). Transition to an overhead line, if applicable, would likely be located within 5 km of the coast.

It is noted that the transmission route options proposed as part of the Project were identified prior to the release of the Victorian State Governments Offshore Wind Implementation Statement 1 (October 2022) and accordingly the location of the grid connection may be subject to further review and consideration.

The offshore wind farm component of the Project is located within the Territorial Sea and the Exclusive Economic Zone (both Commonwealth Waters), with the grid connection within the Glenelg Local Government Area (LGA) in Victoria. The offshore wind farm component for the Southern Winds OWP would encompass an area of approximately 290km².

1.2.1 Study Area

As shown in **Figure 1.1**, the Study Area extends beyond the Project Area. The purpose of the Study Area is to provide additional context to the existing site conditions and for identification of potential impacts. It provides flexibility in siting and design as a response to the outcomes of Phase 1 and subsequent assessments.

The Study Area includes:

- A 5 km buffer around the offshore wind farm components (offshore wind turbines and offshore substations) and subsea export cable routes up to the shoreline.
- A 2.5 km buffer around the onshore overhead (or underground where needed) transmission line and the onshore substation except where alternatives are considered.

The following definitions apply within the Study Area:

- Offshore refers to all areas from the low water line along the coast out to sea. For the purpose of the Project, the Study Area and Project Area lie in Commonwealth and State Waters (see definitions below).

- Onshore refers to all land-based areas above the low water line.
- State Waters refers to area from the low water line along the coast up to 3 nautical miles seaward.
- Territorial Waters and Contiguous Zone (Commonwealth) refers to land from the State Water boundary up to 12 and 24 nautical miles respectively, from the low water line along to the coast.
- Exclusive Economic Zone extends from the Territorial Waters and Contiguous Zone up to 200 nautical miles from the low water line along to the coast.



Legend

- | | | | | |
|---|---|-------------------------------|--|--|
| Southern Winds Offshore Wind Project Study Area | Southern Winds Offshore Wind Project Area consists of: | Potential turbine layout | Portland airport | Glenelg Estuary and Discovery Bay Ramsar site |
| Southern Winds Onshore Wind Project Study Area | Southern Winds Offshore Wind Project Boundary | Substation | Local Government Boundary | Piccaninnie Ponds Karst Wetlands Ramsar site |
| | Onshore transmission route option 1 | Transition joint bay option 1 | State Forest, National Parks, Reserves | VIC Coastal and Internal Waters |
| | Onshore transmission route option 2 | Transition joint bay option 2 | Roads | Territorial Sea |
| | Subsea cabling option 1 | Heywood terminal station | Drainage line | Exclusive Economic Zone (Amended by Perth Treaty 1997) |
| | Subsea cabling option 2 | Portland aluminium smelter | | |

Data source: VIC Data (2022)

FIGURE 1.1
Study Area

2.0 Impact Screening Methodology

An impact screening has been undertaken through a desktop assessment to identify potential impacts associated with the Project. An ‘impact’ is any change to an environmental, heritage or social asset, value, or use, that would occur because of the Project’s construction, operation, or decommissioning. Potential impacts have been identified for a range of different technical disciplines typically included in an Environment Effects Statement (EES) for a project including offshore wind turbine, transmission line and/or marine aspects, and in consideration of those disciplines whose desktop studies would help inform and identify critical survey requirements and EES / EIS study program content, including marine, biodiversity, social, hydrology, cultural heritage, land use, landscape and visual, coastal issues and soils, air quality, noise and vibration and transport.

The impact screening process involved the following key steps:

- Establishing the existing conditions or baseline conditions on which to identify and assess potential impacts.
- Considering the Project design, construction, operation, and decommissioning activities in the context of the existing conditions.
- Identifying potential impact pathways between Project elements and environmental receptors.

An overview of this process is shown in **Figure 2.1**.

The desktop assessment included a review of publicly available databases, literature, mapping, and desktop studies previously undertaken by BFE. Based on the outcomes of the desktop assessment and the identification of potential impacts, preliminary design constraints were then identified to inform Project design and assist in avoiding or mitigating potential impacts.

The impact screening has also been used to inform the Project’s planning and environmental approval strategy and inform the recommended ‘next steps’ for the Project including further environmental assessments required to inform Project approvals.

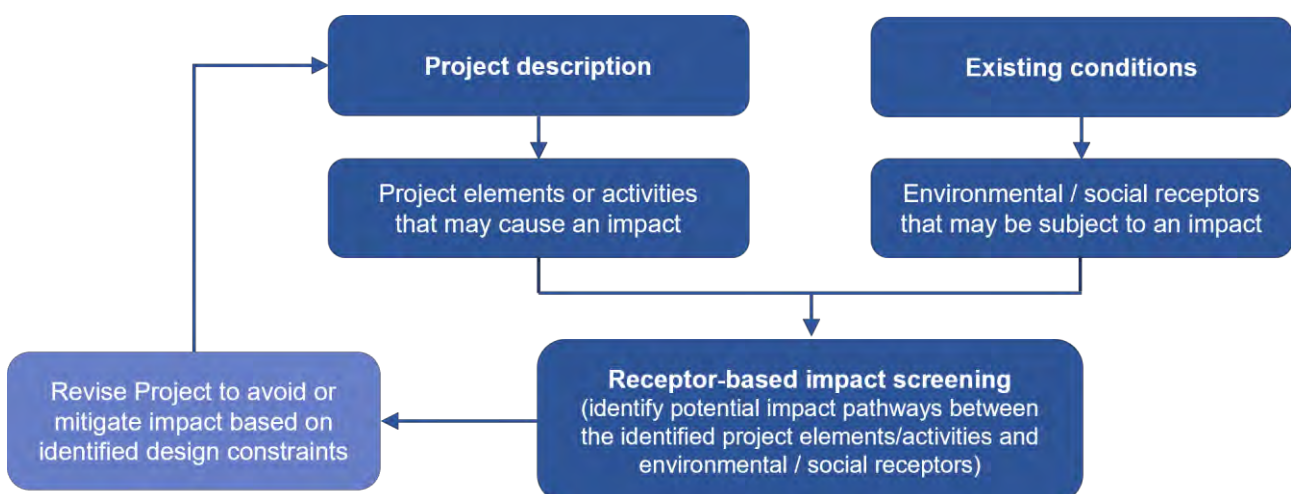


Figure 2.1 Impact Screening Methodology

3.0 Marine

This section summarises the information provided in the Preliminary Desktop Marine Environmental Assessment prepared by BMT (October 2022).

3.1 Existing Conditions

The desktop marine environment assessment has considered the offshore component of the Study Area (see **Figure 1.1**) and does not consider the onshore component of the Study Area.

The offshore components of the Project are located off the South Australian and Victorian coast, within the south-eastern marine region. The region is generally considered to have low productivity (a low production of organic matter by phytoplankton), except for localised hotspots including the Bonney Coast Upwelling² within which the Project lies and is a Key Ecological Feature (KEF) of the marine environment (Department of Environment, 2015).

The current within the Study Area generally flows in an easterly direction towards Bass Strait. Generally, the area has a very active wave environment with high winds. Deakin University maintain a wave and current buoy at Cape Bridgewater which reports wave heights of up to 8 m in the winter months, with summer providing calmer conditions. The water temperature varies, but averages around 14°C in winter and 16 to 17°C in summer.

3.1.1 Glenelg, Discovery Bay and Cape Nelson Biounits

The offshore Study Area intersects with the Glenelg biounit which is located within Victorian coastal waters. The biounit is characterised by extreme exposure to prevailing weather. It is dominated by infralittoral rock and sublittoral sediment³ (Victorian Environmental Assessment Council, 2019). The natural values of this biounit include:

- One of 12 sites worldwide that is a feeding area for the Blue Whale (*Balaenoptera musculus*).
- Contains extensive habitat for the Hooded Plover (*thinornis cucullatus*), which nests along the coastline.
- Contains the Nelson Reefs on the South Australian border which harbour important giant kelp beds.
- Contains the Noble Rocks which are unique as the only rocky reef along an otherwise sandy coastline.

The Study Area surrounding the option 2 subsea cable route is located within the adjacent Discovery Bay biounit, which is dominated by infralittoral fine sand, with some low-profile reef communities (Victorian Environmental Assessment Council, 2019). The natural values of this biounit include:

² The Bonney Coast Upwelling is a predictable, seasonal upwelling bringing cold nutrient rich water to the sea surface and supporting regionally high productivity and high species diversity in an area where such sites are relatively rare and mostly of smaller scale (Department of Climate Change, Energy, the Environment and Water, 2022)

³ Infralittoral rock includes habitats of bedrock which occur in the shallow subtidal zone. Sublittoral sediment is the sediment near shore zone and covers infralittoral zones. Sediment ranges from larger rocks and boulders through to pebbles, coarse sand, fine sands and mixed sediments.

- One of 12 sites worldwide that is a feeding area for the Pygmy Blue Whale (*Balaenoptera musculus*).
- High numbers of southern right whales and the Southern Elephant Seal (*Mirounga leonine*) recorded.
- A haul out (a location on land where seals come ashore to rest) and occasional breeding site for the Australian fur-seal (*Arctocephalus pusillus doriferus*).
- Contains extensive habitat for the hooded plover along the shoreline.
- Provides feeding and roosting habitat for endangered seabirds (including the southern giant petrel (*macronectes giganteus*) and wandering albatross (*Diomedea exulans*).
- Provides nursery habitat for the great white shark (*Carcharodon carcharias*) and grey nurse shark (*Carcharias taurus*).
- Provides nursery habitat for the southern bluefin tuna (*thunnus maccoyii*).
- Contains the most productive abalone habitat in Victoria (west of Cape Bridgewater).
- Provides reef for sessile invertebrates (sponges, ascidians, bryozoans, gorgonians).

The Study Area surrounding the option 1 subsea cable route is located within the Cape Nelson biounit, which is characterised by high-energy, wave-dominated beaches and rocky shores, sublittoral reef and sediments, coastal cliffs, and lagoons. The natural values of this biounit include:

- Aggregation area for the southern right whale *Eubalaena australis*.
- Deen Maar supports an Australian fur seal breeding colony *Arctocephalus pusillus* and White Sharks also occur near this area.
- Important area for seabirds (Common Diving-petrel *Pelecanoides urinatrix*, Fairy Prion *Pachyptila turtur*, Caspian Tern *Hydroprogne caspia*, Little Penguin *Eudyptula minor*, White-bellied Sea Eagle *Haliaeetus leucogaster* and Shy Albatross *Thalassarche cauta*) and migratory shorebird breeding area. The biounit also supports the highest breeding density of Hooded Plovers.
- Rocky reefs support diverse fish, invertebrate and macroalgae communities.
- Seagrass meadows in Portland Bay supports populations of kingfish, whiting, flathead, mulloway and snapper, as well as rare Brown Algae *Cystophora cymodocea*.
- Dutton Way beach supports rare snapping shrimp *Alpheus australosulcatus*.
- Highest breeding density of hooded plovers and migratory shorebird breeding area.
- Port Fairy Boulder shores include basalt boulders with steep drop-off and protected lagoons which support high biodiversity of micro-habitats, and associated flora and fauna.
- Protected listed communities and species (e.g. Orange-bellied Parrot *Neophema chrysogaster*), endemic or rare species particularly vulnerable to environmental change.

3.1.2 Protected Areas

The Discovery Bay Marine National Park is located within the Study Area (see **Figure 4.2**). The subsea cabling options both avoid the Discovery Bay Marine National Park and would be located to its north and south. The marine park is recognised as an important habitat for commercial fish, including tuna and mackerel (Director of National Parks, 2013), and is a key migratory area for humpback, fin, blue and sei whales.

The Study Area also intersects with the South Australian Lower South East Marine Park, however no infrastructure will be located within the park. The sanctuary zone within the park protects several values - seabed habitats including rocky reef and soft-sediment habitat, important shorebird roosting and feeding areas, shallow macroalgae beds and the intertidal rock reef at Frenchy Point that supports diverse invertebrate fauna (Marine Park Local Advisory Group, 2010).

Two Ramsar wetlands are located within proximity to, and adjacent to, the offshore Study Area. The Glenelg Estuary and Discovery Bay Ramsar Wetlands site⁴ is located adjacent to the offshore Study Area (and within the onshore Study Area) and the Piccaninnie Ponds Karst Ramsar Wetlands site is located within the South Australian coastline approximately 3.5 km from the offshore Study Area. Ramsar wetlands are discussed further in **Section 4.1.23.0**.

3.1.3 Other Marine Uses

3.1.3.1 Fisheries

The Bonney Coast Upwelling helps to increase the primary productivity⁵ of Discovery and Bridgewater Bays to support a variety of marine habitats such as the *Heterozostera* seagrass meadows that provide an important nursery and feeding ground for a range of commercially important species.

There are a number of Protected Aquatic Biota (PABs) declared under the Victorian *Fisheries Act 1995*. These include Syngnathidea (i.e. seahorses, pipefish and seadragons) and the great white shark. A permit is required from the Victorian Fisheries Authority to take, injure, damage or destroy protected aquatic biota under Section 72 of the Victorian *Fisheries Act 1995*.

A number of commercial fisheries exist within the Study Area and its surrounds. Within Commonwealth waters these include the southern and eastern Scalefish and Shark Fishery, the Southern Squid Jig Fishery, the small pelagic fishery and the Southern Tuna and Billfish Fishery.

Within Victorian state waters, there are fishery access licenses issued under Section 38 of the Victorian *Fisheries Act 1995* for western rock lobster, abalone and pipis (Victorian Environmental Assessment Council, 2019). The area between Cape Nelson and Cape Bridgewater has previously been reported as the largest catch of Blacklip Abalone *Haliotis rubra* in the Western Zone of Victoria. A large number of species are recorded to have been caught nearby off Portland by commercial and recreational users including Australian Salmon *Arripis trutta*, Bluethroat Wrasse *Notolabrus tetricus*, Giant Crab *Pseudocarcinus gigas*, Gummy Shark *Mustelus antarcticus*, King George Whiting *Sillaginodes punctatus*, Ocean Jacket *Nelusetta ayraud*, Pale Octopus *Octopus pallidus*, Pipi *Donax deltooides*, School Shark *Galeorhinus galeus*, Silver Trevallies *Pseudocaranx spp*, Snapper *Chrysophrys auratus*, Southern Rock Lobster *Jasus edwardsii* and

⁴ This is Australia's newest Ramsar wetland

⁵ Primary productivity is the rate at which energy is converted to organic matter (predominantly by phytoplankton), which is then consumed by both marine herbivores and carnivores.

Southern Sand Flathead *Platycephalus bassensis*. Key nursery habitat for the Endangered Southern Bluefin Tuna *Thunnus maccoyii* is also identified within the Study Area.

There are no aquaculture leases within the Study Area.

The fishing industry is one of the largest employers in the region, including indirect employment such as fish processing, marine engineering, ship building and maintenance. Commercial fishing directly from Portland involves fishing for sharks, abalone, crayfish and squid. Port MacDonnell houses Australia's largest rock lobster fishing fleet.

3.1.3.2 Recreation

There are a few locations along the Discovery Bay Coastal Park that are accessible by 4WD and are popular for hiking trails (e.g. Great South West walking track) and recreational camping. These areas include Lake Monibeong, White Beach and Cape Bridgewater. The Great South West walking track extends along the Discovery Bay coastline within the Discovery Bay Coastal Park. The naturalness and wildlife of the area are a unique drawcard for many visitors to the region.

Cape Bridgewater is a popular destination for whale watching, visiting seal colonies and bushwalking. Surfing and diving are also popular activities around the headland. There are two recreational boat ramps, one at Portland and one at Nelson. There are several whale watching and fishing charters that launch from Portland and may visit the Study Area.

3.1.3.3 Shipping and Navigation

The 2021 vessel tracking information for the region shows the main shipping channel from the Port of Melbourne to Port Adelaide is within proximity to the Study Area (Marine Traffic, 2022) (see **Figure 3.1**), with between 35,000 to 200,000 vessel movements per year (Marine Traffic, 2022).

Further consultation with the major shipping ports and Harbor Masters will be required to understand if the offshore wind turbines represent a navigational hazard for larger container vessels.

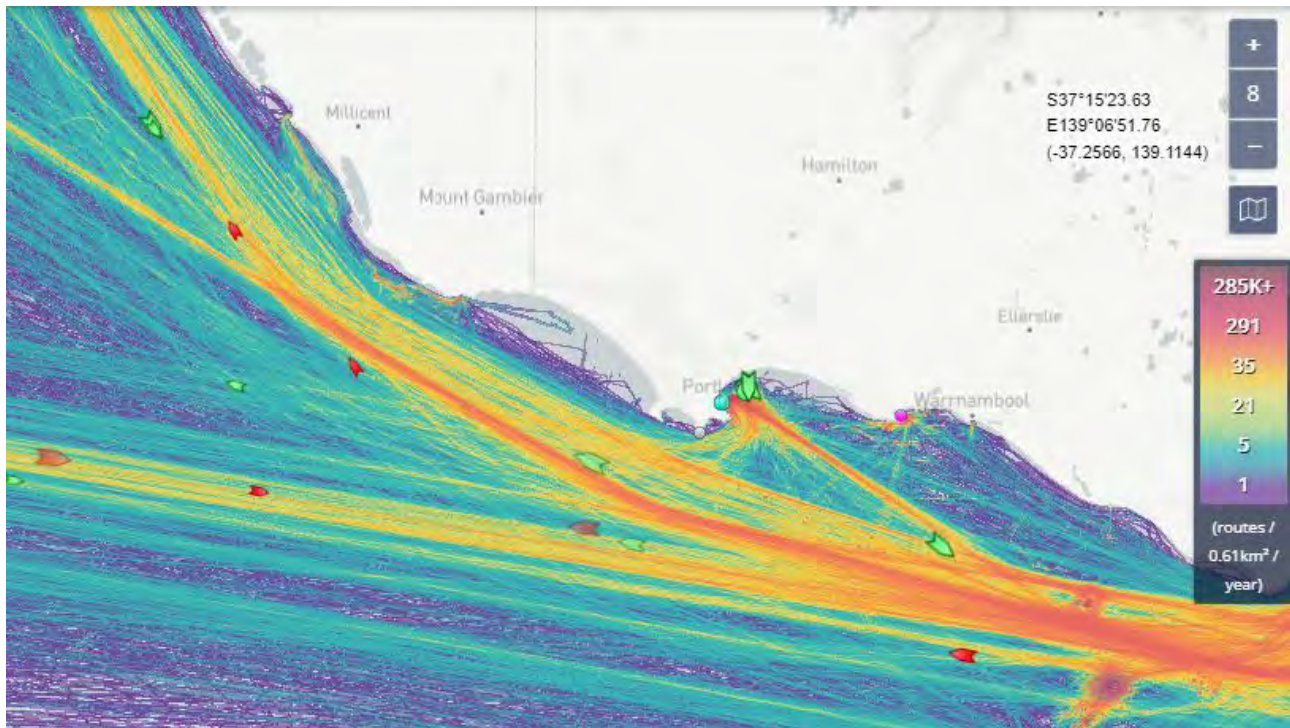


Figure 3.1 Vessel Tracking (Marine Traffic, 2022)

3.1.4 Benthic Environment and Habitats

Seamap Australia mapping shows the nearshore environment along the coastline within the Study Area as containing seagrass (mixed reef) and undifferentiated algae / invertebrates.

Some reef is also identified as being located along the shoreline adjacent to the Study Area. These reefs are classed as basalt reefs (dominated by kelp including large brown kelp (*Ecklonia radiata*)) and calcarenite reefs (including sponges, ascidians, bryozoans and gorgonians).

Unique biotypes (a group of organisms with the same genetic material) within the region include benthic vegetation (brown algae, bull kelp, and common kelp) and sessile invertebrates (animals without backbones that are attached to the reef), which include a high diversity of sponge and seawhip assemblages (related groups of species populations that occur together).

3.1.5 Biologically Important Areas

The offshore Study Area is nominated as a Biologically Important Area (BIA) for the following species:

- Whales: foraging habitat and high use area for Pygmy Blue Whale *Balaenoptera musculus breviceauda*, aggregation, migration and resting areas for Southern Right Whale *Eubalaena australis*.
- Seabirds (foraging only): Antipodean Albatross *Diomedea exulans antipodensis*, Wandering Albatross *Diomedea exulans*, Wedge-tailed Shearwater *Ardenna pacifica*, Common Diving-petrel *Pelecanoides urinatrix*, Buller's Albatross *Thalassarche bulleri*, Indian Yellow Nosed Albatross *Thalassarche chlorohychnos bassi*, Black-browed Albatross *Thalassarche melanophris*, and Campbell Albatross *Thalassarche melanophris impavida*.

- Sharks: foraging area for the White Shark *Carcharodon carcharias*.

3.1.6 Threatened Marine Fauna Species

Based on a search of the EPBC Protected Matters Search Tool (PMST), this section provides an overview of the listed threatened species and listed migratory marine species that have potential to occur within the offshore Study Area. This includes marine fauna (whale, dolphin, seal, turtle, shark and fish and marine benthic species), with threatened bird and bat species, and terrestrial threatened ecological communities which are addressed in **Section 4.0**.

Based on a search of the EPBC PMST, sixty-two (62) listed threatened and migratory marine fauna species are likely to occur within the offshore Study Area. Of these, 48 are listed under the EPBC Act and 25 are listed under the *Flora and Fauna Guarantee Act 1988* (FFG Act). These include:

- 12 whale, dolphin, and seal species
- 3 turtle species
- 34 shark and fish species
- 13 marine benthic species.

3.1.6.1 Whale, Dolphin, and Seal Species

Table 3.1 identifies the listed threatened whale, dolphin and seal species that have potential to occur within the offshore Study Area.

Table 3.1 Whale, Dolphin, and Seal species likely to occur within the offshore Study Area

Common Name	Scientific Name	Conservation Status	
		EPBC	FFG
Long-nosed fur-seal	<i>Arctocephalus forsteri</i>	Marine	V
Australian fur seal	<i>Arctocephalus pusillus</i>	Marine	
Sei Whale	<i>Balaenoptera borealis</i>	VU, Migratory	
Blue Whale	<i>Balaenoptera musculus</i>	EN, Migratory	Cr
Fin Whale	<i>Balaenoptera physalus</i>	VU, Migratory	
Pygmy right whale	<i>Caperea marginate</i>	Migratory	
Southern Right Whale	<i>Eubalaena australis</i>	EN, Migratory	Cr
Humpback Whale	<i>Megaptera novaeangliae</i>	Migratory	V
Killer Whale	<i>Orcinus orca</i>	Migratory	
Australian Sea Lion	<i>Neophoca cinerea</i>	Endangered	E
Dusky Dolphin	<i>Lagenorhynchus obscurus</i>	Migratory	
Sperm Whale	<i>Physeter macrocephalus</i>	Migratory	

Table Note: EPBC Status: EN = Endangered, CR = Critically Endangered, VU = Vulnerable. FFG Status: Cr= Critically Endangered, E = Endangered, V = Vulnerable, Cd = Conservation Dependent

In the east of the Study Area at Cape Bridgewater, there is a known colony of Australian sea lions and long-nose fur seal. It is likely that individual animals forage within the Study Area and may be sensitive to physical disturbance and underwater noise or vibration. The Australian fur seal *Arctocephalus pusillus* is

also known to occur in the Study Area, although breeding is restricted to a small number of rocky islands or headlands mostly in Bass Strait.

The Southern Right Whale *Eubalaena australis* migrates between summer feeding areas in the Southern Ocean to inshore coastal waters off Australia. The western coastal areas of Victoria are classified as a large established aggregation area where calving occurs for this species (Department of Sustainability, Environment, Water, Population and Communities (DSEWPC), 2012). The Portland area is a BIA for these whales and has been highlighted as a key area for breeding females. Nine Southern Right Whale *Eubalaena australis* sightings were collected via DELWP monitoring programs and public sighting reports in 2020 in the vicinity of the Study Area (State Wide Integrated Flora and Fauna Teams (SWIFFT), 2020). The importance of the Portland area for females with calves is also identified in Stamation et al. (2020), which highlights the Study Area as being a key area for breeding females. The 2021 season sighting data was collected by SWIFFT from public sightings data and submitted photos. Recordings includes several cow-calf pairs near Portland.

