



Greater Gippsland Offshore Wind Project Preliminary Desktop Biodiversity and Constraints assessment

Prepared for Umwelt (Australia) Pty Limited

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SUMMARY

Biosis Pty Ltd was commissioned by Umwelt (Australia) Pty Limited to complete a preliminary desktop biodiversity and constraints assessment of the study area proposed for the development of the Greater Gippsland Offshore Wind Project. The objectives of this assessment were to identify potential ecological values and constraints, assess risks and potential impacts to ecological values and identify possible mitigations. The primary focus of the report is on the terrestrial environment, freshwater aquatic systems and shorebird communities. However, for completeness and where required, marine fauna (particularly seabirds) have been included within the report. This assessment has been conducted with a view to inform project referrals under both the Commonwealth of Australia's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Victoria's *Environment Effects Act 1978* (EE Act).

Ecological values

Key ecological values identified within the study area are as follows:

- Extensive areas of native vegetation contained primarily within public land including:
 - Gippsland Lakes Coastal Park,
 - Holey Plains State Park,
 - Ninety Mile Beach Marine National Park.
 - Giffard (Rifle Range) Flora Reserve,
 - Stradbroke Flora and Fauna Reserve.
- Nineteen (19) Ecological Vegetation Classes (EVCs) within the Gippsland Plain bioregion including:
 - Seven (7) EVCs with a Bioregional Conservation Status (BCS) of Endangered,
 - Eight (8) EVCs with a BCS of Vulnerable,
 - One EVC with a BCS of Depleted.
- Over 300 wetlands are modelled within the search area including:
 - Two internationally important (Ramsar) wetlands - The Gippsland Lakes and Corner Inlet,
 - Two waterbodies of regional significance - Jack Smith Lake & Lake Denison.
- Numerous waterways and tributaries including:
 - Merriman Creek & associated tributaries
- Populations and / or suitable habitat for 91 threatened flora species of which 62 have been identified as likely to occur within the study area and will likely warrant further consideration. This includes:
 - Four (4) flora species listed under the EPBC Act only
 - Eleven (11) flora species listed under the EPBC Act and FFG Act
 - Forty-seven (47) flora species listed under the FFG Act only

- Populations and / or suitable habitat for 129 threatened fauna species of which 98 have been identified as likely to occur within the study area and will likely warrant further consideration. This includes:
 - Thirteen (13) fauna species listed under the EPBC Act only
 - Thirty-seven (37) fauna species listed under the EPBC Act and FFG Act
 - Forty-eight (48) fauna species listed under the FFG Act only
- Suitable habitat for 77 migratory species listed under the EPBC Act including:
 - Eight (8) terrestrial birds
 - Thirty-four (34) shorebirds, wetland birds and terns
 - Thirty-five (35) marine species (including 19 seabirds)
- Four (4) nationally (EPBC Act) listed and seven (7) state (FFG Act) listed threatened ecological communities.

Government legislation and policy

An assessment of the project in relation to key biodiversity legislation and policy is provided and summarised below.

Potential impacts to MNES under the EPBC Act

Our preliminary assessment of the project's potential impacts to biodiversity against the Matters of National Environmental Significance (MNES), *Significant Impact Criteria Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth of Australia 2013) indicate that the project could significantly impact the following MNES:

- Listed threatened species and ecological communities
- Listed migratory species
- Wetlands of international importance (Ramsar sites)
- Commonwealth marine areas.

Further details are provided in Section 5.1.

Potential environmental effects under the EE Act

Our preliminary assessment of the project's potential impacts to biodiversity against the individual and combined referral criteria outlined in the *Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978* (DSE 2006) indicate that the project could meet up to four of the individual potential environmental effects criteria and up to five of the combination of potential environmental effects criteria.

Further details are provided in Section 5.2.

Recommendations

The primary measure to reduce impacts to biodiversity values within the study area is to avoid and minimise removal of native vegetation and terrestrial and aquatic habitat. It is critical that this be considered during the design phase of the project, when key decisions are made about the location of project components such as built infrastructure / site compounds / access roads / temporary material storage etc.

This could be achieved by:

- Avoiding / minimising unnecessary duplication of infrastructure e.g. utilise existing easements to connect to existing transmission network, co-locate project components with other infrastructure.
- Aligning the impact footprint through existing cleared land including agricultural land and plantations.
- Strategic use of horizontal directional drilling (HDD) / boring rather than open trenching methods for underground cables, particularly in sensitive areas such as beach landings and when crossing waterways.
- Further assessment to identify which avifauna species are likely to be at risk of collisions with wind turbines, to allow further exploration of mitigation options and design reconfiguration.
- Careful timing of activities around periods or areas of ecological significance (e.g. breeding sites and breeding seasons) to further minimise and/or avoid impacts.
- The development of a project specific Construction Environmental Management Plan (CEMP) and Operational Environmental Management Plan (OEMP).
- General project area and design refinement may be required to further avoid and minimise impacts following this preliminary assessment (Phase 1) and further environmental assessments including potential targeted surveys to identify potential impacts.

The results of this assessment should be:

- Used to inform the referrals process under both the EPBC Act and EE Act to develop an appropriate scope for the environmental impact assessment of the project.
- Integrated into project design to avoid and minimise impacts to biodiversity.
- Used to inform development of a project specific CEMP and OEMP.
- Used to inform development of an offset strategy for potential impacts to biodiversity.

The following recommendations are made with a view to progressing ecological assessment and project design:

- Undertake an ecological site inspection to delineate (and or confirm based on previous surveys) areas of the site in which listed ecological communities and habitat for listed flora and terrestrial fauna exist and to map portions of the site containing ecological values.
- On the basis of information obtained during the site visit, provide recommendations, if applicable, for any residual targeted investigations that may be necessary.
- Develop a study program for detailed ecological assessments to delineate the potential impacts of the offshore infrastructure (turbines, substations and undersea cables) on key species and communities.

It is important to note that for all species and ecological communities, this current assessment is preliminary and is subject to confirmation and/or change based on the results of detailed field based assessment of the study area.

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1. Introduction

1.1. Project overview

BlueFloat Energy and Energy Estate is proposing the development of the Greater Gippsland Offshore Wind Project (the project), to be located between 10 to 42 kilometres off the coastline of Gippsland, between Woodside Beach and Seaspray, Victoria (Figure 1). The project will consist of 139 bottom-fixed wind turbines, two to four offshore substations and associated infrastructure with the capacity to generate up to 2.085 gigawatts of electricity. The turbines would have a capacity between 15MW and 20MW with hub heights between 165m and 190m and rotor diameters of between 250m to 275m.

The offshore wind farm component is expected to encompass an area of approximately 700 km² and will be located within the Territorial Sea and the Exclusive Economic Zone (EEZ). Route options currently proposed for the transmission line incorporate 330kV subsea cables between the offshore substations and McLoughlins Beach – Seaspray Coastal Reserve, with an onshore landing either northeast or west of the Ninety Mile Beach Marine National Park (Figure 1). An underground cable will run approximately 6-18 km from the coast to a new substation. An overhead transmission line will then run either:

- approximately 85km to the Hazelwood Terminal Station along route option 1a / 1b (see Figure 1); or
- approximately 65 km following the BassLink corridor to the Loy Yang Power Station, option 2 (see Figure 1).

The transmission line will be located within an easement approximately 80-100m wide.

The onshore transmission line is located in the Wellington Local Government Area (LGA) with the grid connection point at the Hazelwood Terminal Station or Loy Yang Power Station in the Latrobe LGA.

Umwelt (Australia) Pty Limited has engaged Biosis to complete a preliminary desktop biodiversity and constraints assessment of the study area proposed for development (Figure 1). The report aims to identify the key potential biodiversity values and constraints, assess risks and potential impacts to ecological values and identify possible mitigations. The primary focus of the report is on the terrestrial environment, freshwater aquatic systems and shorebird communities. However, for completeness and where required, marine fauna (particularly seabirds) have been included within the report. This assessment of ecological values and constraints has been conducted with a view to informing project referrals under both the Commonwealth of Australia's Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) and Victoria's Environment Effects Act 1978 (EE Act).

1.2. Scope of assessment

The objectives of this preliminary desktop biodiversity and constraints assessment are to:

- Undertake biodiversity database searches and spatial dataset analysis if the search area (study area buffered by 10 kilometres) to identify potential ecological values, including:
 - Listed threatened species and communities, listed migratory species, Wetlands of International Importance and Commonwealth marine waters (MNES) protected by the Commonwealth EPBC Act.
 - Biodiversity values protected under the *Flora and Fauna Guarantee Act 1988 (Vic)* (FFG Act).

- Other relevant matters including non-listed species that may be affected by the Project and that would require further investigation.
- Carry out a high-level assessment of potential impacts to ecological values and mitigation measures with regard to the EPBC Act and EE Act.
- Provide a report documenting this assessment to inform the EPBC Act and EE Act referrals.
- Recommend any further assessments of the site that may be required (such as a vegetation impact assessment or targeted searches for threatened species).

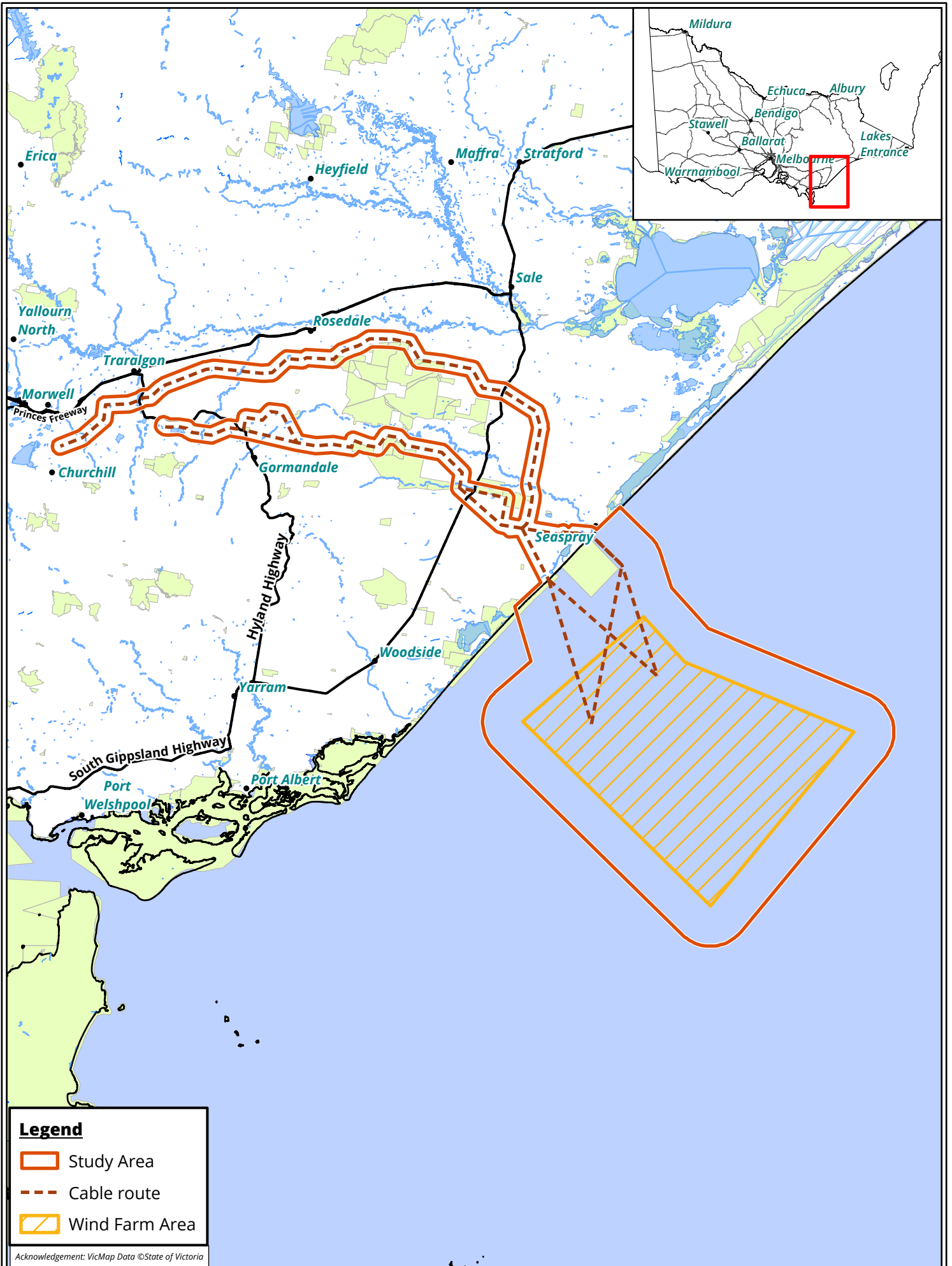
1.3. Location of the study area

The study area includes both an offshore and onshore component (Figure 1). The offshore component is located approximately 10 to 42 kilometres off the Gippsland coastline, between Woodside Beach and Seaspray. It encompasses an area of approximately 700km² and includes both State and Commonwealth waters, as well as waters within the Exclusive Economic Zone (EEZ). The onshore component is within the Gippsland Plain Bioregion and encompasses an area of approximately 34, 730 hectares of private and public land, the adjacent road reserves and approximately 18 kilometres of coastline.

The study area extends beyond the project area (project footprint) 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. Specifically, the study area includes:

A 5 km buffer around the offshore wind farm components (wind turbines and offshore substations) and subsea export cable routes up to the shoreline. A 1 km buffer around the onshore overhead (or underground where needed) transmission line and the onshore substation (referred to as the transmission line corridor) 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 Waters) 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 (Commonwealth Waters) extends from the Territorial Waters and Contiguous Zone up to 200 nautical miles from the low water line along to the coast.

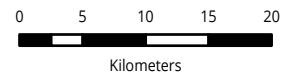


Acknowledgement: VicMap Data ©State of Victoria

Figure 1 Location of the Study Area - Gippsland, Victoria



Matter: 37595
 Date: 04 October 2022
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F1_Locality
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx



Scale: 1:600,000 @ A4
 Coordinate System GDA 1994 MGA Zone 55

2. Approach

This section outlines the approach taken by the project team to deliver the preliminary ecological assessment. Our approach includes:

- Background review of databases and literature to identify ecological values and constraints.
- Assessment of potential impacts to ecological values against:
 - Potential for significant impacts to MNES listed under the EPBC Act against the *Matters of National Environmental Significance, Significant Impact Criteria Guidelines 1.1* Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth of Australia 2013),
 - Potential to satisfy criteria for referral under the EE Act as outlined in Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978 (the ‘ministerial guidelines’) (DSE 2006).

2.1. Background review

2.1.1. Database searches

In order to provide a context for the study area, information about flora and fauna from within 10 kilometres of the study area (the ‘search area’) was obtained from relevant biodiversity databases, many of which are maintained by the Victorian Department of Environment, Land, Water and Planning (DELWP) or the Australian Department of Climate Change, Energy, the Environment and Water (DCCEEW). Records from the following databases were collated and reviewed:

- DELWP’s Victorian Biodiversity Atlas (VBA), including the ‘VBA_FLORA25, FLORA100 & FLORA Restricted’ and ‘VBA_FAUNA25, FAUNA100 & FAUNA Restricted’ datasets
- DCCEEW’s Protected Matters Search Tool for matters protected by the Commonwealth EPBC Act

Other sources of biodiversity information were examined including:

- DELWP’s NatureKit mapping tool
- DELWP’s Habitat Importance maps

2.1.2. Spatial datasets

The following spatial datasets have been accessed and used to understand existing conditions and to identify opportunities and constraints when undertaking further design:

- Topographic data including roads, waterways, contours, cadastre,
- Land tenure (public and private),
- Ecological Vegetation Classes (EVC) (NV2005_EVCBCS) (DELWP 2018a),
- Flora and Fauna Guarantee Act Listed Communities (NV2005_FFG_COMM) (DELWP 2018b),
- Ecological Communities of National Environmental Significance Distributions (Public Grids) (DAWE 2020),

- Victorian Biodiversity Atlas (VBA) flora and fauna records,
- Ramsar Wetlands of Australia (DoEE 2018),
- Victorian Wetland Inventory (Current) (WETLAND_CURRENT) (DELWP 2021).

2.2. Definitions of threatened species or communities

Threatened species or communities include those species or communities that are listed under the EPBC Act and FFG Act. The conservation status of a species or ecological community is determined by its listing status under Commonwealth or State legislation / policy (Table 1).

Table 1 Conservation status of threatened species and ecological communities

| Conservation status | |
|---------------------|---|
| National | Listed as nationally critically endangered, endangered or vulnerable under the EPBC Act |
| State | Listed as extinct, extinct in the wild, critically endangered, endangered, vulnerable or conservation dependent in Victoria under the FFG Act |

Lists of threatened species generated from the databases are provided in Appendix A (flora) and Appendix B (fauna) and the species have been assessed to determine their likelihood of occurrence based on the process outlined below.

2.3. Determining likelihood of occurrence of threatened species

Likelihood of occurrence indicates the potential for a species or ecological community to occur regularly within the study area. It is based on expert opinion, information in relevant biodiversity databases and reports, and an assessment of the habitats on site. Likelihood of occurrence is ranked as negligible, low, medium, high or recorded. The rationale for the rank assigned is provided for each species in Appendix A (flora) and Appendix B (fauna). Those species for which there is little or no suitable habitat within the study area are assigned a likelihood of low or negligible and are not considered further.

Only those species listed under the EPBC Act or the FFG Act (hereafter referred to as 'threatened species') are assessed to determine their likelihood of occurrence. Threatened species which have at least medium likelihood of occurrence are given further consideration in this report.

2.4. Legislation and policy

The implications for the project were assessed in relation to key biodiversity legislation and policy including:

- Matters listed under the EPBC Act, associated policy statements, significant impacts guidelines, listing advice and key threatening processes
- Threatened taxa, communities and threatening processes listed under Section 10 of the FFG Act and associated action statements and listing advice

- Planning and Environment Act 1987 as it relates to referral criteria under the Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978 (the 'EE Act ministerial guidelines') (DSE 2006).
- Noxious weeds and pest animals lists under the Catchment and Land Protection Act 1994 (CaLP Act)
- Environment Effects Act 1978, particularly the EE Act ministerial guidelines (DSE 2006).
- National Parks Act 1975 as it relates to referral criteria under the EE Act ministerial guidelines (DSE 2006).

2.5. Mapping

Umwelt (Australia) Pty Limited supplied spatial data files outlining the location and extent of the study area.

3. Biodiversity legislation and government policy

This section provides an overview of the key biodiversity legislation relevant to the development of the project to the assessment and approval stage. This section does not describe the legislation and policy in detail.

3.1. Commonwealth

3.1.1. Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act applies to developments and associated activities that have the potential to significantly impact on Matters of National Environmental Significance (MNES) protected under the Act. Guidance on the potential for significant impacts is provided in the Matters of National Environmental Significance, Significant Impact Criteria Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999 (the 'SIC guidelines') (Commonwealth of Australia 2013).

MNES relevant to the project are:

- Listed threatened species and ecological communities
- Migratory species
- Wetlands of International Importance (Ramsar sites)
- Commonwealth marine waters

An assessment of the project's potential to have a significant impact to MNES under the EPBC Act is provided in Table 10 (Section 5).

3.2. State

3.2.1. Flora and Fauna Guarantee Act 1988 (FFG Act)

The FFG Act is the key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes. Matters listed under the FFG Act are specifically mentioned in referral criteria under the EE Act ministerial guidelines (DSE 2006).

3.2.2. Planning and Environment Act 1987 (incl. Planning Schemes)

The Planning and Environment Act 1987 controls the planning and development of land in Victoria and provides for the development of planning schemes for all municipalities.

Of particular relevance to the proposal are controls relating to the removal, destruction or lopping of native vegetation contained within the Wellington Planning Scheme (the Scheme), including permit requirements. The Scheme (Clause 73.01) defines 'native vegetation' as 'Plants that are indigenous to Victoria, including trees, shrubs, herbs, and grasses'. It is an objective of Clause 12.01-2 of the Planning Policy Framework (Native Vegetation Management) that removal of native vegetation results in no net loss in the contribution made by native vegetation to Victoria's biodiversity.

Under Clause 66.02, a permit application to remove, destroy or lop native vegetation is required to be referred to DELWP as a recommending referral authority if any of the following apply:

- the class of application is on the detailed assessment pathway
- a property vegetation precinct plan applies to the site or
- the native vegetation is on Crown land occupied or managed by the Responsible Authority.

Victoria's Guidelines for the removal, destruction or lopping of native vegetation (the Guidelines)

The Guidelines are incorporated into the Victoria Planning Provisions and all planning schemes in Victoria (DELWP 2017a).

The purpose of the Guidelines is to guide how impacts to biodiversity should be considered when assessing a permit application to remove, destroy or lop native vegetation. The objective for the Guidelines in Victoria is 'No net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation'.

Under the Guidelines, there are three assessment pathways for assessing an application for a permit to remove native vegetation: basic, intermediate and detailed.

The assessment pathway will be determined following an onsite assessment of the proposed impact area.

3.2.3. Environment Effects Act 1978

The Environment Effects Act 1978 establishes a process to assess the environmental impacts of a project. If applicable, the Act requires that an Environment Effects Statement (EES) be prepared by the proponent. The EES is submitted to the Minister for Planning and enables them to assess the potential environmental effects of the proposed development. The general objective of the assessment process is to provide for the transparent, integrated and timely assessment of the environmental effects of projects capable of having a significant effect on the environment (DSE 2005a).

The 'Ministerial Guidelines for assessment of environmental effects under the Environment Effects Act 1978' (DSE 2005a) provide a range of criteria that can be used to determine whether a referral is required to be made under the Environment Effects Act 1978. These criteria relate to individual potential environmental effects and a combination of (two or more) potential environmental effects. Once a referral is made, the Minister for Planning will determine whether an EES is required for a project.

An assessment of the project against the individual potential effects criteria and against the combination of potential effects criteria is provided in Table 11 (Section 5). However, the guidelines are not binding, and the decision as to whether an EES is required is ultimately at the discretion of the Minister for Planning.

3.2.4. National Parks Act 1975

The National Parks Act 1975 concerns the creation and management of National Parks, State parks, marine national parks and marine sanctuaries in Victoria. Several parks within the study area are included under this Act.

4. Results

The ecological features of the study area are described below and mapped in Figure 2-6.

Flora and fauna species previously recorded or predicted to occur within the local area along with an assessment of the likelihood of the species occurring within the study area are listed in Appendix A (flora) and Appendix B (fauna). Unless of particular note, these species are not discussed further.

4.1. Landscape context

The onshore component of the study area encompasses a shore landing proposed either northeast or west of the Ninety Mile Beach Marine National Park. The coastal component of the study area thus includes approximately 18 kilometres of coastline. From the coastal landing, an underground transmission cable is proposed which will run approximately 8-16 kilometres from the coast to a new substation (4,763.7 hectares) (an indicative substation at Giffard 8km inland was applied for this desktop assessment). From here, an overhead transmission line will run over either:

- A 85 kilometre (16,503.4 hectares) stretch of land which extends inland to the Hazelwood Terminal Station (option 1a and 1b); or
- A 65 kilometre (13, 517.3 hectares) stretch of land which extends inland to the Loy Yang Power Station (option 2).

These routes are yet to be considered and will be subject to further assessment and review, as well as community and stakeholder engagement.

The onshore component of the study area lies within the Gippsland Plain Bioregion which occurs between the eastern shore of Port Phillip Bay and extends to Gippsland Lakes near Lakes Entrance (excluding Wilsons Promontory). This bioregion is characterised by flat to slightly undulating coastal plains occurring from the coastline and inland to an elevation of 200 metres. The region experiences a temperate climate with a mean annual rainfall varying from 550 mm to 1120 mm pa, depending on location within the bioregion. The wettest period of the year occurs between May and October. Native vegetation within the bioregion has been significantly cleared, with clearing rates very high in the western parts near Melbourne and some reserves and patches of remnant vegetation increasing in size towards the east across the bioregion (Vicflora 2020).

The land surrounding the study area consists of a variety of landforms and land uses. A large section of the southern boundary borders (and incorporates) the Heathy woodlands of Stradbroke Flora and Fauna Reserve. The eastern and western ends of the study area incorporate and border forestry plantations. The majority of the remaining study area is surrounded by agricultural land and small reserves. The middle of the study area runs through several cleared, agricultural paddocks between Holey Plains State Park and Stradbroke Flora and Fauna Reserve. Remnant vegetation in these paddocks may provide important connections between the two reserves.

Landforms that occur within the study area include coastal and dune complexes, plains, low hills and large coastal / near-coastal waterbodies such as Lake Denison and Lake Reeve. Lake Reeve runs along the Ninety Mile Beach from Ocean Grange to just east of Seaspray where it is intersected by the Study Area. Lake Reeve is included in the Gippsland Lakes Wetland of International Importance (Ramsar Site).

4.2. Vegetation

A total of 19 Ecological Vegetation Classes (EVCs) across the Gippsland Plain bioregion are modelled to occur within the study area according to DELWP's Native Vegetation - Modelled 2005 Ecological Vegetation Classes (with Bioregional Conservation Status) dataset (Figure 2). These EVCs are presented along with bioregional conservation status (BCS) in Table 2 and include a range of forest, woodland, wetland, scrub and saltmarsh communities. It should be noted that there are some EVCs, primarily wetland communities, which are not modelled within the NV2005_EVCBCS dataset (DELWP 2018a). Such EVCs may also be present within the study area but have not been captured in this desktop assessment.

Just over a third of modelled native vegetation within the study area is EVC 16 – Lowland Forest (35% of modelled EVC area) followed by EVC 48 – Heathy woodland (23%), EVC 3 – Damp Sands Herb-rich Woodland (9%) and EVC 191 – Riparian Scrub (8%). The modelled area of these four EVCs combined represents approximately 75% of modelled native vegetation extent within the study area.

EVC 16 – Lowland Forest is a diverse ecosystem that occurs on relatively fertile, moderately well-drained soils in areas of relatively high rainfall. Characteristic canopy species include Messmate Stringybark *Eucalyptus obliqua*, Narrow-leaf Peppermint *Eucalyptus radiata* and Yertchuk *Eucalyptus consideniiana*. EVC 48 – Heathy Woodland is a low woodland associated with nutrient poor soils. The canopy is dominated by Eucalypt species such as Messmate Stringybark or Narrow-leaf Peppermint but can also include Saw Banksia *Banksia serrata* over a diverse array of ericoid shrubs or bracken (depending on fire frequency).

Of the EVCs modelled to occur within the study area; eight have a BCS of vulnerable and seven have a BCS of Endangered. Consideration of avoiding endangered or vulnerable, sensitive or isolated vegetation types will be important through detailed design to reduce the project's overall impacts and to locate the majority of impacts in more resilient and / or plentiful (e.g. Least Concern) vegetation types.

It should be noted some EVCs that are expected to be present within the study area have not been captured in this desktop assessment due to the scale at which vegetation modelling is undertaken by DELWP.

Table 2 DELWP 2005 modelled EVCs within the study area and their Bioregional Conservation Status (BCS)

| EVC | BCS | Modelled extent within the study area (ha) |
|--|---------------|--|
| Gippsland Plain Bioregion | | |
| EVC 01 - Coastal Dune Scrub/Coastal Dune Grassland Mosaic | Depleted | 92.09 |
| EVC 02 - Coast Banksia Woodland | Vulnerable | 13.68 |
| EVC 03 - Damp Sands Herb-rich Woodland | Vulnerable | 656.87 |
| EVC 09 - Coastal Saltmarsh | Least Concern | 5.63 |
| EVC 10 - Estuarine Wetland | Least Concern | 460.16 |
| EVC 16 - Lowland Forest | Vulnerable | 2678.15 |
| EVC 18 - Riparian Forest | Vulnerable | 43.14 |
| EVC 29 - Damp Forest | Endangered | 3.70 |
| EVC 48 - Heathy Woodland | Least Concern | 1696.51 |
| EVC 53 - Swamp Scrub | Endangered | 202.91 |
| EVC 55 - Plains Grassy Woodland | Endangered | 178.95 |
| EVC 56 - Floodplain Riparian Woodland | Endangered | 2.44 |
| EVC 83 - Swampy Riparian Woodland | Endangered | 19.14 |
| EVC 132 - Plains Grassland | Endangered | 71.40 |

| EVC | BCS | Modelled extent within the study area (ha) |
|--|------------|--|
| EVC 136 - Sedge Wetland | Vulnerable | 89.15 |
| EVC 151 - Plains Grassy Forest | Vulnerable | 10.19 |
| EVC 191 - Riparian Scrub | Vulnerable | 631.30 |
| EVC 259 – Plains Grassy Woodland/Gilgai Wetland Mosaic | Endangered | 10.55 |
| EVC 698 - Lowland Forest/Heathy Woodland Mosaic | Vulnerable | 264.68 |

4.3. Wetlands and waterways

As shown in Figure 3, over 300 wetlands occur within the study area based on DELWP's Victorian Wetland Inventory dataset (DELWP 2021). Two of the wetlands within the search area (study area buffered by 10 kilometres) are recognized as Ramsar sites. A Ramsar site is a wetland site designated to be of international importance under the Ramsar Convention and is a MNES under the EPBC Act.

The first of these Ramsar sites, the Gippsland Lakes, is located within the study area and includes Lake Reeve, Lake Coleman and Lake Wellington (DEPI 2013). An important criterion of the Ramsar listing of the Gippsland Lakes is the provision of habitat for nationally and internationally threatened flora and fauna. In addition, Corner Inlet, another Ramsar wetland is within 10 km of the study area (i.e. within the search area). Corner Inlet is a wetland of high biogeographical significance due to its geological history and its importance to migratory shorebirds. The wetland also supports several saltmarshes and mangroves.

There is potential that the proposed wind project development will indirectly impact the ecological values of the Gippsland Lakes and Corner Inlet Ramsar sites. In particular this relates to the potential for impacts on avifauna, including listed threatened and migratory species that utilise these systems and may traverse both the onshore cable area, as well as the offshore wind turbine area, which may result in collisions.

Other major natural hydrological features within the search area include:

- Lake Denison
 - Considered a site of regional significance primarily because the lake, barrier, bluff and the lagoonal channels represent distinctive stages in the evolution of barrier and lagoon systems (VRO 2019b).
- Jack Smith Lake
 - Considered a site of regional significance as a remnant of the extensive lagoon and inlet complex that extended from Merriman Creek south-west to Woodside Beach and the lake's with similarities to Lake Reeve (part of the Gippsland Lakes Ramsar Wetland) (VRO 2019a).
- Black Swamp
- Snake Swamp
- Coastal saltmarshes; north-east and south-west of Seaspray.

Impacts to aquatic, estuarine or marine ecosystems are relevant to both the Commonwealth and State biodiversity legislation. Avoiding wetlands and waterways should be a focus at the design stage to reduce the project's overall impacts by locating as much of the terrestrial impact footprint as possible within existing cleared land including plantations and through utilising existing transmission infrastructure.

4.4. Other ecological values

The study area contains 11 pieces of public land considered likely to be of significant ecological value including flora reserves, bushland reserves, wildlife reserves, flora and fauna reserves, natural features reserves, nature conservation reserves and state forests (Figure 3). Three of these are included within the National Parks Act 1975:

- Gippsland Lakes Coastal Park
- Holey Plains State Park
- Ninety Mile Beach Marine National Park

Other pieces of public land likely to be of significance include:

- Giffard (Rifle Range) Flora Reserve
- Giffard H30 Bushland Reserve
- Gormandale Flora Reserve
- Jack Smith Lake Wildlife Reserve (hunting)
- Lake Denison Wildlife Reserve (hunting)
- McLoughlins Beach - Seaspray Coastal Reserve
- Merrimans Creek Flora Reserve
- Stradbroke Flora and Fauna Reserve

The study area includes approximately 18 kilometres of coastline along Ninety Mile Beach Marine National Park. The entire length of Ninety Mile Beach is backed by dunes forming a coastal barrier which is critical in protecting the coastal plain from marine erosion and inundation (VRO n.d.). The beach also provides habitat for beach dwelling fauna such as shorebirds.

4.5. Fauna habitat (terrestrial, freshwater aquatic, coastal and offshore)

4.5.1. Terrestrial, freshwater aquatic and coastal fauna habitat

Cleared land for the purpose of 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.

Woodland and forest vegetation may provide suitable habitats for various terrestrial bird species including some that are threatened. In addition, these vegetation types provide habitat for various arboreal mammals and reptiles. Scrub and heathland vegetation provides further habitat to a range of ground-dwelling fauna including small mammals, reptiles and birds.

Several wetlands and waterways in the area are of high value to a range of shorebirds and other wetland birds. In particular, the Gippsland Lakes and Corner Inlet, are listed as a Ramsar sites and provide important habitat for numerous resident and migratory shorebirds. In addition, Lake Denison and Jack Smith Lake are areas of regional significance and provide important seasonal habitat for a number of migratory shorebirds. Wetlands and surrounding waterways throughout the study area also provide habitat for a range of ichthyofauna and other aquatic species.

The coastal habitat at Ninety Mile Beach is a highly dynamic environment which may not be suitable to all shorebird species. However, while it is unlikely that this area will support a high diversity and abundance of shorebirds, there are several migratory species which are known to utilise this area. In addition, the sandy beaches also provide habitat for some resident shorebirds.

4.5.2. Offshore fauna habitat

Although an assessment of marine species is beyond the scope of this report, we include a description of offshore habitat for a complete assessment of the existing environment. 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 (Chambers et al. 2015). The Bass Strait Islands around Wilsons Promontory provide breeding habitat for a range of seabird species including large numbers of the migratory Short-tailed Shearwater *Ardenna tenuirostris*.

The offshore environment is also likely to provide foraging habitat for several threatened and/or migratory seabirds including various albatross and petrel species. In addition, the offshore environment associated with the study area may also serve as a movement passage and foraging ground for several other marine megafauna, including fur seals, whales, dolphins, sea turtles and sharks.

4.6. Threatened flora

Threatened flora are at a heightened risk of impact during works due to their sedentary nature. Furthermore, important identification characters for many threatened grass and dormant herb species are not present year-round. In general, the risk of significantly impacting threatened flora can be reduced through a combination of detailed assessment and/or an integrated and interactive engagement and subsequent design response, as well as works controls at the construction stage. Thus, consideration will need to be given to potential habitat for threatened flora species throughout the design and assessment phases of the project.

A 10 kilometre buffered search of the PMST and Victorian biodiversity databases indicates 91 threatened flora species occur, or are predicted to occur, within the search area. These species are provided with likelihood rankings in Appendix A. A total of 62 of these listed flora species are considered to have a medium to high likelihood of occurring within the study area (Table 3). This includes:

- Four (4) flora species listed under the EPBC Act only
- Eleven (11) flora species listed under both the EPBC Act and FFG Act
- Forty-seven (47) flora species listed under the FFG Act only.

Threatened flora records within the study area are shown in Figure 4.

Areas of greatest value for threatened flora species within the study area are:

- Giffard (Rifle Range) Flora Reserve: known to support populations of and / or suitable habitat for several EPBC and FFG listed flora species such as Dwarf Kerrawang *Commersonia prostrata* (EPBC EN).
- Stradbroke Flora and Fauna Reserve and surrounding reserves: known to support populations of and / or suitable habitat for several EPBC and FFG listed flora species including Golden Grevillea *Grevillea chrysophaea* (FFG vu).
- Wetlands, lakes and waterways, particularly Fresh-water creeks and their associate wetlands such as the Merriman Creek, Kangaroo creek and Monkey Creek: Likely to support habitat for several EPBC

and FFG listed flora species including River Swamp Wallaby-grass *Amphibromus fluitans* (EPBC VU), Yarra Gum *Eucalyptus yarraensis* (FFG cr) and Swamp everlasting *Xerochrysum palustre* (EPBC VU, FFG cr).

Table 3 Summary of EPBC and FFG Act listed flora species most likely to occur in the study area

| Common name | Scientific name | Conservation status | |
|----------------------------|--|---------------------|-----|
| | | EPBC | FFG |
| River Swamp Wallaby-grass | <i>Amphibromus fluitans</i> | VU | |
| Eastern Spider-orchid | <i>Caladenia orientalis</i> | EN | e |
| Thick-lip Spider-orchid | <i>Caladenia tessellata</i> | VU | |
| Dwarf Kerrawang | <i>Commersonia prostrata</i> | EN | e |
| Matted Flax-lily | <i>Dianella amoena</i> | EN | cr |
| Trailing Hop-bush | <i>Dodonaea procumbens</i> | VU | |
| Strzelecki Gum | <i>Eucalyptus strzeleckii</i> | VU | cr |
| Maroon Leek-orchid | <i>Prasophyllum frenchii</i> | EN | e |
| Dense Leek-orchid | <i>Prasophyllum spicatum</i> | VU | cr |
| Wellington Mint-bush | <i>Prostanthera galbraithiae</i> | VU | e |
| Green-striped Greenhood | <i>Pterostylis chlorogramma</i> | VU | e |
| Swamp Fireweed | <i>Senecio psilocarpus</i> | VU | |
| Metallic Sun-orchid | <i>Thelymitra epipactoides</i> | EN | e |
| Spiral Sun-orchid | <i>Thelymitra matthewsii</i> | VU | e |
| Swamp Everlasting | <i>Xerochrysum palustre</i> | VU | cr |
| Sticky Wattle | <i>Acacia howittii</i> | | v |
| Stunted Sheoak | <i>Allocasuarina nana</i> | | e |
| Sea Water-mat | <i>Althenia marina</i> | | cr |
| Wavy Swamp Wallaby-grass | <i>Amphibromus sinuatus</i> | | e |
| Small-leaf Star-hair | <i>Astrotricha parvifolia</i> subsp. 1 | | cr |
| Veined Spear-grass | <i>Austrostipa rudis</i> subsp. <i>australis</i> | | e |
| Velvet Apple-berry | <i>Billardiera scandens</i> s.s. | | e |
| Variable Bossiaea | <i>Bossiaea heterophylla</i> | | e |
| Elegant Daisy | <i>Brachyscome salkiniae</i> | | v |
| Orange-tip Finger-orchid | <i>Caladenia aurantiaca</i> | | e |
| Slender Pink-fingers | <i>Caladenia vulgaris</i> | | v |
| Naked Beard-orchid | <i>Calochilus imberbis</i> | | cr |
| Mountain Bird-orchid | <i>Chiloglottis jeanesii</i> | | v |
| Pale Swamp Everlasting | <i>Coronidium gunnianum</i> | | cr |
| Spurred Helmet-orchid | <i>Corybas aconitiflorus</i> | | e |
| Fringed Helmet-orchid | <i>Corybas fimbriatus</i> | | e |
| Grey Billy-buttons | <i>Craspedia canens</i> | | cr |
| Eastern Water-ribbons | <i>Cyanogeton microtuberosum</i> | | e |
| Bear's-ear | <i>Cymbonotus lawsonianus</i> | | e |
| Purple Diuris | <i>Diuris punctata</i> var. <i>punctata</i> | | e |
| Rough-grain Love-grass | <i>Eragrostis trachycarpa</i> | | e |
| Gippsland Lakes Peppermint | <i>Eucalyptus arenicola</i> | | e |
| Coast Grey-box | <i>Eucalyptus bosistoana</i> | | e |

| Common name | Scientific name | Conservation status | |
|---------------------|---|---------------------|-----|
| | | EPBC | FFG |
| Green Scentbark | <i>Eucalyptus fulgens</i> | | e |
| Southern Blue-gum | <i>Eucalyptus globulus subsp. globulus</i> | | e |
| Yarra Gum | <i>Eucalyptus yarraensis</i> | | cr |
| Veiled Fringe-sedge | <i>Fimbristylis velata</i> | | e |
| Golden Grevillea | <i>Grevillea chrysophaea</i> | | v |
| Salt Blown-grass | <i>Lachnagrostis robusta</i> | | e |
| Rough Blown-grass | <i>Lachnagrostis rudis subsp. rudis</i> | | e |
| Purple Blown-grass | <i>Lachnagrostis semibarbata var. filifolia</i> | | e |
| Purple Blown-grass | <i>Lachnagrostis semibarbata var. semibarbata</i> | | e |
| Dune Wood-sorrel | <i>Oxalis rubens</i> | | e |
| Heath Platysace | <i>Platysace ericoides</i> | | e |
| Coast Fescue | <i>Poa billardierei</i> | | e |
| Golden Pomaderris | <i>Pomaderris aurea</i> | | e |
| Striped Pomaderris | <i>Pomaderris pilifera subsp. pilifera</i> | | e |
| Fibre-ball Weed | <i>Posidonia australis</i> | | e |
| Fisch's Greenhood | <i>Pterostylis fischii</i> | | e |
| Mentone Greenhood | <i>Pterostylis X toveyana</i> | | e |
| Shingle Fireweed | <i>Senecio diaschides</i> | | e |
| Annual Fireweed | <i>Senecio glomeratus subsp. longifructus</i> | | v |
| Rush Lily | <i>Sowerbaea juncea</i> | | v |
| Winter Sun-orchid | <i>Thelymitra hiemalis</i> | | cr |
| Dusky Violet | <i>Viola fuscoviolacea</i> | | e |
| Parsley Xanthosia | <i>Xanthosia leiophylla</i> | | e |
| Pink Zieria | <i>Zieria veronicea subsp. veronicea</i> | | e |

4.6.1. Nationally significant flora

The 15 EPBC Act listed species considered most likely to occur within the project area occupy a range of habitats from wetlands, saltmarsh and coastal dunes through to forests, woodlands and heathlands. Seven of the 15 EPBC Act listed species are terrestrial orchids and include Spider Orchids, Leek-Orchids, Sun orchids and a Greenhood Orchid. Terrestrial orchids are cryptic species, emerging from the ground and flowering for only short periods of time each year. To identify the extent of these species throughout the study area, highly targeted assessments (taking into consideration climate conditions and time of year) will be necessary. Where this is not possible, proposed impacts should avoid areas with recent and historic records and all suitable habitat (as determined by field validation of existing vegetation).

Amongst the species most likely to occur in the study area are Swamp Fireweed *Senecio psilocarpus* and River Swamp Wallaby-grass *Amphibromus fluitans*. Correct identification of these species is difficult and relies on the presence of certain characters that are only present for small periods of time.

Wellington Mint Bush *Prostanthera galbraithiae*, is a Victorian endemic with a highly restricted distribution to the south of Sale. Given the endemic and restricted nature of this distribution, impacts on this species should be avoided wherever possible.

Where impacts within suitable habitat for any EPBC Act listed species is unavoidable it is highly likely that targeted surveys will be required to support an assessment of the potential for significant impact on MNES.

4.6.2. State significant flora

The 58 FFG Act listed (state listed) flora species most likely to occur within the study area are found in a range of habitats throughout the study area. There are a number of range restricted flora species such as the Gippsland Lakes Peppermint *Eucalyptus arenicola* (FFG e). The study area is also likely to contain disjunct populations of several threatened flora species such as Rush Lily *Sowerbaea juncea* (FFG vu) and Dusky Violet *Viola fuscoviolacea* (FFG en).

Due to the large number of FFG Act listed flora species and the breadth of habitats that these species occupy, it is likely that several of these species will need to be considered further. This will require detailed assessments to determine the extent of each species throughout the study area.

4.7. Threatened fauna

A 10 kilometre buffered search of the PMST and Victorian databases indicates 129 threatened fauna species occur, or are predicted to occur, in the search area (the study area buffered by 10 kilometres) (Appendix B). A total of 98 of these fauna species are considered to have a medium or higher likelihood of occurring within the study area (Appendix B). This includes:

- Thirteen (13) fauna species listed under the EPBC Act only
- Thirty-seven (37) fauna species listed under the EPBC Act and FFG Act
- Forty-eight (48) fauna species listed under the FFG Act only.

Threatened fauna records within the study area are shown in Figure 5.

Threatened fauna have the potential to be impacted during both construction and operational phases of the project. Hollow-dependent fauna, sedentary fauna or fauna with relatively defined ecological niches and / or small home ranges are considered most likely to be impacted during on shore works during the construction phase of the project due to their ecology and habitat requirements and the nature of the proposed activities, which may involve habitat loss and disturbance. Highly mobile and/or volant marine fauna (i.e. species that primarily fly or glide) such as seabirds and potentially shorebirds, are most likely to be impacted during the operational phase as their aerial movements place them at risk of collision with wind turbines. In addition, mobile terrestrial species may also be impacted during the construction phase if foraging or roosting/nesting habitat is directly or indirectly affected.

Threatened fauna which are considered likely to occur within the study area may warrant further consideration during the design and assessment phases of the project. These species occupy a variety of habitats ranging from wetlands, saltmarshes and coastal dunes, to forests, woodlands and heathlands as well as open ocean environments. This also places species at different levels of risk in relation to the various aspects of the proposed development. As such, further discussion of threatened fauna considered likely to occur within the study area, is provided under the following sub-headings:

- Avifauna (including terrestrial birds and shorebirds)
- Other terrestrial and aquatic fauna
- Marine fauna (including seabirds, marine mammals, sea fishes and marine reptiles)

4.7.1. Avifauna

For the purpose of this report, avifauna are discussed separately as, terrestrial birds (all species occupying terrestrial habitats) and shorebirds (marine and freshwaters waders, wetland birds and terns).

Terrestrial birds

A total of seven nationally listed and 11 state listed terrestrial avifauna species, are considered to have a medium or higher likelihood of occurring within the study area (Table 4). In addition, five of the nationally listed species are also state listed. Impacts to terrestrial birds are likely to arise during the construction stage, particularly if the construction of transmission line infrastructure results in the disturbance of, or the removal of suitable habitat. Threatened terrestrial birds in the present study occupy a range of habitat types, and careful consideration should be given to the impacts on individual species, associated with habitat loss.

On and offshore wind energy projects usually pose a particular threat to avifauna given the risk of collisions with turbines. The positioning of wind turbines offshore places them well outside of the flight range of many terrestrial birds and as such collision risks during the operational phase may be considered negligible for most of these species. However, there is a concern for terrestrial birds which are known to traverse Bass Strait in large numbers at certain times of the year when moving between Tasmania and mainland Australia. Species of particular concern include Orange-bellied Parrot *Neophema chrysogaster*, Swift Parrot *Lathamus discolor* and White-throated Needletail *Hirundapus caudacutus*. Although, rough timelines for arrival and departure have been documented, there is still a paucity of information on the migratory routes taken across the marine environment, as well as the flight heights during these large-scale movements. As such, it is not possible to discount the effects of an offshore wind project on these species, and further consideration is warranted. These and other non-listed species are collectively termed Bass Strait migrants and are discussed further in Section 4.8 Migratory fauna.

Table 4 Threatened terrestrial bird species most likely to occur within the study area

| Common name | Species name | Conservation status | |
|---------------------------|----------------------------------|---------------------|-----|
| | | EPBC | FFG |
| Glossy Black-Cockatoo | <i>Calyptorhynchus lathami</i> | VU | cr |
| 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> | VU | v |
| Pilotbird | <i>Pycnoptilus floccosus</i> | VU | |
| Painted Honeyeater | <i>Grantiella picta</i> | VU | v |
| Grey Goshawk | <i>Accipiter novaehollandiae</i> | | e |
| Little Eagle | <i>Hieraaetus morphnoides</i> | | v |
| White-bellied Sea-Eagle | <i>Haliaeetus leucogaster</i> | | e |
| Square-tailed Kite | <i>Lophoictinia isura</i> | | v |
| Barking Owl | <i>Ninox connivens</i> | | cr |
| Powerful Owl | <i>Ninox strenua</i> | | v |
| Masked Owl | <i>Tyto novaehollandiae</i> | | cr |
| Hooded Robin | <i>Melanodryas cucullata</i> | | v |
| Chestnut-rumped Heathwren | <i>Calamanthus pyrrhopygius</i> | | v |
| White-browed Treecreeper | <i>Climacteris affinis</i> | | e |

| Common name | Species name | Conservation status | |
|------------------|------------------------------|---------------------|-----|
| | | EPBC | FFG |
| Diamond Firetail | <i>Stagonopleura guttata</i> | | v |

Shorebirds, wetland birds and terns

For the purpose of this report, marine waders, wetland birds and terns are discussed under one section, considering that many of the species often overlap in their use of coastal and freshwater aquatic habitats. A total of 11 nationally listed and 24 state listed shorebird species are considered to have a medium or higher likelihood of occurring within the study area (Table 5). In addition, nine of the 11 nationally listed species are also state listed. Thirteen of these threatened shorebird species and both tern species are also listed as migratory.

Impacts to most of these birds are likely to occur during the development stage, particularly if the construction of infrastructure impacts the integrity of surrounding wetlands and waterways which provide critical habitat for a number of these species. Onshore cable routing may also pose a threat to shorebird species that are known to occur along the coastal regions of the study area. Particular shorebird hotspots within the study area include Gippsland Lakes and Corner Inlet, both of which are Ramsar sites and globally recognised as an important habitat for resident and migratory shorebirds.

Impacts to migratory shorebirds during the operational phase of the wind project is an important consideration. In addition to providing important foraging habitat for over 30,000 shorebirds each year, Corner Inlet is also an important gathering site for trans-equatorial migratory shorebirds which gather in large numbers prior to departing on their northward migration. Migratory shorebirds may be at risk of collisions with wind turbines, especially during their departure and arrival. The offshore location of wind turbines may place them well beyond the departure and arrival ranges of migratory shorebirds. However, given their mobility and the relatively poor understanding of migration routes and flight heights, migratory shorebirds cannot be discounted from occurring within the study area and may require further consideration during the design and assessment phase of the project.

Table 5 Threatened shorebird, wetland bird and tern species 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 (baueri) | <i>Limosa lapponica baueri</i> | VU | |
| Hooded Plover | <i>Thinornis cucullatus</i> | VU | v |
| Lesser Sand Plover | <i>Charadrius mongolus</i> | EN | e |
| Greater Sand Plover | <i>Charadrius leschenaultii</i> | VU | v |
| Eastern Curlew | <i>Numenius madagascariensis</i> | CR | cr |
| Curlew Sandpiper | <i>Calidris ferruginea</i> | CR | cr |
| Red Knot | <i>Calidris canutus</i> | EN | e |
| Great Knot | <i>Calidris tenuirostris</i> | CR | cr |
| Lewin's Rail | <i>Lewinia pectoralis</i> | | v |
| Little Egret | <i>Egretta garzetta</i> | | e |
| Plumed Egret | <i>Ardea intermedia plumifera</i> | | cr |

| Common name | Species name | Conservation status | |
|---------------------------|------------------------------|---------------------|-----|
| | | EPBC | FFG |
| 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 |
| Caspian Tern | <i>Hydroprogne caspia</i> | | v |
| Little Tern | <i>Sternula albifrons</i> | | cr |
| Ruddy Turnstone | <i>Arenaria interpres</i> | | e |
| Grey Plover | <i>Pluvialis squatarola</i> | | v |
| Pacific Golden Plover | <i>Pluvialis fulva</i> | | v |
| Whimbrel | <i>Numenius phaeopus</i> | | e |
| Wood Sandpiper | <i>Tringa glareola</i> | | e |
| Grey-tailed Tattler | <i>Tringa brevipes</i> | | cr |
| Common Sandpiper | <i>Actitis hypoleucos</i> | | v |
| Common Greenshank | <i>Tringa nebularia</i> | | e |
| Marsh Sandpiper | <i>Tringa stagnatilis</i> | | e |
| Terek Sandpiper | <i>Xenus cinereus</i> | | e |
| Black-tailed Godwit | <i>Limosa limosa</i> | | cr |

4.7.2. Other terrestrial and aquatic fauna

A total of nine nationally listed and 11 state listed non-avian fauna are considered to have a medium of higher likelihood of occurring within the study area (Table 6). In addition, eight of the nine nationally listed species are also state listed. These species include both terrestrial ground-dwelling and arboreal species, as well as species inhabiting freshwater streams and waterbodies throughout the study area.

The construction and operation of offshore wind turbines is unlikely to pose any inherent risk to these terrestrial fauna. However, impacts to the terrestrial environment and waterbodies throughout the local area associated with the construction of substations and routing of transmission lines is likely to warrant consideration. Removal and impact to large trees and native vegetation may impact EPBC listed arboreal species such as Southern Greater Glider *Petauroides volans* and Grey-headed Flying-fox *Pteropus poliocephalus*. Under boring or trenching activities associated with cable routing may impact the habitat of ground-dwelling fauna such as New Holland Mouse *Pseudomys novaehollandiae* and Southern Brown Bandicoot *Isodon obesulus obesulus* potentially through habitat removal or fragmentation. Wetlands and waterways within the study area and surrounds are likely to provide important habitat for nationally listed amphibian and ichthyofauna populations. Any impacts to aquatic habitats associated with the works during the developmental phase (e.g. runoff, altering of the natural course of waterways, etc.) should be taken into consideration.