Blue Whales *Balaenoptera musculus* are regularly present in the Bonney Coast Upwelling between December and April/May, and their presence has been linked to surface swarms of coastal krill that form in response to the upwelling of nutrient rich, cool water (CSIRO, 2004). The area is recognised as one of 12 locations in the world where this species is regularly observed in high numbers. To the west of Portland, where the upwelling surfaces, whales often aggregate in a relatively narrow band around a mean depth of 86 m, along or near surface temperature fronts. Noise interference is cited in the Blue Whale Conservation Plan (Australian Government, 2015) as being a potential threat to the species, causing avoidance behaviour. Potential forms of noise interference include seismic and drilling operations, mining, some types of dredging, infrastructure construction and operation, vessel noise and low flying planes and chronic vessel noise.

Other threatened whale species may occur occasionally in the Study Area such as fin *Balaenoptera physalus* and sei whales *Balaenoptera borealis* however, these are infrequently recorded and tend to occur further offshore (i.e. 20 – 60 km) (Species Profile and Threats Database (SPRAT), 2021) with no known mating or calving activity in Australian waters.

3.1.6.2 Turtles

Table 3.2 identifies the listed threatened turtle species that have potential to occur within the offshore Study Area.

Table 3.2 Turtle species with potential to occur within the offshore Study Area

Common Name	Scientific Name	Conservation Status	
		EPBC	FFG
Loggerhead Turtle	<i>Caretta caretta</i>	EN, Migratory	
Green Turtle	<i>Chelonia mydas</i>	VU, Migratory	
Leatherback Turtle	<i>Dermochelys coriacea</i>	EN, Migratory	Cr

Table Note: EPBC Status: EN = Endangered, CR = Critically Endangered, VU = Vulnerable. FFG Status: Cr= Critically Endangered, E = Endangered, V = Vulnerable, Cd = Conservation Dependent

Sightings of threatened turtle species along the shoreline are uncommon, although they would be using the nutrient rich waters surrounding the Study Area for feeding purposes on occasion. The Study Area is not likely to be a key habitat for turtles.

3.1.6.3 Sharks and Fish

Table 3.3 identifies the listed threatened shark and fish species that have potential to occur within the offshore Study Area.

Table 3.3 Shark and fish species with potential to occur within the offshore Study Area

Common Name	Scientific Name	Conservation Status	
		EPBC	FFG
Shortfin mako	<i>Isurus oxyrinchus</i>	Migratory	
Australian grayling	<i>Prototroctes maraena</i>	VU	E
White shark	<i>Carcharodon carcharias</i>	VU, Migratory	E
Grey nurse shark	<i>Carcharias taurus</i>		CR
Porbeagle	<i>Lamna nasus</i>	Migratory	
Eastern dwarf galaxias	<i>Galaxiella pusilla</i>	VU	E
Yarra pygmy Perch	<i>Nannoperca obscuras</i>	VU	
School shark	<i>Galeorhinus galeus</i>	CD	
Blue warehou	<i>Seriolella brama</i>	CD	Cd
Southern bluefin tuna	<i>Thunnus maccoyii</i>	CD	Cd
Upside down fish	<i>Heraldia nocturna</i>	Marine	
Big bellied seahorse	<i>Hippocampus abdominalis</i>	Marine	
Short-headed seahorse	<i>Hippocampus breviceps</i>	Marine	
Crested pipefish	<i>Histiogamphelus briggsii</i>	Marine	
Rhino pipefish	<i>Histiogamphelus cristatus</i>	Marine	
Deepbody pipefish	<i>Kaupus costatus</i>	Marine	
Brushtail pipefish	<i>Leptiochthys fistularius</i>	Marine	
Australian smooth pipefish	<i>Lissocampus caudalis</i>	Marine	
Javelin pipefish	<i>Lissocampus runa</i>	Marine	
Sawtooth pipefish	<i>Maroubra perserrata</i>	Marine	
Tuckers pipefish	<i>Mitotichys tuckeri</i>	Marine	
Red pipefish	<i>Notiocampus ruber</i>	Marine	
Leafy seadragon	<i>Phycodurus eques</i>	Marine	
Common seadragon	<i>Phyllopteryx taeniolatus</i>	Marine	
Pugnose pipefish	<i>Pugnaso curtirostris</i>	Marine	
Robust pipehorse	<i>Solegnathus robustus</i>	Marine	
Spiny pipehorse	<i>Solegnathus spinosissimus</i>	Marine	
Spotted pipefish	<i>Stigmatopora argus</i>	Marine	
Wide-bodied pipefish	<i>Stigmatopora nigra</i>	Marine	
Ringback pipefish	<i>Stipecampus cristatus</i>	Marine	
Hairy pipefish	<i>Urocampus carinirostris</i>	Marine	
Mother of pearl pipefish	<i>Vanacampus margaritifer</i>	Marine	
Port Phillip pipefish	<i>Vanacampus phillipi</i>	Marine	
Longsnout pipefish	<i>Vanacampus peocilolaemus</i>	Marine	

Table Note: EPBC Status: EN = Endangered, CR = Critically Endangered, VU = Vulnerable. FFG Status: Cr= Critically Endangered, E = Endangered, V = Vulnerable, Cd = Conservation Dependent

The White Shark *Carcharodon carcharias* is widely, but not evenly distributed in Australian waters. The Study Area is mapped as a BIA for the White Sharks (for foraging purposes only). Given the proximity of a sea lion and fur seal colony at Cape Bridgewater, the Study Area may attract number of White Sharks.

The Australian Grayling *Prototroctes maraena*, Eastern Dwarf Galaxias *Galaxiella pusilla* and Yarra Pygmy Perch *Nannoperca obscura* are threatened freshwater fish that are known to inhabit rivers and creeks in the Discovery Bay region (SWIFFT, 2022). The species migrate out to sea for a period of time during the larvae phase.

A number of other fish and Syngnathidae species were recorded in the EPBC PMST, although none of them are listed as threatened or migratory species. These include pipefishes, seahorses and starfish however, these are normally associated with vegetation in sheltered or exposed reef area at a range of 0 to 50 m, but most commonly at depths of between 5 m and 25 m. Given the lack of potential habitat near the offshore wind turbines, these species are not likely to occur in proximity to the wind farm, but may occur closer to shore.

3.1.6.4 Marine Benthic Species

Table 3.4 identifies the threatened marine benthic species that have potential to occur within the offshore Study Area. There are no EPBC listed species.

Table 3.4 Marine benthic species with potential to occur within the offshore Study Area

Common Name	Scientific Name	Conservation Status	
		EPBC	FFG
Ghost shrimp species	<i>Eucalliax tooradin</i>		E
Ghost shrimp species	<i>Michelea microphylla</i>		V
Brittle star species	<i>Amphiura trisacantha</i>		Cr
Sea-cucumber species	<i>Apsolidium densum</i>		E
Sea-cucumber species	<i>Apsolidium handrecki</i>		E
Brittle star species	<i>Ophiocomina australis</i>		Cr
Sea-cucumber species	<i>Pentocnus bursatus</i>		Cr
Sea-cucumber species	<i>Thyone nigra</i>		E
Sea-cucumber species	<i>Trochodota shepherdii</i>		Cr
Stalked hydroid species	<i>Ralpharia coccinea</i>		Cr
Chiton species	<i>Bassethullia glypta</i>		Cr
Marine opisthobranch species	<i>Platydoris galbana</i>		E
Marine opisthobranch species	<i>Rhodope rousei</i>		Cr

Table Note: EPBC Status: EN = Endangered, CR = Critically Endangered, VU = Vulnerable. FFG Status: Cr= Critically Endangered, E = Endangered, V = Vulnerable, Cd = Conservation Dependent

3.1.7 Threatened Ecological Communities

The Giant Kelp Marine Forests of South East Australia Threatened Ecological Community (TEC), listed as Endangered under the EPBC Act, has the potential to occur within the eastern and western sections of the nearshore environment around Cape Bridgewater and Nelson.

Commonwealth mapping of the likely extent of this TEC identifies the TEC as 'maybe occurring' (Department of the Environment, 2022).

3.1.8 Commonwealth Marine Areas

The Commonwealth marine area commences three nautical miles from Lowest Astronomical Tide (LAT) (as defined under the *Seas and Submerged Lands Act 1973* from the coastline). The offshore wind turbines, majority of cabling and two offshore sub-stations are all within the Commonwealth marine area; the subsea cabling connecting into the onshore grid system is also located within State waters.

The Study Area is located within the Bonney Coast Upwelling KEF. This is a seasonal upwelling that brings cold nutrient rich water to the sea surface and is a high productivity area. This in turn attracts a high diversity of species, in particular it is a key feeding area for Blue Whales *Balaenoptera musculus* and many other listed species. The abundance of krill in the Bonney Coast Upwelling is a food source for many seabirds and fish which then attracts penguins and seals which feed on them. It regularly occurs between November/December and March/April annually (CSIRO, 2004).

3.1.9 Matters of National Environmental Significance

Under the EPBC Act, an action may require approval if the action has, will have, or is likely to have, a significant impact on a Matter of National Environmental Significance (MNES). Of the nine MNES protected under the EPBC Act, the BMT report identified that the Project has the potential to significantly impact on the following three MNES within the offshore marine Study Area:

- Listed threatened species and ecological communities
- Migratory species
- Commonwealth marine areas.

In accordance with the *Matters of National Environmental Significance Significant Impact Guidelines 1.1*, a person who proposes to take an action that will have, or is likely to have, a significant impact on a MNES must refer that action to the minister for a decision on whether assessment and approval is required under the EPBC Act.

Table 3.5 Summary of Desktop Assessment Outcomes – Marine

Summary of Assessment Outcomes	
<ul style="list-style-type: none"> • The Discovery Bay Marine National Park is located within the Study Area and is recognised as an important habitat for commercial fish, including tuna and mackerel, and is also a key migratory area for whales, including humpback, fin, blue and sei whales. No Project infrastructure will be located within the national park. • The Glenelg, Discovery Bay and Cape Nelson biounits are located in State Waters of the offshore Study Area. Option 1 of the subsea cabling intersects with the Cape Nelson biounit. Option 2 of the subsea cabling intersects with the Discovery Bay biounit. The biounits hold great environment value including: <ul style="list-style-type: none"> ○ One of 12 sites worldwide that is a feeding area for the Blue Whale (<i>Balaenoptera musculus</i>). ○ Contains extensive habitat for the Hooded Plover (<i>thinornis cucullatus</i>), which nests along the coastline. ○ Contains the Nelson Reefs on the South Australian border which harbour important giant kelp beds. ○ Contains the Noble Rocks which are unique as the only rocky reef along an otherwise sandy coastline. • Two Ramsar wetlands are located within proximity to, and adjacent to, the offshore Study Area: Glenelg Estuary and Discovery Bay Ramsar Wetlands site located adjacent to the offshore Study Area (and within the onshore Study Area) and the Piccaninnie Ponds Karst Ramsar Wetlands site is located within the South Australian coastline. • Several commercial fisheries exist within the Study Area or nearby surrounds. The fishing industry is one of the largest employers in the region, including indirect employment such as fish processing, marine engineering, ship building and maintenance. • The main shipping channel from the Port of Melbourne to the Port Adelaide is within proximity to the Study Area, with between 35,000 to 200,000 vessel movements per year within the region. • Marine recreational activities are limited within the Study Area. There are two boat ramps at Portland and Nelson, although numbers of recreational fishers would be expected to be low within the Study Area given the high wave environment and often dangerous conditions. • The nearshore environment along the coastline within the Study Area is mapped as seagrass (mixed reef) and undifferentiated algae / invertebrates. Some reef is also identified along the shoreline adjacent to the Study Area. • Three MNES protected under the EPBC Act have potential to be impact by the offshore component of the Project: Nationally listed threatened species, listed migratory species and Commonwealth marine areas. • The Study Area is located within the Bonney Coast Upwelling KEF. This is a seasonal upwelling that brings cold nutrient rich water to the sea surface and is a high productivity area. This in turn attracts a high diversity of species, in particular it is a key feeding area for blue whales as well as many other listed species. • 48 threatened and migratory marine fauna species have potential to occur within the offshore Study Area based on a search of the EPBC PMST: <ul style="list-style-type: none"> ○ 33 bird species ○ 5 fish species ○ 5 marine mammal species (4 whale and 1 seal) ○ 3 turtle species ○ 2 shark species. ○ 13 marine benthic species. 	

3.2 Potential Impacts

Following definition of the existing environmental context of the Project site and surrounding area, potential marine impacts have been identified with consideration of the Project design, construction, operation, and decommissioning activities in the context of the existing conditions. An overview of these potential impacts is provided in **Table 3.6**.

Table 3.6 Potential Impacts – Marine

Impact	Project Component	Phase
Loss of sensitive marine habitats results in habitat fragmentation for benthic communities and the values they support, as well as displacement of listed threatened/migratory species.	Offshore	Operation
Pile driving results in noise impacts on marine fauna including threatened and listed migratory species (whales/dolphins, pinnipeds, turtles, sharks) and species of high fishery significance (finfish, rock lobster).	Offshore	Construction Decommissioning
Pile driving and dredging generate sediment plumes and increase turbidity, resulting in impacts on light sensitive habitats or fauna species.	Offshore	Construction Decommissioning
Disturbance of contaminated or acidic sediments impact on water quality within the marine environment.	Offshore	Construction Decommissioning
Vessel movements strike marine fauna, particularly large slow-moving fauna near the water's surface such as whales.	Offshore	Construction Operation Decommissioning
Vessels introduce marine pests into the study area through biofouling or the release of ballast water impacting on the marine environment (such as fisheries productivity).	Offshore	Construction Operation
A spill or uncontrolled release of fuels, oils, lubricants, bio-fouling paints, and other chemicals stored and/or used by vessels, wind turbines and facilities results in lethal and sub-lethal impacts on marine organisms.	Offshore	Construction Operation Decommissioning
Bird species (seabirds, migratory birds, and parrots) collide with offshore wind turbines during operation resulting in injury or mortality.	Offshore	Operation
Offshore wind turbines generate noise and vibration resulting in impacts on marine fauna behaviour, such as changes in avoidance or attraction responses, and masking of fauna sounds.	Offshore	Operation
Electrical cables between the offshore wind turbines, offshore substation and shore-based facilities produce electromagnetic fields, impacting on marine invertebrate and vertebrate fauna species.	Offshore	Operation
Presence of marine structures (offshore wind turbines, offshore substation) alter local hydrodynamic processes resulting in localised changes to sedimentary processes (such as scour and sediment deposit).	Offshore	Operation
Navigational or hazard lighting on offshore wind turbines impact on marine species, including seabird and fish species, through behavioural changes such as avoidance, disorientation or reduced reproductive effort.	Offshore	Operation

Impact	Project Component	Phase
Offshore wind turbines become colonised by benthic flora and fauna species and act as fish aggregation devices, which may increase predators to the area and result in localised changes to the marine communities in the vicinity of the wind turbines.	Offshore	Operation
Temporary exclusion zones around offshore wind turbines during construction (approximately 500 m per pylon) impact on recreational users.	Offshore	Construction
Exclusion zones around offshore wind turbines during operation (approximately 50 m per pylon) impacts on recreational users.	Offshore	Operation

4.0 Biodiversity

This section summarises the information provided in the Preliminary Desktop Biodiversity and Constraints Assessment prepared by Biosis Pty Ltd (October, 2022).

This section relates to terrestrial, aquatic, and coastal biodiversity values. Marine biodiversity is discussed in **Section 3.0**.

4.1 Existing Conditions

4.1.1 Vegetation

The Study Area for terrestrial, aquatic and coastal biodiversity values is located within three Bioregions; Bridgewater, Glenelg Plain and the Victorian Volcanic Plain. A total of 26 Ecological Vegetation Classes (EVCs) across the three bioregions are modelled to occur within the Study Area (see **Figure 4.1**). These EVCs are outlined in **Table 4.1** and include a range of forest, woodland, wetland and scrub communities.

Table 4.1 Modelled EVCs within the Study Area

EVC	Bioregional Conservation Status	Modelled extent (ha) within study area
EVC 03 – Damp Sands Herb-rich Woodland	Vulnerable	2,509
EVC 05 – Coastal Sand Heathland	Rare	33
EVC 06 – Sand Heathland	Rare	89
EVC 10 – Estuarine Wetland	Endangered	19
EVC 16 – Lowland Forest	Least Concern	7,257
EVC 23 – Herb-rich Foothill Forest	Vulnerable	4,437
EVC 48 – Heathy Woodland	Least Concern	1,170
EVC 53 – Swamp Scrub	Vulnerable and Endangered	176
EVC 132 – Plains Grassland	Endangered	5
EVC 160 – Coastal Dune Scrub	Least Concern	1,295
EVC 161 – Coastal Headland Scrub	Vulnerable and Endangered	605
EVC 198 – Sedgy Riparian Woodland	Vulnerable	0.5
EVC 200 – Shallow Freshwater Marsh	Endangered	60
EVC 650 – Heathy Woodland/Damp Heathy Woodland/Damp Heathland Mosaic	Vulnerable	3,473
EVC 651 – Plains Swampy Woodland	Endangered	7
EVC 664 – Limestone Ridge Woodland	Vulnerable	5
EVC 680 – Freshwater Meadow	Endangered	57
EVC 681 – Deep Freshwater Marsh	Vulnerable	220
EVC 682 – Permanent Open Freshwater	N/A	71
EVC 684 – Permanent Saline	N/A	17
EVC 713 – Damp Sands Herb-rich Woodland/Damp Heathland/Damp Heathy Woodland Mosaic	Vulnerable	982

EVC	Bioregional Conservation Status	Modelled extent (ha) within study area
EVC 746 – Damp Heathland/Damp Heathy Woodland Mosaic	Depleted and Vulnerable	459
EVC 762 – Damp Heathland/Sand Heathland Mosaic	Depleted	97
EVC 797 – Coastal Landfill/Sand Accretion	N/A	37
EVC 858 – Coastal Alkaline Scrub	Endangered and Least Concern	7,763
EVC 876 – Spray-zone Coastal Shrubland	Rare and Endangered	102
Total		30,945

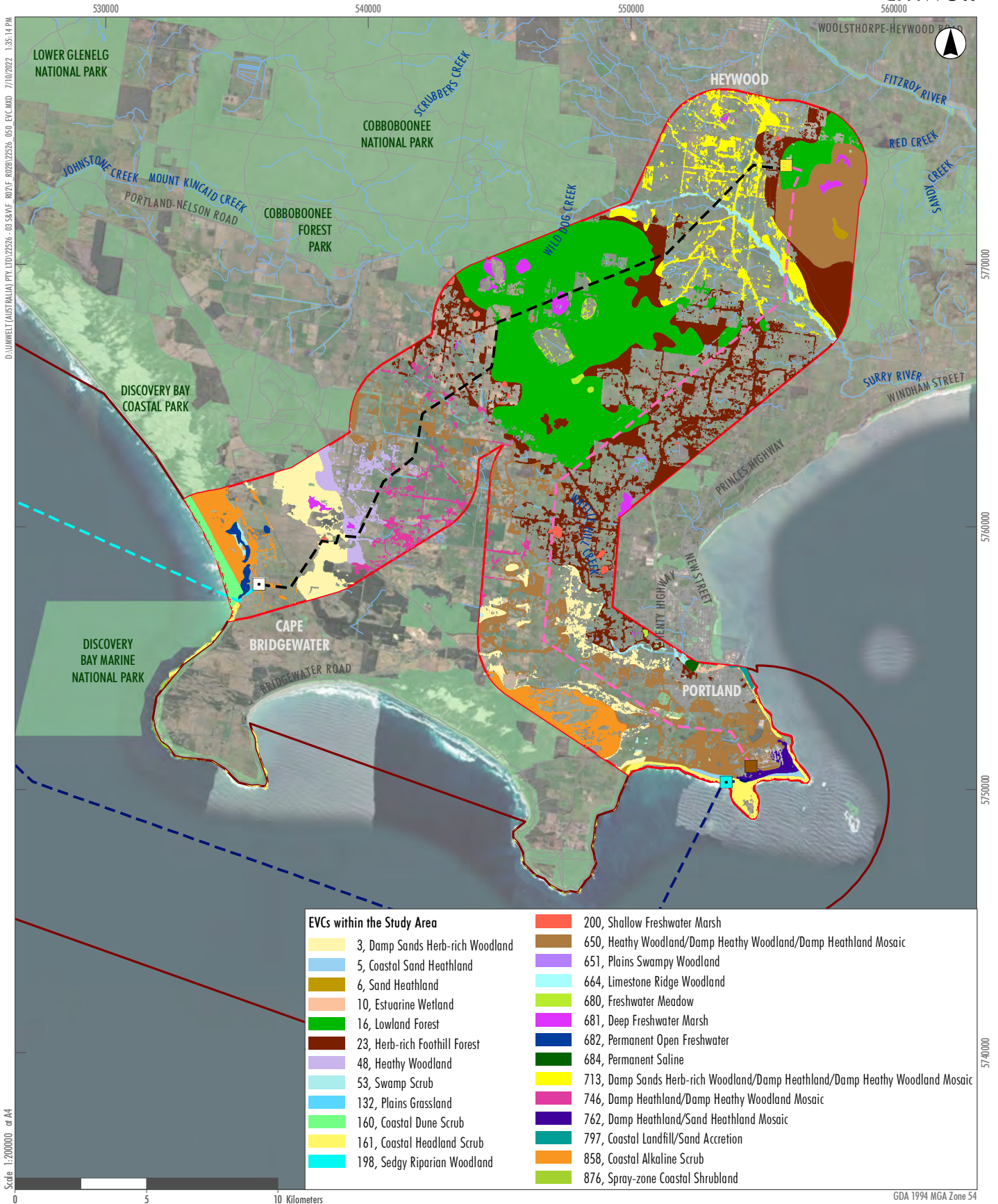
4.1.2 Ramsar wetlands

The Glenelg Estuary and Discovery Bay Ramsar Wetlands site is within the onshore Study Area where the option 2 subsea cabling crosses the shoreline (see **Figure 4.2**).

The Glenelg Estuary and Discovery Bay Ramsar Wetlands site provides habitat for nationally and internationally threatened flora and fauna. This includes over 90 waterbird species as well as 14 species of native fish which have diadromous life cycles (meaning they migrate between salt water and fresh water), and which are dependent on the system as a migratory route. The *Baumea* sedgeland within the wetland area also support more than one per cent of the Ancient greenling *Hemiphysalis mirabilis* population (a species of damselfly).

Bridgewater Lakes forms part of the Glenelg Estuary and Discovery Bay Ramsar Wetlands site and is considered a site of state significance as the lakes comprise one of the longest freshwater coastal lake systems in Victoria. The lakes are not stream fed - annual variation in the level of the lake indicates the influence of groundwater drainage.

The Piccanninnie Ponds Karst Wetlands Ramsar site is not located within the Study Area, however it supports several wetland bird species that may interact with the Project. The Ramsar site is situated on the South Australian coastline, within 10 km of the offshore wind turbines (see **Figure 4.2**). The Piccanninnie Ponds is a unique karst wetland system and provides habitat for diverse assemblages of native flora and fauna many of which are of conservation significance. The site is a known winter roosting and foraging location for the Orange-bellied Parrot *Neophema chrysogaster*.

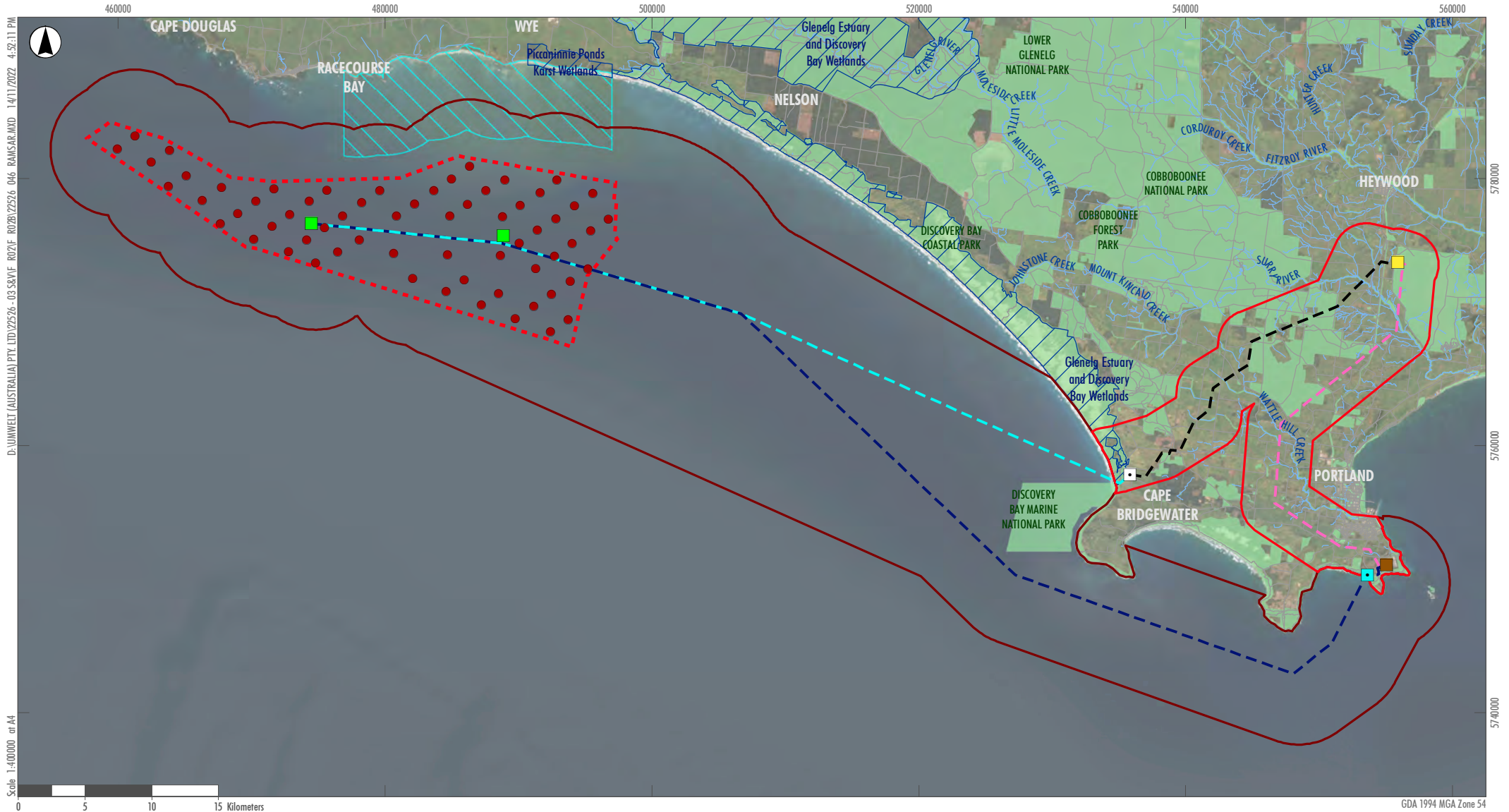


Legend

- Southern Winds Offshore Wind Project Study Area
- Southern Winds Onshore Wind Project Study Area
- Southern Winds Offshore Wind Project Area consists of:**
- Onshore transmission route option 1
- Onshore transmission route option 2
- Subsea cabling option 1
- Subsea cabling option 2
- Heywood terminal station
- Transition joint bay option 1
- Transition joint bay option 2
- Portland aluminium smelter
- Roads
- Drainage line

FIGURE 4.1

EVCs within the Study Area



Legend

- | | | | |
|---|---|-------------------------------|--|
| Southern Winds Offshore Wind Project Study Area | Southern Winds Offshore Wind Project Area consists of: | Potential turbine layout | State Forest, National Parks, Reserves |
| Southern Winds Onshore Wind Project Study Area | Southern Winds Offshore Wind Project Boundary | Substation | Ramsar Site |
| | Onshore transmission route option 1 | Heywood terminal station | Lower South East Marine Park |
| | Onshore transmission route option 2 | Transition joint bay option 1 | Roads |
| | Subsea cabling option 1 | Transition joint bay option 2 | Drainage line |
| | Subsea cabling option 2 | Portland aluminium smelter | |

FIGURE 4.2
Ramsar Wetlands

4.1.3 Fauna Habitat

An overview of the key fauna habitat within the Study Area is provided in **Table 4.2**.

Table 4.2 Fauna Habitat

Habitat	Description
Terrestrial	Cleared land for agricultural practices within the Study Area holds limited ecological value to fauna. However, patches of remnant vegetation may provide important connections between higher quality habitats. The remaining area comprises a range of forest, scrub, woodland, grassland, wetland, heathland and saltmarsh vegetation which is of high ecological value to fauna.
Freshwater aquatic	Several wetlands and waterways within proximity to the Study Area are of high value to a range of shorebirds and other wetland birds. The Glenelg Estuary and Discovery Bay Ramsar Wetlands site provides important habitat for numerous resident and migratory shorebirds and waterbirds. The Piccaninnie Ponds Karst Wetlands Ramsar site supports a winter roosting population of Orange-bellied Parrot <i>Neophema chrysogaster</i> . Fawthrop Lagoon, although disturbed, provides some habitat for rare and threatened waterbirds species. Wetlands and surrounding waterways throughout the Study Area also provide habitat for a range of ichthyofauna and other aquatic species.
Coastal	The coastal habitat throughout the Study Area provides habitat for both migratory and resident shorebirds.
Offshore	Bass Strait is considered to be an area of high importance for a large number of marine predators, particularly for a vast number of seabird species that breed and forage within this area. The offshore environment is also likely to provide foraging habitat for several threatened and/or migratory seabirds including various albatross and petrel species.

4.1.4 Threatened Flora

A search of the PMST and Victorian biodiversity databases identified 17 flora species listed under the Commonwealth EPBC Act and 82 flora species listed under the Victorian (FFG Act) that have a medium to high likelihood of occurring within the Study Area.

Areas of greatest value for threatened flora species within the Study Area include:

- Bridgewater Lakes and the surrounding Discovery Bay Coastal Park vegetation, known to support populations of Coast Ballarat *Exocarpus syrticola* (FFG e), Leafy Greenhood *Pterostylis cucullata* subsp. *cucullata* (FFG e) and Coast Helmet Orchid *Corybas despectans* (FFG e).
- Point Danger Coastal Reserve known to support populations of Mellblom's Spider Orchid *Caladenia hastata* (EPBC EN, FFG Cr), Shiny Tea-tree *Leptospermum turbinatum* (FFG e) and Oval-leaf *Logania ovata* (FFG, e).
- Cobboboonee National Park known to support populations of Swamp Fireweed *Senecio psilocarpus* (EPBC, VU) and Western Peppermint *Eucalyptus falciformis* (FFG v).

A total of 10 of the 17 EPBC Act listed species most likely to occur are terrestrial orchids including Spider Orchids, Leek-Orchids, Sun orchids and Greenhood Orchids. Terrestrial orchids are cryptic species, emerging from the ground and flowering for only short periods of time each year. To identify the potential presence and extent of these species throughout the Study Area, targeted assessments will be necessary.

Table 4.3 EPBC Act listed threatened flora species most likely to occur within the onshore Study Area

Common Name	Species name	Conservation Status	
		EPBC	FFG
River Swamp Wallaby-grass	<i>Amphibromus fluitans</i>	VU	
Limestone Spider-orchid	<i>Caladenia calcicola</i>	VU	Cr
Colourful Spider-orchid	<i>Caladenia colorata</i>	EN	Cr
Mellblom's Spider-orchid	<i>Caladenia hastata</i>	EN	Cr
Ornate Pink-fingers	<i>Caladenia ornata</i>	VU	E
Wrinkled Cassinia	<i>Cassinia rugata</i>	VU	Cr
Clover Glycine	<i>Glycine latrobeana</i>	VU	V
Coast Ixodia	<i>Ixodia achillaeoides</i> subsp. <i>arenicola</i>	VU	
Maroon Leek-orchid	<i>Prasophyllum frenchii</i>	EN	E
Dense Leek-orchid	<i>Prasophyllum spicatum</i>	VU	Cr
Green-striped Greenhood	<i>Pterostylis chlorogramma</i>	VU	E
Leafy Greenhood	<i>Pterostylis cucullata</i> subsp. <i>cucullata</i>	VU	E
Swamp Greenhood	<i>Pterostylis tenuissima</i>	VU	
Swamp Fireweed	<i>Senecio psilocarpus</i>	VU	
Coast Dandelion	<i>Taraxacum cygnorum</i>	VU	Cr
Metallic Sun-orchid	<i>Thelymitra epipactoides</i>	EN	E
Swamp Everlasting	<i>Xerochrysum palustre</i>	VU	Cr

Table Note: EPBC Status: EN = Endangered, CR = Critically Endangered, VU = Vulnerable. FFG Status: Cr= Critically Endangered, E = Endangered, V = Vulnerable, Cd = Conservation Dependent

4.1.5 Threatened Fauna

A search of the PMST and Victorian biodiversity databases identified 55 EPBC Act listed and 48 FFG Act listed fauna species (excluding marine fauna which is addressed in **Section 3.0**) considered to have a medium or higher likelihood of occurring within the Study Area (see **Figure 4.4**). These have been categorised into the following:

- Avifauna (terrestrial birds and shorebirds)
- Terrestrial and aquatic fauna
- Seabirds.

Threatened fauna records within 10 km of the Study Area are shown in **Figure 4.4**.

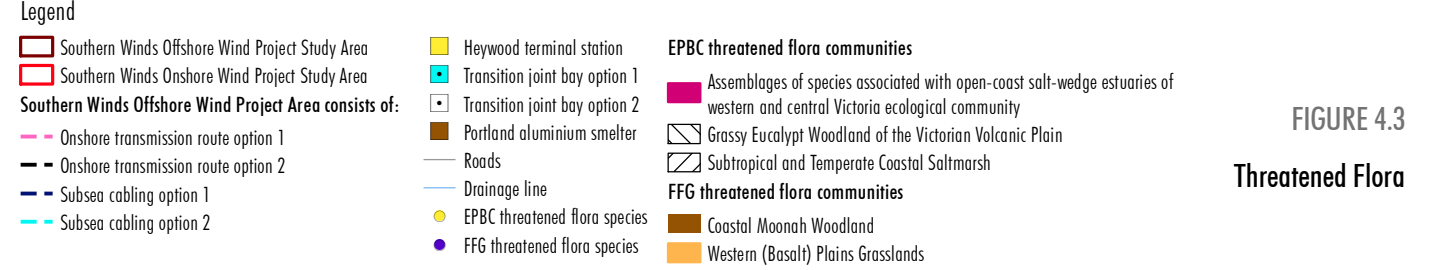
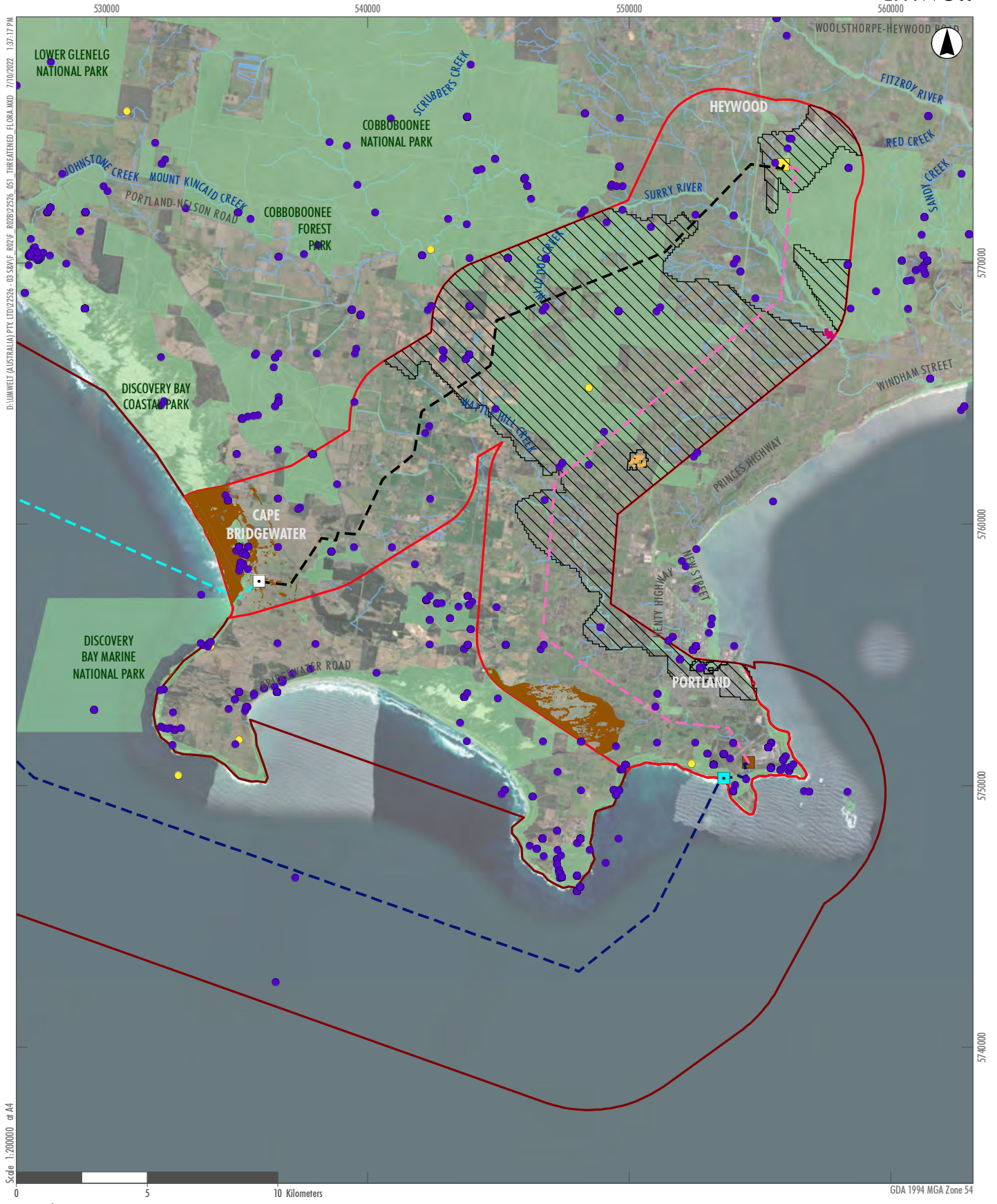


FIGURE 4.3
Threatened Flora

4.1.5.1 Avifauna

Terrestrial birds

Five EPBC Act listed and nine FFG Act listed terrestrial avifauna species have a medium or higher likelihood of occurring within the Study Area, as identified in **Table 4.4**. Orange-bellied Parrot *Neophema chrysogaster* and Swift Parrot *Lathamus discolor* are known to traverse Bass Strait at certain times of the year when migrating from Tasmania to mainland Australia. White-throated Needletail *Hirundapus caudacutus* is also migratory (a trans-equatorial migrant).

Table 4.4 Threatened terrestrial bird species most likely to occur within the Study Area

Common Name	Species name	Conservation Status	
		EPBC	FFG
Red-tailed Black-Cockatoo (south-eastern)	<i>Calyptorhynchus banksii graptogyne</i>	EN	E
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	EN	
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	CR	Cr
Swift Parrot	<i>Lathamus discolor</i>	CR	Cr
White-throated Needletail	<i>Hirundapus caudacutus</i>	CR, Migratory	V
Grey Goshawk	<i>Accipiter novaehollandiae</i>	VU	E
Little Eagle	<i>Hieraetus morphnoides</i>		V
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>		E
Powerful Owl	<i>Ninox strenua</i>		V
Masked Owl	<i>Tyto novaehollandiae</i>		Cr
Ground Parrot	<i>Pezoporus wallicus</i>		E
Chestnut-rumped Heathwren	<i>Calamanthus pyrrhopygius</i>		V
Diamond Firetail	<i>Stagonopleura guttata</i>		v
Rufous Bristlebird (Coorong)	<i>Dasyornis broadbenti broadbenti</i>		E

Table Note: EPBC Status: EN = Endangered, CR = Critically Endangered, VU = Vulnerable. FFG Status: Cr= Critically Endangered, E = Endangered, V = Vulnerable, Cd = Conservation Dependent

The following additional information on parrot species has been derived from the report prepared by BMT.

Orange-bellied parrots *Neophema chrysogaster* inhabit coastal and surrounding areas including saltmarshes, littoral heathlands and scrublands. They breed in Tasmania and then migrate to southern mainland Australia for winter. The species is listed as critically endangered under the EPBC Act. Typically, the species migrate closer to Port Phillip Bay, then disperse east and west along the Victorian coastline.

Swift Parrot *Lathamus discolor* (listed as critically endangered under the EPBC Act) also breeds in Tasmania and migrates to mainland Australia in autumn. During winter, the parrots disperse across a broad landscape, foraging on nectar in eucalypt woodlands mainly in inland Victoria and New South Wales. The migratory pathways of the species are not well understood however, it is considered most likely they cross the Victorian coastline around Port Phillip Bay including the Mornington and Bellarine Peninsulas. Whilst the onshore Study Area does not contain habitat for the species i.e. eucalypt woodlands, it is possible that individuals pass through the Study Area whilst migrating to their preferred habitat.

Shorebirds, wetland birds, and terns

As identified in **Table 4.5**, nine EPBC Act listed and 25 FFG Act listed shorebird species are considered to have a medium or higher likelihood of occurring within the Study Area. Shorebird hotspots within the Study Area include the Glenelg Estuary and Discovery Bay Ramsar Wetlands Site which is globally recognised as an important habitat for resident and migratory shorebirds.

Table 4.5 Threatened shorebird, wetland birds and terns most likely to occur within the Study Area

Common Name	Species Name	Conservation Status	
		EPBC	FFG
Australian Painted-snipe	<i>Rostratula australis</i>	EN	Cr
Australasian Bittern	<i>Botaurus poiciloptilus</i>	EN	Cr
Australian fairy Tern	<i>Sternula nereis nereis</i>	VU	
Bar-tailed Godwit (<i>baueri</i>)	<i>Limosa lapponica baueri</i>	VU, Migratory	
Hooded Plover	<i>Thinornis cucullatus</i>	VU	V
Eastern Curlew	<i>Numenius madagascariensis</i>	CR, Migratory	Cr
Curlew Sandpiper	<i>Calidris ferruginea</i>	CR, Migratory	Cr
Red Knot	<i>Calidris canutus</i>	EN, Migratory	E
Great Knot	<i>Calidris tenuirostris</i>	CR, Migratory	Cr
Lewin's Rail	<i>Lewinia pectoralis</i>		V
Brolga	<i>Antigone rubicunda</i>		E
Little Egret	<i>Egretta garzetta</i>		C
Eastern Great Egret	<i>Ardea alba modesta</i>		V
Australian Little Bittern	<i>Ixobrychus dubius</i>		E
Magpie Goose	<i>Anseranas semipalmata</i>		V
Australasian Shoveler	<i>Spatula rhynchotis</i>		V
Freckled Duck	<i>Stictonetta naevosa</i>		E
Hardhead	<i>Aythya australis</i>		V
Blue-billed Duck	<i>Oxyura australis</i>		V
Musk Duck	<i>Biziura lobata</i>		V
Australian Gull-billed Tern	<i>Gelochelidon macrotarsa</i>		E
Caspian Tern	<i>Hydroprogne caspia</i>	Migratory	V
Little Tern	<i>Sternula albifrons</i>	Migratory	Cr
Ruddy Turnstone	<i>Arenaria interpres</i>	Migratory	E
Grey Plover	<i>Pluvialis squatarola</i>	Migratory	V
Pacific Golden Plover	<i>Pluvialis fulva</i>	Migratory	V
Whimbrel	<i>Numenius phaeopus</i>	Migratory	E
Wood Sandpiper	<i>Tringa glareola</i>	Migratory	E
Grey-tailed Tattler	<i>Tringa brevipes</i>	Migratory	Cr
Common Sandpiper	<i>Actitis hypoleucos</i>	Migratory	V
Common Greenshank	<i>Tringa nebularia</i>	Migratory	E
Marsh Sandpiper	<i>Tringa stagnatilis</i>	Migratory	E
Terek Sandpiper	<i>Xenus cinereus</i>	Migratory	E

Common Name	Species Name	Conservation Status	
		EPBC	FFG
Black-tailed Godwit	<i>Limosa limosa</i>	Migratory	E

Table Note: EPBC Status: EN = Endangered, CR = Critically Endangered, VU = Vulnerable. FFG Status: Cr= Critically Endangered, E = Endangered, V = Vulnerable, Cd = Conservation Dependent

4.1.5.2 Terrestrial and Aquatic Fauna

As identified in **Table 4.6**, 13 EPBC Act listed and 11 FFG Act listed non-avian fauna species have a medium to higher likelihood of occurring within the Study Area. Threatened arboreal species such as Grey-headed Flying Fox *Litoria raniformis* and Southern Bent-winged Bat *Miniopterus orianae bassanii* may utilise large trees and native vegetation within the onshore Study Area for roosting and foraging. Wetlands and waterways within the Study Areas and surrounds are likely to provide important habitat for nationally listed amphibian and ichthyofauna populations, including Growling Grass Frog *Litoria raniformis*.

Table 4.6 Threatened non-avian terrestrial and freshwater fauna most likely to occur within the Study Area

Common Name	Species Name	Conservation Status	
		EPBC	FFG
Spot-tailed Quoll	<i>Dasyurus maculatus maculatus</i>	EN	E
Swamp Antechinus	<i>Antechinus minimus maritimus</i>	VU	V
Long-nosed Potoroo	<i>Potorous tridactylus trisulcatus</i>	VU	V
Heath Mouse	<i>Pseudomys shortridgei</i>	EN	E
Southern Brown Bandicoot	<i>Isodon obesulus obesulus</i>	EN	E
Grey-headed Flying Fox	<i>Pteropus poliocephalus</i>	VU	V
Southern Bent-winged Bat (southern spp.)	<i>Miniopterus orianae bassanii</i>	CR	Cr
Growling Grass Frog	<i>Litoria raniformis</i>	VU	V
Australian Grayling	<i>Prototroctes maraena</i>	VU	E
Dwarf Galaxias	<i>Galaxiella pusilla</i>	VU	E
Yarra Pygmy Perch	<i>Nannoperca obscura</i>	VU	V
Variiegated Pygmy Perch	<i>Nannoperca variegata</i>	VU	E
Glenleg Spiny Crayfish	<i>Euastacus bispinosus</i>	EN	E
White-footed Dunnart	<i>Sminthopsis leucopus</i>		V
Platypus	<i>Ornithorhynchus anatinus</i>		V
Striped Worm-Lizard	<i>Aprasia striolata</i>		E
Bearded Dragon	<i>Pogona barbata</i>		V
Swamp Skink	<i>Lissolepis coventryi</i>		E
Southern Toadlet	<i>Pseudophryne semimarmorata</i>		E
Little Galaxias	<i>Galaxiella tooourthoourt</i>		E
Ancient Greenling Damselyf	<i>Hemiphysalia mirabilis</i>		E
Southern Hooded Shrimp	<i>Athanopsis australis</i>		E
Portland Burrowing Crayfish	<i>Engaeus strictifrons</i>		E
Hairy Burrowing Crayfish	<i>Engaeus sericatus</i>		V

Table Note: EPBC Status: EN = Endangered, CR = Critically Endangered, VU = Vulnerable. FFG Status: Cr= Critically Endangered, E = Endangered, V = Vulnerable, Cd = Conservation Dependent

4.1.5.3 Seabirds

This section identifies threatened seabirds that are likely to occur within the Study Area. Other threatened marine fauna with potential to occur within the offshore Study Area are discussed in **Section 3.0**.

Fifteen EPBC Act listed and two FFG Act listed seabird species are considered likely to occur within the Study Area, as identified in **Table 4.7**. Of these, 12 are also listed as Migratory under the EPBC Act.