Consistent with nationally significant terrestrial and aquatic fauna, some state listed species, particularly those which are sedentary or have specific habitat requirements have the potential to be impacted during the development phase of the project. On public land, DELWP has a duty under the FFG Act to consider the

objectives of FFG Act, Biodiversity 2037 targets (DELWP 2017), action statements, potentially threatening processes (i.e. loss of hollow-bearing trees or coarse woody debris), critical habitat determinations and management plans made under the Act. Whilst approvals for impacts to FFG Act fauna habitat and communities are currently not required under the FFG Act, impacts will be considered by DELWP and the Responsible Authority in determining a response to any application for vegetation removal under Clause 52.17 (Native Vegetation) of the relevant planning scheme as part of any approval for future development of the site.

Table 6 Other threatened, non-avian terrestrial and freshwater aquatic species most likely to occur within the study area

| Common name | Species name | Conservation status | |
|--------------------------------|--|---------------------|-----|
| | | EPBC | FFG |
| Southern Greater Glider | <i>Petauroides volans</i> | VU | v |
| New Holland Mouse | <i>Pseudomys novaehollandiae</i> | VU | e |
| Southern Brown Bandicoot | <i>Isodon obesulus obesulus</i> | EN | e |
| Grey-headed Flying-fox | <i>Pteropus poliocephalus</i> | VU | v |
| Green and Golden Bell Frog | <i>Litoria aurea</i> | VU | |
| 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 |
| Macquarie Perch | <i>Macquaria australasica</i> | EN | e |
| White-footed Dunnart | <i>Sminthopsis leucopus</i> | | v |
| Platypus | <i>Ornithorhynchus anatinus</i> | | v |
| Yellow-bellied Sheath-tail Bat | <i>Saccolaimus flaviventris</i> | | v |
| Lace Monitor | <i>Varanus varius</i> | | e |
| Swamp Skink | <i>Lissolepis coventryi</i> | | e |
| Glossy Grass Skink | <i>Pseudemoia rawlinsoni</i> | | e |
| Southern Toadlet | <i>Pseudophryne semimarmorata</i> | | e |
| Martin's Toadlet | <i>Uperoleia martini</i> | | cr |
| Flinders Pygmy Perch | <i>Nannoperca</i> sp. 1 | | v |
| Alpine Darner Dragonfly | <i>Austroaeschna (Austroaeschna) flavomaculata</i> | | v |
| South Gippsland Spiny Crayfish | <i>Euastacus neodiversus</i> | | e |

4.7.3. Marine fauna

Database searches identified a total of 23 nationally listed and two state listed marine fauna which are considered to have a medium or higher likelihood of occurrence within the proposed offshore area. Potential impacts to marine fauna, including seabirds, marine mammals, marine reptiles and fishes are beyond the scope of this report and these assessments have been undertaken by BMT (Preliminary Desktop Marine Environmental Assessment, September 2022). However, to provide a more complete assessment of the existing environment, marine species are briefly discussed below.

Seabirds are of particular concern as there is a risk of collision with wind turbines. A total of 15 nationally listed and one state listed seabird species are considered likely to occur within the study area (Table 7). Of these 16 seabird species, 13 are also listed as migratory. In addition, nine of the 15 nationally listed seabirds are also state listed. The proposed area thus has the potential to overlap with the at-sea distributions of 11

threatened Albatross species and five threatened Procellariidae (Petrels and Shearwaters) with an EPBC status.

The Bass Strait Islands, particularly those to west and east of Wilsons Promontory, provide nesting habitat for a number of other important seabird species (Schumann et al. 2014). While there are no known seabird breeding colonies within the study area, several breeding species are known to breed within 50 kilometres of the study area, including:

- Little Penguin *Eudyptula minor*
- Short-tailed Shearwater *Ardenna tenuirostris*
- Black-faced Cormorant *Phalacrocorax fuscescens*
- Common Diving-Petrel *Pelecanoides urinatrix*
- Fairy Prion *Pachyptila turtar*
- Pacific Gull *Larus pacificus*

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 study area.

Table 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 | |
| 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 | |
| Campbell Albatross | <i>Thalassarche impavida</i> | VU, Migratory | |
| Light-mantled Sooty Albatross | <i>Phoebetria palpebrata</i> | Migratory | cr |

Database searches also identified a number of other threatened marine megafauna species with the potential to occur within the proposed study area. These species are outside the scope of this report but are included in Table 8 and Appendix 2, along with likelihood estimations. Of relevance to the study area is the movement patterns of whale species, including Southern Right Whales *Eubalaena australis* and Southern Humpback Whale *Megaptera novaeangliae*. In addition, the proposed study area may overlap with the distributions of EPBC listed marine fishes such as the Southern Bluefin Tuna *Thunnus maccoyii*, Blue Warehouse *Seriollela brama*, Great White Shark *Carcharodon carcharias* and School Shark *Galeorhinus galeus*. It is also noteworthy that the study area is within travel range of several Australian fur seal *Arctocephalus pusillus*

doriferus and Long-nosed fur seal *A. forsteri* breeding colonies, with both of these fur seal species known to forage extensively throughout this area.

Table 8 Threatened seabird species most likely to occur within the study area

| Common name | Species name | Conservation status | |
|--------------------------------|---|---------------------|-----|
| | | EPBC | FFG |
| Southern Elephant Seal | <i>Mirounga leonina</i> | VU | |
| Southern Right Whale | <i>Eubalaena australis</i> | EN | e |
| Southern Humpback Whale | <i>Megaptera novaeangliae australis</i> | VU | cr |
| Leathery Turtle | <i>Dermochelys coriacea</i> | EN | cr |
| Southern Bluefin Tuna | <i>Thunnus maccoyii</i> | CD | cd |
| Great White Shark | <i>Carcharodon carcharias</i> | VU | e |
| Blue Warehouse | <i>Seriola lalandi</i> | CD | cd |
| School Shark | <i>Galeorhinus galeus</i> | CD | |
| Long-nosed Fur Seal | <i>Arctophoca forsteri</i> | | v |

4.8. Migratory species

A 10 kilometre buffered search of the PMST and Victorian databases indicates 77 migratory species that occur or are predicted to occur, within the search area (Appendix B). In total, 33 of these species are also listed as threatened under national legislation, while a further 14 are listed under state legislation.

Eight of these species are terrestrial avifauna, three of which are known to migrate across the marine environment of Bass Strait between Victoria and Tasmania. These three species include White-throated Needletail *Hirundapus caudacutus*, Fork-tailed Swift *Apus pacificus* and Satin Flycatcher *Myiagra cyanoleuca*. Thirty four (34) of the listed migratory species are grouped as shorebirds, wetland birds and terns, which utilise a variety of freshwater aquatic, coastal and offshore habitats (in the case of most tern species).

The remaining migratory fauna are marine species which typically travel extensive distances and are likely to occur within the study area. This includes 19 seabirds, primarily comprising 14 species of albatross, both species of Giant Petrel and three species of Shearwater. Noteworthy is that this includes Short-tailed shearwater *Ardenna tenuirostris*, the most numerically abundant seabird in south-eastern Australia which is known to breed in large numbers at colonies within 50 km of the study area (Schumann et al. 2014). The 16 remaining migratory fauna are all marine species, comprising various mammals, sharks and sea turtles. Further assessment of these species is outside the scope of this report, but it is likely that their distributions will overlap with the proposed study area.

4.9. Threatened ecological communities

A ten (10) kilometre buffered search of the PMST and Victorian databases indicates four (4) Threatened Ecological Communities (TECs) listed under the EPBC Act and eight (8) listed under the FFG ACT occur, or are predicted to occur. Based on the available desktop data, 11 of the 12 TECs are considered likely to occur within the study area. Warm Temperate Rainforest is unlikely to occur within the study area. Descriptions of each TEC are provided in Table 9. Modelled occurrences of these TECs are presented in Figure 6. The EPBC Act listed TECs Natural Damp Grassland of the Victorian Coastal Plains and Gippsland Red Gum (*Eucalyptus tereticornis* subsp. *mediana*) Grassy Woodland and Associated Native Grassland are broadly modelled throughout large swathes of the study area. Modelled occurrences of the Subtropical and Temperate Coastal Saltmarsh are much more spatially refined. It should be noted that Subtropical and Temperate Coastal

Saltmarsh can occur and do persist in low-lying areas of otherwise cleared agricultural land and can be difficult to detect.

Many of the FFG listed TECs remain as small, disjunct patches of vegetation running along roadsides, creek lines and between plantations. Roadside remnant vegetation can be highly diverse and plays an important role in providing biodiversity and habitat in otherwise agricultural landscapes. Despite their size, many of these remnants may be of a high quality; though, there is little connectivity between them, and they may be heavily degraded.

Warm Temperate Rainforest is modelled to occur within 10 kilometres, predominantly in the Tarra-Bulga National Park. The remnant vegetation within the study area is dominated by heathy woodlands and some Eucalypt dominated forests. As a result, Warm Temperate Rainforests are unlikely to occur. Cool temperate rainforest is also not modelled to occur within the study area, however, since it is known to persist as small along creek lines, it may occur within the study area.

Similarly, Herb-rich Plains Grassy Wetlands are only modelled to occur within 10 kilometres of the study area. However, the floodplain riparian woodland that occurs within the study area may support Herb-rich Plains Grassy Wetlands.

The modelled Forest Red Gum Grassy Woodland and Plains Grassland communities around the Loy Yang Power Station may no longer exist or be highly degraded. Majority of the study area is not modelled to support any FFG Act listed TECs, besides the Coastal Moonah Woodlands on the coastline.

Table 9 TECs considered likely to occur within the study area

| Community Name | Conservation status | Source | Description |
|---|-----------------------|--------|---|
| National significance | | | |
| Gippsland Red Gum (<i>Eucalyptus tereticornis</i> subsp. <i>mediana</i>) Grassy Woodland and Associated Native Grassland | Critically Endangered | PMST | A type of eucalypt woodland with the tree canopy dominated by Gippsland Red Gum and the ground layer dominated by grasses or grass-like plants. The ecological community occurs in two forms. The grassy woodland form is dominated by a tree canopy with a graminoid ground layer. In the grassland form, the tree cover is largely absent. The woodland and grassland forms now show a degree of divergence in their floristic composition due to differences in their long-term management history (DEWHA 2008). |
| Natural Damp Grassland of the Victorian Coastal Plains | Critically Endangered | PMST | A type of grassland ranging to open grassy woodland with scattered trees and shrubs that occurs in Victoria's coastal plains. It is generally found on heavy grey silty-loamy soils, which are poorly drained and therefore often damp and sometimes waterlogged. The grassland has a variable floristic composition but generally is dominated by tussock grasses, notably Kangaroo Grass <i>Themeda triandra</i> on the drier sites or Common Tussock-grass <i>Poa labillardierei</i> , on wetter sites. Where trees are present, they are typically a sparse cover of eucalypt species associated with damp sites, such as Manna Gum <i>E. viminalis</i> or Swamp Gum <i>E. ovata</i> , but characteristically exclude Gippsland Red Gum which occurs on the drier parts of the Gippsland Plain subregion. Non-eucalypt trees may include Drooping She-oak <i>Allocasuarina verticillata</i> , Blackwood <i>Acacia melanoxylon</i> , Black Wattle <i>A. mearnsii</i> and Silver Banksia <i>Banksia marginata</i> (DoE 2015). |

| Community Name | Conservation status | Source | Description |
|---|-----------------------|--------|---|
| Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains | Critically Endangered | PMST | These wetlands are temporary, becoming inundated on a seasonal basis. The vegetation is treeless, dominated by a diverse herbaceous understorey. The species present are typically characteristic of wet locations and missing or rare in adjacent dry land. The diversity of the system is highly depending on the site-conditions (wet or dry). It is modelled to occur on flat plains (below 500 m above seas level) in the temperate zone of south-eastern Australia. A range of graminoids is often present and typically includes one or more of the following taxa: <i>Amphibromus</i> spp., <i>Carex tereticaulis</i> , <i>Lachnagrostis</i> spp. |
| Subtropical and Temperate Coastal Saltmarsh | Vulnerable | PMST | This ecological community occurs in coastal areas under regular or intermittent tidal influence. In southern latitudes (e.g. Victoria) saltmarsh is often the main vegetation-type in the intertidal zone and commonly occurs in association with estuaries. The ecological community consists mainly of salt-tolerant vegetation (halophytes) including: grasses, herbs, sedges, rushes and shrubs. Succulent herbs, shrubs and grasses generally dominate and vegetation is generally of less than 0.5 m height. Many species of non-vascular plants are also found in saltmarsh, including epiphytic algae, diatoms and cyanobacterial mats (DSEWPC 2013). |
| State significance | | | |
| Central Gippsland Plains Grassland Community | Threatened | | This community is dominated by Kangaroo Grass) and includes a range of native herbs and, rarely, trees such as Drooping She-oak, Burgan <i>Kunzea ericoides</i> and Forest Red Gum. The community is extremely restricted in distribution; it is estimated that less than 20 to 30 hectares remain (SAC n.d.). |

| Community Name | Conservation status | Source | Description |
|--|---------------------|--------|--|
| Coastal Moonah (<i>Melaleuca lanceolata</i> subsp. <i>lanceolata</i>) Woodland Community | Threatened | | This community is an open grassy woodland that is dominated by Moonah and found along parts of the Victorian coastline. Coastal Moonah Woodlands tend to occur on high-level dunes along the coast where soils are strongly alkaline and developed on moderately organic aeolian sands or on dune calcarenites (SAC n.d.). |
| Cool Temperate Rainforest Community | Threatened | | This community supports forest vegetation with a rainforest tree canopy of variable height. Combinations of Myrtle Beech <i>Nothofagus cunninghamii</i> , Southern Sassafras <i>Atherosperma moschatum</i> and Blackwood <i>Acacia melanoxylon</i> tend to dominate these communities. Cool temperate rainforest often occurs along the margins of streams, however more extensive stands can form where little disturbance (particularly by fire) has occurred. |
| Forest Red Gum Grassy Woodland Community | Threatened | | This community is a type of woodland found at a number of sites in Gippsland. The community is characteristically dominated by Forest Red Gum, often with co-dominant Red Box <i>E. polyanthemus</i> . Coast Grey Box <i>E. bosistoana</i> occurs towards the coast, while Apple Box <i>E. bridgesiana</i> is often co-dominant on sandy sites (SAC n.d.). |
| Herb-rich Plains Grassy Wetland (West Gippsland) Community | Threatened | | This community typically occurs in shallow, seasonal wetlands that fill in winter and spring and are dry by summer. It supports a diverse mix of grasses, sedges and aquatic herbs. The community is typically zoned with emergent sedges and grasses along the peripheral while amphibious herbs occur in the deeper water. Very little of this community remains (about 70 ha). |
| Plains Grassland (South Gippsland) Community | Threatened | | This community varies in structure from closed tussock grassland to open woodland. Its original vegetation structure is likely to have been an open woodland that included areas of very sparsely-treed tussock grassland with shrubby zones associated with drainage lines. This community type occurs in places on the Gippsland plains in the Yarram region between Seaspray and Welshpool (SAC n.d.). |

| Community Name | Conservation status | Source | Description |
|--|---------------------|--------|---|
| Sedge Rich Eucalyptus camphora Swamp Community | Threatened | | This community is characterised by Mountain Swamp Gum <i>E. camphora</i> over a shrub layer dominated by Woolly Tea-tree <i>Leptospermum lanigerum</i> and a ground cover of diverse sedges and rushes. The community varies in structure from an open woodland or open grassy woodland to a closed shrubland and, where it has been highly disturbed, a grassland dominated by the Common Reed <i>Phragmites australis</i> (SAC n.d.). |

4.10. Threatening processes

High-level assessments of the potential of the project to contribute to the listed potentially threatening processes under the FFG Act and listed key threatening processes under the EPBC Act are provided below (DELWP 2016, DAWE 2021). Many of these threatening processes may already be operating in the project area and nearby public land but will need to be considered in more detail during project design and planning, especially processes that are likely to lead to the spread of weeds and pathogens, and cause habitat fragmentation. The contribution of the project to these threatening processes is primarily associated with:

- Potential impacts to terrestrial ecosystems from onshore works including the spread of viruses / diseases and impacts from introduced species.
- Potential impacts to aquatic, estuarine and marine ecosystems from onshore and offshore works in and / or adjacent to these areas.

Potentially threatening processes listed under the EPBC Act (DAWE 2021) and potentially threatening processes, as defined in the FFG Processes List (DELWP 2016), that are either already present or likely to be present within the project area shown in Table 10:

Table 10 EPBC and FFG threatening processes either already present or likely to be present within the study area

| EPBC threatening processes | FFG threatening processes |
|--|--|
| Aggressive exclusion of birds from potential woodland and forest habitat by over-abundant noisy miners (<i>Manorina melanocephala</i>) | Alteration to the natural flow regimes of rivers and streams |
| Competition and land degradation by rabbits | Alteration to the natural temperature regimes of rivers and streams |
| Competition and land degradation by unmanaged goats | Degradation of native riparian vegetation along Victorian rivers and streams |
| Dieback caused by the root-rot fungus (<i>Phytophthora cinnamomi</i>) | Habitat fragmentation as a threatening process for fauna in Victoria |
| Infection of amphibians with chytrid fungus resulting in chytridiomycosis | Increase in sediment input into Victorian rivers and streams due to human activities |
| Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris | Input of petroleum and related products into Victorian marine and estuarine environments |
| Land clearance | Input of toxic substances into Victorian rivers and streams |
| Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants | Invasion of native vegetation by 'environmental weeds' |
| Novel biota and their impact on biodiversity | Loss of hollow-bearing trees from Victorian native forests |

| EPBC threatening processes | FFG threatening processes |
|--|--|
| Predation by European red fox | Spread of <i>Pittosporum undulatum</i> in areas outside its natural distribution |
| Predation by feral cats | The discharge of human-generated marine debris into Victorian marine or estuarine waters |
| Predation, habitat degradation, competition and disease transmission by Feral Pigs | The introduction of exotic organisms into Victorian marine waters |
| | The spread of <i>Phytophthora cinnamomi</i> from infected sites into parks and reserves, including roadsides, under the control of a state or local government authority |
| | Use of <i>Phytophthora</i> -infected gravel in construction of roads, bridges and reservoirs |
| | Wetland loss and degradation as a result of change in water regime, dredging, draining, filling and grazing |

5. Potential impacts and mitigation measures

This section provides a high-level assessment of potential impacts to ecological values against:

- Potential for significant impacts to MNES under the SIC guidelines (Commonwealth of Australia 2013),
- Potential to satisfy criteria for referral under the EE Act as outlined in the ministerial guidelines (DSE 2006).

These preliminary assessments against MNES and EE Act referral criteria have been conducted without the application of mitigation measures or further design refinement.

Potential mitigation measures have been included below as a means to inform further design development and mitigation development for the project to avoid and further minimise these impacts. However, it is important to note that this current assessment is preliminary and is subject to confirmation and/or change based on the results of detailed field-based assessment of the study area and further surveys efforts to inform possible impacts.

5.1. Potential for significant impacts to MNES

MNES relevant to the project are summarised in Table 11. It includes an assessment against the EPBC Act policy statements published by the Australian Government which provide guidance on the practical application of EPBC Act.

The preliminary assessment of the project's potential impacts to biodiversity against the *Matters of National Environmental Significance, Significant Impact Criteria Guidelines 1.1 Environmental Protection and Biodiversity Conservation Act 1999* (Commonwealth of Australia 2013) indicate that the project could significantly impact the following MNES:

- EPBC listed species and communities
- Migratory species
- Wetlands of international importance (Ramsar sites)
- Commonwealth marine waters

The EPBC Act is likely to be triggered and referral of the proposed action to the Australian Government Minister for the Environment is therefore recommended to confirm if the project is a controlled action and further assessment and approval is required.

Table 11 Assessment of potential impacts against SIC guidelines under the EPBC Act (Commonwealth of Australia 2013)

| MNES | Project specifics | Assessment against significant impact guidelines | Potential impacts to MNES |
|--|--|---|--|
| EPBC Act listed species | Study area contains populations of and / or habitat for 94 EPBC Act listed threatened species (incl. flora and fauna). The likelihood of these species occurring in the study area is assessed in Appendix A (flora) and Appendix B (fauna). | A total of 65 of these EPBC listed species are considered likely to occur within the study area. Therefore, it is possible that impacts from the project may result in significant impacts to EPBC Act listed threatened species. | Habitat destruction, loss, modification or fragmentation. Disturbance and disruption of life cycles. Collision with wind turbines and/or, to a lesser extent, overhead transmission lines, leading to mortalities. Introduction of disease and/or invasive species. |
| EPBC Act listed communities | Study area may contain up to three EPBC Act listed TECs with a conservation status of CR making them eligible for significant impact assessment against SIC guidelines. | Depending on the terrestrial impacts associated with the project, namely the onshore cable route, there is the potential for significant impacts to TECs. | Reduction in the extent of TECs. Fragmentation of TECs. Destruction of habitat and factors critical to the survival and persistence of TECs. |
| Migratory species | Study area contains wetlands, coastal and offshore habitat features that support up to 77 migratory species. | Depending on the terrestrial impacts associated with the project, namely the onshore cable route, there is the potential for significant impacts to migratory species. In addition, migratory species, specifically avifauna, may be at risk of collisions with offshore turbines. | Habitat destruction, loss, modification or fragmentation. Disturbance and disruption of life cycles. Collision with wind turbines and/or overhead transmission line leading to mortalities. Introduction of disease and/or invasive species. |
| Wetlands of international importance (Ramsar sites) | Study area contains the Gippsland Lakes Ramsar site and is within 10 kilometres of the Corner Inlet Ramsar site. | Depending on the terrestrial impacts associated with the project, namely the onshore cable route, it is possible that the project may significantly impact these Ramsar sites. In addition, migratory shorebird species that utilise these sites in larger numbers may be at risk from offshore operations. | Impacts to the lifecycles and potentially the survival of native species inhabiting the wetland (including migratory species). Impacts to the ecological integrity of the wetland through habitat loss or destruction. Indirect impacts through the introduction of pollutants, nutrients, disease and invasive species. |

| MNES | Project specifics | Assessment against significant impact guidelines | Potential impacts to MNES |
|--|---|--|--|
| <p>Commonwealth marine waters</p> | <p>The offshore component of the study area includes Commonwealth marine waters within Bass Strait.</p> | <p>The marine environment within Bass Strait provides foraging and breeding habitat for numerous land-based marine predators including a range of seabird species and at least two fur seal species.</p> | <p>Habitat loss, modification or fragmentation. Disturbance and disruption of life cycles. Collision with wind turbines and/or overhead transmission line leading to mortalities. Introduction of disease and/or invasive species.</p> |

5.2. Preliminary MNES Significant Impact Assessment

A preliminary assessment of potential significant impact to each MNES is provided below. Note that we provide an assessment for terrestrial species, shorebirds and seabirds. An assessment for other marine species is beyond the scope of our report and has not been included here.

5.2.1. Critically Endangered or Endangered Species

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

- lead to a long-term decrease in the size of a population
- reduce the area of occupancy of the species
- fragment an existing population into two or more populations
- adversely affect habitat critical to the survival of a species
- disrupt the breeding cycle of a population
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
- result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species’ habitat
- introduce disease that may cause the species to decline, or
- interfere with the recovery of the species.

Table 12 Preliminary assessment of significant impacts to Critically Endangered or Endangered species with a medium or higher likelihood of occurrence within the study area

| Species/Species Group | Potential Impacts | Likelihood of Significant Impact |
|--|--|---|
| Flora: Eastern Spider-orchid, Dwarf Kerrawang, Matted Flax-lily, Maroon Leek-orchid, Metallic Sun-orchid. | Threatened flora are at risk of impact during the development stage, particularly in the proposed shore landing area. However, to determine the presence of threatened flora within the impact area will require an on-site assessment, and potentially targeted surveys for more cryptic species. | Likely (to be determined following an on-site assessment) |
| Terrestrial Birds: Gang-gang Cockatoo | Terrestrial birds could be potentially impacted during the construction phase, only if the onshore works result in disturbance to or removal of important habitat for these species. However, an on-site assessment is required to assess the availability of habitat for terrestrial birds. | Unlikely (to be determined following an on-site assessment) |

| Species/Species Group | Potential Impacts | Likelihood of Significant Impact |
|--|---|---|
| <p>Bass Strait Migrants: Orange-bellied Parrot, Swift Parrot</p> | <p>Terrestrial birds which traverse Bass Strait are at risk of collision with offshore wind turbines if they pass through the study area. In addition, there is a potential for the onshore component of the study area to support suitable habitat for these species. Therefore, there is potential for these species to be impacted by onshore works during the construction phase. For species such as Orange-bellied Parrot, where population numbers are extremely low, any impact to the population (such as additional mortality) should be considered significant.</p> | <p>Likely (to be determined following a more detailed assessment)</p> |
| <p>Shorebirds and Waterbirds: Australian Painted-snipe, Australasian Bittern, Lesser Sand Plover, Eastern Curlew, Curlew Sandpiper, Red Knot, Great Knot.</p> | <p>Impacts to these species are most likely to occur during the construction phase, particularly if works impact the integrity of surrounding wetland environments. In addition to resident shorebirds, the onshore environment also supports large numbers of trans-equatorial migrants. It is likely that offshore impact area will be well beyond the range of these species. Furthermore, although flight heights during migration are still poorly understood for most species, available evidence suggests that migrating shorebirds travel at great heights and will likely be beyond the rotor-swept area should they traverse the offshore area. Uncertainty still exists with regard to the movements of shorebird species between Victoria and Tasmania and as such, impact to shorebirds may warrant further investigation.</p> | <p>Unlikely (to be determined following a more detailed assessment of the onshore habitat within the study area and surveys within the offshore area)</p> |
| <p>Seabirds: Gould's Petrel, Grey-headed Albatross, Shy Albatross, Southern Giant Petrel</p> | <p>The marine environment of Bass Strait supports recognized areas of high marine productivity and provides foraging opportunities for a range of seabird species. While none of the Critically Endangered or Endangered seabird species breed within close proximity to the study area, most are known to forage within these waters and the productive waters of the shelf-edge, particularly during the non-breeding period. However, given that the at-sea distribution of these species is still relatively poorly understood, it is possible that large numbers of individuals may occur within the offshore component of the study area and be at risk of collision with wind turbines.</p> | <p>Likely</p> |

| Species/Species Group | Potential Impacts | Likelihood of Significant Impact |
|--|---|---|
| Terrestrial Mammals: Southern Brown Bandicoot | Terrestrial mammals could be potentially impacted during the construction phase, if onshore works result in disturbance to or removal of important habitat for these species. However, an on-site assessment is required to assess the availability of habitat for these species and targeted surveys may be required for cryptic species, to fully assess potential impacts. | Likely (to be determined following and on-site assessment) |
| Ichthyofauna: Macquarie Perch | Impacts to ichthyofauna are only expected to occur if onshore works impact the integrity of waterbodies utilised by these species. | Unlikely (to be determined following an on-site assessment) |

5.2.2. Vulnerable Species

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- lead to a long-term decrease in the size of an important population of a species
- reduce the area of occupancy of an important population
- fragment an existing important population into two or more populations
- adversely affect habitat critical to the survival of a species
- disrupt the breeding cycle of an important population
- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
- result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species’ habitat
- introduce disease that may cause the species to decline, or
- interfere substantially with the recovery of the species.