The marine environment off Portland is known to provide productive foraging habitats for several seabird species. In addition to the listed threatened seabird species, additional seabirds that may warrant further attention include:

- Australasian Gannet *Morus serrator* – The species has breeding colonies at Point Danger and Lawrence Rocks, both of which are located within the Study Area.
- Short-tailed shearwater *Ardenna tenuirostris* – The most numerically abundant seabird species in south-eastern Australia which has a breeding colony at Griffith Island in Port Fairy, approximately 50 kilometres from the Study Area.

Given the high mobility and dispersal capabilities of seabirds, particularly outside of the breeding period, it is highly likely that these species' ranges overlap with the offshore component of the Study Area.

Table 4.7 Threatened seabird species most likely to occur within the Study Area

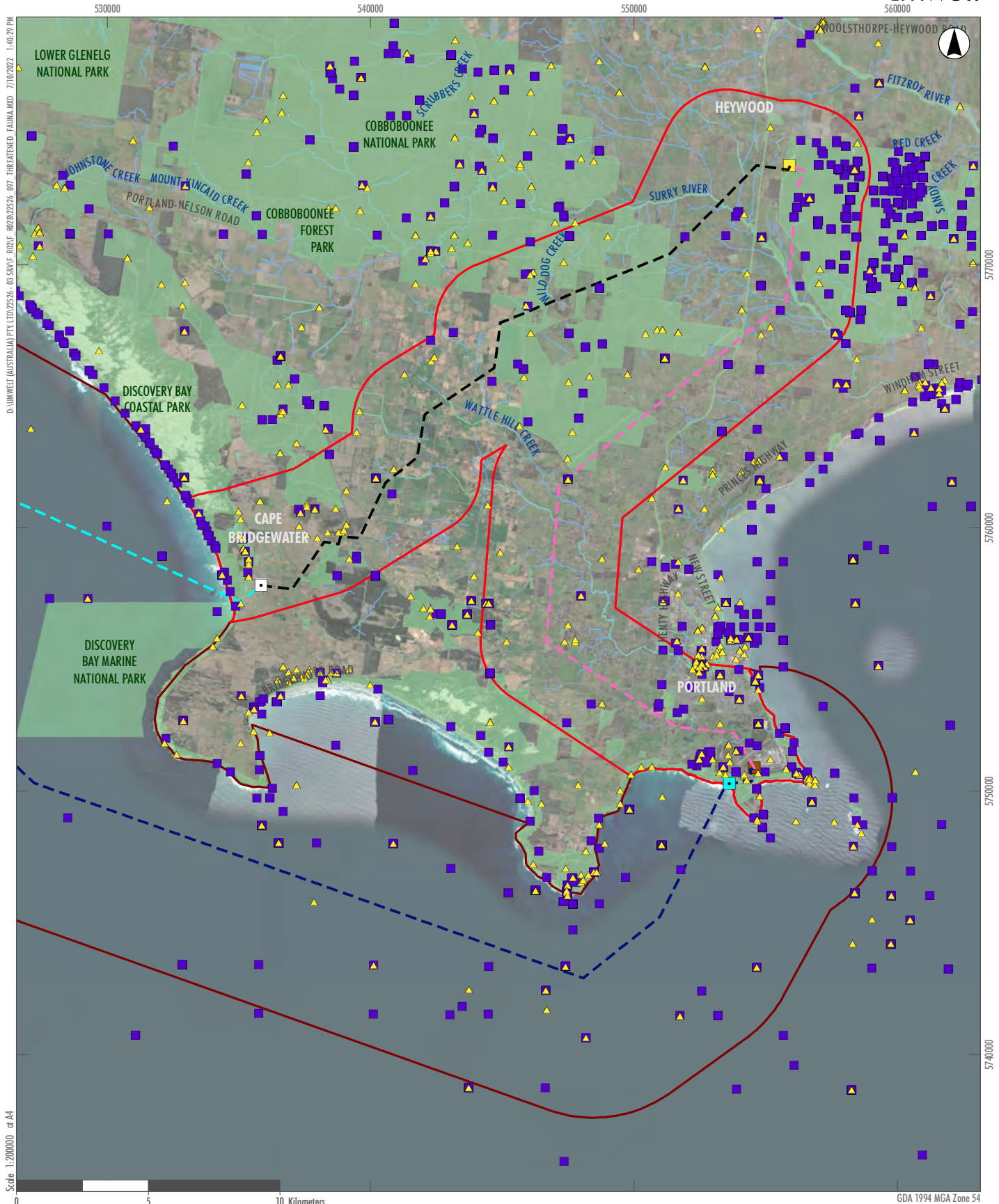
Common Name	Species Name	Conservation Status	
		EPBC	FFG
Fairy Prion (southern)	<i>Pachyptila turtur subantarctica</i>	VU	
Soft-plumaged Petrel	<i>Pterodroma mollis</i>	VU	
Gould's Petrel	<i>Pterodroma leucoptera leucoptera</i>	EN	
Blue Petrel	<i>Halobaena caerulea</i>	VU	
Wandering Albatross	<i>Diomedea exulans</i>	VU, Migratory	Cr
Black-browed Albatross	<i>Thalassarche melanophris</i>	VU, Migratory	
Indian Yellow-nosed Albatross	<i>Thalassarche carteri</i>	VU, Migratory	E
Grey-headed Albatross	<i>Thalassarche chrysostoma</i>	EN, Migratory	E
Shy Albatross	<i>Thalassarche cauta</i>	EN, Migratory	E
Sooty Albatross	<i>Phoebetria fusca</i>	VU, Migratory	Cr
Southern Giant-Petrel	<i>Macronectes giganteus</i>	EN, Migratory	E
Buller's Albatross	<i>Thalassarche bulleri</i>	VU, Migratory	E
Northern Giant-Petrel	<i>Macronectes halli</i>	VU, Migratory	E
Southern Royal Albatross	<i>Diomedea epomophora</i>	VU, Migratory	Cr
White-capped Albatross	<i>Thalassarche steadi</i>	VU, Migratory	
White-faced Storm-Petrel	<i>Pelagodroma marina</i>		E
Light-mantled Sooty Albatross	<i>Phoebetria palpebrata</i>	Migratory	Cr

Table Note: EPBC Status: EN = Endangered, CR = Critically Endangered, VU = Vulnerable. FFG Status: Cr= Critically Endangered, E = Endangered, V = Vulnerable, Cd = Conservation Dependent

The following additional information on seabirds has been provided in the report prepared by BMT (2022).

There are several records of threatened seabirds being present within the offshore Study Area. The Study Area is mapped as a BIA for the Antipodean Albatross, Wandering Albatross *Diomedea exulans*, Wedge-tailed Shearwater, Common Diving-petrel, Buller's Albatross, Indian Yellow-nosed albatross *Thalassarche carteri*, Black-browed Albatross *Thalassarche melanophris* and Campbell Albatross.

Albatross and petrel species largely breed in Antarctica and islands south of Australia and exhibit a broad range of diets and foraging behaviours, making their at-sea distributions diverse. All waters within Australian jurisdiction can be considered foraging habitat for albatross and petrel species, however the most critical foraging habitat is waters south of 25 degrees where most species spend majority of their time foraging. Seabirds are known to feed on fish, cephalopod and/or crustaceans within the marine environment, diving to the surface water level or just below. This potentially makes them vulnerable to turbine strike.



- Legend**
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 - Southern Winds Onshore Wind Project Study Area
 - Southern Winds Offshore Wind Project Area consists of:**
 - Onshore transmission route option 1
 - Onshore transmission route option 2
 - Subsea cabling option 1
 - Subsea cabling option 2
 - Heywood terminal station
 - Transition joint bay option 1
 - Transition joint bay option 2
 - Portland aluminium smelter
 - Roads
 - Drainage line
 - EPBC threatened fauna species
 - FFG threatened fauna species

FIGURE 4.4
Threatened Fauna

4.1.6 Migratory Species

A search of the Study Area with a 10 km buffer (the search area) of the PMST and Victorian databases identified 67 migratory bird species predicted to occur. Thirty-one of these species are also listed as threatened under the EPBC Act and/or FFG Act, and are identified above in **Table 4.4**, **Table 4.5**, and **Table 4.7**. A list of these migratory bird species is provided in **Table 4.8**. Migratory marine fauna (whales, dolphins, turtles, sharks) are identified in **Section 3.0**.

Table 4.8 Migratory species predicted to occur within 10 km of the Study Area

Common Name	Species Name
Pin-tailed Snipe	<i>Gallinago stenura</i>
Swinhoe's Snipe	<i>Gallinago megala</i>
Broad-billed Sandpiper	<i>Limicola falcinellus</i>
Latham's Snipe	<i>Gallinago hardwickii</i>
Glossy Ibis	<i>Plegadis falcinellus</i>
Eastern Osprey	<i>Pandion cristatus</i>
Fork-tailed Swift	<i>Apus pacificus</i>
Osprey	<i>Pandion haliaetus</i>
Wilson's Storm-Petrel	<i>Oceanites oceanicus</i>
Sooty Shearwater	<i>Ardenna grisea</i>
Short-tailed Shearwater	<i>Ardenna tenuirostris</i>
Flesh-footed Shearwater	<i>Ardenna carneipes</i>
Grey Petrel	<i>Procellaria cinerea</i>
Common Tern	<i>Sterna hirundo</i>
Arctic Jaeger	<i>Stercorarius parasiticus</i>
Bulwer's Petrel	<i>Bulweria bulwerii</i>
White-chinned Petrel	<i>Procellaria aequinoctialis</i>
Long-tailed Jaeger	<i>Stercorarius longicaudus</i>
Pomarine Jaeger	<i>Stercorarius pomarinus</i>
South Polar Skua	<i>Catharacta maccormicki</i>
Northern Royal Albatross	<i>Diomedea antipodensis</i>
New Zealand Wandering Albatross	<i>Diomedea antipodensis</i>
Salvin's Albatross	<i>Thalassarche salvini</i>
Campbell Albatross	<i>Thalassarche impavida</i>
Crested Tern	<i>Thalasseus bergii</i>
Lesser Sand Plover	<i>Charadrius mongolus</i>
Double-banded Plover	<i>Charadrius bicinctus</i>
Oriental Plover	<i>Charadrius veredus</i>
Little Curlew	<i>Numenius minutus</i>

Common Name	Species Name
Red-necked Stint	<i>Calidris ruficollis</i>
Sharptailed Sandpiper	<i>Calidris acuminata</i>
Sanderling	<i>Calidris alba</i>
Pectoral Sandpiper	<i>Calidris melanotos</i>
Yellow Wagtail	<i>Motacilla flava</i>
Rufous Faintail	<i>Rhipidura rufifrons</i>
Satin Flycatcher	<i>Myiagra cyanoleuca</i>
Black-faced Monarch	<i>Monarcha melanopsis</i>

4.1.7 Threatened Ecological Communities

Eight threatened ecological communities (TECs) are likely to occur within the Study Area, as identified in Table 4.9 and shown in Figure 4.5.

Table 4.9 TECs likely to occur within the Study Area

Community Name	Conservation Status	Modelled extent within the Study Area
EPBC Act listed		
Assemblages of species associated with open-coast saltwedge estuaries of western and central Victoria ecological community.	EN	These TECs generally occurs at estuaries. While it is broadly modelled throughout the Study Area, no estuaries occur within the Study Area. Considered less likely to occur.
Subtropical and Temperate Coastal Saltmarsh.	VU	
Giant Kelp Marine Forests of South East Australia.	EN	
Grassy Eucalypt Woodland of the Victorian Volcanic Plain.	CR	This TEC is broadly mapped to occur in the northern section of the Study Area, north-east of Cashmore.
Karst springs and associated alkaline fens of the Naracoorte Coastal Plain Bioregion.	EN	
Natural Temperate Grassland of the Victorian Volcanic Plain.	CR	
FFG Act listed		
Coastal Moonah (<i>Melaleuca lanceolata</i> subsp. <i>lanceolata</i>) Woodland Community.	Threatened	These TECs are modelled to occur along the coastline near Bridgewater Lakes and further inlands, north of Cape Nelson. The extent of Western Basalt Plains Grasslands throughout the Study Area is restricted to a 20 ha patch made up of several small, disjunct patches.
Western (Basalt) Plains Grasslands Community.	Threatened	

4.1.8 Matters of National Environmental Significance

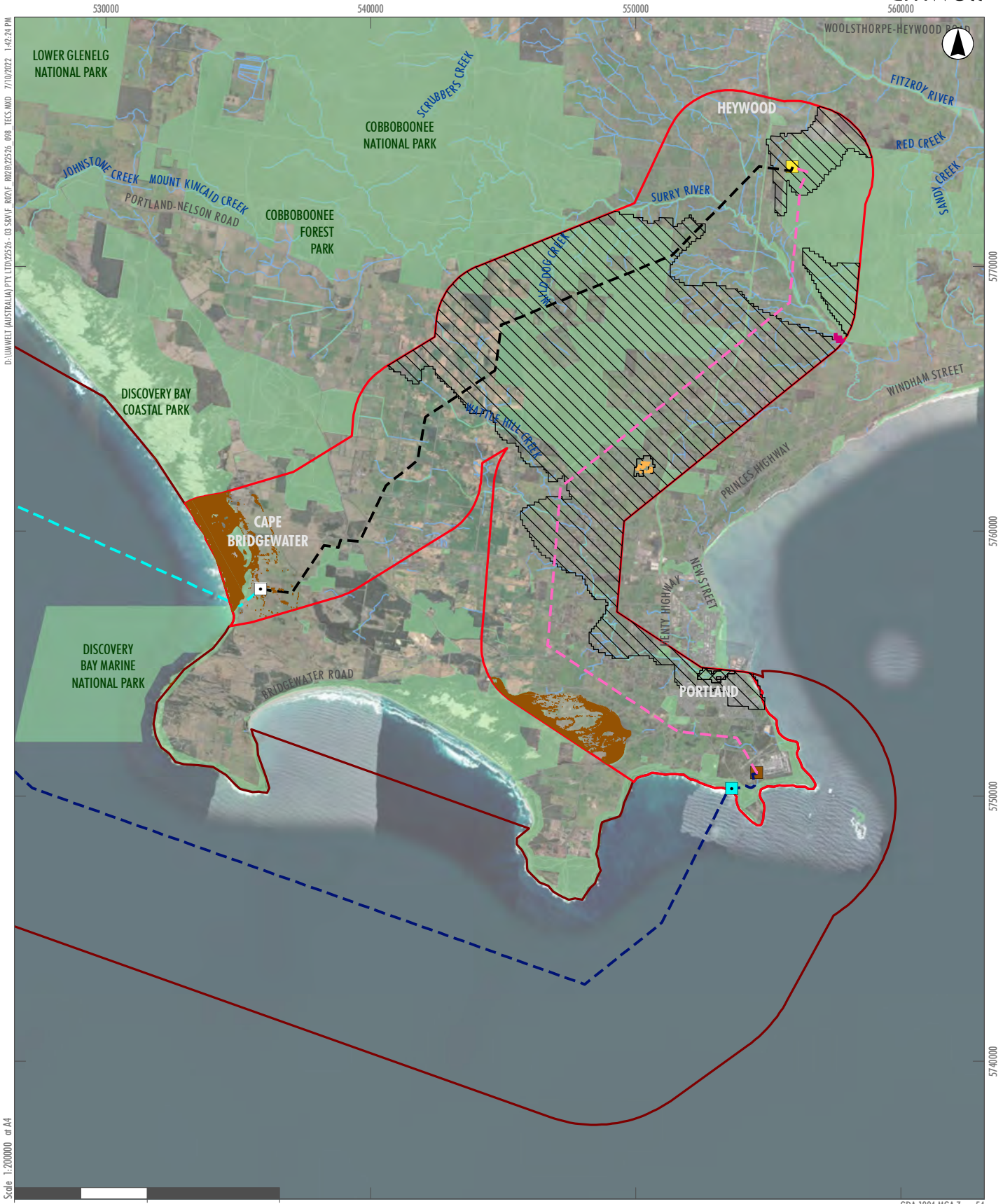
Under the EPBC Act, an action may require approval if the action has, will have, or is likely to have, a significant impact on a MNES. Of the nine MNES protected under the EPBC Act, the Biosis report identified the Project has potential to impact on four MNES within the Study Area:

- Nationally listed threatened species and ecological communities
- Migratory species
- Ramsar wetlands
- Commonwealth marine area.

In accordance with the *Matters of National Environmental Significance Significant Impact Guidelines 1.1*, a person who proposes to take an action that will have, or is likely to have, a significant impact on a MNES must refer that action to the Minister for Planning for a decision on whether assessment and approval is required under the EPBC Act.

Table 4.10 Summary of Desktop Assessment Outcomes – Biodiversity

Summary of Assessment Outcomes
<ul style="list-style-type: none"> • The Study Area is located within three Bioregions; Bridgewater, Glenelg Plain and the Victorian Volcanic Plain. A total of 26 Ecological Vegetation Classes (EVCs) across the three bioregions are modelled to occur within the Study Area. • The Glenelg Estuary and Discovery Bay Ramsar Wetlands site intersects with the onshore Study Area and provides habitat for nationally and internationally threatened flora and fauna. The Piccanninnie Ponds Karst Wetlands Ramsar site is located within 10 km of the offshore wind turbines within the South Australian coast, and is a known winter roosting and foraging location for the Orange-bellied Parrot <i>Neophema chrysogaster</i>. • 17 EPBC Act listed and 82 FFG Act listed flora species have a medium to high likelihood of occurring within the Study Area, including ten terrestrial orchid species. Areas of greatest value for flora species include Bridgewater Lakes, Discovery Bay Coastal Park, Point Danger Coastal Reserve and Cobboboonoo National Park. • 55 EPBC Act listed and 48 FFG Act listed terrestrial fauna species have a medium or higher likelihood of occurring within the Study Area, including avifauna, terrestrial and aquatic fauna and marine fauna. • 67 Migratory bird species listed under the EPBC Act are predicted to occur within the search area (Study Area with a 10 km buffer). • Eight TECs are likely to occur within the Study Area, six listed under the EPBC Act and two listed under the FFG Act.



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 - Roads
 - Drainage line

- EPBC threatened flora communities**
- Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community
 - Grassy Eucalypt Woodland of the Victorian Volcanic Plain
 - Subtropical and Temperate Coastal Saltmarsh
- FFG threatened flora communities**
- Coastal Moonah Woodland
 - Western (Basalt) Plains Grasslands

FIGURE 4.5
Threatened Ecological Communities

4.2 Potential Impacts

Following definition of the existing environmental context of the Project site and surrounding area, potential biodiversity impacts have been identified with consideration of the Project design, construction, operation, and decommissioning activities in the context of the existing conditions. An overview of these potential impacts is provided in **Table 4.11**.

Table 4.11 Potential Impacts – Biodiversity

Impact	Project Component	Phase
Potential impact on native vegetation through the clearing of EVCs for the underground cable, substation and transmission line.	Onshore	Construction
Potential indirect impacts such as sedimentation from ground disturbance works, which may alter habitat conditions in downstream Ramsar wetlands (EPBC Act), lakes and wetlands of regional and local significance (Bridgewater Lakes and Fawthrop Lagoon).	Onshore	Construction
Potential loss or fragmentation of habitat, or disturbance to -EPBC Act and/or FFG Act listed threatened species and communities (terrestrial flora and fauna) from removal of vegetation.	Onshore: Transmission line, Underground cable, Substation	Construction Operation
Potential impacts from construction on the health or biodiversity of terrestrial aquatic habitats and species that utilise these habitats (i.e. Dwarf Galaxias, Growling Grass Frog).	Onshore: Transmission line, Underground cable, Substation	Construction
Potential loss of habitat or disturbance to EPBC Act-listed threatened species and communities due to dredging, piling or other invasive construction activities in the marine environment.	Offshore: Turbines, Substation, Subsea cable	Construction Operation
Potential loss of habitat or disturbance to EPBC Act-listed migratory birds, or their habitat such as foraging or roosting/nesting areas.	Onshore & Offshore: Whole project	Construction Operation
Potential for birds to collide with turbines – particularly listed threatened bird species and migratory birds (including migratory shorebirds).	Offshore: Turbines	Operation
Potential for impacts on the ecological character of the Glenelg Estuary and Discovery Bay and Piccanninnie Ponds Karst Wetlands Ramsar sites, including listed species that use the sites wetland habitats and waterbird breeding functions.	Offshore: Turbines Onshore: Subsea cable	Construction Operation
Potential introduction or spread of pests or weeds from construction works which may impact native vegetation, threatened species / communities or agricultural productivity.	Onshore & Offshore: Whole of Project	Construction Operation
Potential cumulative ecological impacts with adjacent proposed offshore and onshore wind projects (terrestrial and marine).	Onshore & Offshore: Whole of Project	Construction Operation
Potential noise and vibration impacts on avifauna (terrestrial birds and shorebirds), terrestrial fauna, and seabirds during construction of the Project.	Onshore & Offshore: Whole of Project	Construction
Potential impacts from artificial lighting on susceptible species (seabirds and migratory species) during construction (such as night works) and operation (substation lighting, turbine safety lighting).	Onshore & Offshore: Whole of Project	Construction Operation

5.0 Social

This section summarises the information provided in the Preliminary Social Risks and Opportunities Analysis prepared by Umwelt (October 2022).

5.1 Existing Conditions

The Study Area for the preliminary social risk and opportunities analysis is considered the ‘area of social influence’. The area of social influence for the Project is defined as:

- The Local Government Areas (LGA) of Glenelg (Victoria), District Council of Grant (South Australia), and the City of Mount Gambier (South Australia).
- The landholdings, property owners and residents situated on, or nearby, the onshore Project Area as well as the footprint of any ancillary infrastructure.
- Landholders of agricultural land and some conservation areas that are likely to host transmission infrastructure.
- Small coastal communities of Cape Douglas, Racecourse Bay, Port MacDonnell and Wye in South Australia and Nelson, Heywood and Mount Richmond in Victoria and other smaller settlements.
- Offshore users who value and/or use the offshore locality, which may include maritime industries, science and research institutes, recreational users, and tourism operators.
- The Barwon South West region of Victoria (specifically the Great South Coast region) and the Limestone Coast region of South Australia.

The area of social influence may extend beyond these boundaries at subsequent stages of Project planning and assessment, to include offshore infrastructure and locations where construction and contractor workforces may be sourced and where materials may be supplied for the Project.

5.1.1 Social Baseline

To understand the communities of interest to the Project and to evaluate their resilience and adaptive capacity to change, a social baseline has been developed which captures several capital areas –natural, human, physical, social, economic, political, and cultural. The vulnerability of each capital area can be assessed through the selection of a suite of socio-economic indicators specific to each capital area to assess a community’s vulnerability to change or conversely their adaptive capacity.

An overview of the capital areas and the key characteristics relevant to the area of social influence is provided in **Table 5.1**.

Table 5.1 Social Baseline

Capital	Description
<p>Natural Capital Natural capital refers to the natural assets and resources that contribute to community sustainability, such as minerals, land, forests, and waterways, which provide benefit to the community, as well as environmental assets that provide cultural, social, or recreational value.</p>	<ul style="list-style-type: none"> • The Glenelg Shire has 107 national parks and conservation reserves covering 25% of the Shire’s land. • The Great South West Walk is a 250 km circular trail that winds through the diverse landscapes of Lower Glenelg National Park, Discovery Bay Coastal Park, Cobboboonee National Park and Cape Nelson State Park. • The Lower Glenelg National Park is a popular destination for canoeing on the Glenelg River and Cape Bridgewater has many natural features, including cliffs, blowholes, sand dunes and a petrified forest. • The Limestone Coast is located in South Australia and lies between Adelaide and Melbourne and comprises seven local government areas. • Mount Gambier is one of a few cities in the world to be established on the slopes of a volcano and has many unique natural features, including the Blue Lake/Warwar, craters, caves, the Umpherston and Engelbrecht sinkholes, underground waterways, gardens, combined with many local tourist attractions. • The Glenelg Estuary and Discovery Bay Ramsar Wetlands site in Victoria and the Piccaninnie Ponds Karst Ramsar Wetlands site in South Australia are within proximity to the Project.
<p>Human Capital The level of human capital within a community is assessed by considering population size, age distribution, education and skills, general population health and the prevalence of vulnerable groups within the community.</p>	<ul style="list-style-type: none"> • The Glenelg Shire population for 2021 was 19,859 and is expected to increase at an average annual growth rate of 0.41%. The City of Mount Gambier had a population of 26,878 in 2021, declining by 0.04% from 2020. The District Council of Grant population for 2021 was 26,878, growing 0.98% from the previous year (ABS, 2021). • The median age in Glenelg Shire is 47 years, 45 years in the District Council of Grant and 40 years in Mount Gambier. • Relevant trade occupations in Glenelg Shire, District Council of Grant and City of Mount Gambier include technicians and trades workers, labourers, and machinery operators and drivers. • Unemployment is 6% in Glenelg, 3.7% at District Council of Grant, and 6.7% in City of Mount Gambier. • Between 2016 and 2026, the age structure forecasts for Glenelg Shire indicate a 2.9% increase in population under working age, a 28.1% increase in population of retirement age, and a 6.7% decrease in population of working age. • From 2016 to 2021, City of Mount Gambier’s population increased by 2.3%, representing an average annual population change of 0.46% per year over the period.
<p>Physical Capital Physical capital includes provision of infrastructure and services to the community. It is important to consider the type, quality, and degree of access to public, built and community infrastructure (including amenities, services and utilities) as well as housing</p>	<ul style="list-style-type: none"> • Portland in the Glenelg Shire and the surrounding region are served by the only deep-water port between Melbourne and Adelaide, providing a vital and growing trade. The Port is the international gateway for the Green Triangle Region (forestry). The export trade includes grain, woodchips, logs, aluminium ingots and livestock, while import commodities are alumina, liquid pitch and fertiliser products. • The Green Triangle spans the border between Victoria and South Australia and is a premier location for growing and processing wood fibre. This area constitutes 17% of Australia’s plantations, or 6 million hectares, and supplies \$1.5 billion in forest industry economic output – 7% of the Green Triangle’s total economic output. • Between 2016 and 2036, Portland (South) is forecast for the greatest increase in development of new dwellings in Glenelg Shire.

Capital	Description
<p>Social Capital</p> <p>Various indicators can be used to examine and assess social capital, including the level of volunteering, population mobility, crime rates, and the demographic composition of the community, such as the percentage of people born overseas, language proficiency etc.</p>	<ul style="list-style-type: none"> • In 2021, the dominant household type in the Glenelg Shire was couples without dependents (50%), compared to 37.6% in Victoria. • In 2021, the dominant household type in the District Council of Grant was couple without dependents (47.4%), followed by couple with children (42.2%), compared to 41% and 40.8% respectively in South Australia. • In City of Mount Gambier, the most dominant family type was couples with children, at 43.1% and couples with children, at 36.2% in 2021. • Glenelg Shire has relatively low mobility when compared with Victoria, with the LGA home to a lower proportion of people with a different address both one year ago (10%) and five years ago (28%). This suggests a reasonably stable and established population. However, there appears a trend in relation to retirees travelling during the winter months. • In City of Mount Gambier, a higher rate of people had lived at the same address 5 years ago (55.7%). Of those, quite a high percentage (35.6%) migrated to the area from elsewhere in Australia. • Glenelg Shire Council has the lowest population density of any Victorian LGA. • 13.8% of 15- to 24-year-olds in Glenelg Shire were disengaged with employment and education, and 11.8% of 15-to-24-year-olds were disengaged with employment and education in the City of Mount Gambier.
<p>Economic Capital</p> <p>Examining a community's economic capital involves consideration of several indicators, including industry and employment distribution, workforce participation and unemployment, income levels and cost of living pressures, such as weekly rent or mortgage repayments.</p>	<ul style="list-style-type: none"> • The Barwon South West region (extending from Queenscliff Heads to the Victorian-South Australian border) offers a number of regional support opportunities for development of the renewable sector. These include development of alternative energy sources which may also help to maintain the region's presence in aluminium production and continued growth in wind farm construction in the region with wind turbine development centred around Portland. • The Portland Aluminium Smelter is a key employer within the region. In 2020, they had around 4,400 employees from Victoria and regional Western Australia. • In Glenelg Shire, key industry sectors of employment include agriculture, forestry and fishing (13.9%), health care and social assistance (13.8%), manufacturing (12.6%), and retail trade (8.6%). • In District Council of Grant, key industry sectors include dairy cattle farming (8.6%), beef cattle farming (4.9%), and road freight transport (3.3%). • In Mount Gambier, key industry sectors of employment include retail trade (14.3%), health care and social assistance (13.8%), manufacturing (11.1%), and construction (6.8%). • Mount Gambier is a centre for a large transport industry resulting from its central location, between Melbourne and Adelaide. • The Limestone Coast region continues to export dairy, world class wines, pasture raised beef and lamb, seafood and plantation forestry products. The Rock Lobster industry in South Australia contributes around \$88 million per annum to the South Australian Economy. On average, tourism employment accounts for 14% of all jobs across the Limestone Coast region. • Both Glenelg Shire and City of Mount Gambier are part of a well-developed tourism trail, with almost a million tourists visiting the Great South Coast region every year.
<p>Political Capital</p> <p>Political capital refers to the governing and organisational structures of the population, including</p>	<ul style="list-style-type: none"> • The Project Area falls within the Australian electoral division of Wannon, which has been represented by Liberal Party MP Dan Tehan since 2010. • In the Victorian parliament, the Project Area is located in the South-West Coast District (Legislative Assembly), and the Western Victoria Region (Legislative

Capital	Description
formal and informal systems, and the existing means for public participation in various aspects of civil life.	<p>Council). Ms Roma Britnell MP of the Liberal Party has represented the South-West Coast District since 2015.</p> <ul style="list-style-type: none"> In state politics, the City of Mount Gambier is in the South Australian House of Assembly electoral district of Mount Gambier, which has been held since 2014 by former Liberal Party member Troy Bell. In Federal politics, the City of Mount Gambier is in the Australian House of Representatives division of Barker, which has been represented by Tony Pasin since 2013. It is a safe Liberal Party of Australia seat.
<p>Cultural Capital</p> <p>Cultural capital includes the way people know and understand their place within the world. It may also refer to the extent to which the local culture, traditions, or language, may promote or hinder wellbeing, social inclusion, and development</p>	<ul style="list-style-type: none"> The Project is located within the traditional lands of the Gunditjmara people within Victoria. The Gunditj Mirring Traditional Owners Aboriginal Corporation (GMTOAC) is the Registered Aboriginal Party (RAP) for the Study Area. The Gunditjmara people are recognised by the Federal Court and the State of Victoria as the Traditional Owners of almost 140,000 ha of land across the southwest of Victoria through a native title determination. Eastern Maar Aboriginal Corporation are the neighbouring RAP to the east of the Study Area. The City of Mount Gambier and District Council of Grant is located within the traditional lands of the Boandik people within South Australia. Mount Gambier is also part of the Limestone Coast; the lands and waters of the Limestone Coast are central to the culture and beliefs of First Nations people, the Buandig, Bindjali and Ngarrindjeri people. In Glenelg Shire, 89.8% of the population spoke English only, and 2.3% spoke a non-English language. The dominant language spoken at home, other than English was Filipino/Tagalog, with 0.3% of the population, or 54 people speaking this language at home. In Mt Gambier, 88.7% of the population spoke English only, and 7.2% spoke a non-English language. Other languages spoken at home included Karen 1.2%, Italian 0.9%, Swahili 0.5%, Greek 0.2% and Mandarin 0.2%.

5.1.2 Stakeholder Identification

Preliminary stakeholder analysis has identified stakeholder groups that BFE should engage with during the next phase of the assessment. A list of these stakeholders is provided in

Table 5.2. It should be noted this is a preliminary list of stakeholders and is not definitive.

A wide range of community and stakeholder groups should be consulted during the Project. Further details on consultation are provided in the Southern Winds Offshore Wind Project Partnership and Engagement Strategy (BFE, 2022).

Table 5.2 Potential Stakeholders

Stakeholder Group	Potential Stakeholders
Host landholders	<ul style="list-style-type: none"> Landholders that will host project infrastructure onshore
Proximal landholders/communities (onshore)	<ul style="list-style-type: none"> Private landholders neighbouring/proximate to the transmission route In Victoria: Portland, Casterton, Heywood, Nelson, Mt Richmond communities In South Australia: Port MacDonnell, Racecourse Bay, Cape Douglas and Wye communities.

Stakeholder Group	Potential Stakeholders
Broader community	<ul style="list-style-type: none"> Residents in Glenelg, District Council of Grant, and City of Mount Gambier LGAs
Ocean users	<ul style="list-style-type: none"> Maritime industries, Port of Portland, science and research institute, recreational users, tourism operators including whale watching and marine observation, ferry operators and fishing charters, commercial business.
Aboriginal stakeholders	<ul style="list-style-type: none"> Gunditj Mirring Traditional Owners Aboriginal Corporation (GMTOAC) Eastern Maar Aboriginal Corporation, including Barwon South West Local Aboriginal Networks (LAN) and Gathering Places, Dhauwurd Wurrung Elderly & Community Health Service Inc (DWECHS) and Winda-Mara Aboriginal Corporation. Boandik Peoples (Registered Aboriginal Party). Buandig people, Bindjali people, Ngarrindjeri people.
Local, State and Commonwealth government	<ul style="list-style-type: none"> Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW). Glenelg Shire Council. City of Mount Gambier. District Council of Grant. Department of Transport. Ports Victoria. Heritage Victoria. First Peoples – State Relations. Parks Victoria. National Parks and Wildlife Service, SA. Victorian Department of Environment, Land, Water and Planning. Regional Development Victoria. Regional Development Australia. Glenelg Hopkins Catchment Management Authority (CMA).
Local business and service providers	<ul style="list-style-type: none"> Port of Portland. Alcoa. Tourism operators. Discover Mount Gambier.
Community and development groups	<ul style="list-style-type: none"> Committee for Portland. Re-Alliance. Barwon South West Waste and Resource Recovery Group.
Environmental groups	<ul style="list-style-type: none"> Friends of the Great South West Walk. Parks Victoria. Nature Glenelg Trust. Birdlife Australia. Waterwatch Victoria. Landcare, Coastcare, and Friends of Networks.

Table 5.3 Summary of Desktop Assessment Outcomes – Social

Summary of Assessment Outcomes	
<ul style="list-style-type: none"> The Glenelg Shire has 107 national parks and conservation reserves covering 25% of the Shire’s land, and provides for a number of nature-based recreational activities including hiking the Great South West Walk and canoeing the Glenelg River. Mount Gambier has many unique natural features including caves, sinkholes, and underground waterways. There are also two Ramsar wetlands within proximity to the Project, the Glenelg Estuary and Discovery Bay Ramsar site in Victoria and the Piccaninnie Ponds Karst Wetlands Ramsar site in South Australia. Portland, in the Glenelg Shire and surrounding region are served by the only deep-water port between Melbourne and Adelaide, providing a vital and growing trade. The Portland Aluminium Smelter is a key employer within the region. The Barwon South West region offers a number of regional support opportunities for development of the renewable sector, including development of alternative energy sources and continued growth in wind farm construction in the region with wind turbine development centred around Portland. Glenelg Shire, District Council of Grant and City of Mount Gambier are part of a well-developed tourism trail, with almost a million tourists visiting the Great South Coast region every year. The Limestone Coast region in South Australia continues to export dairy, world class wines, pasture raised beef and lamb, seafood and plantation forestry products. The Rock Lobster industry in South Australia contributes around \$88 million per annum to the South Australian Economy. On average, tourism employment accounts for 14% of all jobs across the Limestone Coast region. 	

5.2 Potential Impacts

Following definition of the existing environmental context of the Project site and surrounding area, potential social impacts have been identified with consideration of the Project design, construction, operation, and decommissioning activities in the context of the existing conditions. An overview of these potential impacts is provided in **Table 5.4**.

Table 5.4 Potential Impacts – Social

Impact	Project Component	Phase
Concerns around underground cabling, including impacts to housing and water bodies associated with subsidence.	Onshore	Construction
Aesthetic changes to the coastline may not ‘fit’ with the ascribed characteristics and values of the coastal landscape.	Offshore	Operation
Social amenity issues associated with onshore construction of the transmission line e.g., noise and lighting.	Onshore	Construction
Disruption to current land uses due to construction of onshore Project infrastructure.	Onshore	Construction
Changes to local tourism, including the Great South West Walk, due to industrialisation of the landscape reducing visitor experience.	Onshore Offshore	Operation
Impacts to onshore recreation activities due to clearing of critical habitats or other temporary or permanent ecological change/ exclusion zones or reduced access.	Onshore	Construction Operation
Impacts on availability and affordability of short-term accommodation in construction phases, particularly in areas with high levels of tourism.	Onshore	Construction
Impacts on Traditional Owners and Aboriginal communities including impacts on connection to Country.	Onshore Offshore	Construction Operation

Impact	Project Component	Phase
Reduction in levels of social cohesion resulting from differing levels of support for the Project.	Onshore Offshore	Planning
Changes to sense of place for coastal communities and/or location of onshore facilities.	Onshore Offshore	Operation
Opposition to the Project due to concerns about energy transition and reliance on existing extractive infrastructure.	Onshore Offshore	Planning Operation
Low community acceptance based on limited understanding of Project design (unfamiliarity with offshore wind technology).	Offshore	Planning Operation
Perceived lack of fairness and quality of decision-making processes.	Onshore Offshore	Planning
Cumulative community impacts from existing and proposed onshore and offshore wind farms across the region.	Onshore Offshore	Operation

The Project is also anticipated to generate a number of benefits, including:

- Local employment generation and procurement of local businesses/services resulting in decreased unemployment rates and local economic benefits.
- Increased energy security and reliability for the future.
- Reduced reliance on carbon emitting industries.
- Diversification in the energy market.
- Use of existing industry infrastructure and local businesses.
- Upgrades to existing local infrastructure.
- Improved access to conservation areas.

6.0 Hydrology

This section summarises the information provided in the Preliminary Hydrology Constraints Assessment prepared by Umwelt (October, 2022).

6.1 Existing Conditions

6.1.1 Catchments, Waterways, and Waterbodies

The onshore Study Area is located within the Glenelg Hopkins catchment region. Within this catchment region, the onshore Study Area is within the Portland Coast basin. The northern part of the onshore Study Area for both transmission route options is located within the catchment system for Surry River and generally drains towards the north-east, discharging at Narrawong. The southern part of the transmission routes is located within the catchment system for Wattle Hill Creek and drains generally toward the south-east, discharging at Portland.

Both transmission route options intersect with Wattle Hill Creek and Surry River and their tributaries. Other unnamed watercourses are also located within the onshore Study Area. In the *Assessment of Victoria's Estuaries Using the Index of Estuary Conditions: Results 2021* (DELWP, 2021), Surry River and Wattle Hill Creek both had ratings of 'Excellent' for water quality.

There are several lakes and intertidal wetland systems within the Study Area inland from the coast, including Bridgewater Lakes located to the north of the shoreline crossing of transmission route option 1. The Glenelg Estuary and Discovery Bay Ramsar site intersects with the Study Area at the shoreline crossing for option 1. The hydrology values within the Study Area are shown in **Figure 6.1**.

6.1.2 Groundwater Dependent Ecosystems (GDEs)

Both transmission routes intersect with low, moderate, and high potential Groundwater Dependent Ecosystems (GDEs) from the coast to approximately 30 km along the transmission route, and low to moderate GDEs further west.

A groundwater impact assessment would be required to determine the depth to groundwater within the Study Area and the potential for transmission line construction works to intersect with groundwater.

6.1.3 Flooding

The following flood studies undertaken in the vicinity of the Study Area were reviewed:

- *Surry River Estuary Flood Study* (Water Technology, 2008): Hydrology was undertaken for the Surry River catchment and flood modelling was undertaken for the Surry River Estuary which is located downstream of the Study Area.
- *Portland Flood Study* (Cardno, 2011): Wattle Hill Creek and is located downstream of the Study Area.

While neither flood study contains flood mapping of the Study Area, the flood studies were reviewed alongside the 10 m resolution Vicmap Digital Elevation Model (DEM) of the area (State Government of

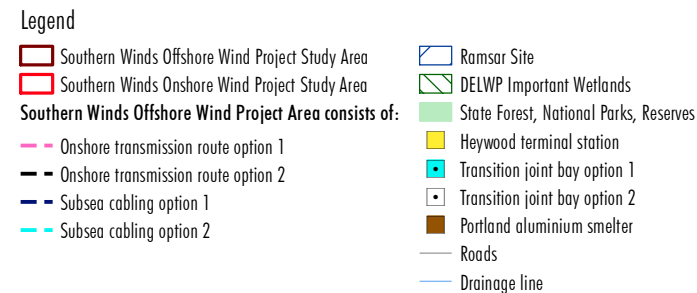


FIGURE 6.1

Hydrology within the Study Area

Victoria, 2021) and stream gauge data for Surry River to understand potential flood risk. It is expected that Surry River has the potential to spread out into a floodplain approximately 1 km wide, while it is expected that flow within Wattle Hill Creek and other tributaries to be relatively contained within the channels.

Table 6.1 Summary of Desktop Assessment Outcomes – Hydrology

Summary of Assessment Outcomes
<ul style="list-style-type: none"> Both transmission routes intersect with Wattle Hill Creek and Surry River and their tributaries. The catchment system for Surry River generally drains towards the north-east. The catchment system for Wattle Hill Creek drains generally toward the south-east. The transmission routes 1 and 2 intersect with low, moderate, and high potential Groundwater Dependent Ecosystems. Surry River has the potential to spread out into a floodplain approximately 1 km wide, while it is expected that flow within Wattle Hill Creek and other tributaries is relatively contained within the channels.

6.2 Potential Impacts

Following definition of the existing environmental context of the Project site and surrounding area, potential hydrology impacts have been identified with consideration of the Project design, construction, operation, and decommissioning activities in the context of the existing conditions. An overview of these potential impacts is provided in **Table 6.2**.

Table 6.2 Potential Impacts – Hydrology

Impact	Project Component	Phase
Surface water quality impacts to watercourses and sensitive waterbodies in the Study Area due to soil erosion and sedimentation from construction and decommissioning activities such as vegetation removal, earthworks, and movement of heavy vehicles.	Onshore	Construction Decommissioning
Trenching of ephemeral watercourses (if required) have the potential to impact the surface water quality of watercourses and sensitive waterbodies within the Study Area and result in soil erosion and sedimentation in downstream waterways.	Onshore	Construction Decommissioning
Fuel or chemical spills, or inappropriate material storage can lead to contamination of groundwater, nearby waterways and/or sensitive waterbodies resulting in environmental degradation.	Onshore	Construction Decommissioning
Impacts to groundwater resources including Groundwater Dependent Ecosystems (GDEs).	Onshore	Construction
Flood risk to project infrastructure such as access tracks.	Onshore	Construction Operation
Afflux to nearby properties due to project infrastructure displacing floodplain storage or altering drainage flow paths.	Onshore	Construction Operation
Fuel or chemical spills, fire management systems or inappropriate material storage, leads to contamination of groundwater, nearby waterways and/or sensitive waterbodies resulting in environmental degradation.	Onshore	Operation
Discharge of stormwater from the Study Area during operation resulting in adverse impacts on receiving environment surface and groundwater water quality.	Onshore	Operation

Impact	Project Component	Phase
Discharge of stormwater from the Study Area during operational phase resulting in adverse impacts on receiving environment surface water geomorphology (e.g. stream bank erosion and scouring) or hydroecology.	Onshore	Operation

7.0 Cultural Heritage

This section summarises the information provided in the Preliminary Desktop Cultural Heritage Constraints Assessment undertaken by Umwelt (October, 2022).

7.1 Existing Conditions

7.1.1 Aboriginal Cultural Heritage

The onshore and offshore Study Area within State jurisdiction (land and sea) is subject to one Registered Aboriginal Party (RAP) in Victoria, the Gunditj Mirring Traditional Owners Aboriginal Corporation (GMTOAC), which is representative of the Gunditjmarra People.

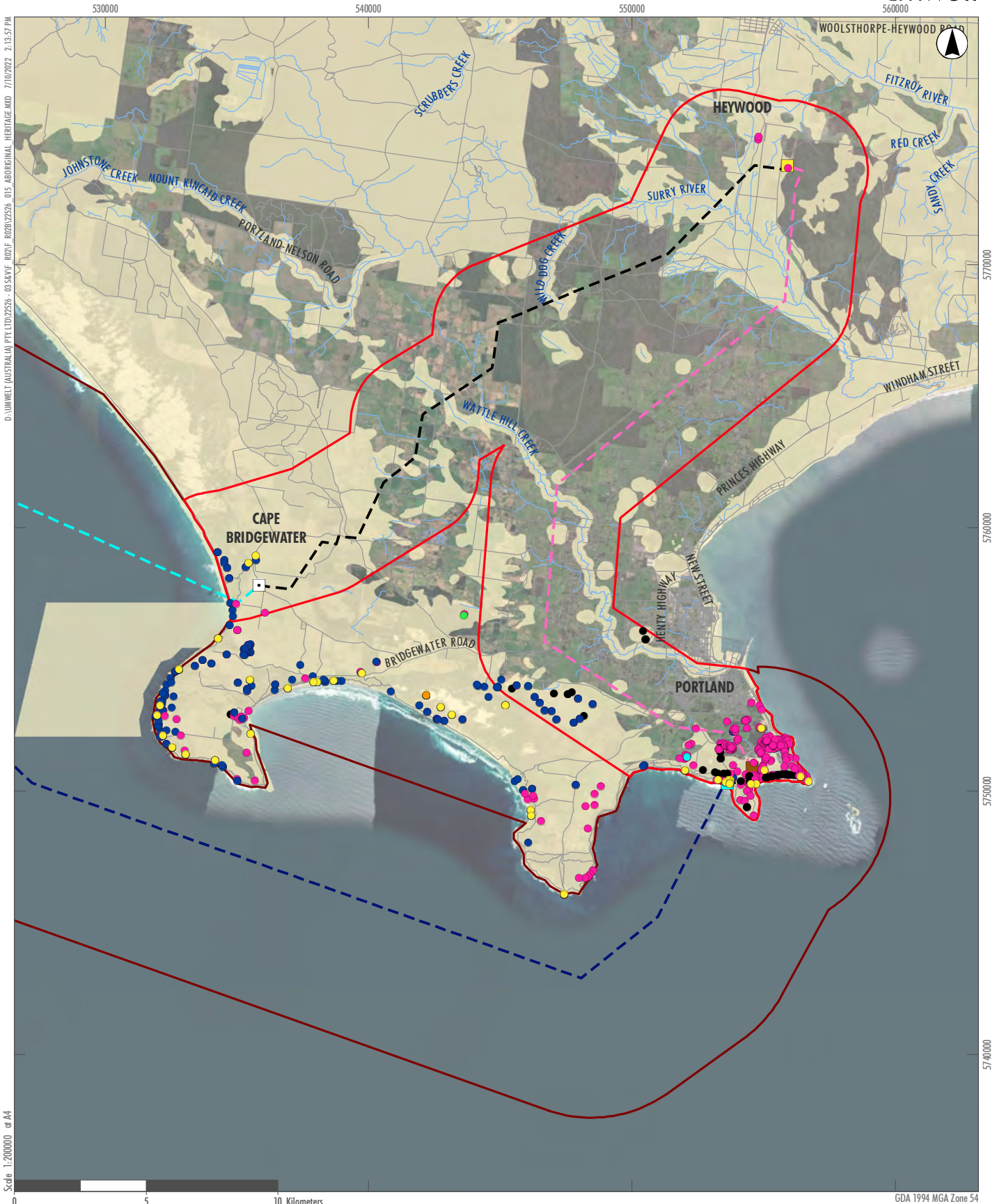
The Project is not located within South Australian jurisdiction (either onshore or offshore) however, the offshore Study Area intersects with South Australian State Waters. The Traditional Owners of South Australian land and State Waters within, and adjacent to the Study Area are the South East Aboriginal Focus Group, who are represented in business matters by the Burrandies Aboriginal Corporation through the Lartara-Wirkeri Cultural Governance Agreement.