Table 13 Preliminary assessment of significant impacts to Vulnerable species with a medium or higher likelihood of occurrence within the study area

| Species/Species Group | Potential Impacts | Potential Significance of Impact |
|---|--|---|
| Flora: River Swamp Wallaby-grass, Thick-lip Spider-orchid, Trailing Hop-bush, Strzelecki Gum, Dense Leek-orchid, Wellington Mint-bush, Green-striped Greenhood, Swamp Fireweed, Spiral Sun-orchid, Swamp Everlasting | Threatened flora are at risk of impact during the development stage, particularly in the proposed shore landing area. However, to determine the presence of threatened flora within the impact area will require an on-site assessment, and potentially targeted surveys for more cryptic species. | Likely (to be determined following an on-site assessment) |

| Species/Species Group | Potential Impacts | Potential Significance of Impact |
|--|---|---|
| <p>Terrestrial Birds: Glossy Black-Cockatoo, Pilot Bird, Painted Honeyeater</p> | <p>Terrestrial birds are likely to be impacted during the construction phase, only if onshore works result in destruction to important habitat for these species. However, an on-site assessment is required to assess the availability of habitat for terrestrial birds.</p> | <p>Unlikely (to be determined following an on-site assessment)</p> |
| <p>Bass Strait Migrants: White-throated Needletail</p> | <p>Terrestrial birds which traverse Bass Strait are at risk of collision with offshore wind turbines if they pass through the study area. In addition, there is a potential for the onshore component of the study area to support suitable habitat for these species. White-throated Needletail, in particular, may warrant further consideration as this species is known to traverse Bass Strait more regularly than other migrants and wind turbines have been identified as a risk to the species.</p> | <p>Likely (to be determined following a more detailed assessment)</p> |
| <p>Shorebirds and Waterbirds: Australian Fairy Tern, Bar-tailed Godwit, Hooded Plover, Greater Sand Plover</p> | <p>Impacts to these species are most likely to occur during the construction phase, particularly if works impact the integrity of surrounding wetland environments. In addition to resident shorebirds, the onshore environment also supports large numbers of trans-equatorial migrants. It is likely that the offshore impact area will be well beyond the range of these species. Furthermore, although flight heights during migration are still poorly understood for most species, available evidence suggests that migrating shorebirds travel at great heights and will likely be beyond the rotor-swept area should they traverse the offshore area. Uncertainty still exists with regard to the movements of shorebird species between Victoria and Tasmania and as such, impact to shorebirds may warrant further investigation.</p> | <p>Unlikely (to be determined following a more detailed assessment of the onshore habitat within the study area and surveys within the offshore area)</p> |
| <p>Seabirds: Fairy Prion (subantarctic subspecies), Blue Petrel, Wandering Albatross, Black-browed Albatross, Indian Yellow-nosed Albatross, Sooty Albatross, Buller's Albatross, Northern Giant-Petrel, Southern Royal Albatross, White-capped Albatross, Campbell Albatross</p> | <p>The marine environment of Bass Strait supports recognized areas of high marine productivity and provides foraging opportunities for a range of seabird species. While none of the Vulnerable seabird species breed within close proximity to the study area, most are known to forage within these waters and the productive waters of the shelf-edge, particularly during the non-breeding period. However, given that the at-sea distribution of these species is still relatively poorly understood, it is possible that large numbers of individuals may occur within the offshore component of the study area and be at risk of collision with wind turbines.</p> | <p>Likely</p> |

| Species/Species Group | Potential Impacts | Potential Significance of Impact |
|---|---|---|
| Terrestrial Mammals: Southern Greater Glider, New Holland Mouse, Grey-headed Flying-fox | Terrestrial mammals could be potentially impacted during the construction phase, if onshore works result in destruction to important habitat for these species. However, an on-site assessment is required to assess the availability of habitat for these species and targeted surveys may be required for cryptic species, to fully assess potential impacts. | Likely (to be determined following and on-site assessment) |
| Amphibians: Green and Golden Bell Frog, Growling Grass Frog | Amphibians could be potentially impacted during the onshore works via impact to the integrity of waterbodies and suitable aquatic habitats. It is likely that the study area will support suitable habitat for these species, although an on-site assessment is required to determine the extent of this habitat and assess potential impacts. | Likely (to be determined following an on-site assessment) |
| Ichthyofauna: Australian Grayling, Dwarf Galaxias | Impacts to ichthyofauna are only expected to occur if onshore works impact the integrity of waterbodies. | Unlikely (to be determined following an on-site assessment) |

5.2.3. Critically Endangered or Endangered Ecological Communities

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

- reduce the extent of an ecological community
- fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines
- adversely affect habitat critical to the survival of an ecological community
- modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns
- cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:
 - assisting invasive species, that are harmful to the listed ecological community, to become established, or
 - causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or
- interfere with the recovery of an ecological community.

The results of this preliminary desktop review suggest that the study area may contain up to two EPBC Act listed TECs with a conservation status of Critically Endangered which makes them eligible for significant impact assessment against SIC guidelines. Depending on the terrestrial impacts associated with the project, namely the onshore cable route, there is the potential for significant impacts to TECs. However, an on-site assessment is required to determine the occurrence and extent of these threatened communities and fully assess the potential for significant impact.

5.2.4. Listed Migratory Species

An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:

- substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species
- result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or
- seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

Table 14 Preliminary assessment of significant impacts to Vulnerable species with a medium or higher likelihood of occurrence within the study area

| Species/Species Group | Potential Impacts | Potential Significance of Impact |
|-----------------------------|---|---|
| Migratory Shorebirds | It is likely that the offshore impact area will be well beyond the range of migratory shorebird species. Furthermore, although flight heights during migration are still poorly understood for most species, available evidence suggests that migrating shorebirds travel at great heights and will likely be beyond the rotor-swept area should they traverse the offshore area. However, further assessment may be required to determine the likelihood of migratory shorebirds to occur within the study area. | Unlikely (to be determined following a more detailed assessment of the onshore habitat within the study area and surveys within the offshore area). |
| Migratory Seabirds | Several species of migratory seabirds are expected to occur within the offshore area, including 14 species of albatross, two species of Giant-Petrel and three species of Shearwater. This includes Short-tailed Shearwater, the most numerically abundant seabird in south-eastern Australia, which breeds in large numbers at islands within 50 kilometres of the study area. | Likely |

| Species/Species Group | Potential Impacts | Potential Significance of Impact |
|------------------------------------|---|--|
| Migratory Terrestrial Birds | Migratory terrestrial birds are likely to be impacted during the construction phase, only if onshore works result in destruction to important habitat for these species. However, an on-site assessment is required to assess the availability of habitat for terrestrial birds. It is unlikely that migratory terrestrial birds will traverse the offshore marine area and be at risk of collision with wind turbines. | Unlikely (to be determined following an on-site assessment) |
| Bass Strait Migrants | Terrestrial birds which traverse Bass Strait are at risk of collision with offshore wind turbines if they pass through the study area. In addition, there is a potential for the onshore component of the study area to support suitable habitat for these species. | Likely (to be determined following a more detailed assessment) |

5.2.5. Wetlands of international importance (Ramsar sites)

An action is likely to have a significant impact on the ecological character of a declared Ramsar wetland if there is a real chance or possibility that it will result in:

- areas of the wetland being destroyed or substantially modified
- a substantial and measurable change in the hydrological regime of the wetland, for example, a substantial change to the volume, timing, duration and frequency of ground and surface water flows to and within the wetland
- the habitat or lifecycle of native species, including invertebrate fauna and fish species dependant upon the wetland being seriously affected
- a substantial and measurable change in the water quality of the wetland – for example, a substantial change in the level of salinity, pollutants, or nutrients in the wetland, or water temperature which may adversely impact on biodiversity, ecological integrity, social amenity or human health, or
- an invasive species that is harmful to the ecological character of the wetland being established (or an existing invasive species being spread) in the wetland.

Depending on the terrestrial impacts associated with the project, namely the construction of the onshore cable route, it is possible that the project may significantly impact these Ramsar sites through:

- Impacts to the lifecycles and potentially the survival of native species inhabiting the wetland (including migratory species). Impacts to the ecological integrity of the wetland through habitat loss or destruction.
- Indirect impacts through the introduction of pollutants, nutrients, disease and invasive species.

5.2.6. Commonwealth marine waters

An action is likely to have a significant impact on the environment in a Commonwealth marine area if there is a real chance or possibility that the action will:

- result in a known or potential pest species becoming established in the Commonwealth marine area
- modify, destroy, fragment, isolate or disturb an important or substantial area of habitat such that an adverse impact on marine ecosystem functioning or integrity in a Commonwealth marine area results
- have a substantial adverse effect on a population of a marine species or cetacean including its life cycle (for example, breeding, feeding, migration behaviour, life expectancy) and spatial distribution
- result in a substantial change in air quality or water quality (including temperature) which may adversely impact on biodiversity, ecological integrity; social amenity or human health
- result in persistent organic chemicals, heavy metals, or other potentially harmful chemicals accumulating in the marine environment such that biodiversity, ecological integrity, social amenity or human health may be adversely affected, or
- have a substantial adverse impact on heritage values of the Commonwealth marine area, including damage or destruction of an historic shipwreck.

Assessment of the impacts to Commonwealth marine waters is beyond the scope of this assessment. However, it is noteworthy that the marine environment within Bass Strait provides foraging habitat for numerous land-based marine predators including a range of seabird species and at least two fur seal species. In addition, the islands within Bass Strait provide breeding habitat for a number of these species (Schumann et al. 2014). While there are no known seabird or seal breeding colonies within the study area, several breeding species are known to breed within 50 kilometres of the study area, including Little Penguin, Short-tailed Shearwater, Black-faced Cormorant, Common Diving-Petrel, Fairy Prion, Pacific Gull, Australian Fur Seal and Long-nosed fur seal. It is highly likely that the at-sea distribution of these species will overlap with the offshore wind turbine area and that volant species may be at risk of collision with wind turbines.

Given the high mobility and dispersal capabilities of seabirds, particularly outside of the breeding period, it is also highly likely that species which overwinter within the Bass Strait marine environment may overlap with the study area.

5.3. Potential to satisfy criteria for referral under the EE Act

An assessment of the potential for the project to satisfy criteria for referral under the EE Act as outlined in the *Ministerial guidelines for assessment of environmental effects* (DSE 2006) is provided in Table 15.

The preliminary assessment of the project's potential impacts to biodiversity against the individual and combined referral criteria outlined in the *Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978* (DSE 2006) indicate that the project could satisfy up to four of the individual potential environmental effects criteria and up to five of the combination of potential environmental effects criteria.

It is therefore likely that an EES referral will be required, although it should be noted that this current assessment is preliminary and is subject to confirmation and/or change based on the results of detailed field-based assessment of the study area and further surveys efforts to inform possible impacts.

5.4. Potential mitigation measures

The primary measure to reduce impacts to biodiversity values within the study area is to avoid and minimise removal of native vegetation and terrestrial and aquatic habitat. In addition, impacts to avifauna (including migratory species), specifically related to collision risks with wind turbines should be taken into account.

Preliminary mitigation measure which should be considered include:

- Avoiding / minimising unnecessary duplication of infrastructure e.g. utilise existing easements to connect to existing transmission network, co-locate project components with other infrastructure.
- Aligning the impact footprint through existing cleared land including agricultural land and plantations.
- Strategic use of horizontal directional drilling (HDD) / boring rather than open trenching methods for underground cables, particularly in sensitive areas such as beach landings and when crossing waterways.
- Further assessment to identify which avifauna species are likely to be at risk of collisions with wind turbines, to allow further exploration of mitigation options and design reconfiguration.
- Careful timing of activities around periods or areas of ecological significance (e.g. breeding sites and breeding seasons) to further minimise and/or avoid impacts.
- The development of a project specific Construction Environmental Management Plan (CEMP) and Operational Environmental Management Plan (OEMP).
- Following this preliminary assessment (Phase 1) and further environmental assessments including potential targeted surveys, general project area and design refinement may be required to further avoid and minimise impacts.

Given the proximity of the project to the Star of the South project the potential for cumulative impacts also needs to be considered as the development approvals process proceeds.

Table 15 Assessment of referral criteria against the ministerial guidelines under the EE Act (DSE 2006)

| Referral criteria | Project specifics | Potential for significant effects |
|---|---|--|
| Individual potential environmental effects | | |
| <p>Potential clearing of 10 ha or more of native vegetation from an area that:</p> <ul style="list-style-type: none"> – is of an Ecological Vegetation Class identified as endangered by the Department of Sustainability and Environment (in accordance with Appendix 2 of Victoria’s Native Vegetation Management Framework); or – is, or is likely to be, of very high conservation significance (as defined in accordance with Appendix 3 of Victoria’s Native Vegetation Management Framework); and – is not authorised under an approved Forest Management Plan or Fire Protection Plan. | <p>Study area contains large areas of native vegetation including EVCs identified as endangered (5 EVCs), vulnerable (7 EVCs) and depleted (1 EVC). Endangered and vulnerable EVCs can all qualify as being of high conservation significance if vegetation condition is high enough.</p> | <p>Depending on the terrestrial impacts associated with the project, and the siting of the onshore cable route and overhead transmission line, it is possible that more than 10 ha of such native vegetation may be cleared.</p> |
| <p>Potential long-term loss of a significant proportion (e.g. 1 to 5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria.</p> | <p>Study area contains known populations of and / or remaining habitat for threatened flora and fauna species.</p> | <p>It is possible that impacts from the project may lead to the long-term loss of a significant proportion of known remaining habitat and / or population of threatened species within Victoria. Potential species with a likelihood of occurrence are noted at Sections 4.6 and 4.7.</p> |
| <p>Potential long-term change to the ecological character of a wetland listed under the Ramsar Convention or in ‘A Directory of Important Wetlands in Australia’.</p> | <p>Study area contains the Gippsland Lakes Ramsar wetland and is within 10 kilometres of the Corner Inlet Ramsar site.</p> | <p>Depending on the terrestrial impacts associated with the project, and the siting of the onshore cable route, it is possible that the project may lead to a long-term change in the ecological character of one or both of these wetlands. In addition, migratory shorebirds which utilise these wetlands in larger numbers may be at risk from offshore operations.</p> |
| <p>Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term.</p> | <p>Study area contains aquatic, estuarine and marine ecosystems.</p> | <p>It is possible that impacts from the project may lead to the extensive or major effects on the health or biodiversity of aquatic, marine and / or marine ecosystems over the long-term.</p> |

| Referral criteria | Project specifics | Potential for significant effects |
|--|---|--|
| Combination of potential environmental effects | | |
| <p>Potential clearing of 10 ha or more of native vegetation, unless authorised under an approved Forest Management Plan or Fire Protection Plan.</p> | <p>Study area contains large areas of native vegetation.</p> | <p>Depending on the terrestrial impacts associated with the project, and the siting of the onshore cable route, it is possible that more than 10 ha of native vegetation may be cleared.</p> |
| <p>Matters listed under the <i>Flora and Fauna Guarantee Act 1988</i>:</p> <ul style="list-style-type: none"> - potential loss of a significant area of a listed ecological community; or - potential loss of a genetically important population of an endangered or threatened species (listed or nominated for listing), including as a result of loss or fragmentation of habitats; or - potential loss of critical habitat; or - potential significant effects on habitat values of a wetland supporting migratory bird species. | <p>Study area contains FFG Act listed ecological communities, populations and / or habitat for threatened species and wetlands that support migratory bird species.</p> | <p>It is possible that impacts from the project may significantly impact matters listed under the FFG Act.</p> |
| <p>Potential extensive or major effects on landscape values of regional importance, especially where recognised by a planning scheme overlay or within or adjoining land reserved under the <i>National Parks Act 1975</i>.</p> | <p>Study area contains areas of land within or adjoining land reserved under the National Parks Act and two wetlands of regional significance, namely Lake Denison and Jack Smith Lake.</p> | <p>It is possible that impacts from the project may result in extensive or major effects on landscape values of regional importance.</p> |
| <p>Potential extensive or major effects on beneficial uses of waterbodies over the long term due to changes in water quality, stream flows or regional groundwater levels.</p> | <p>Study area contains numerous waterbodies including lakes, rivers and creeks.</p> | <p>It is possible that impacts from the project may result in extensive or major effects on beneficial uses of waterbodies over the long-term due to changes in water quality, streamflows or regional groundwater levels.</p> |

6. Key ecological values and recommendations

This section summarises key ecological values, potential implications of the project under the EPBC Act and EE Act and provides recommendations on proceeding with the development application process while avoiding and / or minimising impacts to biodiversity.

Ecological values

Key ecological values identified within the study area are as follows:

- Extensive areas of native vegetation contained primarily within public land including:
 - Gippsland Lakes Coastal Park,
 - Holey Plains State Park,
 - Ninety Mile Beach Marine National Park.
 - Giffard (Rifle Range) Flora Reserve,
 - Stradbroke Flora and Fauna Reserve.
- Nineteen (19) Ecological Vegetation Classes (EVCs) within the Gippsland Plain bioregion including:
 - Seven (7) EVCs with a Bioregional Conservation Status (BCS) of Endangered,
 - Eight (8) EVCs with a BCS of Vulnerable,
 - One EVC with a BCS of Depleted.
- Over 300 wetlands are modelled within the search area including:
 - Two internationally important (Ramsar) wetlands - The Gippsland Lakes and Corner Inlet,
 - Two waterbodies of regional significance - Jack Smith Lake & Lake Denison.
- Numerous waterways and tributaries including:
 - Merriman Creek & associated tributaries
- Populations and / or suitable habitat for 91 threatened flora species of which 62 have been identified as likely to occur within the study area and will likely warrant further consideration. This includes:
 - Four (4) flora species listed under the EPBC Act only
 - Eleven (11) flora species listed under the EPBC Act and FFG Act
 - Forty-seven (47) flora species listed under the FFG Act only
- Populations and / or suitable habitat for 129 threatened fauna species of which 98 have been identified as likely to occur within the study area and will likely warrant further consideration. This includes:
 - Thirteen (13) fauna species listed under the EPBC Act only
 - Thirty-seven (37) fauna species listed under the EPBC Act and FFG Act
 - Forty-eight (48) fauna species listed under the FFG Act only

- Suitable habitat for 77 migratory species listed under the EPBC Act including:
 - Eight (8) terrestrial birds
 - Thirty-four (34) shorebirds, wetland birds and terns
 - Thirty-five (35) marine species (including 19 seabirds)
- Four (4) nationally (EPBC Act) listed and seven (7) state (FFG Act) listed threatened ecological communities.

Government legislation and policy

An assessment of the project in relation to key biodiversity legislation and policy is provided and summarised below.

Potential impacts to MNES under the EPBC Act

Our preliminary assessment of the project's potential impacts to biodiversity against the Matters of National Environmental Significance (MNES), *Significant Impact Criteria Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth of Australia 2013) indicate that the project could significantly impact the following MNES:

- Listed threatened species and ecological communities
- Listed migratory species
- Wetlands of international importance (Ramsar sites)
- Commonwealth marine areas.

Further details are provided in Section 5.1.

Potential environmental effects under the EE Act

Our preliminary assessment of the project's potential impacts to biodiversity against the individual and combined referral criteria outlined in the *Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978* (DSE 2006) indicate that the project could meet up to four of the individual potential environmental effects criteria and up to five of the combination of potential environmental effects criteria.

Further details are provided in Section 5.2.

Recommendations

The primary measure to reduce impacts to biodiversity values within the study area is to avoid and minimise removal of native vegetation and terrestrial and aquatic habitat. It is critical that this be considered during the design phase of the project, when key decisions are made about the location of project components such as built infrastructure / site compounds / access roads / temporary material storage etc.

This could be achieved by:

- Avoiding / minimising unnecessary duplication of infrastructure e.g. utilise existing easements to connect to existing transmission network, co-locate project components with other infrastructure.

- Aligning the impact footprint through existing cleared land including agricultural land and plantations.
- Strategic use of horizontal directional drilling (HDD) / boring rather than open trenching methods for underground cables, particularly in sensitive areas such as beach landings and when crossing waterways.
- Further assessment to identify which avifauna species are likely to be at risk of collisions with wind turbines, to allow further exploration of mitigation options and design reconfiguration.
- Careful timing of activities around periods or areas of ecological significance (e.g. breeding sites and breeding seasons) to further minimise and/or avoid impacts.
- The development of a project specific Construction Environmental Management Plan (CEMP) and Operational Environmental Management Plan (OEMP).
- General project area and design refinement may be required to further avoid and minimise impacts following this preliminary assessment (Phase 1) and further environmental assessments including potential targeted surveys to identify potential impacts.

The results of this assessment should be:

- Used to inform the referrals process under both the EPBC Act and EE Act to develop an appropriate scope for the environmental impact assessment of the project.
- Integrated into project design to avoid and minimise impacts to biodiversity.
- Used to inform development of a project specific CEMP and OEMP.
- Used to inform development of an offset strategy for potential impacts to biodiversity.

The following recommendations are made with a view to progressing ecological assessment and project design:

- Undertake an ecological site inspection to delineate (and or confirm based on previous surveys) areas of the site in which listed ecological communities and habitat for listed flora and terrestrial fauna exist and to map portions of the site containing ecological values.
- On the basis of information obtained during the site visit, provide recommendations, if applicable, for any residual targeted investigations that may be necessary.
- Develop a study program for detailed ecological assessments to delineate the potential impacts of the offshore infrastructure (turbines, substations and undersea cables) on key species and communities.

It is important to note that for all species and ecological communities, this current assessment is preliminary and is subject to confirmation and/or change based on the results of detailed field based assessment of the study area.

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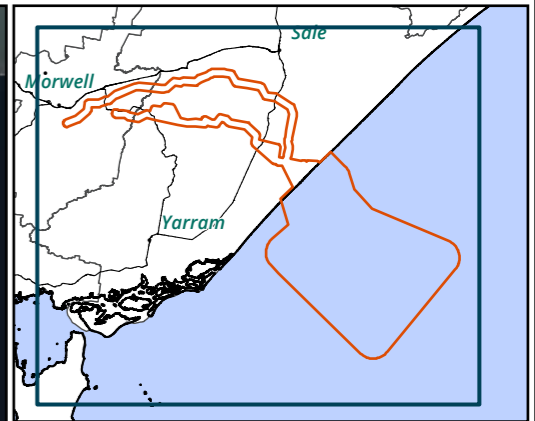
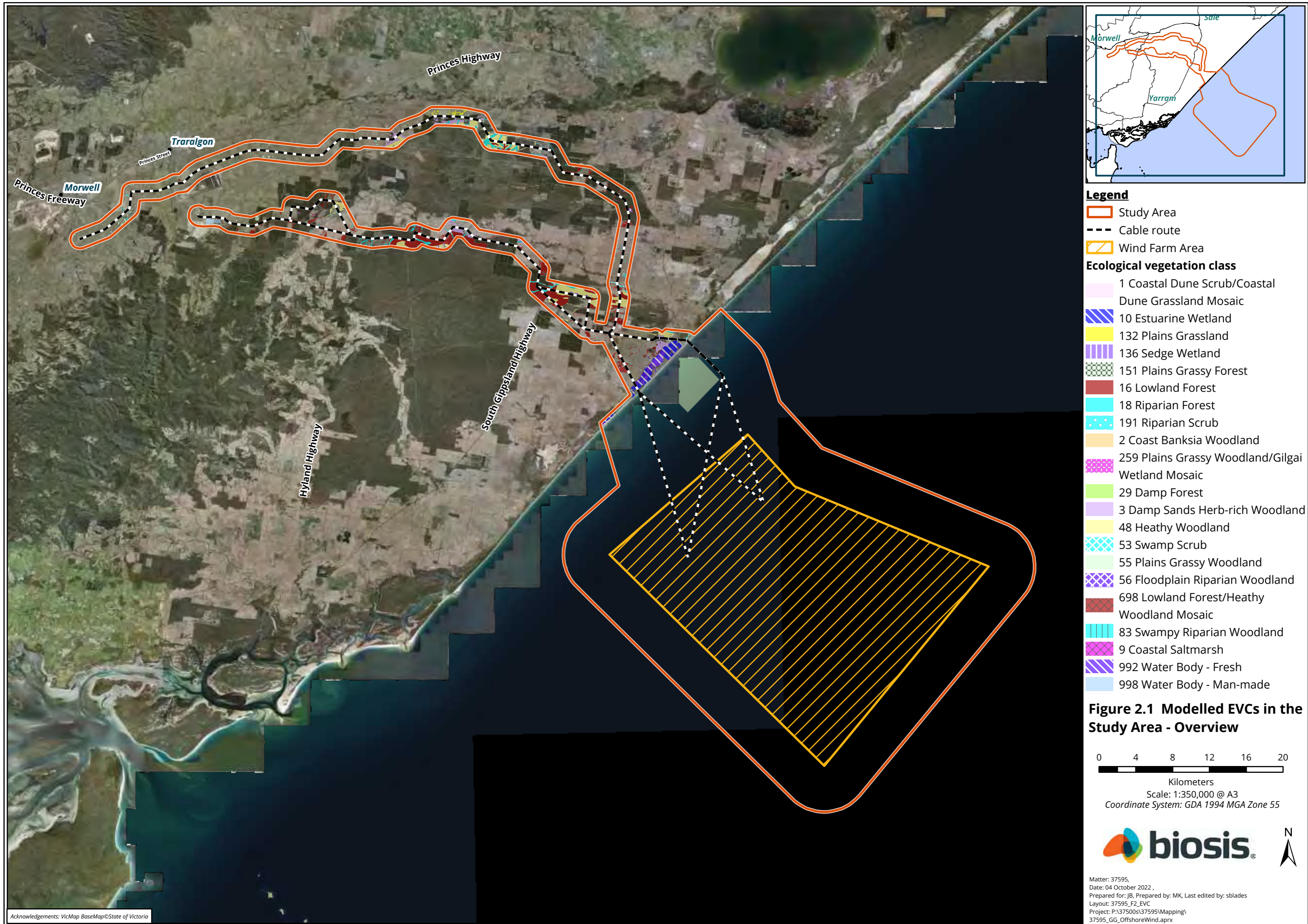
Vicflora 2020. *Gippsland Plain*, Royal Botanic Gardens Victoria, accessed 28 June 2022, <https://vicflora.rbg.vic.gov.au/flora/bioregions/gippsland-plain>.