A total of 365 registered Aboriginal Places (Aboriginal cultural heritage sites registered on the Victorian Aboriginal Heritage Register (VAHR)) are located within the onshore Study Area. The types of sites within the Study Area include artefact scatters, earth features, shell middens, low density artefact distributions (LDADs), two object collections, and an Aboriginal historical place. A summary of these sites is presented in **Table 7.1**. The locations of these sites are shown in **Figure 7.1**.

Table 7.1 Summary of Registered Aboriginal Places within the Study Area

Site Type	Number of Sites
Aboriginal Historical Place	1
Artefact Scatter	244
Earth Feature: Hearth	2
Earth Feature: Soil Deposit	27
Low Density Artefact Distribution	49
Object Collection	2
Shell Midden	40
Total	365

There are also multiple areas of cultural heritage sensitivity within the Study Area, as shown in **Figure 7.1**.



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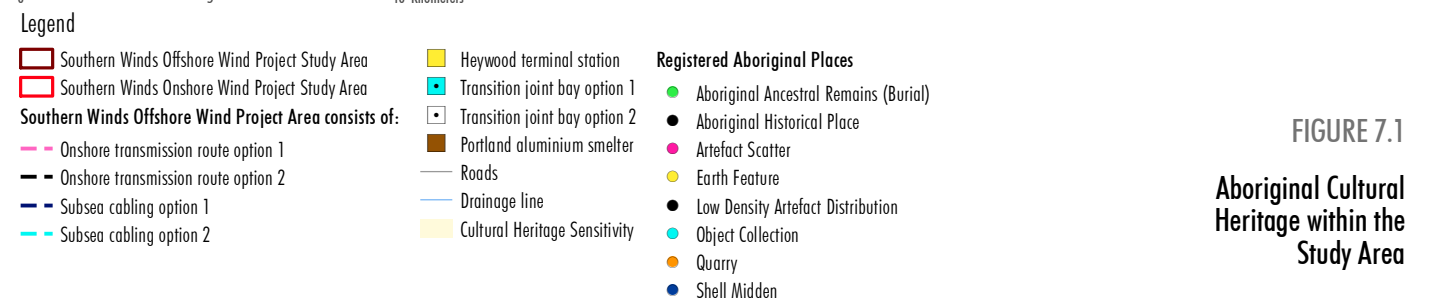


FIGURE 7.1
Aboriginal Cultural Heritage within the Study Area

7.1.2 Non-Aboriginal Cultural Heritage ('Historical')

There are multiple non-Aboriginal cultural heritage values within the Study Area listed on the Victorian Heritage Register (VHR), the Victorian Heritage Inventory (VHI) and the Glenelg Planning Scheme Heritage Overlay (HO). A summary of these sites is provided in **Table 7.2** and shown in **Figure 7.2**.

Works or impacts to places listed on the VHR and VHI would require statutory approval. Planning approval may be required to undertake works within a place listed in the Schedule to the Heritage Overlay. **Table 7.2** identifies the relevant statutory approvals required if the Project impacts on these sites.

Table 7.2 Non-Aboriginal Heritage Sites within the Study Area

Heritage Register	No. of sites within the onshore Study Area	Statutory Approval Requirements
Victorian Heritage Register (VHR)	7	Permit required under the <i>Heritage Act 2017</i> for works or impacts to listed places.
Victorian Heritage Inventory (VHI)	20	Consent required under the <i>Heritage Act 2017</i> for works or impacts to listed places.
Glenelg Planning Scheme Heritage Overlay	13	Planning approval may be required under the <i>Planning and Environment Act 1987</i> for buildings and works and / or impacts on trees on sites listed on the Schedule to the Heritage Overlay.

The Heritage Overlay has been applied to non-Aboriginal cultural heritage sites to historic residences in the vicinity of the Project, Bridgewater Lakes, Johnstone River and Swan Lake and South Portland Cemetery.

There are also 6 sites listed on the National Trust Heritage Register in Victoria. This Trust does not provide any statutory protection. Notwithstanding, impacts on these sites should be avoided.

A search of the Australasian Underwater Cultural Heritage Database (AUCHD) confirmed that there are six non-Aboriginal cultural heritage sites listed on the AUCHD within the Study Area. As listed in **Table 7.3** and shown in **Figure 7.3**, these comprise five shipwrecks located offshore and one shipwreck located onshore. There are several other shipwrecks just outside the Study Area.

Table 7.3 AUCHD Listings within the Study Area

Name of Ship	Shipwreck ID	Year Wrecked	Onshore/Offshore
The Triumph	6654	1863	Offshore
Jane	6303	1863	Offshore
Captain Cook	6042	1850	Offshore
Isabella	6286	1837	Offshore
Merope	6429	1839	Offshore
Unknown French Whaler	6758	1841	Onshore

A permit would be required under the Commonwealth *Underwater Cultural Heritage Act 2018* (UCH Act) if the Project impacts on any of these shipwrecks. None of these shipwrecks have exclusion zones. Permits are issued by the DCCEEW. The UCHA Act also protects Aboriginal cultural heritage in Commonwealth waters. Heritage Victoria has a delegated responsibility for day-to-day decisions under the UCHA Act. Notwithstanding, impacts on these sites should be avoided.



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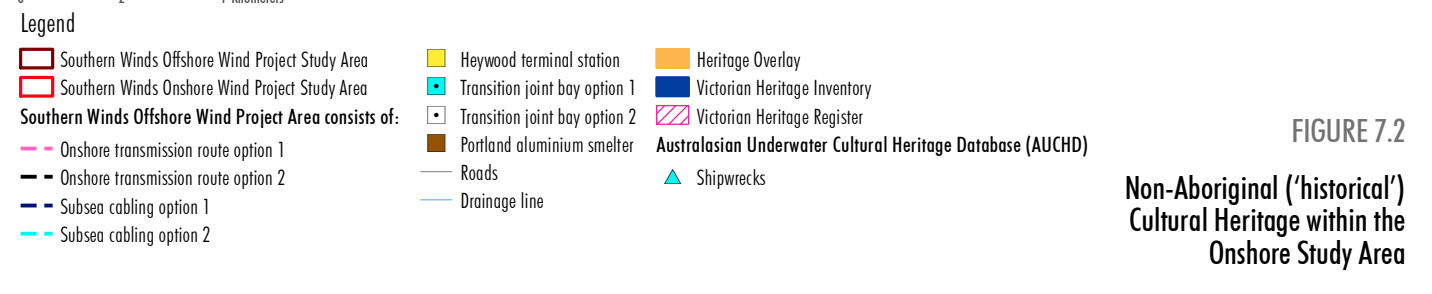
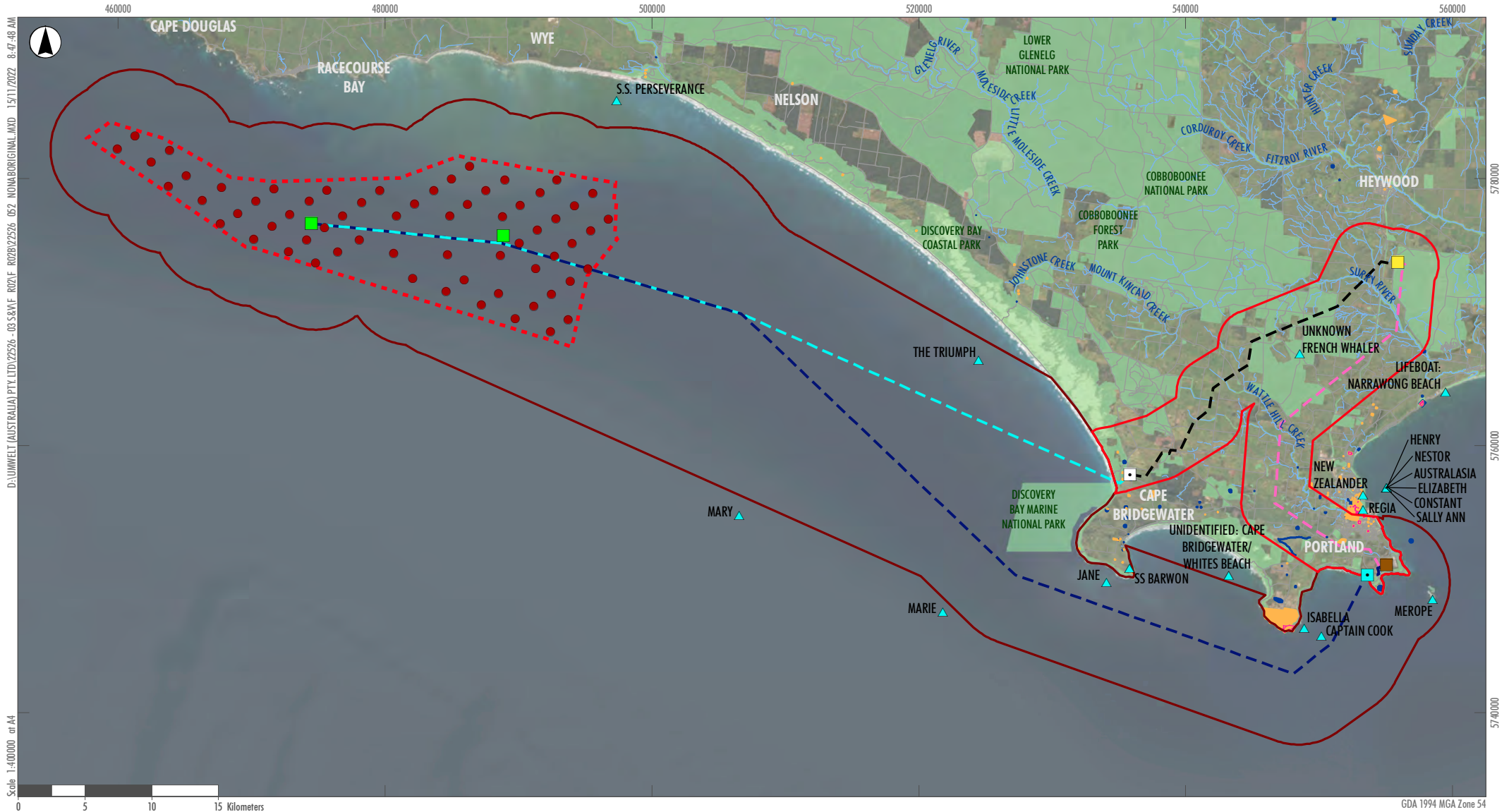


FIGURE 7.2
Non-Aboriginal ('historical') Cultural Heritage within the Onshore Study Area



Legend

- | | | | |
|---|---|-------------------------------|---|
| Southern Winds Offshore Wind Project Study Area | Southern Winds Offshore Wind Project Area consists of: | Potential turbine layout | Heritage Overlay |
| Southern Winds Onshore Wind Project Study Area | Southern Winds Offshore Wind Project Boundary | Substation | Victorian Heritage Inventory |
| Onshore transmission route option 1 | Onshore transmission route option 2 | Heywood terminal station | Victorian Heritage Register |
| Subsea cabling option 1 | Subsea cabling option 2 | Transition joint bay option 1 | Australasian Underwater Cultural Heritage Database (AUCHD) |
| | | Transition joint bay option 2 | Shipwrecks |
| | | Portland aluminium smelter | |

Data source: VIC Data (2022)

FIGURE 7.3
Non-Aboriginal ('historical') Cultural Heritage within the Offshore Study Area

7.1.3 Non-Registered (Predicted) Cultural Heritage

The Study Area has been used by Aboriginal people and then also by non-Aboriginal people in various ways over a long period of time, for an array of purposes. Therefore, the Study Area is likely to contain a range of cultural heritage material, both Aboriginal and non-Aboriginal.

The following predictive statements can be made regarding non-registered cultural heritage values that may exist within the Study Area, Aboriginal and non-Aboriginal:

- It is **highly likely** that further non-registered Aboriginal cultural heritage material exists within the Study Area:
 - Non-registered Aboriginal sites are **highly likely** to exist within areas of cultural heritage sensitivity, including near water sources, swamps, areas of remnant vegetation, dune deposits, coastal areas, and wetlands.
 - It is **highly likely** that non-registered Aboriginal sites will include surface and sub-surface stone artefact scatters, camping and occupation sites, scarred trees, Aboriginal ancestral remains, as well as intangible cultural values (associations, stories, song lines).
- There is **potential** for non-registered Aboriginal cultural heritage material that has been removed from its original context to exist within the Study Area. These sites may comprise of surface artefacts that have been collected by people and stored, whether by people on their private property or by researchers conducting archaeological digs and includes reinterred material (which may or may not have been recorded during reinternment). These types of sites are defined by the VAHC as ‘object collections’.
- There is **potential** for non-registered underwater Aboriginal sites to exist within the Study Area.
- Based on the post-colonisation background of the area, there is **potential** for unrecorded Aboriginal cultural heritage associated with acts of colonial violence to be present within the Study Area, and this may include human remains.
- It is **unlikely** that *in situ* Aboriginal material will be located within the Study Area where significant ground disturbance in the form of construction of infrastructure has occurred, such as areas in proximity to the city of Portland, logging plantations, sealed public roads and highways, and the Portland Aluminium Smelter.
- Sub-surface Aboriginal cultural heritage material is **likely** to exist in disturbed/cleared areas and farmland/grazing paddocks across the area despite historical surface disturbances.
- It is **likely** that undiscovered Aboriginal cultural heritage material will exist in the offshore areas of the Study Area.
- It is **highly likely** that non-registered non-Aboriginal (‘historical’) cultural heritage material exists within the Study Area:
 - It is **likely** that historical material such as surface artefact scatters and features exist within the Study Area related to the region’s land use by whalers and sealers, squatters, pastoralists, explorers, and miners. If present, surface artefact scatters are likely to be associated with

temporary camps and historical structures (e.g., shearing sheds, squatters' huts, etc.), former homesteads or agricultural equipment, structures, historical irrigation, and earthworks.

- It is **unlikely** for previously unidentified built historical heritage places (buildings) to be present within the Study Area.
- It is **unlikely** that further non-registered underwater non-Aboriginal cultural heritage sites including shipwrecks exist within the Study Area.

Table 7.4 Summary of Desktop Assessment Outcomes – Cultural Heritage

Summary of Assessment Outcomes
<ul style="list-style-type: none"> ● A total of 365 registered Aboriginal Places (Aboriginal cultural heritage sites registered on the Victorian Aboriginal Heritage Register (VAHR)) are located within the Study Area. The types of sites within the Study Area include an Aboriginal historical place, artefact scatters, earth features, shell middens, low density artefact distributions (LDADs), and two object collections. ● There are 46 listed non-Aboriginal cultural heritage sites located within the Study Area: <ul style="list-style-type: none"> ○ Seven are listed on the Victorian Heritage Register. A permit would be required if the Project impacts on any of these sites. ○ Twenty sites are listed on the Victorian Heritage Inventory. Consent would be required if the Project impacts on any of these sites. ○ Thirteen sites are listed on the Glenelg Planning Scheme Heritage Overlay. Planning approval may be required to undertake works within any of these sites. ● The Study Area has been utilised by Aboriginal people and then also by non-Aboriginal people in various ways over a long period of time, for an array of purposes both onshore and offshore. Therefore, the Study Area is likely to contain a range of non-registered cultural heritage material, both Aboriginal and non-Aboriginal.

7.2 Potential Impacts

Following definition of the existing environmental context of the Project site and surrounding area, potential cultural heritage impacts have been identified with consideration of the Project design, construction, operation, and decommissioning activities in the context of the existing conditions. An overview of these potential impacts is provided in **Table 7.5**.

Due to the extent of areas of cultural heritage sensitivity within the Study Area, it would not be feasibly possible for the Project to avoid all areas of cultural heritage sensitivity. Therefore, a mandatory Cultural Heritage Management Plan (CHMP) will be required for the Project.

Table 7.5 Potential Impacts – Cultural Heritage

Impact	Project Component	Phase
Disturbance of registered Aboriginal Places within the onshore Study Area resulting in impacts on the cultural heritage values of these places.	Onshore	Construction
Disturbance of the physical material of registered non-Aboriginal cultural heritage sites (shipwrecks) within the Study Area, resulting in impacts on the cultural heritage values of these sites.	Onshore Offshore	Construction
Disturbance of unrecorded non-Aboriginal cultural heritage material within Study Area.	Onshore Offshore	Construction
Disturbance of unrecorded Aboriginal cultural heritage material within the Study Area.	Onshore Offshore	Construction
Impacts on intangible and unrecorded cultural values associated with the project area including its cultural and spiritual significance to the Gunditjmara people and neighbouring traditional owners.	Onshore Offshore	Construction and Operation

8.0 Land Use

8.1 Existing Conditions

The onshore component of the Project is located within the Glenelg LGA. Land within the onshore Study Area is mostly used for agriculture with some areas of conservation and nature reserves. The onshore Study Area for option 1 subsea cabling landing and route intersects with the Portland township.

The underground cabling for transmission route option 1 also crosses the shoreline over public land at the Nelson Bay Coastal Reserve and Narrawong Coastal Reserve. It would then connect into the existing switchyard at the Portland Aluminium Smelter. No works will be undertaken along the existing 500 kV transmission line between the Portland Aluminium Smelter switchyard and the Heywood Terminal Station however, this has been included in the Study Area to allow for flexibility as the Project develops. This area runs through predominantly agricultural land to the existing Heywood Terminal Station. The northern extent of the Study Area for transmission route option 1 intersects with Mount Clay State Forest and Narrawong Flora Reserve south of the Heywood Terminal Station. Several smaller parcels of public land set aside for conservation are located within transmission route option 1.

The underground cabling for transmission route option 2 crosses the shoreline over public land used for conservation and recreation purposes, landing near the south east corner of Discovery Bay Coastal Park and the Glenelg Estuary and Discovery Bay Ramsar Wetland site to the north of the Discovery Bay Marine National Park. Transmission route option 2 then crosses agricultural land, passing the Portland Airport, until it meets Cobboboonee Forest, where it travels through sections of Cobboboonee Forest Park for approximately seven kilometres. From there, the transmission line crosses agricultural land, spanning the Surry River and the Portland Railway Line, before connecting to the Heywood Terminal Station. Several small parcels of public land set aside for conservation purposes are located within the transmission route.

8.1.1 Public land

There are several areas of public land such as parks, reserves, Indigenous protected areas, plantations and waterways that intersect with the onshore Study Area. These areas of public land, which include areas such as the Glenelg Estuary and Discovery Bay Ramsar Wetlands site, are protected for conversation purposes due to their high flora and fauna significance. They also provide a range of recreation experiences in a sustainable way to protect the natural values . This is discussed further in **Section 8.1.3**.

An overview of the amount of public land within the onshore Study Area is provided in

Table 8.1 and shown in **Figure 8.1**.

Table 8.1 Public land within the onshore Study Area

Onshore Study Area		Public land	
Number of land parcels	Area (ha)	Area (ha)	% of area is public land
4,803	15,658 ha	2,388 ha	15%

A summary of the public land sites intersected by the onshore Study Area is provided in **Table 8.2**.

Table 8.2 Public Land within the onshore Study Area

Category	Name	Description	Managing Agency and Legislation
Ramsar site	Glenelg Estuary and Discovery Bay Ramsar site.	Option 2 of the subsea cabling intersects with the Glenelg Estuary and Discovery Bay Ramsar site as it crosses the shoreline.	Management of Ramsar sites in Victoria is coordinated by DELWP. Implementation of the Glenelg Estuary and Discovery Bay Ramsar Site Management Plan is coordinated by the Glenelg Hopkins Catchment Management Authority. Ramsar wetlands are protected under the EPBC Act.
NPA Schedule 3 Other Park	Discovery Bay Coastal Park.	Discovery Bay Coastal Park covers the shoreline of the transmission route option 2.	Managed by Parks Victoria and reserved under the <i>National Parks Act 1975</i> .
National Park	Mount Richmond National Park. Cobboboonee National Park.	Transmission route option 2 intersects with Mount Richmond National Park in the southern extent of the route and intersects with a small section of Cobboboonee National Park in the north adjacent to Cobboboonee Forest Park.	Managed by Parks Victoria and reserved under the <i>National Parks Act 1975</i> .
Forest Park	Cobboboonee Forest Park.	Both transmission route options intersect the Cobboboonee Forest Park, with option 2 traversing the middle of the park.	Managed by DELWP and reserved under the <i>Crown Land (Reserves) Act 1978</i> .
State Forest	Mount Clay State Forest. Portland West State Forest.	Mount Clay State Forest surrounds the Heywood Terminal Station. The Portland West State Forest intersects with transmission route option 1 south-west of Portland.	Managed by DELWP and reserved under the <i>Forests Act 1958</i> .
Coastal Reserve	Nelson Bay Coastal Reserve.	Option 1 crosses the shoreline at Nelson Bay Coastal Reserve.	Unreserved Crown land managed by Parks Victoria.
	Narrawong Coastal Reserve. Point Danger Reserve.	Option 1 crosses the shoreline at Narrawong Coastal Reserve. Point Danger is south of the Aluminium Smelter.	Managed by Committees of Management and reserved under the <i>Crown Land (Reserves) Act 1978</i> .
Nature Conservation Reserve	Narrawong Flora Reserve.	Narrawong Flora Reserve intersects with the transmission route option 1 south of the Heywood Terminal Station.	Managed by Parks Victoria and reserved under the <i>Forests Act 1958</i> .

Category	Name	Description	Managing Agency and Legislation
	Nine Mile Flora and Fauna Reserve.	The transmission route option 1 intersects with the Nine Mile Flora and Fauna Reserve, south-east of Narrawong Flora Reserve.	Managed by Parks Victoria and reserved under the <i>Crown Land (Reserves) Act 1978</i> .
	Tarragal Education Area. Dry Hole Recreation and Water Reserve. Nelson Park – Portland. Yarraman Park – Portland.	Tarragal Education Area is located within transmission route option 2, near Mount Richmond National Park. Dry Hole Recreation and Water Reserve is located adjacent to the Cobboboonee Forest Park. Nelson Park and Yarraman Park are located to the south-west of Portland.	Managed by DELWP and reserved under the <i>Crown Land (Reserves) Act 1978</i> .
	Heathmere Recreation & Flora/Fauna Reserve. Trewalla Recreation Reserve. Fawthrop Lagoon – Portland. Alexandra Park – Portland. Henty Park – Portland.	These are located within the transmission routes south of the Heywood Terminal Station. They intersect with the transmission route option 1 in West and to the south of Portland.	Managed by Committees of Management, local government, and/or Council. Reserved under the <i>Crown Land (Reserves) Act 1978</i> .
Natural Features Reserve	Stream Frontages. Surrey River Water Frontage.	Surry River Water Frontage traverses east to west in the northern extent of the Study Area, just south of the Heywood Terminal Station.	Unreserved Crown land managed by DELWP.
	Heywood Bushland Reserve.	This is located to the north-west of the Heywood Terminal Station.	Unreserved Crown land managed by Parks Victoria.
	Gorae Bushland Reserve. Bolwarra H43 Bushland Reserves. Bolwarra H44 Bushland Reserve. Trewalla H48 Bushland Reserve. Trewalla H49 Bushland Reserve. Portland H46 Bushland Reserve. Portland H47 Bushland Reserve.	These are located adjacent to the transmission route option 2 in Gorae. These bushland reserves are scattered throughout the transmission route option 1.	Managed by Parks Victoria and reserved under the <i>Crown Land (Reserves) Act 1978</i> .
Services and utilities area	Water and sewerage services Cemetery Reserve. Portland Railway Line Drains.	Small areas of crown land reserved for services and utilities are scattered throughout the Study Area.	Unreserved Crown land managed by DELWP.

Category	Name	Description	Managing Agency and Legislation
Uncategorised Public Land	Other reserves and public land.	Small areas of uncategorised public land are scattered throughout the Study Area.	Unreserved Crown land managed by DELWP.

8.1.1.1 Native Title

As shown on Figure 3.2 of the Desktop Cultural Heritage and Archaeology Constraints Assessment, the Study Area is located within the following areas:

- Parts of the Study Area fall within the boundaries of the Gunditjmara People native title claim (Tribunal No. VCD2007/001), for which the registered native title body corporate is the GMTOAC.
- Parts of the Study Area overlap with three registered Indigenous Land Use Agreements (ILUA) (Tribunal No. VI2006/004, VI2010/001, VI2015/002).
- Parts of the Study Area overlap with a Future Act Notice (Tribunal No. VS2000/0025).

The offshore Study Area extends into South Australian waters. The Traditional Owners of the land are the Boandik people, represented by Burrandies Aboriginal Corporation. A scheduled application was identified for First Nations of the South East (Tribunal Number SC2017/002), including the Traditional lands of the Boandik peoples.

8.1.2 Infrastructure

The arterial roads that intersect with the onshore Study Area are Portland Nelson Road, Bridgewater Road, Henty Highway, Madeira Packet Road and Princes Highway. The Study Area also intersects with several other sealed and unsealed local roads. The Portland Railway Line runs north to south from Heywood to Portland within the Study Area. The Portland City Gate to Portland Smelter gas pipeline, owned by Ausnet Gas Services Pty Ltd, intersects with the transmission route option 1.

Transmission route option 1 connects into the Portland Aluminium Smelter and will use the existing 500 kV Heywood – Portland transmission line between the Portland Aluminium Smelter and the Heywood Terminal Station.

Pacific Hydro’s Portland Wind Farm is located within proximity to, and within parts of the onshore Study Area. It has three segments at Cape Bridgewater, Cape Nelson and Cape Sir William Grant and has been in operation since 2010.

The Cape Grant Quarry is located approximately 6 km south of Portland, on the eastern cliff of Cape Sir William Grant (Port of Portland, 2022). This quarry is covered by Work Authority WA74, granted to Port of Portland Pty Ltd under the *Mineral Resources (Sustainable Development) Act 1990*.

The Port of Portland is located north of the onshore Study Area, north of the Portland Aluminium Smelter. It is Victoria’s only naturally deep-water port, providing a logistics gateway to the rest of Australia and the world, with connectivity to national road and rail networks. It is one of Australia’s busiest regional ports and currently handles seven commodities including sustainable forestry products, livestock, grain, mineral sands, fertiliser, smelter products and wind turbines (Port of Portland, 2022).

Keppel Prince is a large fabricator, construction and maintenance contractor based in Portland. Keppel Prince fabricate, blast, fit-out, and store wind towers, as well as supply and install the internal components of onshore wind turbines (Keppel Prince, 2022).

Transmission route option 2 is located within proximity to Portland Airport, approximately 1 km at the closest point. The Study Area is located within the inner horizontal surface of the Portland Airport Obstacle Limitation Surface (OLS), which may infringe on acceptable clearance limits of the OLS.

8.1.3 Recreation

The onshore Study Area contains several reserves set aside for conservation and recreation purposes. The Discovery Bay coastline, Cape Bridgewater and Cape Nelson provide a number of recreational activities including boating, fishing, camping, oceanside walking trails, and kayaking. The Glenelg Estuary and Discovery Bay Ramsar Wetlands site intersects with the Study Area where subsea cabling option 2 crosses the shoreline. The Ramsar site stretches along the Discovery Bay coastline for approximately 75 km and is a popular recreation and tourism destination, with lookouts such as Cape Nelson lighthouse, Celia lookout at Cape Bridgewater and Picnic Hill Reserve lookout and campgrounds along the coast.

Within the Study Area, there are coastal walking tracks including the Great South West Walk, as well as inland walking tracks and horse riding trails through Cobboboonee Forest Park. Several nature conservation reserves, natural features reserves and community use areas are scattered throughout the Study Area which are used for recreational activities by local community members.

There are campsites east and west of the Study Area along the coastline including Springs Camp, Trewalla Camping Area, Swan Lake and Lake Mombeong.

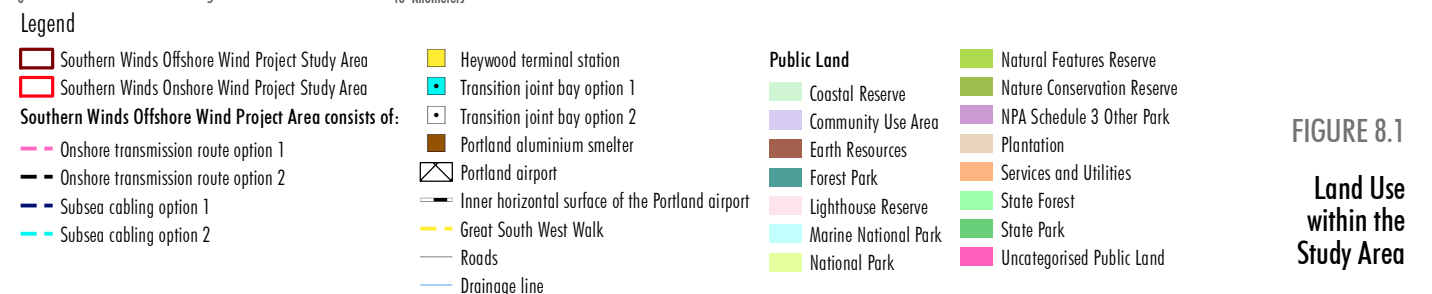
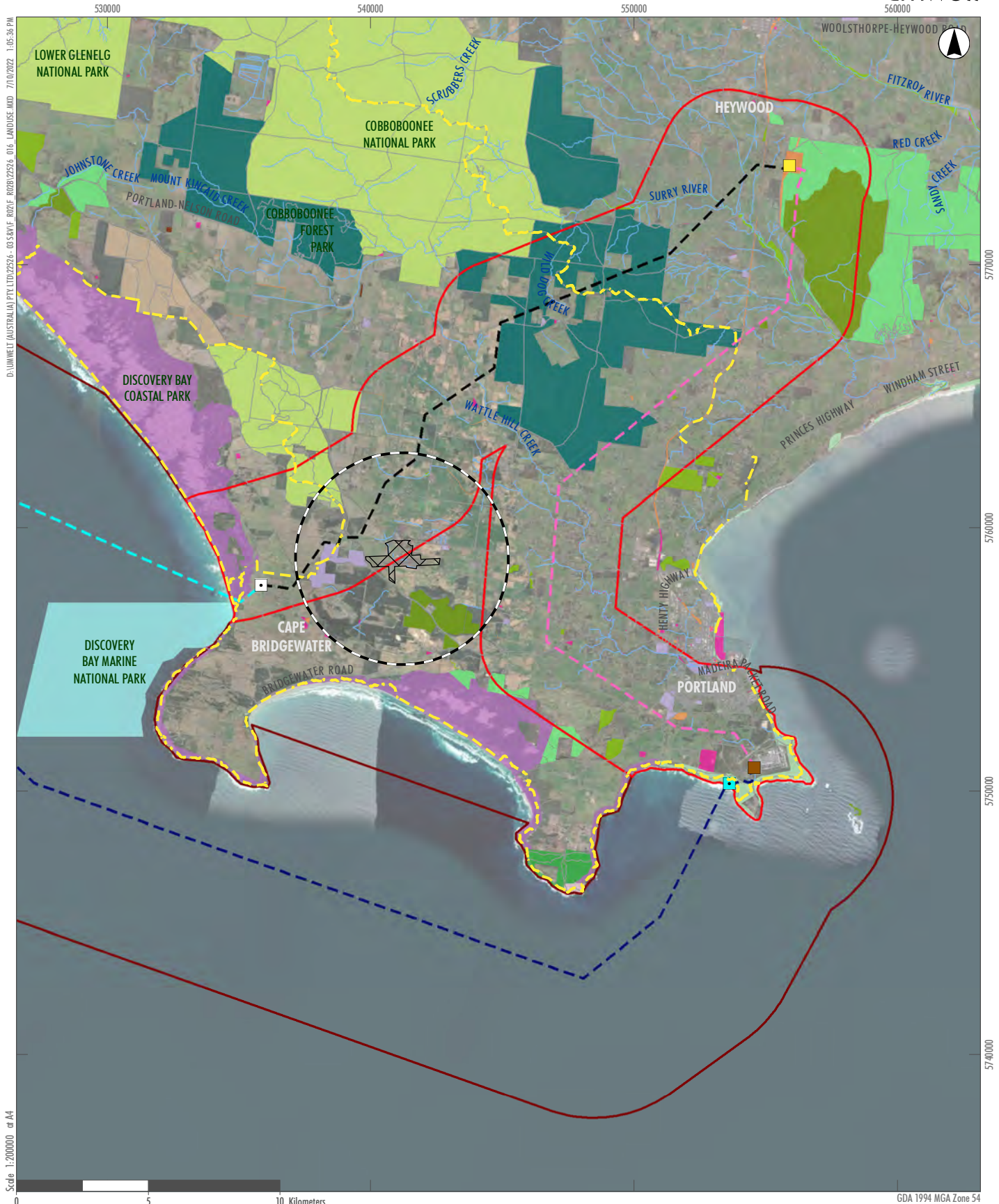


FIGURE 8.1
Land Use within the Study Area

8.1.4 Planning Scheme Context

The onshore component of the Study Area is subject to the provisions of the Glenelg Planning Scheme. A list of the relevant planning zones and overlays is provided in **Table 8.3**. The zones and overlays are shown in **Figure 8.2**, **Figure 8.3** and **Figure 8.4**.

Table 8.3 Planning Zones and Overlays

Planning Control	Description
Planning Zones	
Clause 33.02 – Industrial 2 Zone (IN2Z)	The IN2Z covers the Portland Aluminium Smelter and associated switchyard where the transmission route option 1 connects into.
Clause 35.03 – Rural Living Zone (RLZ)	The RLZ applies to areas of the onshore Study Area south of Heathmere and west of Portland.
Clause 35.06 – Rural Conservation Zone (Schedule 1 - Conservation values) (RCZ1)	The RCZ1 applies to areas of the onshore Study Area surrounding Bridgewater Lakes along the coastline, where subsea cabling option 2 crosses the shoreline, and to the west of the Portland Aluminium Smelter where transmission route option 1 crosses the shoreline.
Clause 35.06 – Rural Conservation Zone (Schedule 2 - Conservation values) (RCZ2)	The RCZ2 applies to a large portion of the onshore Study Area between Portland West and Heywood, including Gorae West and land surrounding Cobboboonee Forest Park.
Clause 35.07 – Farming Zone (FZ)	The FZ applies to a large portion of the onshore Study Area near Cashmore and Gorae West, west of Portland and north of Heathmere.
Clause 36.01 – Public Use Zone (PUZ1 – Service & Utility)	The PUZ1 applies to the Heywood Terminal Station in the north of the onshore Study Area.
Clause 36.02 – Public Park and Recreation Zone (PPRZ)	The PPRZ applies to the coastline of the onshore Study Area at the Nelson Bay Coastal Reserve where subsea cabling option 1 crosses the shoreline and the Discovery Bay Coastal Park where option 2 crosses the shoreline. It also applies to Mount Richmond National Park.
Clause 36.03 – Public Conservation and Resource Zone (PCRZ)	The PCRZ applies to land within the Study Area including Cobboboonee Forest Park, Portland H47 Bushland Reserve, Portland H46 Bushland Reserve and Narrawong Flora Reserve.
Clause 36.04 – Transport Zone 1 (State transport infrastructure) (TRZ1)	The TRZ1 applies to the Portland Railway Line between Maroona through Hamilton to Portland within the onshore Study Area.
Clause 36.04 – Transport Zone 2 (Principal road network) (TRZ2)	The TRZ2 applies to the Princes Highway, Portland-Nelson Road, Bridgewater Road, and Madeira Packet Road.
Clause 36.04 – Transport Zone 4 (Other transport use) (TRZ4)	The TRZ4 applies to the Portland Airport which intersects with the transmission route option 2.
Clause 37.09 – Port Zone (PZ)	The PZ applies to the Cape Grant Quarry located approximately 6 km south of Portland, on the eastern cliff of Cape Sir William Grant.
Planning Overlays	
Clause 42.01 – Environmental Significance Overlay (Schedule 1 - Coastal areas) (ESO1)	The ESO1 applies to the coastline of the onshore Study Area of option 1 and option 2 of the subsea cabling. The ESO1 identifies the significance of the coastal areas.
Clause 42.01 – Environmental Significance Overlay (Schedule 2 - Waterway, wetland and estuary protection) (ESO2)	The ESO2 applies to small areas associated with waterways, wetlands and estuary protection near Portland.

Planning Control	Description
Clause 42.01 – Environmental Significance Overlay (Schedule 3 - South-eastern Red-tailed Black Cockatoo habitat areas) (ESO3)	ESO3 applies to parts of the onshore Study Area in the north of the Study Area over Gorae West, parts of Cobboboonee Forest Park and Heathmere.
Clause 42.03 – Significant Landscape Overlay (Schedule 1 - Glenelg River estuary and surrounds) (SLO1)	The SLO1 applies to coastal land extending from the South Australia-Victoria border east along Discovery Bay. The SLO1 does not apply to the onshore Study Area however, would require consideration as there will be views to the offshore wind turbines.
Clause 42.03 – Significant Landscape Overlay (Schedule 2 - Bridgewater lakes and surrounds) (SLO2)	SLO2 applies to the coastline where subsea cabling option 2 will cross.
Clause 42.03 – Significant Landscape Overlay (Schedule 3 - Cape Bridgewater and Cape Nelson) (SLO3)	SLO3 applies to the coastline where subsea cabling option 1 will cross.
Clause 43.02 – Design and Development Overlay (Schedule 1 - Airport environs) (DDO1)	The DDO1 covers a large portion of the onshore Study Area in the south. DDO1 is associated with associated with airport environs, specifically Portland Airport.
Clause 43.01 – Heritage Overlay (HO)	The HO applies to land in the transmission route options in the southern extent of the Study Area near the coastline are
Clause 44.03 – Floodway Overlay (FO)	The FO applies to a small section of the onshore Study Area in Portland West.
Clause 44.04 – Land Subject to Inundation Overlay (LSIO)	The LSIO applies to a small section of onshore Study Area in Portland West.
Clause 44.06 – Bushfire Management Overlay (BMO)	The BMO applies to most of the onshore Study Area.
Clause 45.02 – Airport Environs Overlay (Schedule 2) (AEO2)	The AEO2 applies to the south of the onshore Study Area and is associated with the Portland Airport.
Clause 45.12 – Specific Controls Overlay (Schedule 5 - Portland Wind Energy Project: Cape Bridgewater Wind Energy Facility, Cape Nelson Wind Energy Facility, Cape Sir William Grant Wind Energy Facility (May 2004) (SCO5)	The SCO5 applies to the shoreline where the subsea cabling option 1 crosses.

The following additional zones and overlays are located within the Study Area however, they are associated with the City of Portland where it is considered unlikely that Project infrastructure would be located:

- Clause 32.03 – Low Density Residential Zone
- Clause 32.08 – General Residential Zone (GRZ)
- Clause 33.01 – Industrial 1 Zone (IN1Z)
- Clause 36.01 – Public Use Zone– Cemetery/Crematorium (PUZ5)
- Clause 36.01 – Public Use Zone – Education (PUZ2)

- Clause 36.01 – Public Use Zone – Local Government (PUZ6)
- Clause 37.01 – Special Use Zone (Schedule 2 – Golf Courses) (SUZ2)
- Clause 37.03 – Urban Floodway Zone (UFZ)
- Clause 42.01 – Environmental Significance Overlay (Schedule 6 – Port of Portland Environs Area 2) (ESO6)
- Clause 43.04 – Development Plan Overlay (Schedule 1 – Residential Development Plan) (DPO1).

Identification and assessment of relevant and applicable planning controls will be undertaken following refinement of Project design.

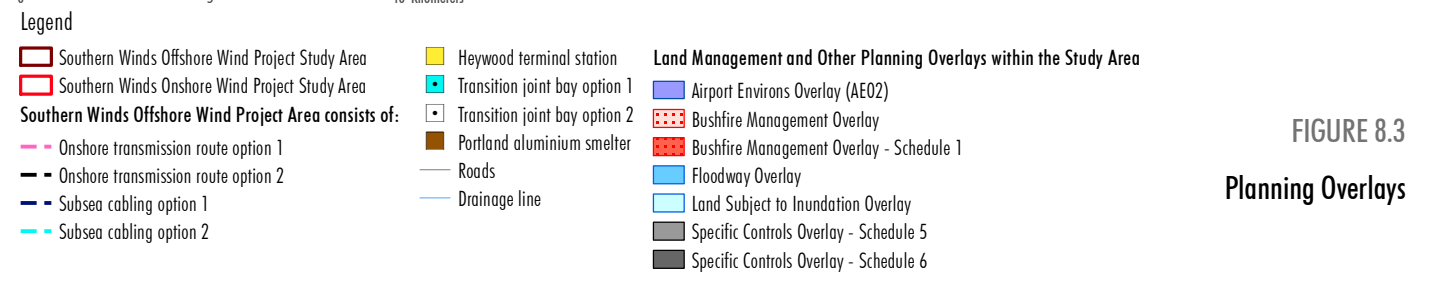
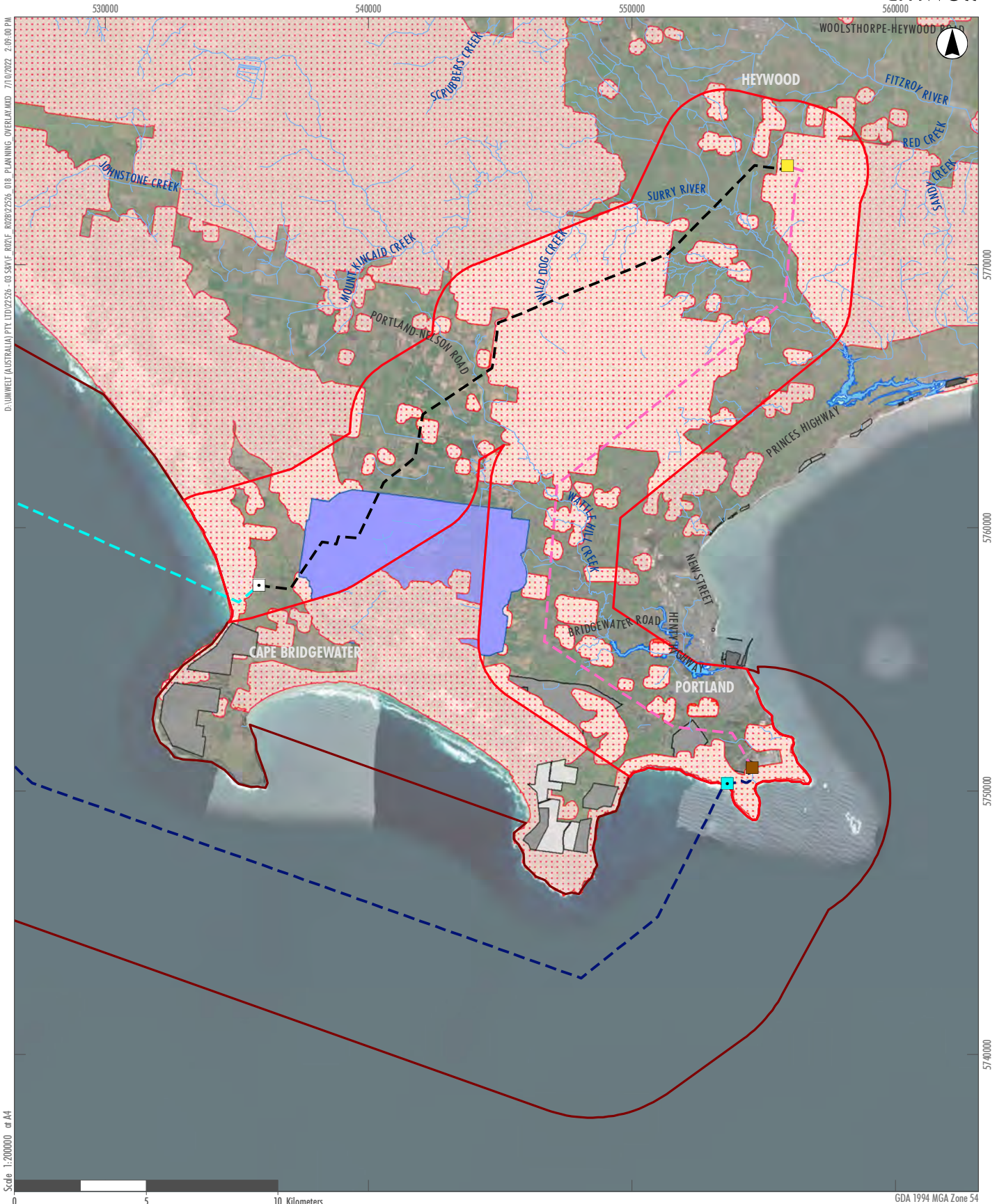
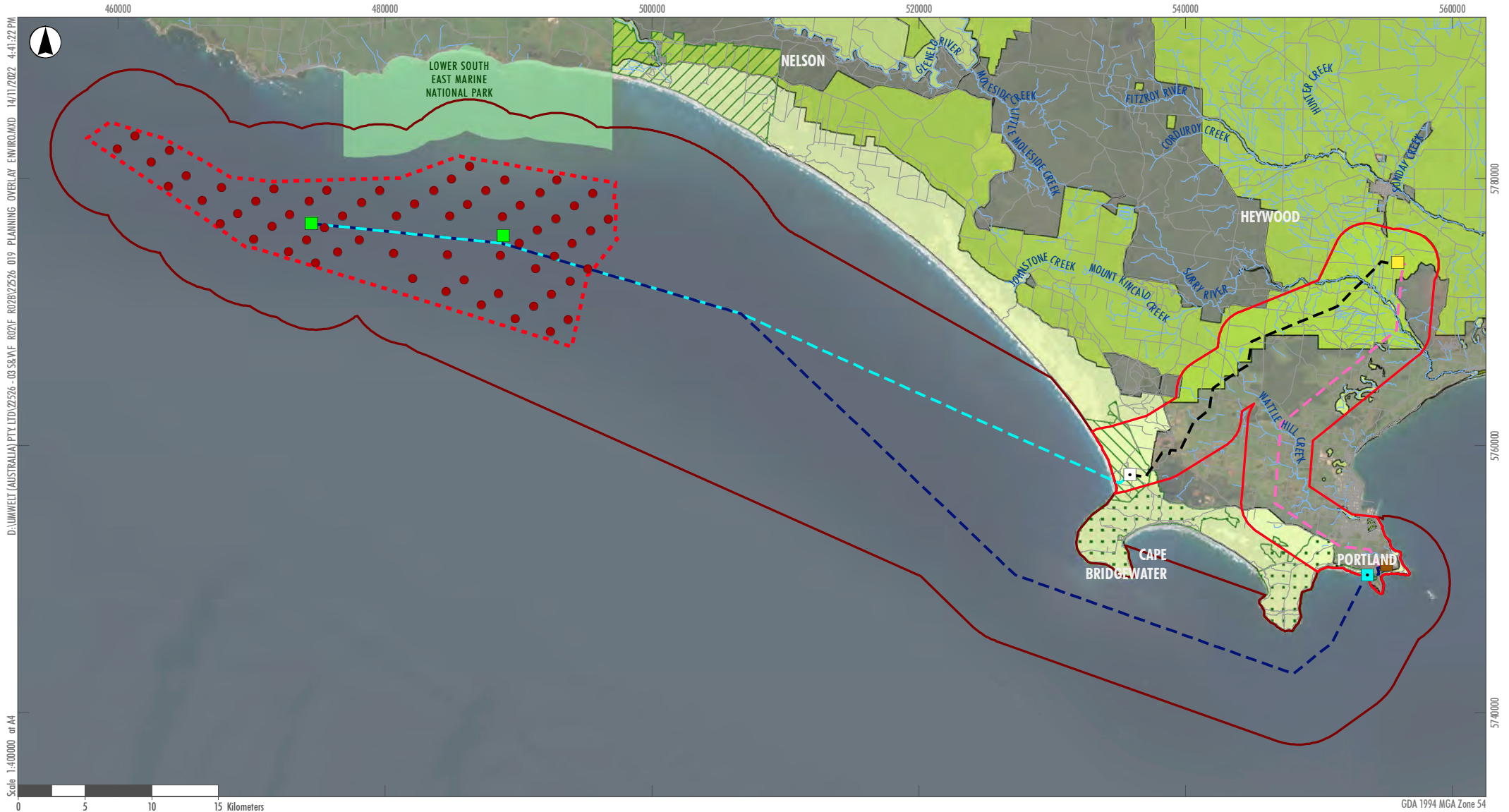


FIGURE 8.3
Planning Overlays



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Legend

- Southern Winds Offshore Wind Project Study Area
- Southern Winds Onshore Wind Project Study Area

Southern Winds Offshore Wind Project Area consists of:

- Southern Winds Offshore Wind Project Boundary
- Onshore transmission route option 1
- Onshore transmission route option 2
- Subsea cabling option 1
- Subsea cabling option 2

- Substation
- Heywood terminal station
- Transition joint bay option 1
- Transition joint bay option 2
- Portland aluminium smelter

- Roads
- Drainage line

Environment and Landscape Planning Overlays

- Environmental Significance Overlay - Schedule 1
- Environmental Significance Overlay - Schedule 2
- Environmental Significance Overlay - Schedule 3

- Environmental Significance Overlay - Schedule 4
- Environmental Significance Overlay - Schedule 5
- Environmental Significance Overlay - Schedule 6
- Significant Landscape Overlay - Schedule 1
- Significant Landscape Overlay - Schedule 2
- Significant Landscape Overlay - Schedule 3

Image Source: ESRI Basemap (2022) Data source: VIC Data (2022)

FIGURE 8.4
Planning Overlays

Table 8.4 Summary of Desktop Assessment Outcomes – Land Use

Summary of Assessment Outcomes	
<ul style="list-style-type: none"> Land uses within the onshore component are predominantly agricultural, with areas of conservation and nature reserves also used for recreational activities. The Glenelg Estuary and Discovery Bay Ramsar Wetlands site intersects with the Study Area where the subsea cabling option 2 crosses the shoreline. There are several areas of public land that intersect with the onshore component, comprising parks, reserves, Indigenous protected areas, and forests. Public land should be avoided, or where not feasible or prudent, impacts on public land should be minimised. The onshore component of the Study Area is subject to the Glenelg Planning Scheme, with the Study Area located in zones including the Farming Zone, Public Conservation and Resource Zone and Rural Conservation Zone. Planning permissions under the <i>Planning and Environment Act 1987</i> will be required. There are several overlays in the Glenelg Planning Scheme that recognise the unique landscape and environmental significance of the region. Permissions under the <i>Marine and Coastal Act 2018</i> will also be required. Where public land is used, public land manager consent may be required to achieve planning approval. Additional consents, leases and licences would also be required under relevant Acts (such as the <i>Forests Act 1958</i> and the <i>Crown Land (Reserves) Act 1978</i> to construct on and use land. Native Title has been declared in parts of the onshore Study Area. It is likely that if Native Title areas cannot be avoided, an Indigenous Land Use Agreement would need to be negotiated with the Native Title holders. The Project is not subject to the provisions of the South Australian planning system as no project infrastructure is will be located within Coastal Waters of South Australia, or on land within South Australia. Notwithstanding, given the locations of offshore wind turbines and other infrastructure offshore from South Australia, due regard will need to be given to relevant planning and environmental provisions as the Project progresses, particularly as they relate to marine and coastal matters and landscape significance. 	