VRO 2019a. Jake Smith Lake. Victorian Government Agriculture Victoria, Melbourne, accessed 28 June 2022. http://vro.agriculture.vic.gov.au/dpi/vro/wgregn.nsf/pages/wg_lf_sig_sale6b.

VRO 2019b. Lake Dennison. Victorian Government Agriculture Victoria, Melbourne, accessed 28 June 2022. http://vro.agriculture.vic.gov.au/dpi/vro/wgregn.nsf/pages/wg_landform_map.

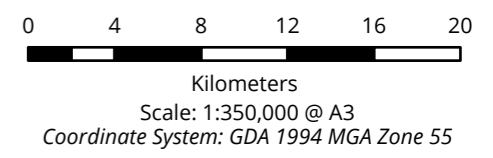
VRO 2020. West Gippsland - Landform. Victorian Government Agriculture Victoria, Melbourne, accessed 28 June 2022. http://vro.agriculture.vic.gov.au/dpi/vro/wgregn.nsf/pages/wg_landform_map.

VRO n.d. The Ninety Mile Beach. Victorian Government Agriculture Victoria, Melbourne, accessed 28 June 2022. [http://vro.agriculture.vic.gov.au/dpi/vro/egreg.nsf/pages/eg_geomorphology_gipps_lakes_pdf/\\$FILE/geomorphology%20gipps%20lakes%20ninety%20mile%20beach.pdf](http://vro.agriculture.vic.gov.au/dpi/vro/egreg.nsf/pages/eg_geomorphology_gipps_lakes_pdf/$FILE/geomorphology%20gipps%20lakes%20ninety%20mile%20beach.pdf)



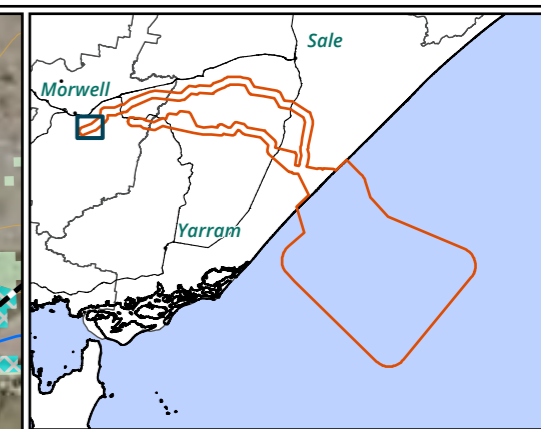
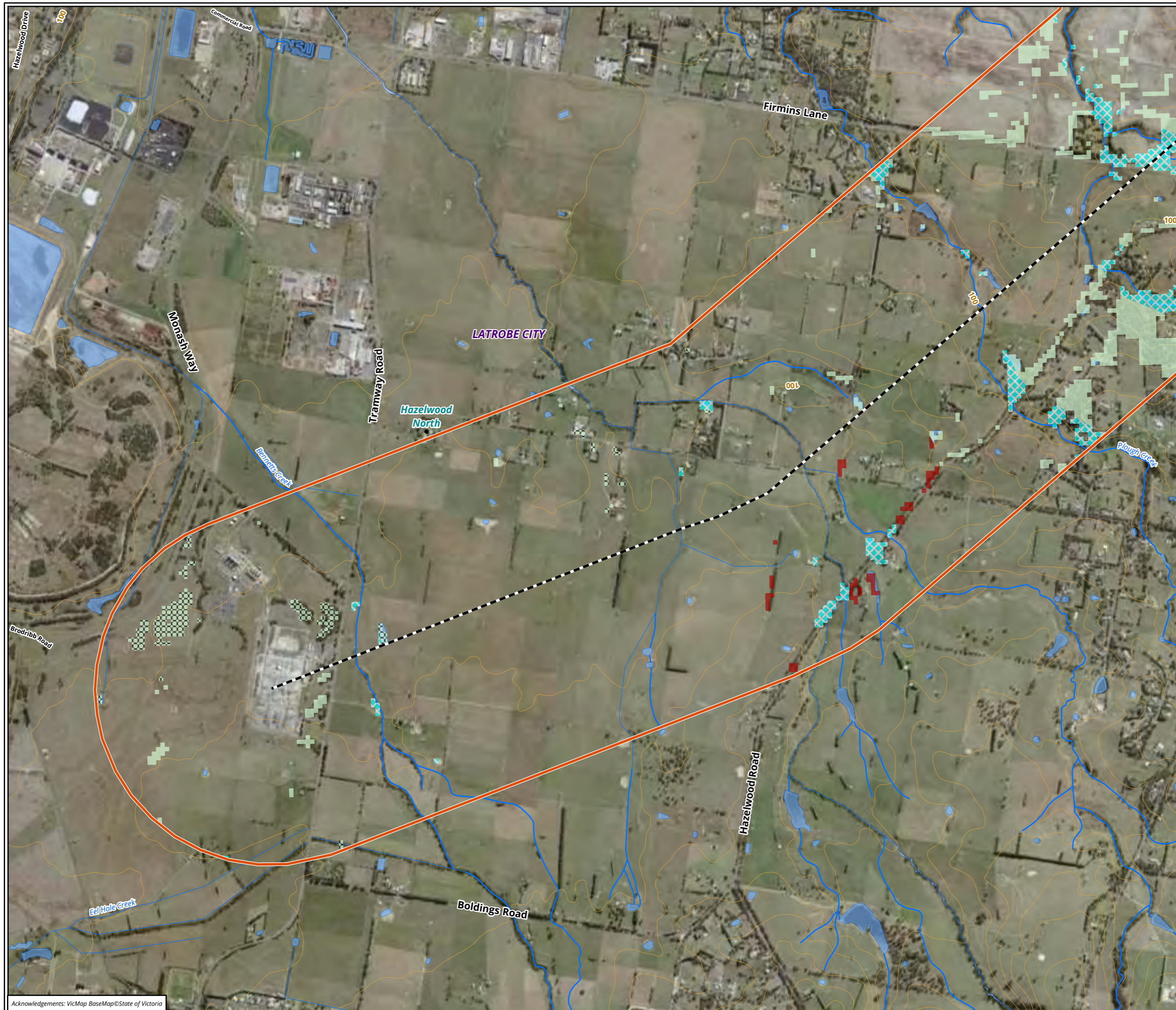
- Legend**
- Study Area
 - Cable route
 - Wind Farm Area
- Ecological vegetation class**
- 1 Coastal Dune Scrub/Coastal Dune Grassland Mosaic
 - 10 Estuarine Wetland
 - 132 Plains Grassland
 - 136 Sedge Wetland
 - 151 Plains Grassy Forest
 - 16 Lowland Forest
 - 18 Riparian Forest
 - 191 Riparian Scrub
 - 2 Coast Banksia Woodland
 - 259 Plains Grassy Woodland/Gilgai Wetland Mosaic
 - 29 Damp Forest
 - 3 Damp Sands Herb-rich Woodland
 - 48 Heathy Woodland
 - 53 Swamp Scrub
 - 55 Plains Grassy Woodland
 - 56 Floodplain Riparian Woodland
 - 698 Lowland Forest/Heathy Woodland Mosaic
 - 83 Swampy Riparian Woodland
 - 9 Coastal Saltmarsh
 - 992 Water Body - Fresh
 - 998 Water Body - Man-made

Figure 2.1 Modelled EVCs in the Study Area - Overview



Matter: 37595,
 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx

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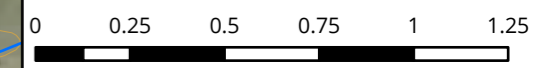
Legend

- Study Area
- Cable route

Ecological vegetation class

- 151 Plains Grassy Forest
- 16 Lowland Forest
- 53 Swamp Scrub
- 55 Plains Grassy Woodland

Figure 2.2 Modelled EVCs in the Study Area

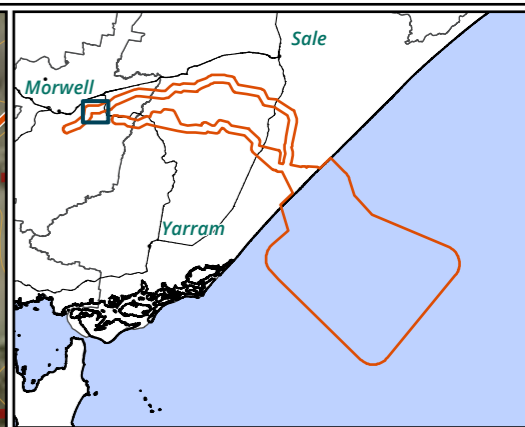


Kilometers
 Scale: 1:20,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



Matter: 37595,
 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx

Acknowledgements: VicMap BaseMap © State of Victoria



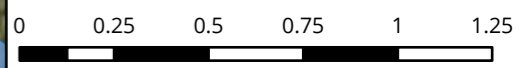
Legend

- Study Area
- Cable route

Ecological vegetation class

- 16 Lowland Forest
- 53 Swamp Scrub
- 55 Plains Grassy Woodland
- 83 Swampy Riparian Woodland

Figure 2.3 Modelled EVCs in the Study Area

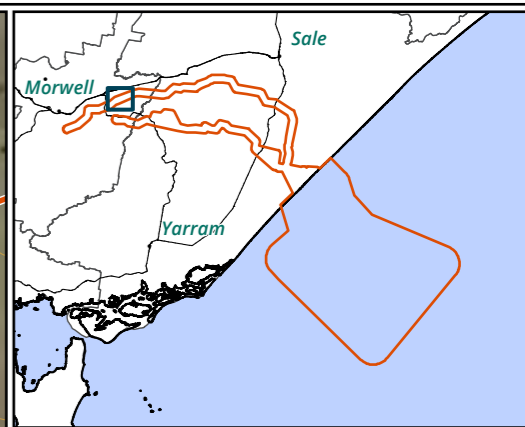


Kilometers
 Scale: 1:20,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



Matter: 37595,
 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx

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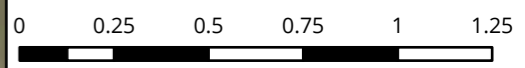
Legend

- Study Area
- Cable route

Ecological vegetation class

- 16 Lowland Forest
- 53 Swamp Scrub
- 55 Plains Grassy Woodland

Figure 2.4 Modelled EVCs in the Study Area

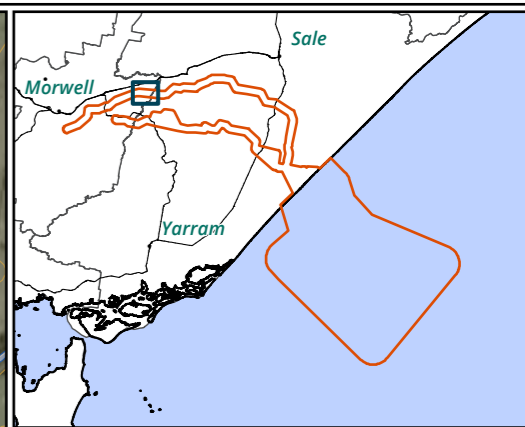


Kilometers
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 Coordinate System: GDA 1994 MGA Zone 55



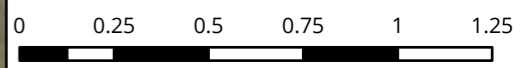
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 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx

Acknowledgements: VicMap BaseMap © State of Victoria



- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 259 Plains Grassy Woodland/Gilgai Wetland Mosaic
 - 53 Swamp Scrub
 - 55 Plains Grassy Woodland
 - 83 Swampy Riparian Woodland

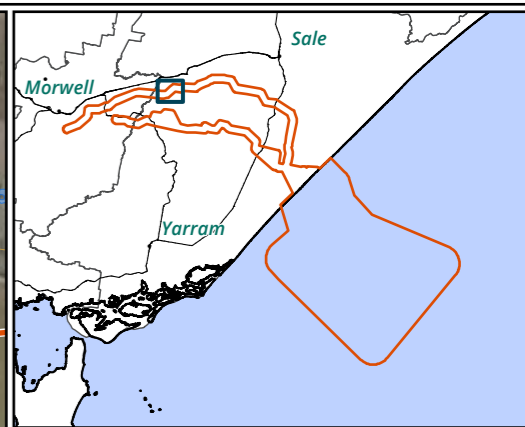
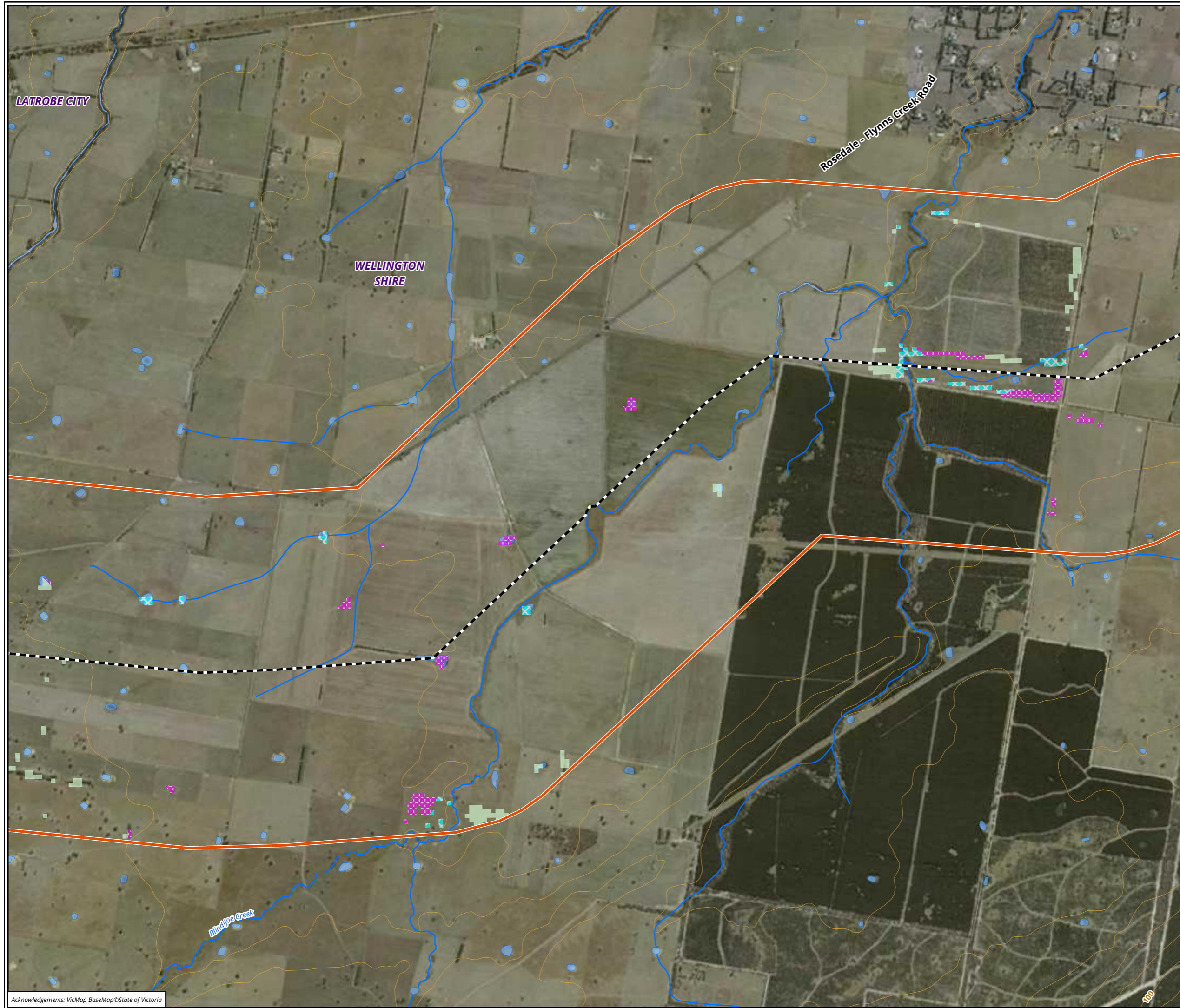
Figure 2.5 Modelled EVCs in the Study Area



Kilometers
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 Coordinate System: GDA 1994 MGA Zone 55

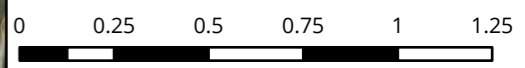


Matter: 37595,
 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx



- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 132 Plains Grassland
 - 259 Plains Grassy Woodland/Gilgai Wetland Mosaic
 - 53 Swamp Scrub
 - 55 Plains Grassy Woodland

Figure 2.6 Modelled EVCs in the Study Area

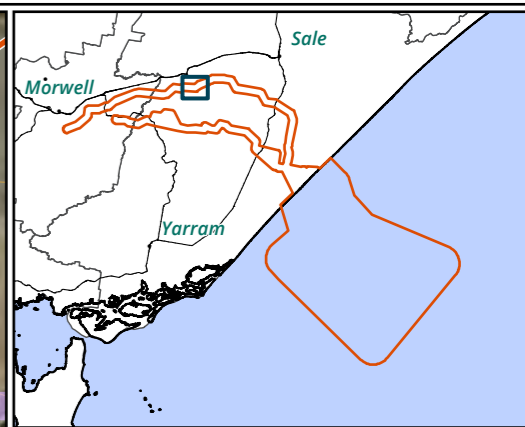
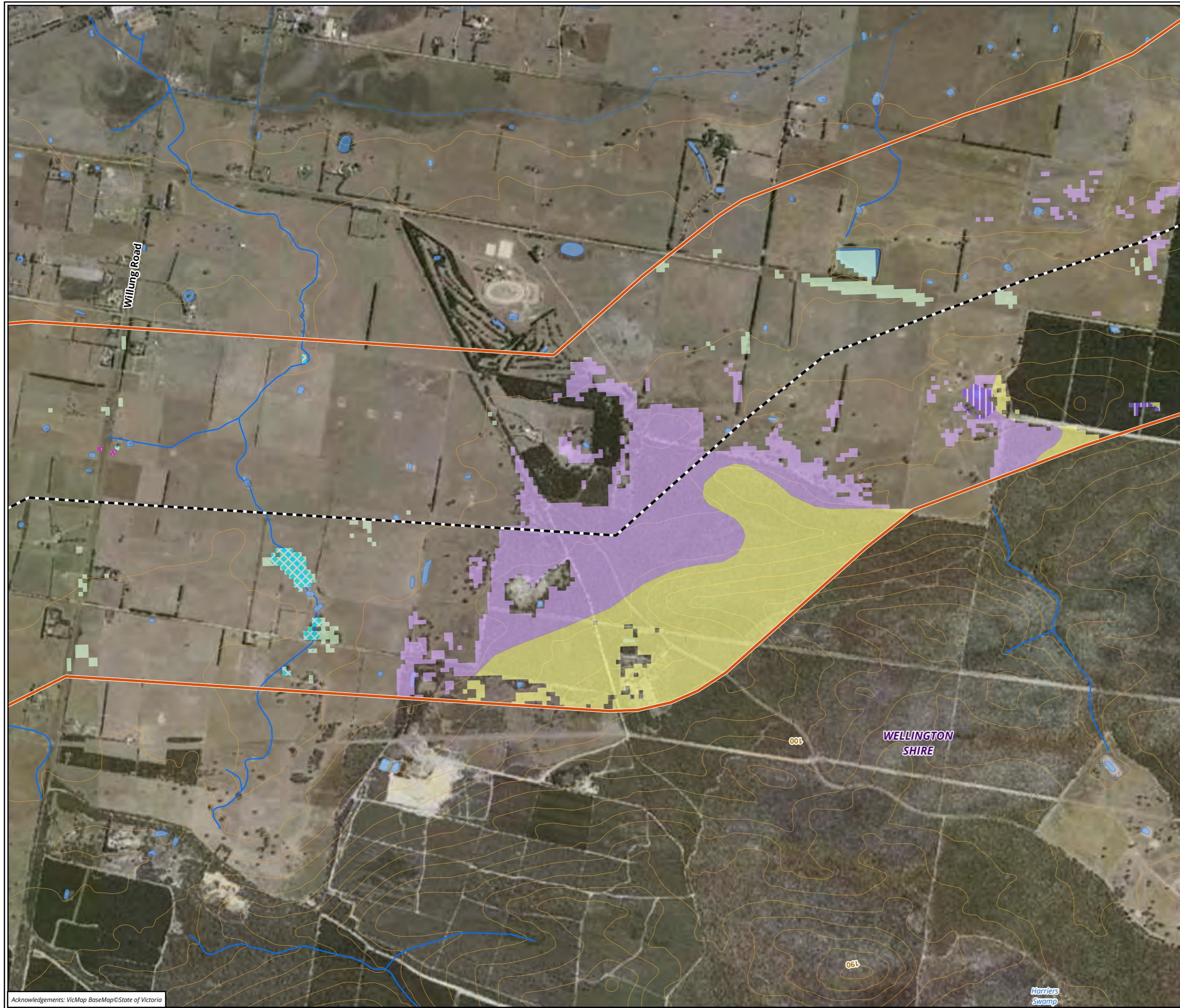


Kilometers
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 Coordinate System: GDA 1994 MGA Zone 55



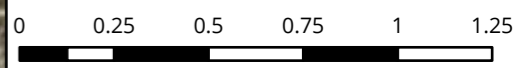
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 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx

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- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 136 Sedge Wetland
 - 259 Plains Grassy Woodland/Gilgai Wetland Mosaic
 - 3 Damp Sands Herb-rich Woodland
 - 48 Heathy Woodland
 - 53 Swamp Scrub
 - 55 Plains Grassy Woodland

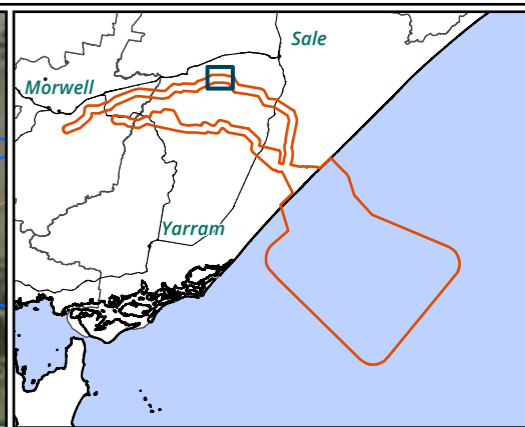
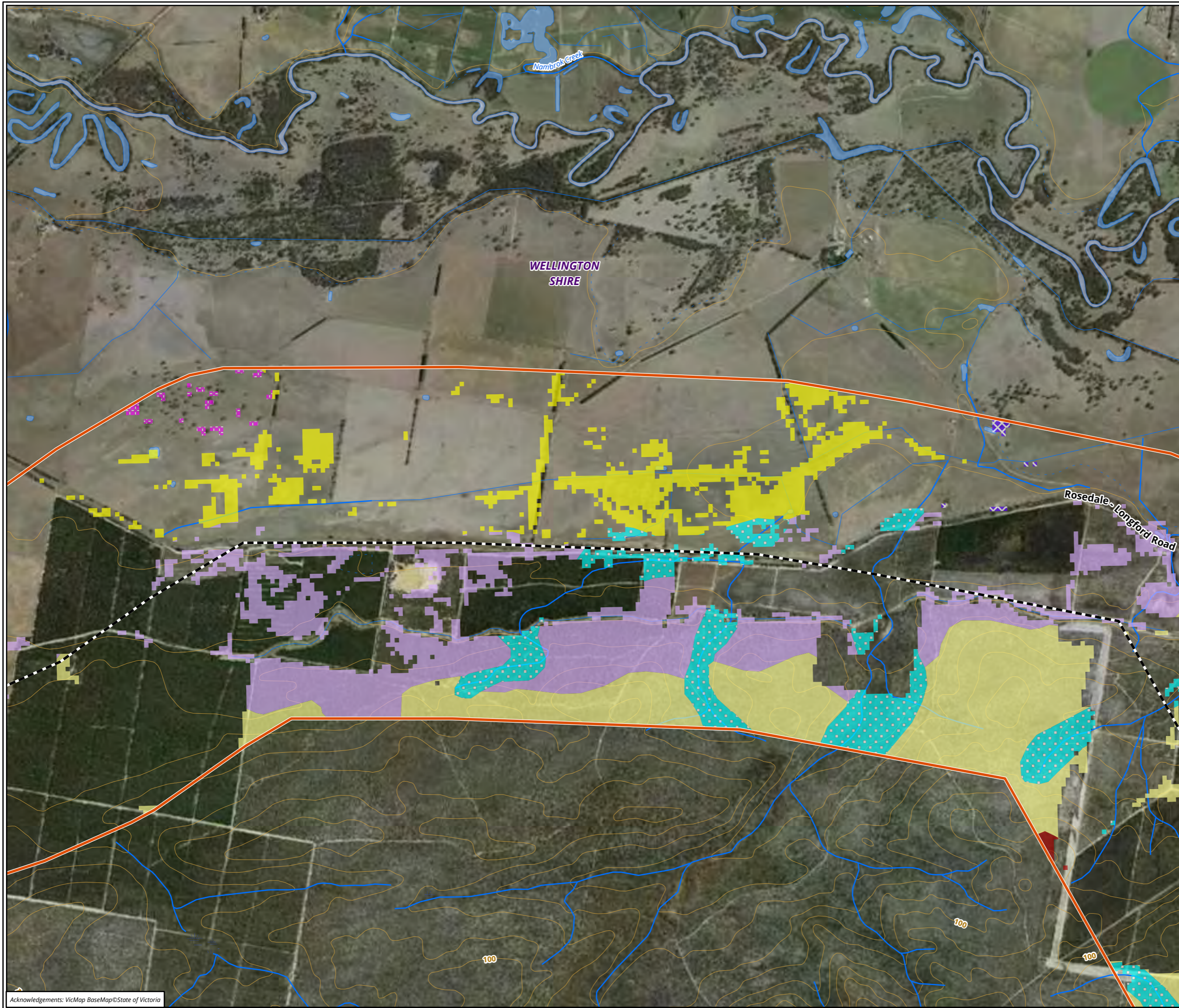
Figure 2.7 Modelled EVCs in the Study Area



Kilometers
 Scale: 1:20,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55

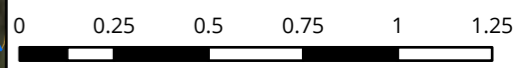


Matter: 37595,
 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx



- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 132 Plains Grassland
 - 16 Lowland Forest
 - 191 Riparian Scrub
 - 259 Plains Grassy Woodland/Gilgai Wetland Mosaic
 - 3 Damp Sands Herb-rich Woodland
 - 48 Heathy Woodland
 - 56 Floodplain Riparian Woodland