8.2 Potential Impacts

Following definition of the existing environmental context of the Project site and surrounding area, potential land use impacts have been identified with consideration of the Project design, construction, operation, and decommissioning activities in the context of the existing conditions. An overview of these potential impacts is provided in **Table 8.5**.

Table 8.5 Potential Impacts – Land Use

Impact	Project Component	Phase
Construction, operation and decommissioning activities result in disturbance and/or disruption to existing land uses. This includes potential disruption (temporary or permanent) to public land uses and public infrastructure, including land uses relating to conservation and recreation.	Onshore	Construction Operation Decommissioning
Disruption to public land management practices such as bushfire management, road maintenance, and timber harvesting during construction, operation, and decommissioning.	Onshore	Construction Operation Decommissioning
Project infrastructure results in land use changes that are incompatible or inconsistent with existing land uses and local and/or regional policy, or future land uses for public and private land.	Onshore	Operation
Construction of the onshore transmission line (underground or overhead) impacts on agricultural practices and productive land.	Onshore	Construction

Impact	Project Component	Phase
Operation of an overhead transmission line would require an easement of 65 m wide through agricultural land, impacting on farming practices and productivity.	Onshore	Operation
Construction, operation, and decommissioning activities impact on areas where Native Title has been determined.	Onshore	Construction Operation Decommissioning
Offshore wind turbines, transmission lines and other prominent infrastructure may be incompatible with planning instruments and associated objectives, such as environmental and/or landscape overlays.	Onshore and offshore	Operation

9.0 Landscape and Visual

9.1 Existing Conditions

The offshore component of the Project will be located off the South Australian coastline near the border with Victoria, between Cape Douglas in South Australia and Nelson in Victoria. The offshore component of the Project will be visible from viewpoints along the Victorian and South Australian coast. There are several conservation and nature reserves along this coastline that are known for their scenic values and recreational activities. The Glenelg Estuary and Discovery Bay Ramsar Wetlands site and the Discovery Bay Coastal Park extend along the Victorian coastline from the Victorian-South Australian border to Cape Bridgewater, with a portion of the Lower Glenelg National Park also located within the Ramsar site.

Along the South Australian coastline, there are areas of conservation reserves as well as tourist attractions and lookout points from which offshore wind turbines may be visible. The Piccaninnie Ponds Karst Ramsar Wetlands site is located adjacent to the border and is a popular destination for visitors. Other sites further along the South Australian coast include Brown Beach, Eight Mile Creek Campground, Port MacDonnell, Cape Northumberland (South Australia's most southern point) and Douglas Point. Additional sensitive receptors are likely to be located along the South Australian coastline that will require consideration in the next phase of assessment. Many of these locations along the Victorian and South Australian coastline provide a range of recreational and tourism activities, including camping, hiking, swimming, diving, fishing, and boating.

There are several locations/viewpoints from which offshore components of the Project (turbines and substations), and onshore infrastructure such as transmission lines would be visible to the public. An overview of these viewpoints is provided in **Table 9.1**. The location of these viewpoints as well as other public spaces and recreation areas that may experience views of the offshore wind turbines during operation are shown in **Figure 9.1**. Subsequent stages of assessment will require more detailed consideration of potential views to project infrastructure, including consultation with relevant landowners, traditional owners, communities and stakeholders, to ensure potential changes to visual amenity are given due consideration.

Potential visual impacts on areas within South Australia will require consideration, as will consideration of relevant landscape planning instruments such as overlays, where they consider vistas to marine and coastal areas.

Table 9.1 Viewpoints for Consideration

Key viewpoint	State	Distance from offshore turbines	Description
Glenelg Estuary and Discovery Bay Ramsar Wetlands site	Victoria	Approximately 10 km at the closest point.	The Glenelg Estuary and Discovery Bay Ramsar Wetlands site is a popular area for recreational and tourism activities, including sightseeing, walking, camping, and recreational fishing.

Key viewpoint	State	Distance from offshore turbines	Description
Discovery Bay Coastal Park	Victoria	Approximately 10 km at the closest point.	The Discovery Bay Coastal Park stretches from the Victorian – South Australian border in the west, along the coastline past Cape Nelson. It covers the Glenelg Estuary and Discovery Bay Ramsar site up until Cape Bridgewater. Discovery Bay is known to offer a range of coastal environments with scenic views. The Great South West Walk traverses much of the Discovery Bay Coastal Park, and follows the coastline around Cape Bridgewater, Cape Nelson, and Portland. The walk is a popular hiking trail for visitors to the area. A number of campgrounds are also located within Discovery Bay Coastal Park including Lake Mombeong, Swan Lake, and Springs Camp. The closest campground is approximately 15 km from the nearest turbine.
Nelson	Victoria	Approximately 11 km at the closest point	Nelson is located at the mouth of the Glenelg River and Discovery Bay, a few kilometres east of the Victorian – South Australian border. Nelson is a popular spot for visitors offering a range of recreational activities including hiking, fishing, and boating (Nelson Tourist Association, 2020).
Piccaninnie Ponds Karst Wetlands Ramsar site	SA	Approximately 8 km at the closest point	Each year around 20,000 people visit Piccaninnie Ponds Karst Wetlands. One of the main attractions is cave diving, with other activities including bushwalking, bird watching, education, nature observation, and recreational fishing on the nearby beaches. Visitors can walk along the beach areas or follow a trail through coastal wattle and bearded heath to the pond’s outlet. There are inland boardwalks to a lookout which provides views over the wetlands (Department of Environment and Water (SA), 2022).
Port MacDonnell	SA	Approximately 9 km at the closest point	Port MacDonnell is a port and popular holiday destination valued for its surrounding coastline and rich maritime history. Port MacDonnell offers a number of recreational activities including cave diving, snorkelling, fishing, hiking and four-wheel driving (Mount Gambier Point, 2021).
Brown Bay/Browns Beach	SA	Approximately 9 km at the closest point	Brown Bay/Brown Beach is a popular location for fishing and surfing, as well as a range of other water sports. The bay spans approximately 6 km and offers white-sand beaches making it a popular and ideal location for visitors (Mount Gambier Point, 2021).
South Australia’s Southern Most Point	SA	Approximately 8 km at the closest point	South Australia’s Southern Most Point, also known as Cape Northumberland, provides wide swept panoramic views of the coastline. It is a popular destination for visitors and tourists to capture sunrises and sunsets as well as four-wheel driving along the beaches. At dusk and dawn each day, fairy penguin sightings may be seen from the Penguin Viewing Platform (South Australian Tourism Commission, 2022).

Table Note: These descriptions have been developed from desktop assessments undertaken using GIS mapping with publicly available data sources.

The onshore component of the Project will be located primarily through agricultural landholdings and some areas of public land (primarily conservation reserves). Transmission route option 1 would use the existing Heywood - Portland 500 kV transmission line for approximately 35 km, whilst option 2 would provide a project-dedicated new line.

Dwellings in Cape Bridgewater, Cashmore, West Portland and Gora West are located within the Study Area.

A number of articles have been published in the local Portland Observer newspaper in recent years discussing community opposition to proposed new overhead transmission lines in the region (Portland Observer, February and March 2021).

9.1.1 Significant Landscape Overlay

The onshore Study Area is affected by the Significant Landscape Overlay under the Glenelg Planning Scheme (see **Figure 8.4**). The following schedules apply:

- Schedule 2 - Bridgewater Lakes and Surrounds: this recognises the Bridgewater Lakes is of State significance for its outstanding visual and scenic qualities. The schedule notes the undulating topography of Bridgewater Lakes and surrounds lends itself to fine views across cleared pastures.
- Schedule 3 - Cape Bridgewater and Cape Nelson: this recognises the spectacular cliffs, pristine bays and dramatic coastal scenery of Cape Bridgewater and Cape Nelson are unique in Victoria and combine to make a landscape of state significance. The schedule notes the coastal landscape has recently experienced significant visual change due to wind turbines in this locality, being the Portland Wind Energy Project.

While it does not affect the onshore Study Area, Schedule 1 to the Significant Landscape Overlay states as follows:

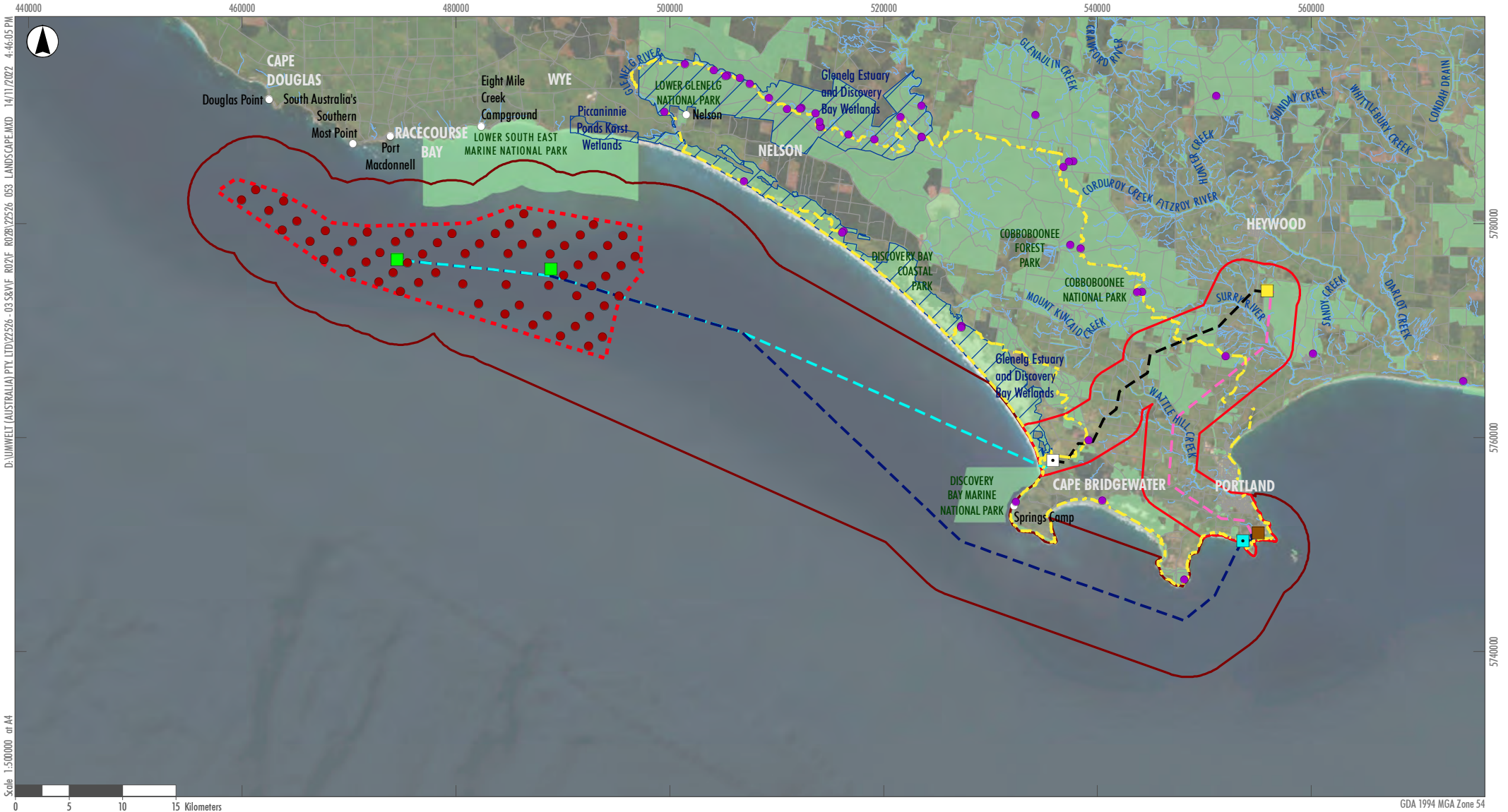
- Schedule 1 - Glenelg River Estuary and Surrounds: this applies to coastal land extending from the South Australia-Victoria border east along Discovery Bay. The schedule has several objectives including ‘*to protect locally significant views and vistas, to the ocean, the Glenelg River Estuary and other natural landforms from Nelson-Portland Road, the Great South West Walk and other publicly accessible locations*’.

The Project would need to consider this overlay and the associated landscape character objectives to be achieved.

9.1.2 State Significance Landscapes

The Discovery Bay Coast, Cape Bridgewater and Cape Nelson are classified as landscapes of State significance in the *Coastal Spaces Landscape Assessment Study* (Department of Sustainability and Environment, 2006).

The Discovery Bay Coast is visually significant for the dramatic sweep of its long, dune backed bay with its rugged open beaches and sense of remoteness. It is characterised by a vast mobile dune system, extending approximately 3 km inland. It is valued by the community for its wild, untamed character (Department of Sustainability and Environment, 2006). Cape Bridgewater and Cape Nelson are visually significant for spectacular high cliffs, pristine bays and dramatic coastal scenery. They are characterised by towering coastal forms, separated by low lying Bridgewater Bay. These landscapes are valued by the community for geological features such as blowholes, shore platforms, petrified forests, and sea caves, and for the Blue, Hump, and Southern Right whales that frequent the area (Department of Sustainability and Environment, 2006).



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|---|---|-------------------------------|--|-----------------------|
| Southern Winds Offshore Wind Project Study Area | Southern Winds Offshore Wind Project Area consists of: | Potential turbine layout | State Forest, National Parks, Reserves | Great South West Walk |
| Southern Winds Onshore Wind Project Study Area | Southern Winds Offshore Wind Project Boundary | Substation | Ramsar Site | Campgrounds |
| | Onshore transmission route option 1 | Heywood terminal station | Roads | |
| | Onshore transmission route option 2 | Transition joint bay option 1 | Drainage line | |
| | Subsea cabling option 1 | Transition joint bay option 2 | | |
| | Subsea cabling option 2 | Portland aluminium smelter | | |

Image Source: ESRI Basemap (2022) Data source: VIC Data (2022); DELWP (2022)

FIGURE 9.1
Landscape and Visual Existing Conditions

9.1.3 Neighbouring Wind Farms (Proposed and Operational)

As shown in **Figure 9.2**, Australis Energy’s VIC Offshore Wind Project is proposed to be located east of the Project Area off the coast in Discovery Bay. Neoen Australia’s Kentbruck Green Power Hub is proposed to be located onshore, inland of the Glenelg Estuary and Discovery Bay Ramsar Wetlands site within a pine plantation. Both projects are currently undergoing assessment through an EES under the *Environment Effects Act 1978* and are not yet therefore approved.

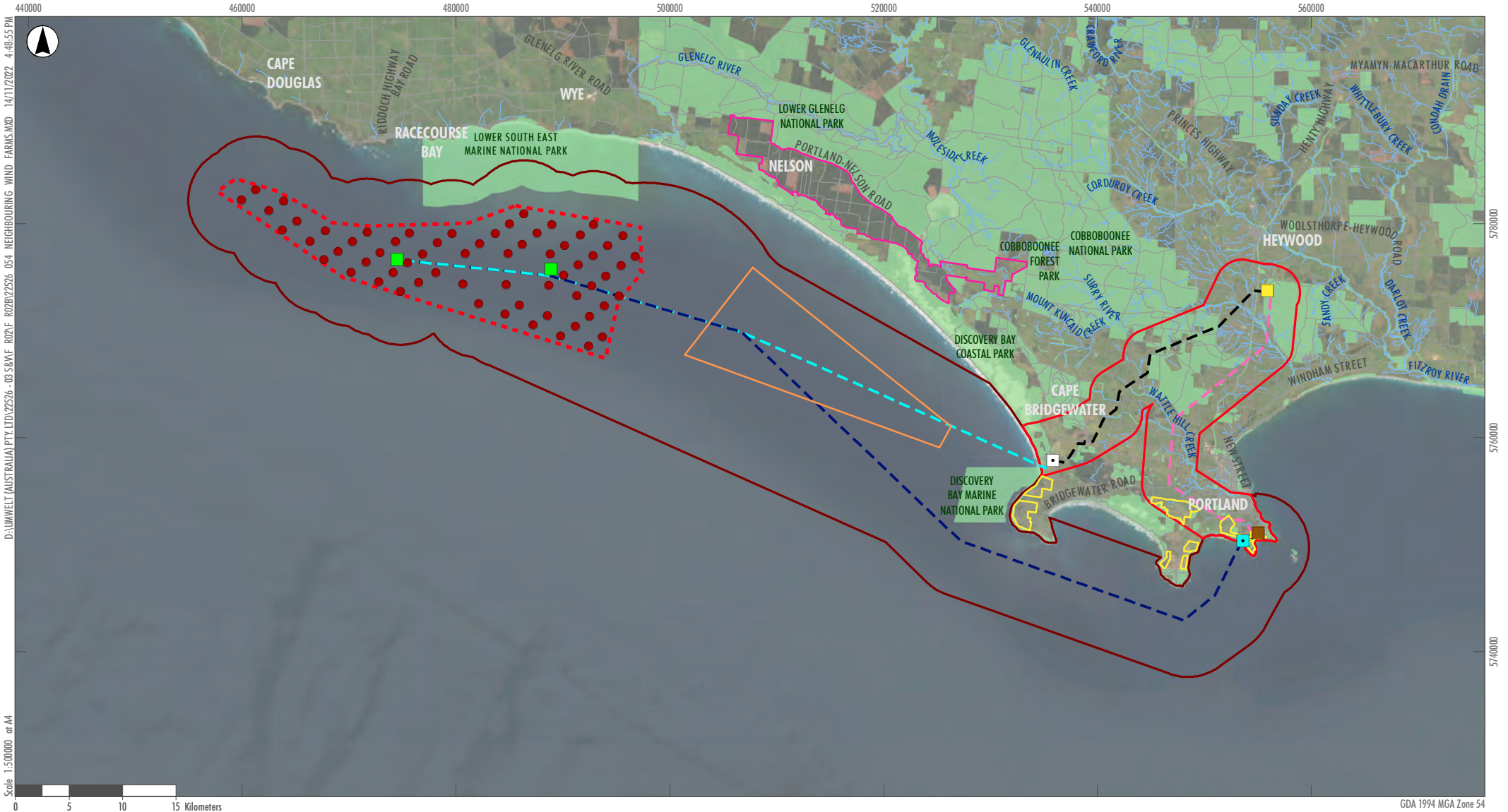
Alinta Energy’s Spinifex Offshore Wind Farm is also proposed off the coast of Portland, east of the Project Area. The Spinifex Offshore Wind Farm is proposed to connect into the Portland Aluminium Smelter and is currently in the pre-planning stage with referrals yet to be submitted.

Pacific Hydro’s existing Portland Wind Farm is located within proximity to, and within parts of the onshore Study Area. It consists of three segments on Cape Bridgewater, Cape Nelson, and Cape Sir William Grant and has been in operation since 2010. The nearest onshore operating wind farm within South Australia is the Lake Bonney Wind Farm, owned by Infigen Energy, approximately 30 km north-east of the nearest offshore turbine.

Potential cumulative visual impacts would require consideration in the visual impact assessment that would be completed for the Project.

Table 9.2 Summary of Desktop Assessment Outcomes – Landscape and Visual

Summary of Assessment Outcomes
<ul style="list-style-type: none"> • The offshore wind farm component of the Project will be visible from a number of public and private viewpoints along the Victorian and South Australian coastline, many of which are associated with a range of recreational activities and uses. • The onshore transmission line would require the addition of new transmission infrastructure within the landscape. There has been significant community opposition to a proposed overhead transmission line within the Study Area, predominantly due to the potential for visual impacts. Further studies to identify a feasible and prudent transmission line route and construction techniques are required, which should also be informed by consultation with stakeholders and the community. • The Discovery Bay Coast, Cape Bridgewater and Cape Nelson are classified as landscapes of State significance in the <i>Coastal Spaces Landscape Assessment Study</i> (Department of Sustainability and Environment, 2006). • There are potential cumulative landscape and visual impacts associated with the offshore wind turbines and the transmission infrastructure. These should be assessed in a coordinated and integrated manner to the extent possible, having regard to information availability and timing.



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|---|---|-------------------------------|--|---------------------------|
| Southern Winds Offshore Wind Project Study Area | Southern Winds Offshore Wind Project Area consists of: | Potential turbine layout | State Forest, National Parks, Reserves | Operating |
| Southern Winds Onshore Wind Project Study Area | Southern Winds Offshore Wind Project Boundary | Substation | Roads | Portland Wind Farm |
| | Onshore transmission route option 1 | Heywood terminal station | Drainage line | Proposed |
| | Onshore transmission route option 2 | Transition joint bay option 1 | | Kentbruck Green Power Hub |
| | Subsea cabling option 1 | Transition joint bay option 2 | | Vic Offshore Wind Project |
| | Subsea cabling option 2 | Portland aluminium smelter | | |

FIGURE 9.2
Neighbouring Wind Farms

Image Source: ESRI Basemap (2022) Data source: VIC Data (2022); DELWP (2022)