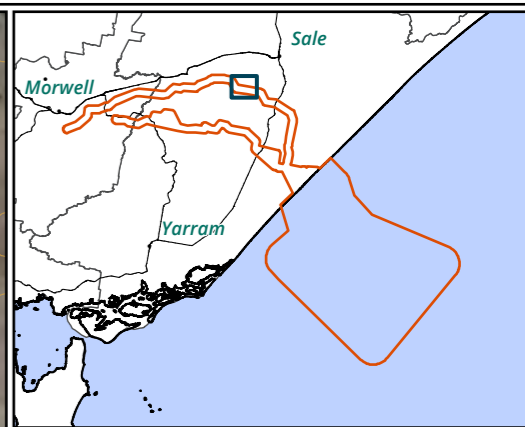
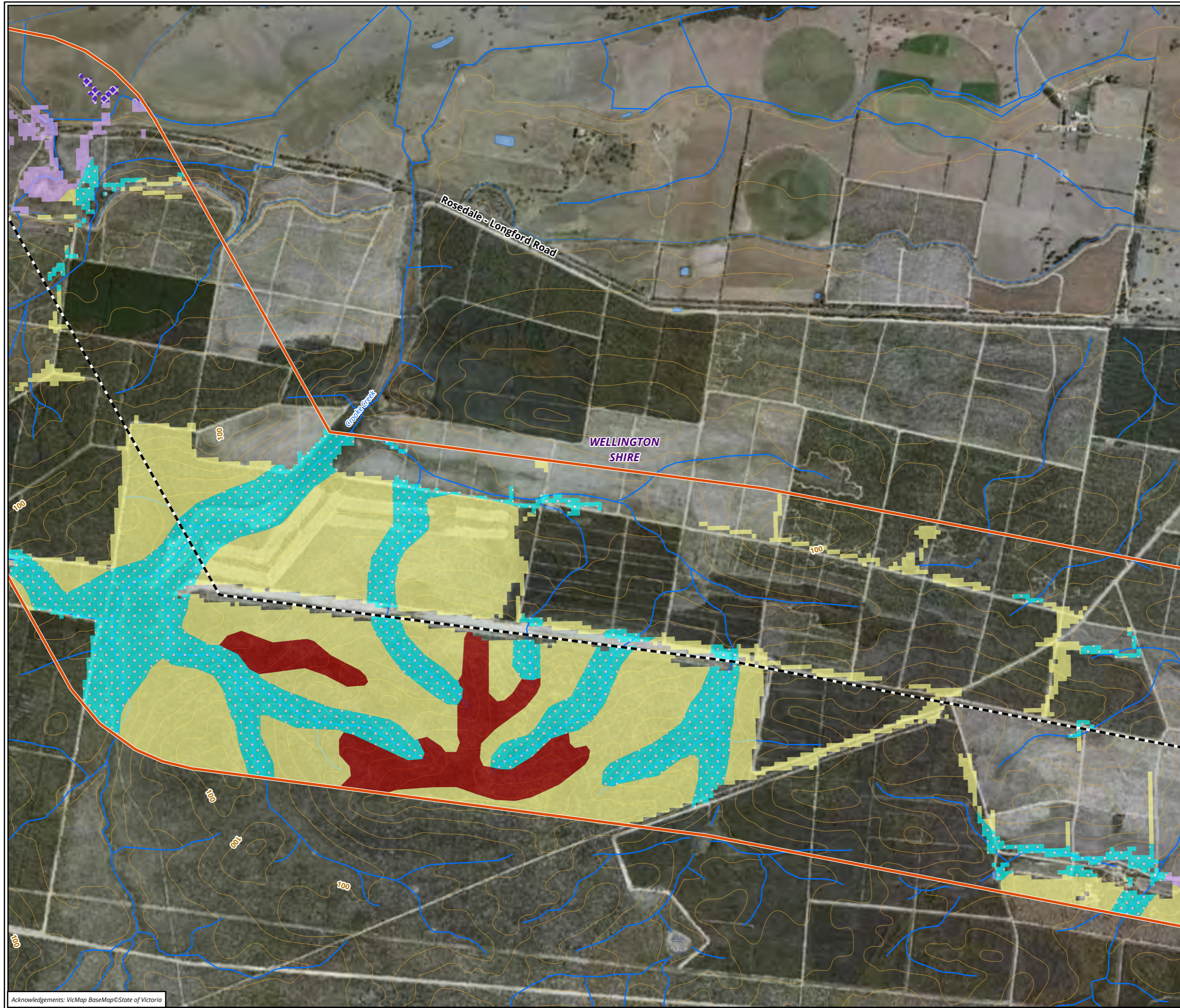
Figure 2.8 Modelled EVCs in the Study Area



Kilometers
 Scale: 1:20,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55

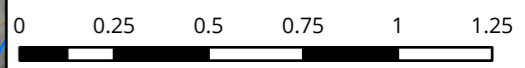


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 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx



- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 16 Lowland Forest
 - 191 Riparian Scrub
 - 3 Damp Sands Herb-rich Woodland
 - 48 Heathy Woodland
 - 56 Floodplain Riparian Woodland

Figure 2.9 Modelled EVCs in the Study Area

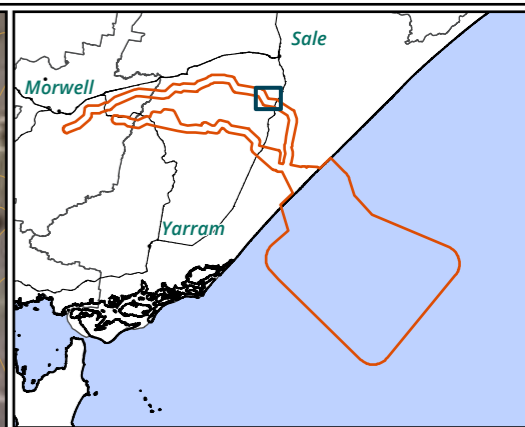
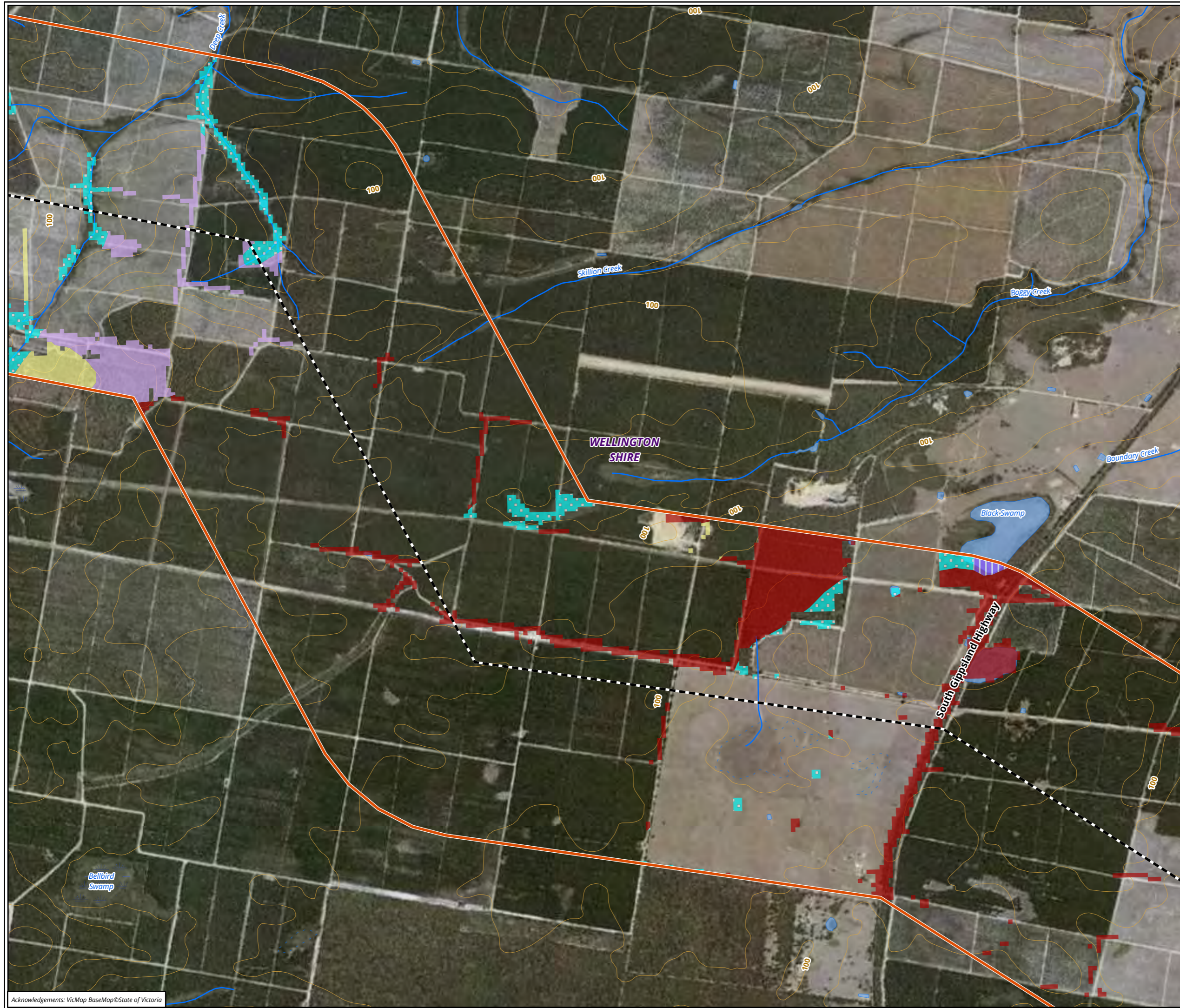


Kilometers
 Scale: 1:20,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



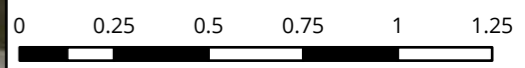
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 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\
 37595_GG_OffshoreWind.aprx

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- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 136 Sedge Wetland
 - 16 Lowland Forest
 - 191 Riparian Scrub
 - 3 Damp Sands Herb-rich Woodland
 - 48 Heathy Woodland

Figure 2.10 Modelled EVCs in the Study Area

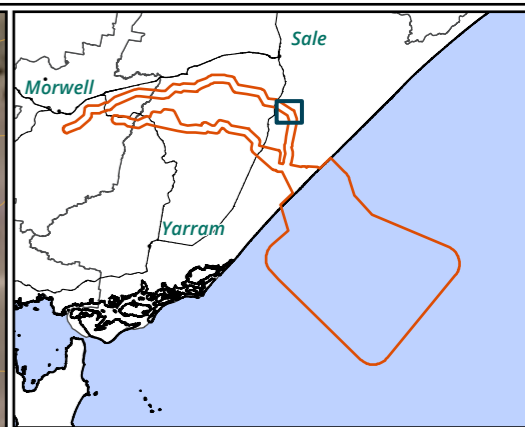
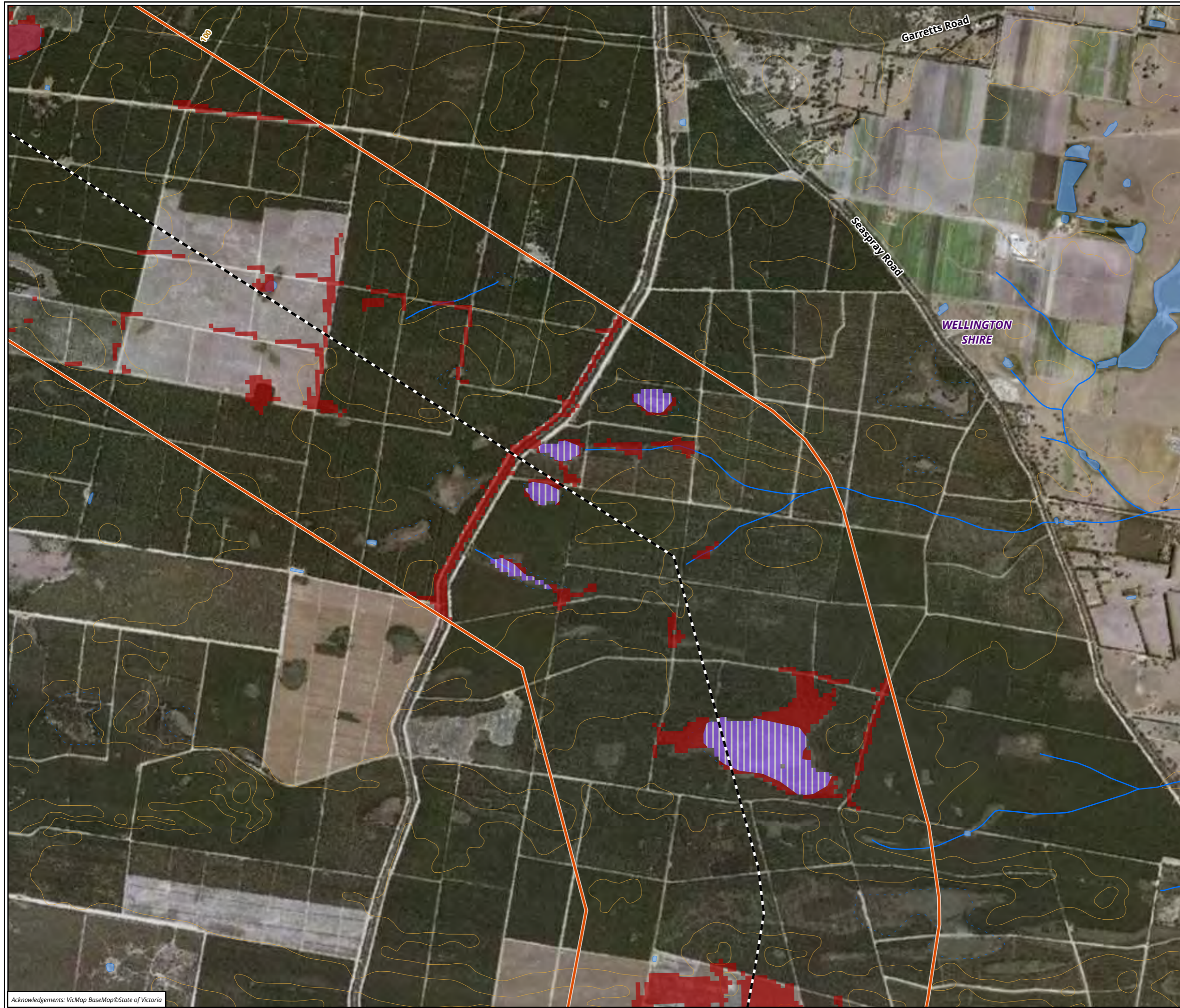


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 Coordinate System: GDA 1994 MGA Zone 55



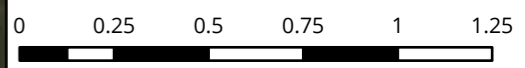
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 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\
 37595_GG_OffshoreWind.aprx

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- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 136 Sedge Wetland
 - 16 Lowland Forest

Figure 2.11 Modelled EVCs in the Study Area

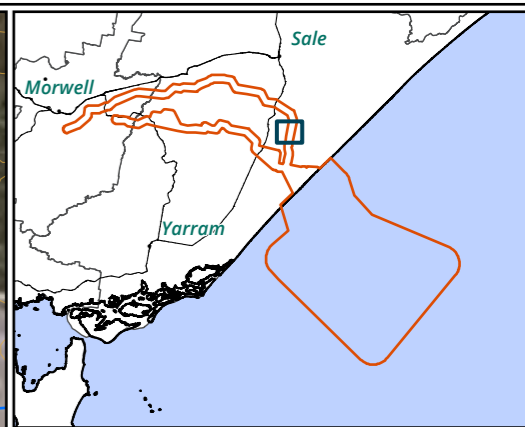
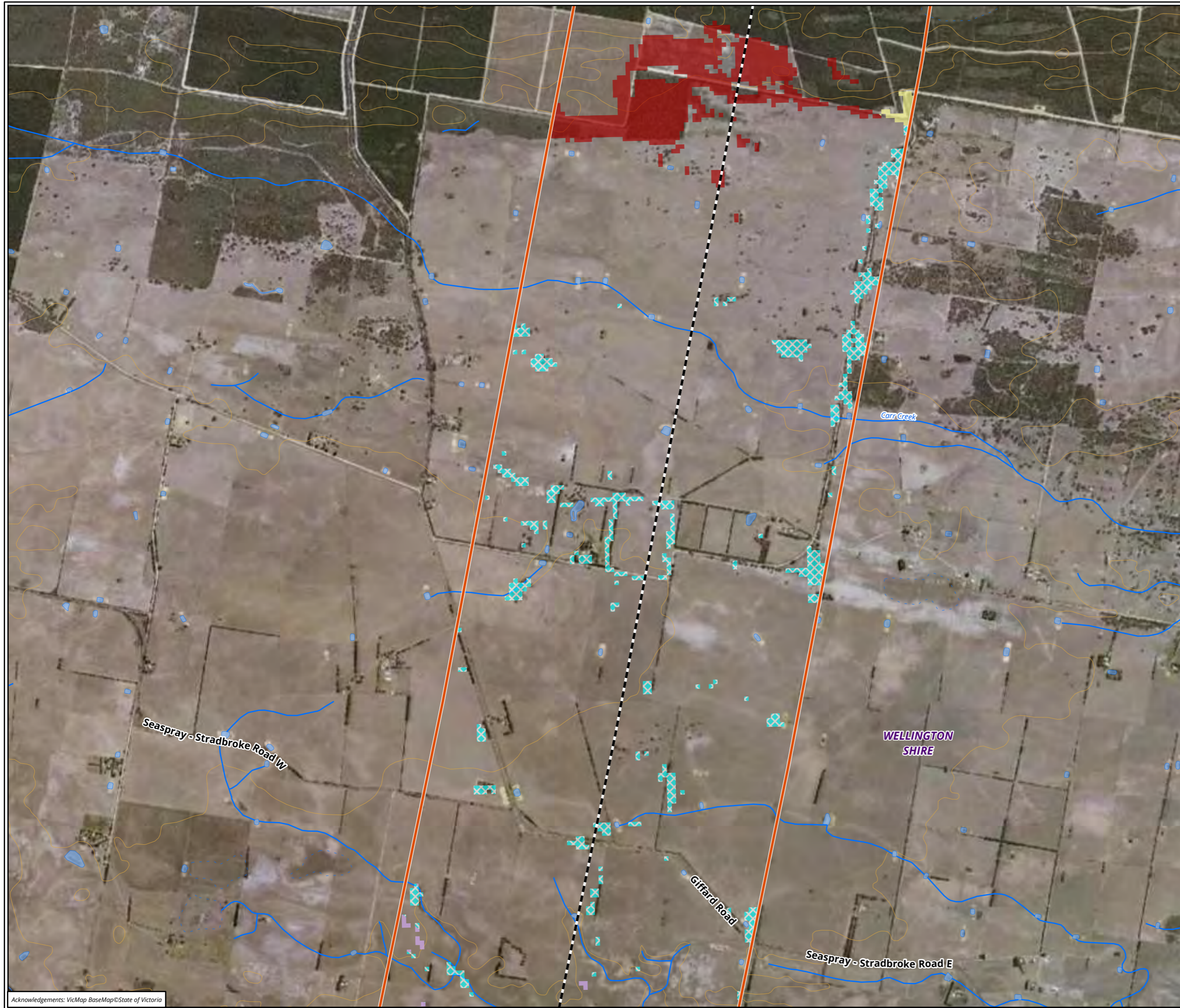


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 Coordinate System: GDA 1994 MGA Zone 55



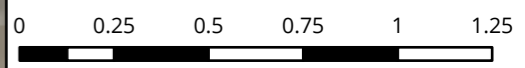
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 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\
 37595_GG_OffshoreWind.aprx

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- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 16 Lowland Forest
 - 3 Damp Sands Herb-rich Woodland
 - 48 Heathy Woodland
 - 53 Swamp Scrub

Figure 2.12 Modelled EVCs in the Study Area

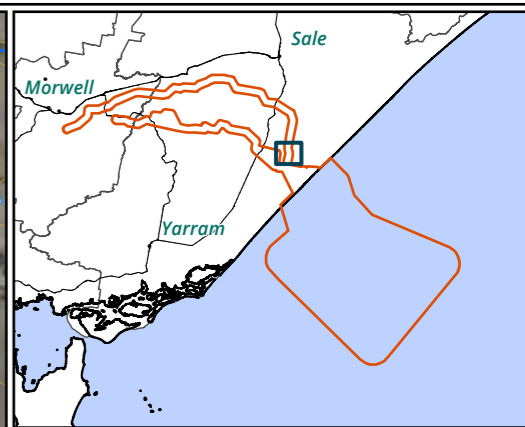
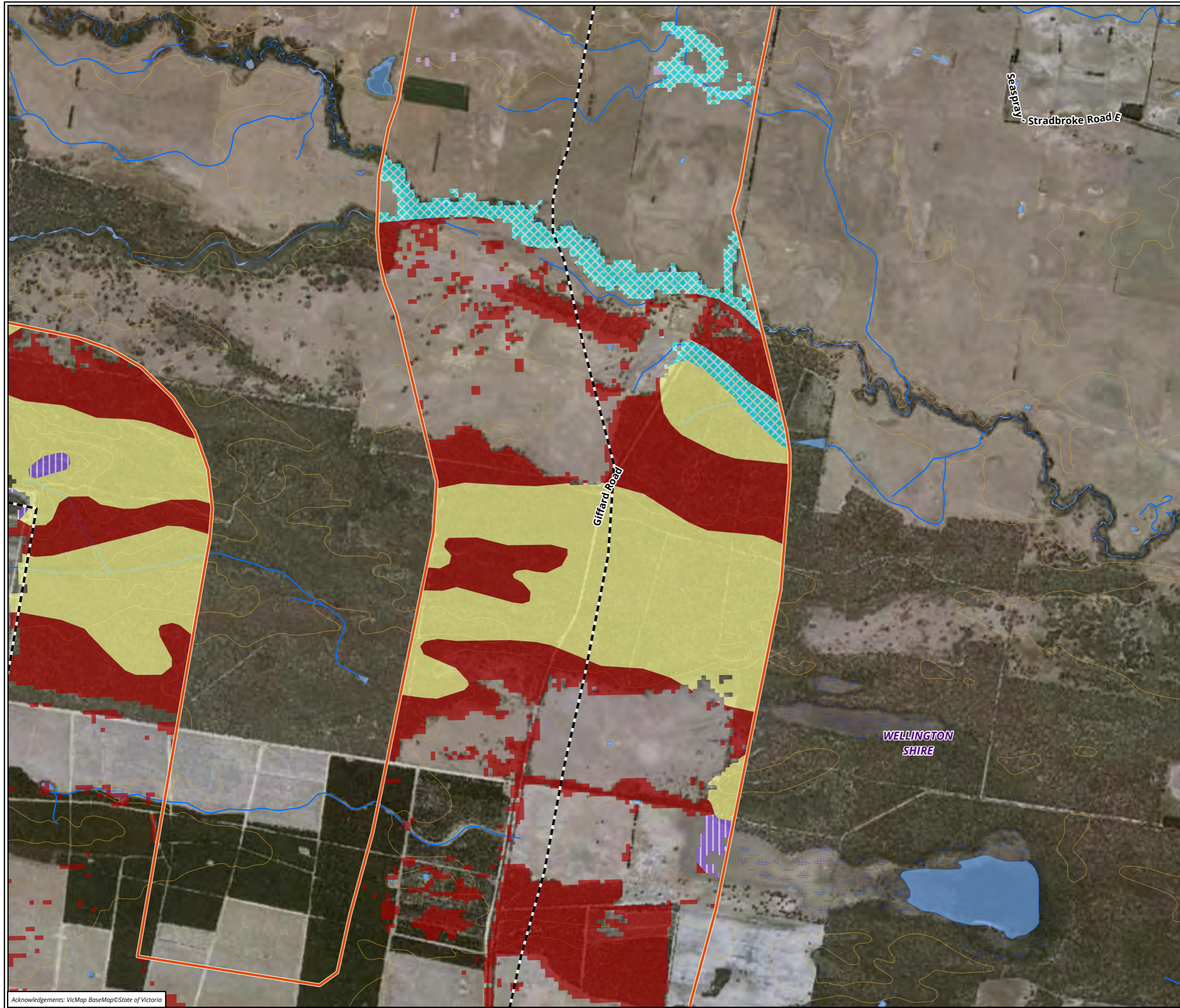


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 Coordinate System: GDA 1994 MGA Zone 55



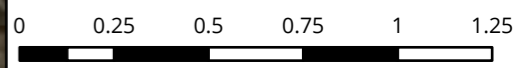
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 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx

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- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 136 Sedge Wetland
 - 16 Lowland Forest
 - 3 Damp Sands Herb-rich Woodland
 - 48 Heathy Woodland
 - 53 Swamp Scrub

Figure 2.13 Modelled EVCs in the Study Area

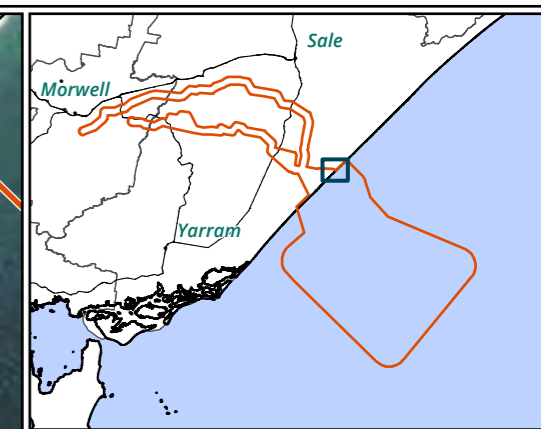


Kilometers
 Scale: 1:20,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



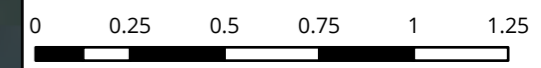
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 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\
 37595_GG_OffshoreWind.aprx

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- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 1 Coastal Dune Scrub/Coastal Dune Grassland Mosaic
 - 10 Estuarine Wetland
 - 191 Riparian Scrub
 - 2 Coast Banksia Woodland
 - 3 Damp Sands Herb-rich Woodland
 - 48 Heathy Woodland
 - 53 Swamp Scrub
 - 992 Water Body - Fresh

Figure 2.14 Modelled EVCs in the Study Area

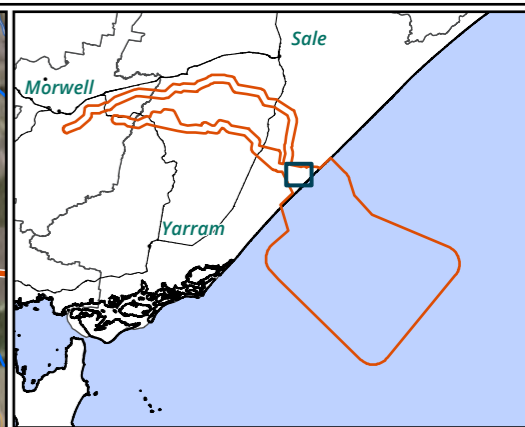
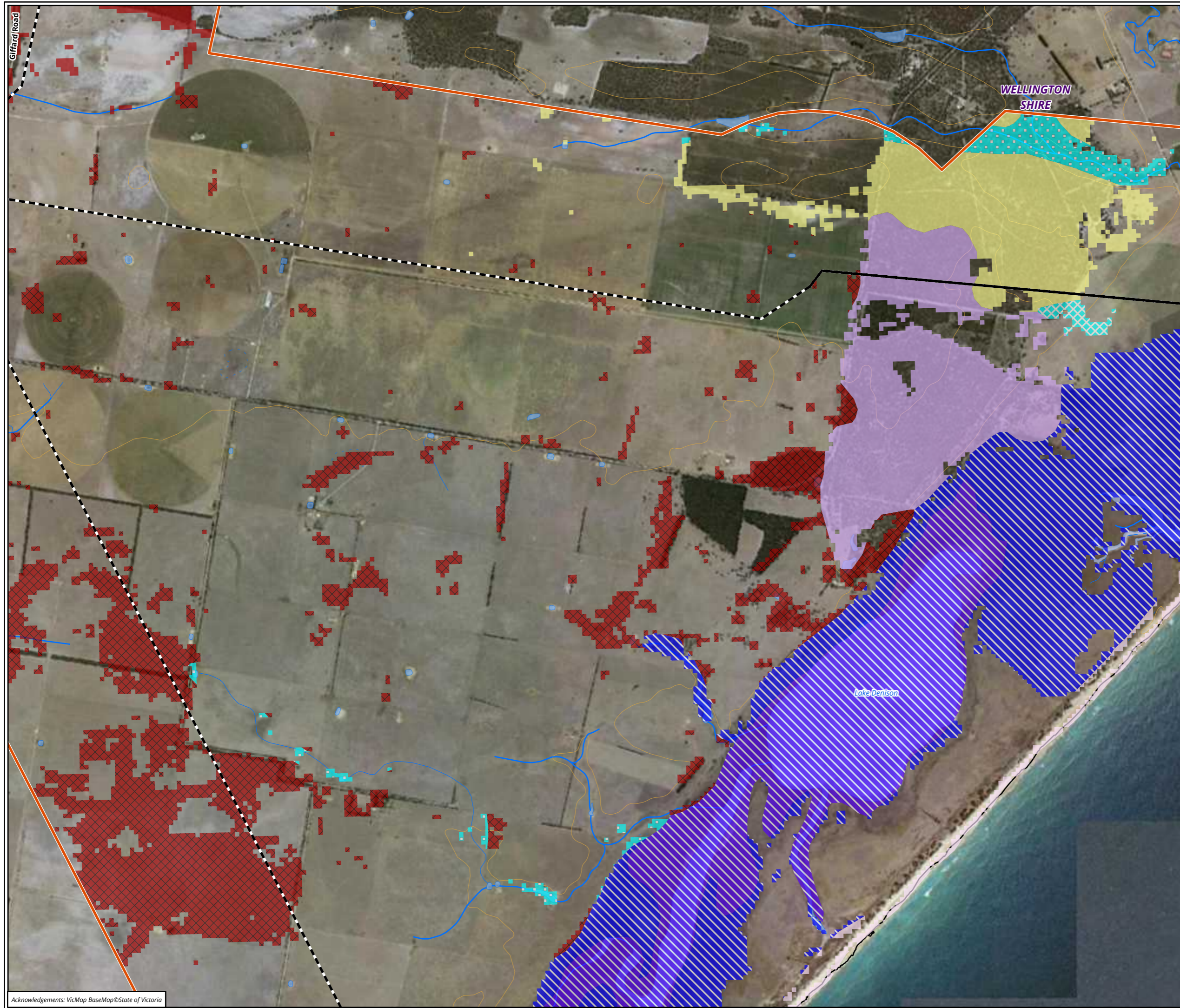


Kilometers
 Scale: 1:20,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



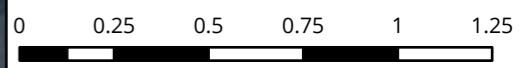
Matter: 37595,
 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\
 37595_GG_OffshoreWind.aprx

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- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 1 Coastal Dune Scrub/Coastal Dune Grassland Mosaic
 - 10 Estuarine Wetland
 - 16 Lowland Forest
 - 191 Riparian Scrub
 - 3 Damp Sands Herb-rich Woodland
 - 48 Heathy Woodland
 - 53 Swamp Scrub
 - 698 Lowland Forest/Heathy Woodland Mosaic
 - 992 Water Body - Fresh

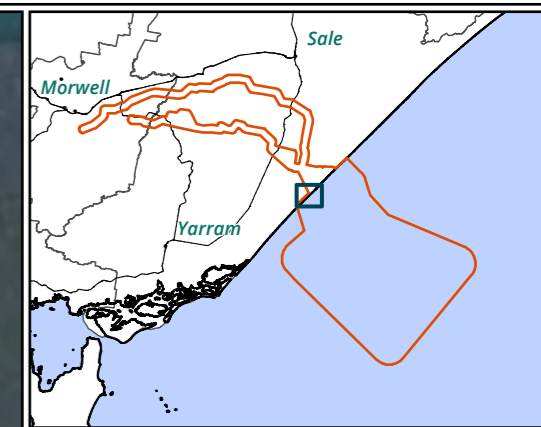
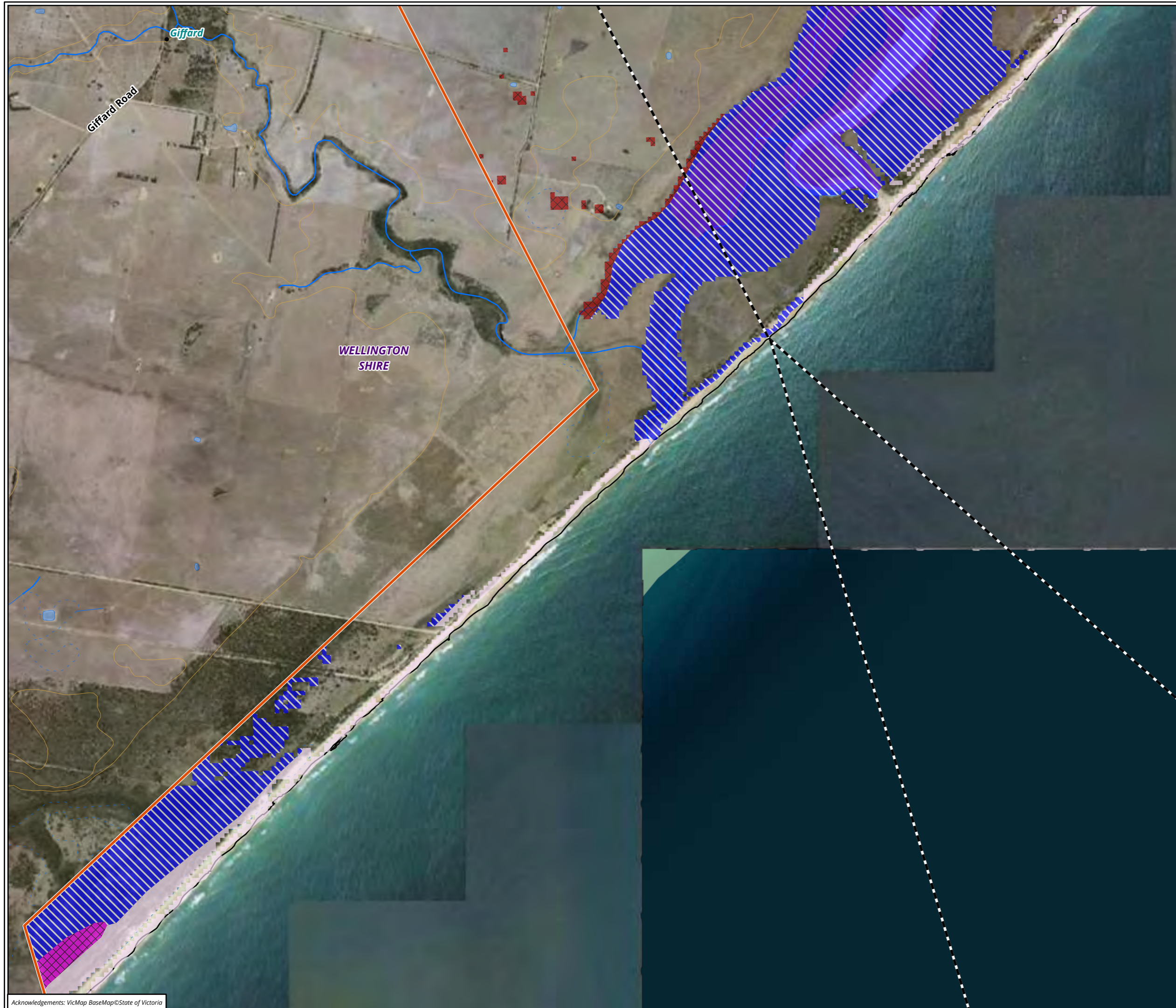
Figure 2.15 Modelled EVCs in the Study Area



Kilometers
 Scale: 1:20,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



Matter: 37595,
 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx



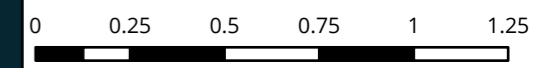
Legend

- Study Area
- Cable route

Ecological vegetation class

- 1 Coastal Dune Scrub/Coastal Dune Grassland Mosaic
- 10 Estuarine Wetland
- 698 Lowland Forest/Heathy Woodland Mosaic
- 9 Coastal Saltmarsh
- 992 Water Body - Fresh

Figure 2.16 Modelled EVCs in the Study Area

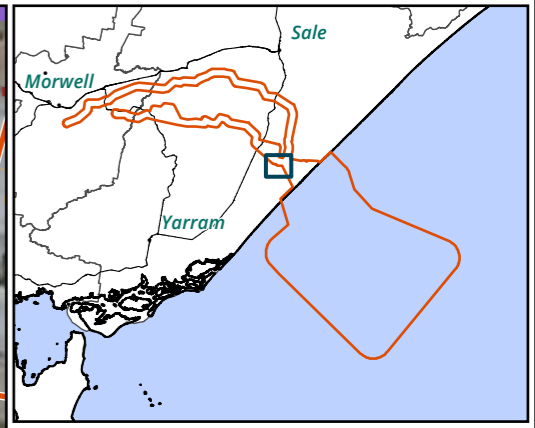
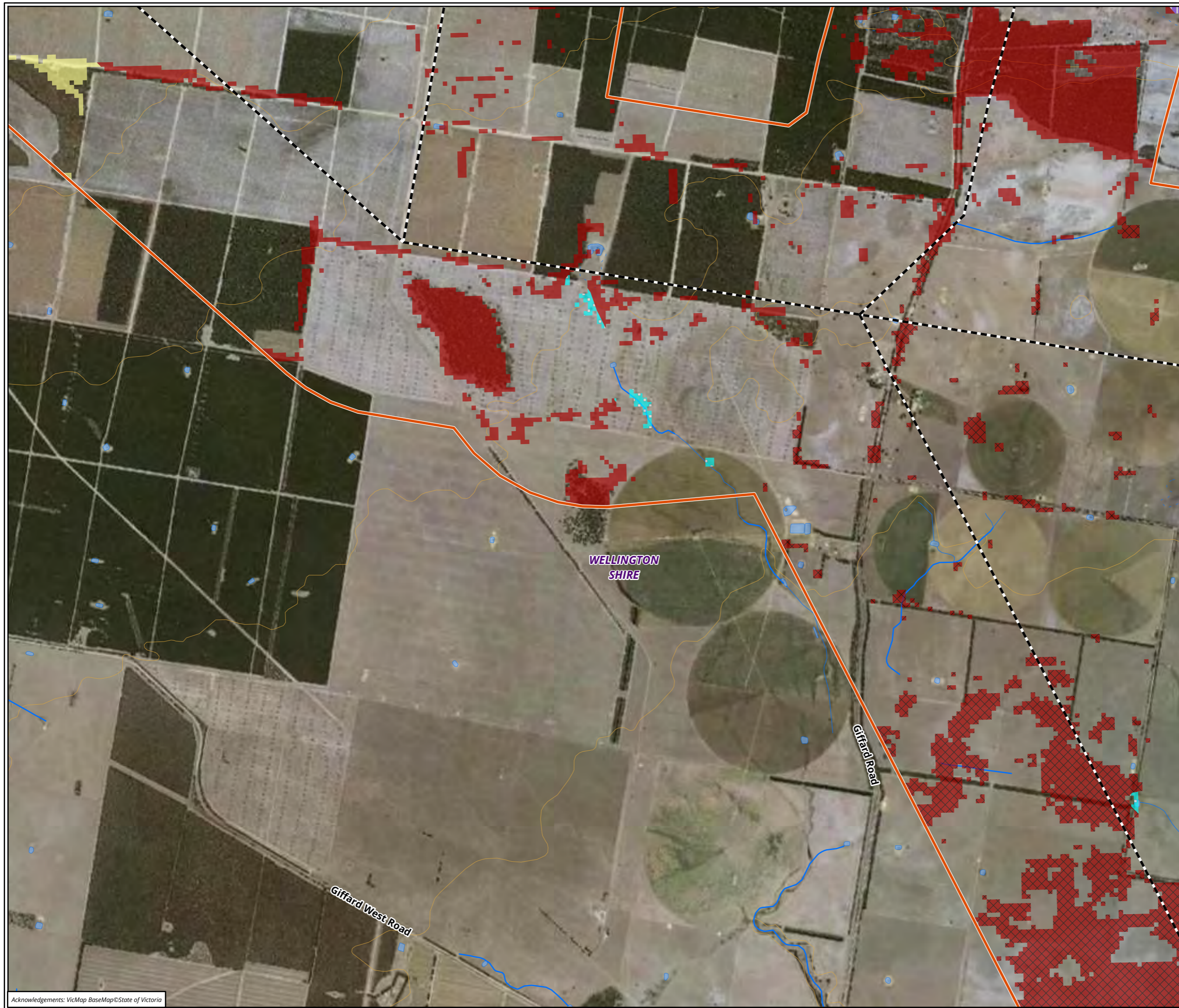


Kilometers
 Scale: 1:20,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



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 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\
 37595_GG_OffshoreWind.aprx

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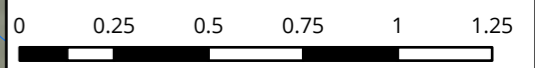
Legend

- Study Area
- Cable route

Ecological vegetation class

- 136 Sedge Wetland
- 16 Lowland Forest
- 191 Riparian Scrub
- 48 Heathy Woodland
- 698 Lowland Forest/Heathy Woodland Mosaic

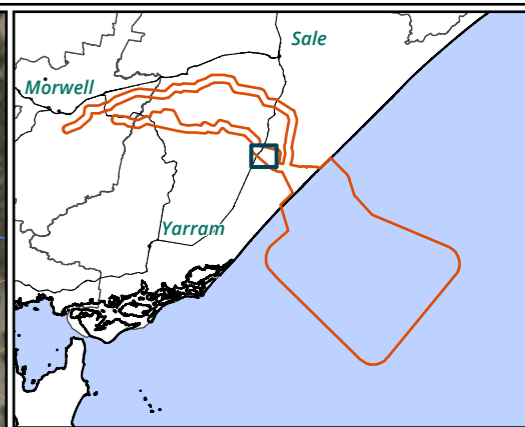
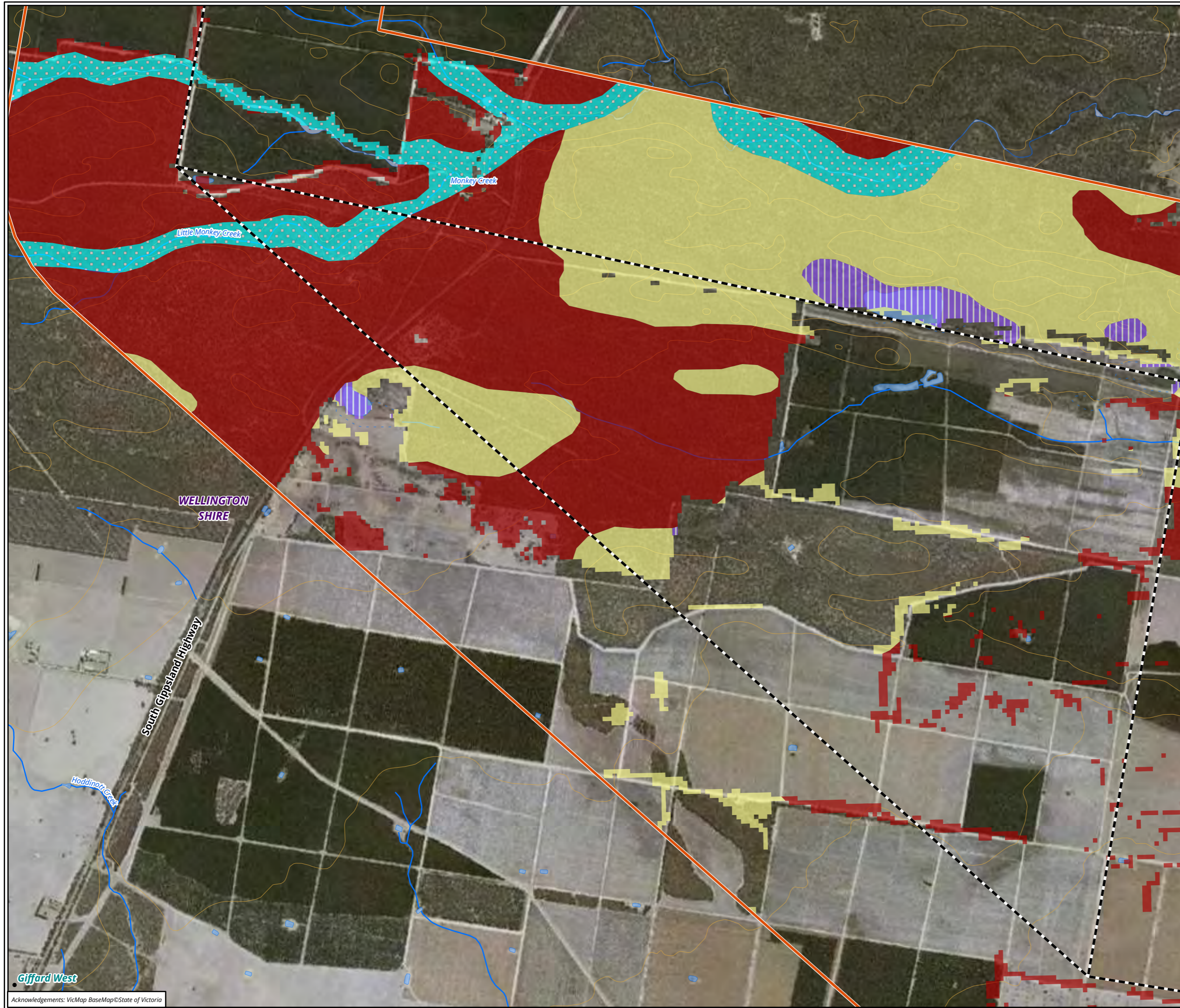
Figure 2.17 Modelled EVCs in the Study Area



Kilometers
 Scale: 1:20,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55

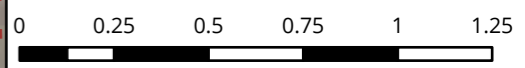


Matter: 37595,
 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx



- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 136 Sedge Wetland
 - 16 Lowland Forest
 - 191 Riparian Scrub
 - 48 Heathy Woodland

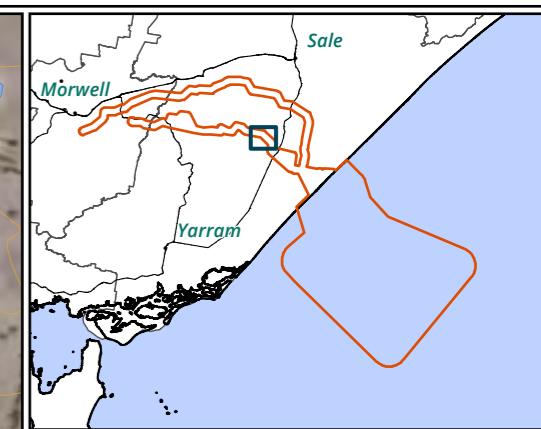
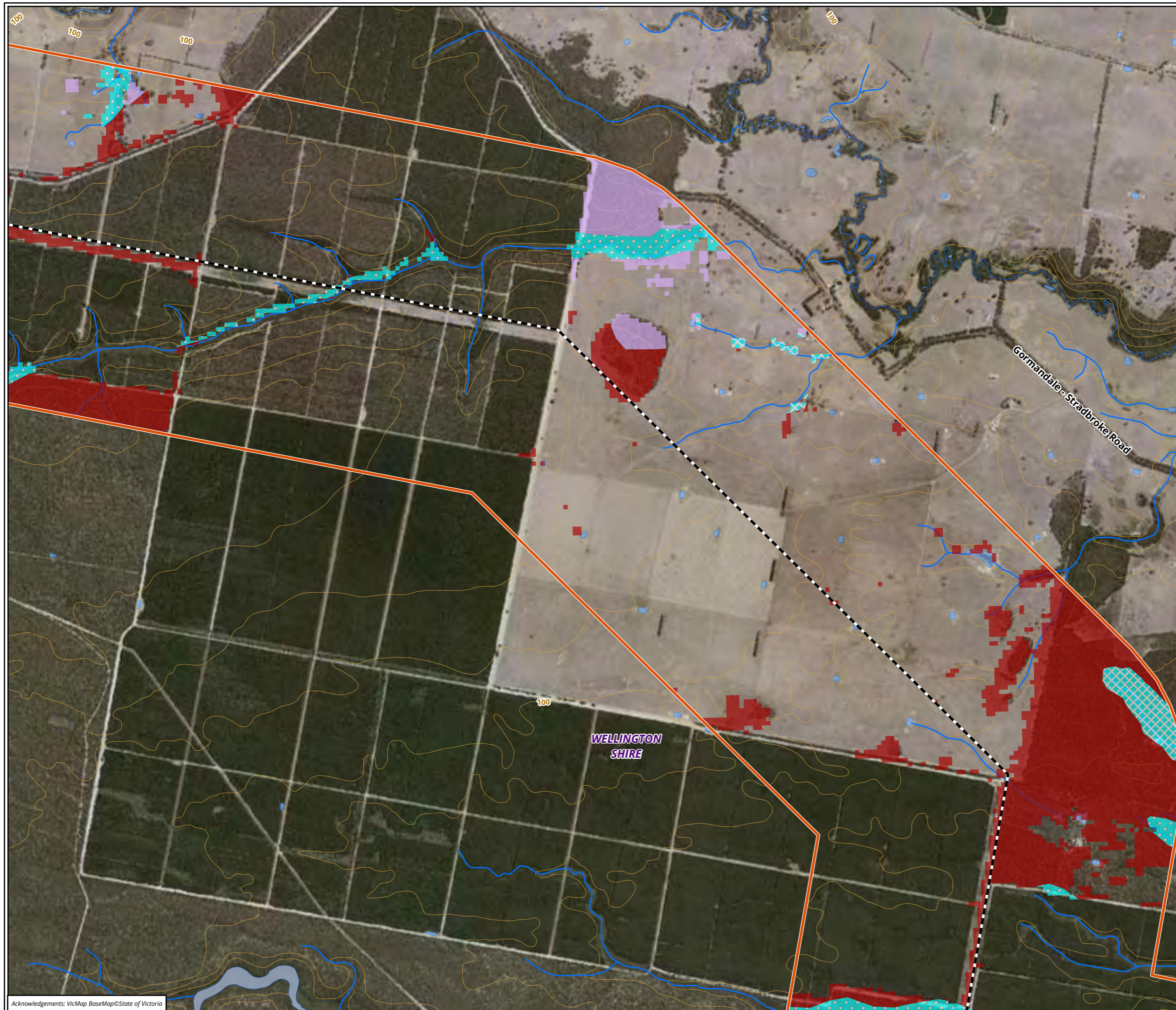
Figure 2.18 Modelled EVCs in the Study Area



Kilometers
 Scale: 1:20,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55

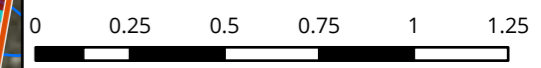


Matter: 37595,
 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx



- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 16 Lowland Forest
 - 191 Riparian Scrub
 - 3 Damp Sands Herb-rich Woodland
 - 53 Swamp Scrub

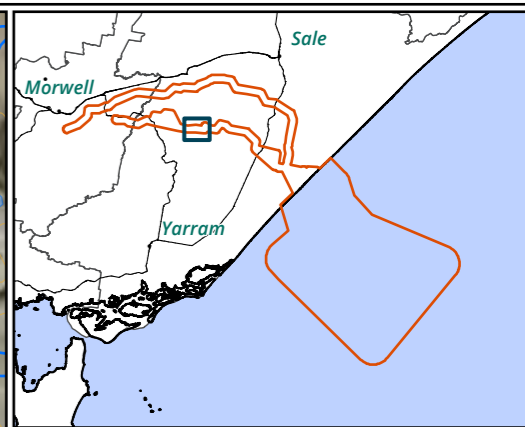
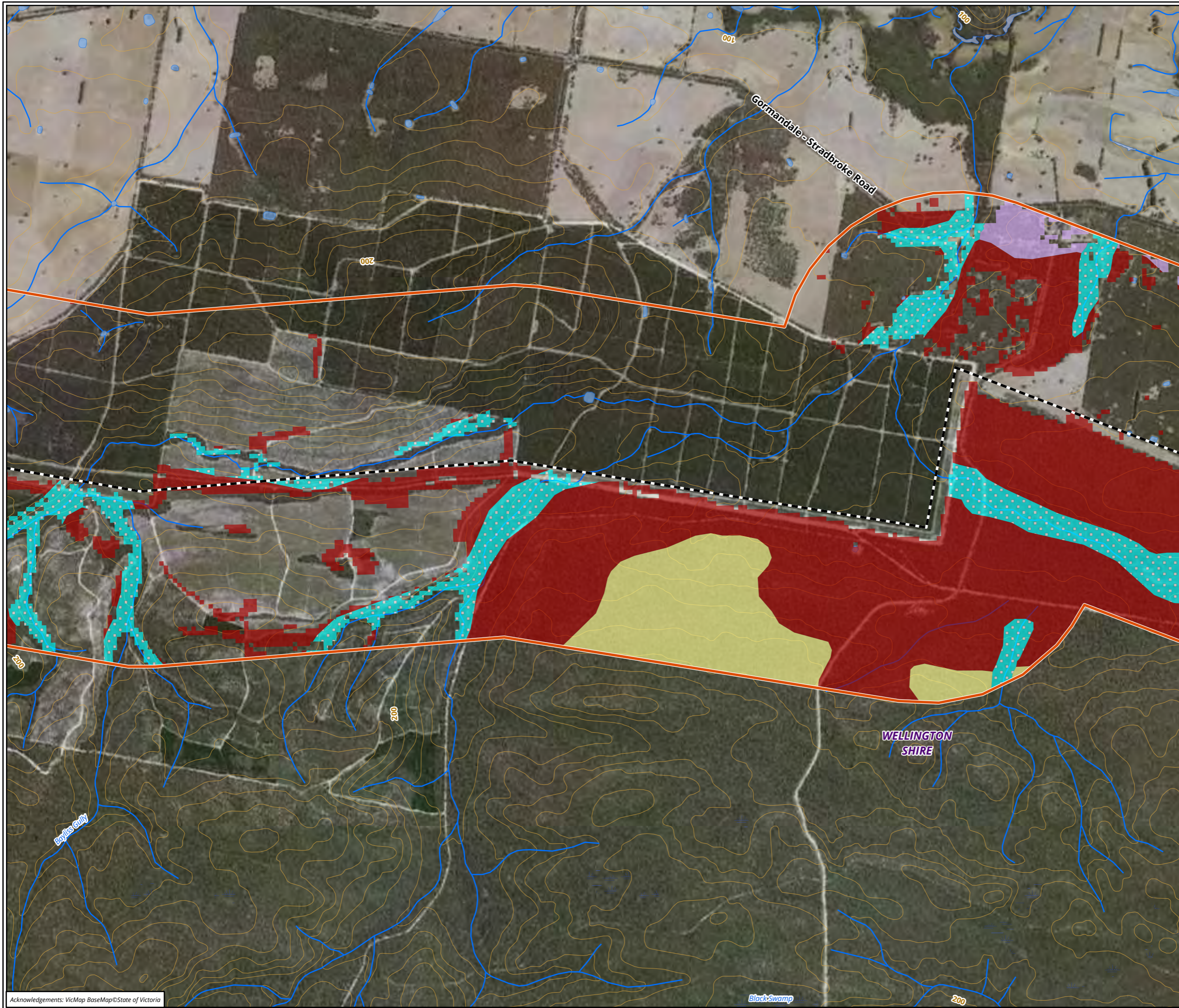
Figure 2.19 Modelled EVCs in the Study Area



Kilometers
 Scale: 1:20,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55

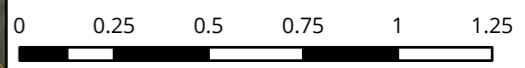


Matter: 37595,
 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx



- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 16 Lowland Forest
 - 191 Riparian Scrub
 - 3 Damp Sands Herb-rich Woodland
 - 48 Heathy Woodland

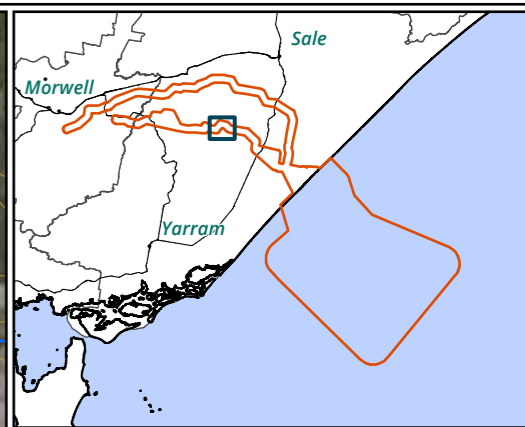
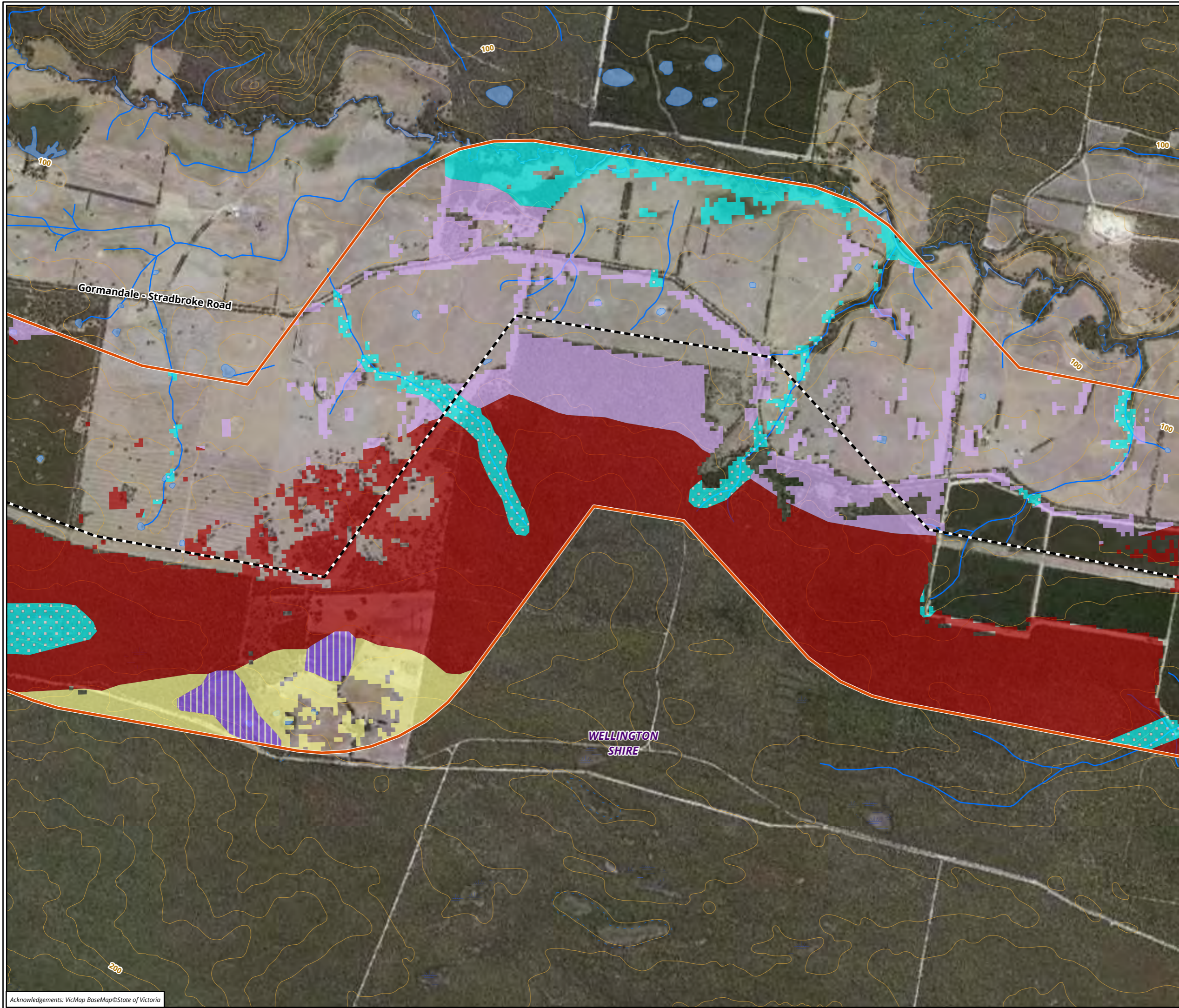
Figure 2.20 Modelled EVCs in the Study Area



Kilometers
 Scale: 1:20,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55

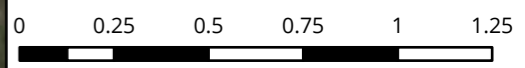


Matter: 37595,
 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx



- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 136 Sedge Wetland
 - 16 Lowland Forest
 - 18 Riparian Forest
 - 191 Riparian Scrub
 - 3 Damp Sands Herb-rich Woodland
 - 48 Heathy Woodland

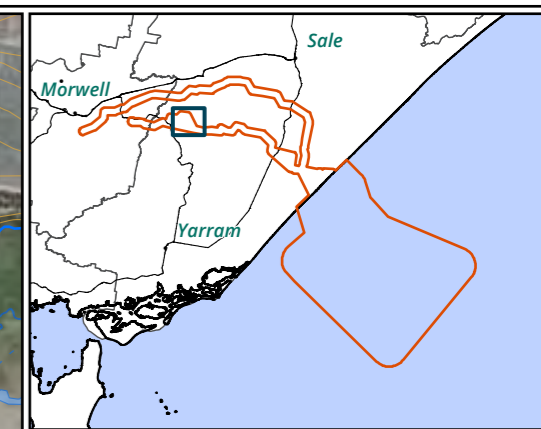
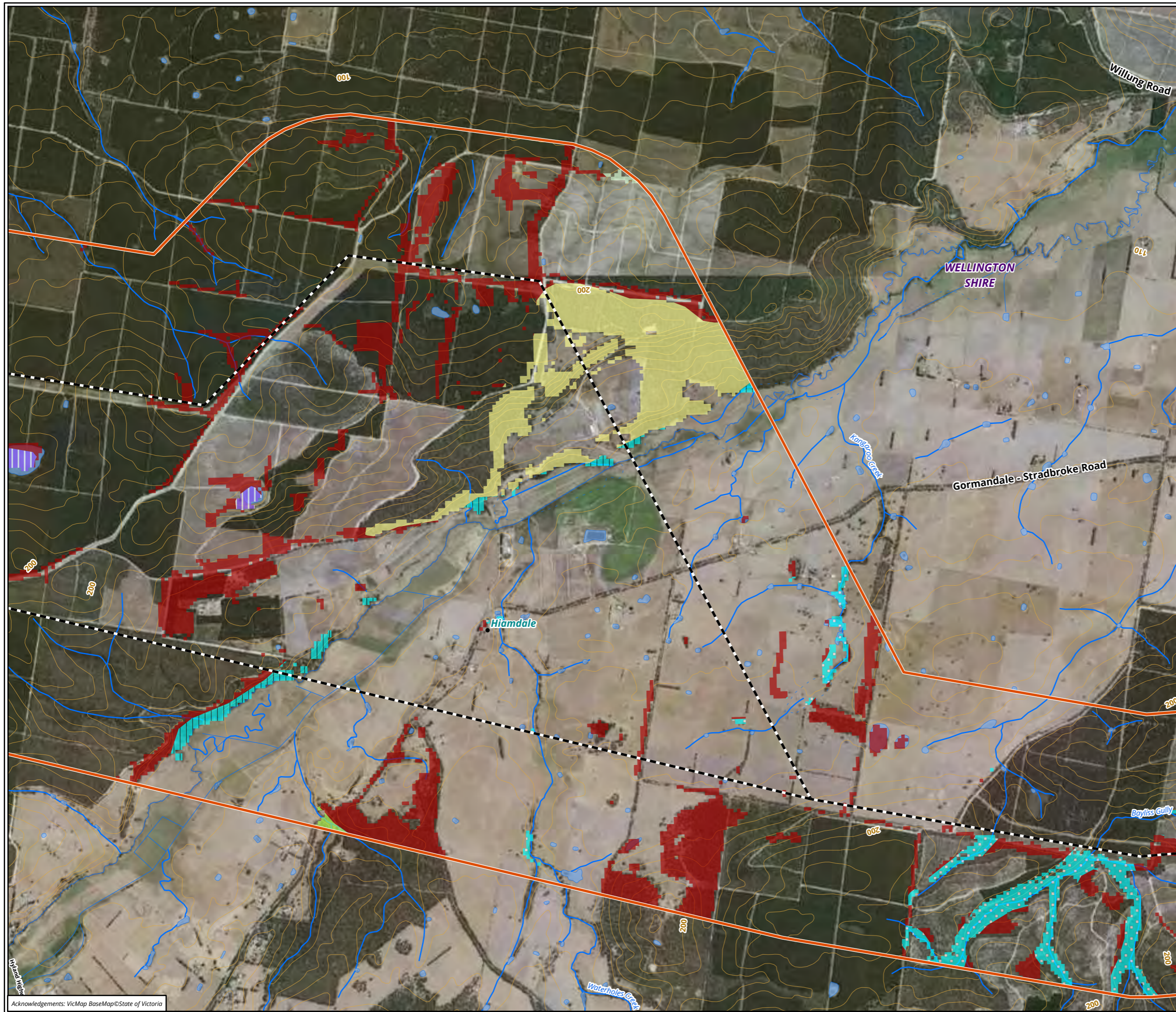
Figure 2.21 Modelled EVCs in the Study Area



Kilometers
 Scale: 1:20,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55

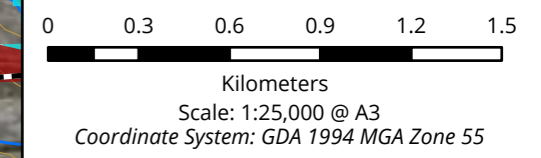


Matter: 37595,
 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx



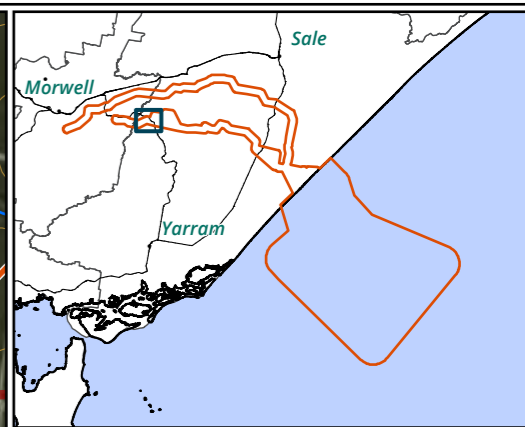
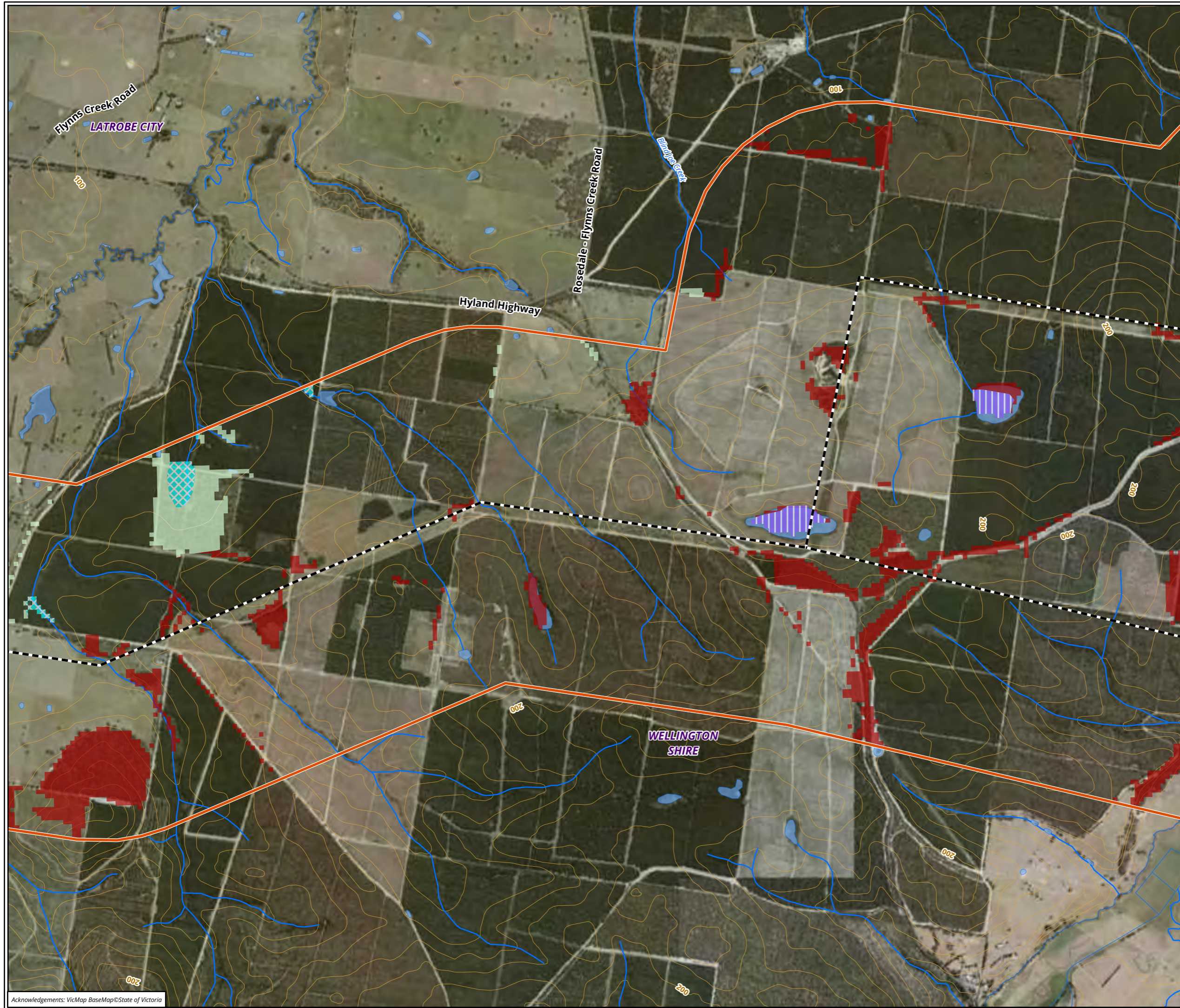
- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 136 Sedge Wetland
 - 16 Lowland Forest
 - 191 Riparian Scrub
 - 29 Damp Forest
 - 48 Heathy Woodland
 - 55 Plains Grassy Woodland
 - 83 Swamy Riparian Woodland

Figure 2.22 Modelled EVCs in the Study Area



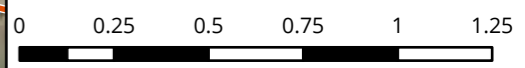
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 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: P:\37595\F2_EVC
 Project: P:\37595\37595\Mapping\37595_GG_OffshoreWind.aprx

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- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 136 Sedge Wetland
 - 16 Lowland Forest
 - 53 Swamp Scrub
 - 55 Plains Grassy Woodland
 - 83 Swampy Riparian Woodland

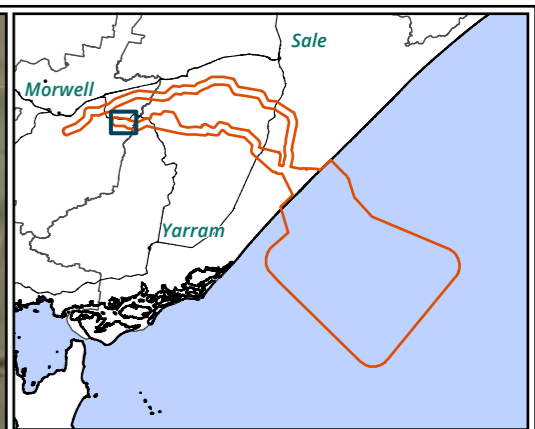
Figure 2.23 Modelled EVCs in the Study Area



Kilometers
 Scale: 1:20,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55

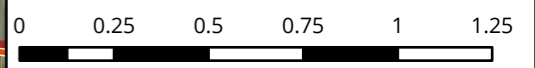


Matter: 37595,
 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F2_EVC
 Project: P:\37500s\37595\Mapping\
 37595_GG_OffshoreWind.aprx



- Legend**
- Study Area
 - Cable route
- Ecological vegetation class**
- 16 Lowland Forest
 - 29 Damp Forest
 - 53 Swamp Scrub
 - 55 Plains Grassy Woodland
 - 83 Swampy Riparian Woodland
 - 998 Water Body - Man-made

Figure 2.24 Modelled EVCs in the Study Area

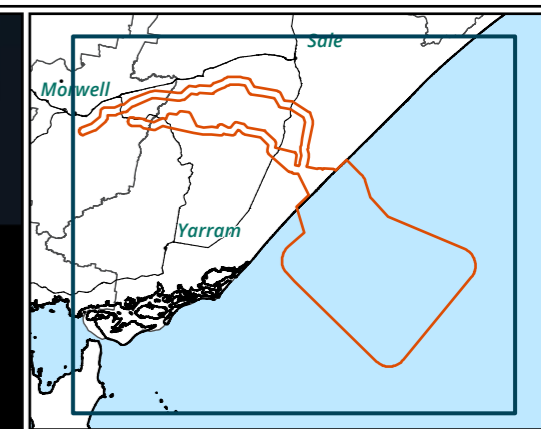


Kilometers
 Scale: 1:20,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



Matter: 37595,
 Date: 04 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
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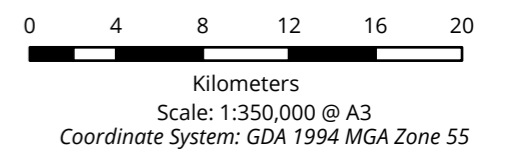
Acknowledgements: VicMap BaseMap © State of Victoria



Legend

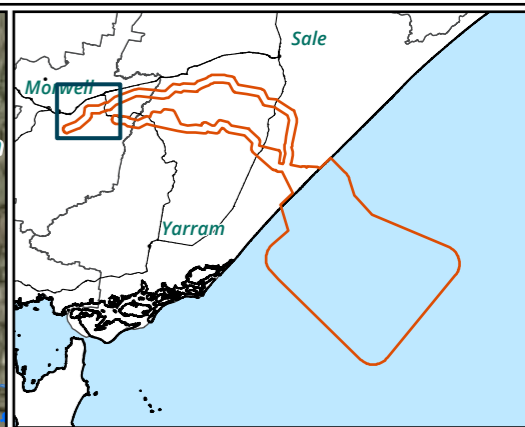
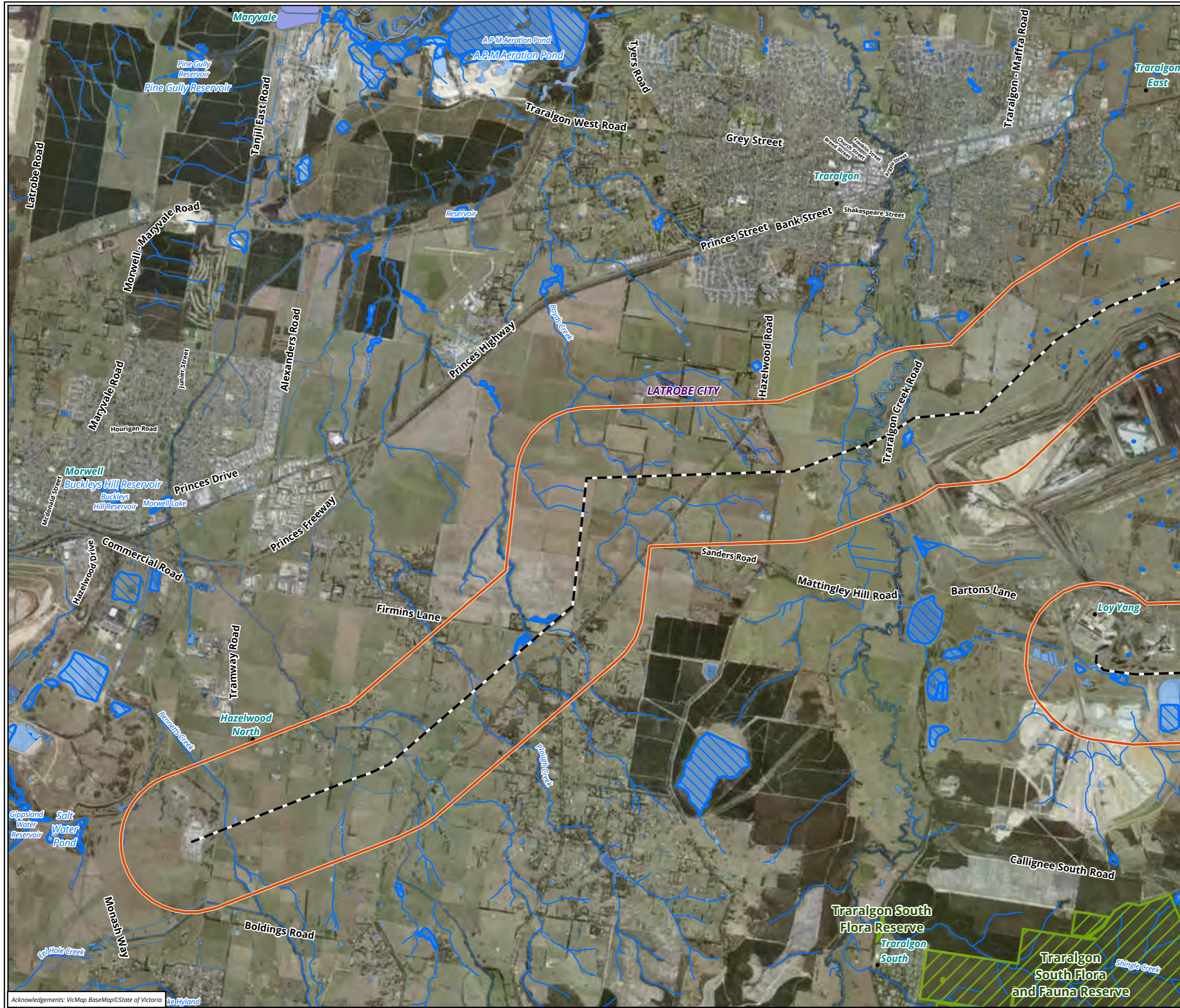
- Study Area
 - Cable route
 - Wind Farm Area
 - RAMSAR site
 - Park/Reserve
- Wetlands**
- 2 - Freshwater meadow
 - 20 - Sewage oxidation basin
 - 3 - Shallow freshwater marsh
 - 4 - Deep freshwater marsh
 - 5 - Permanent open freshwater
 - 6 - Semi-permanent saline
 - 7 - Permanent saline

Figure 3.1 - Parks, reserves and wetlands in the Study Area - Overview



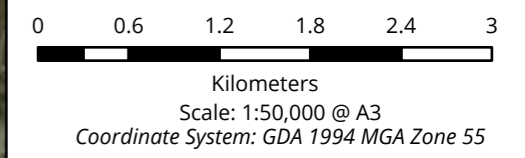
Matter: 37595,
 Date: 05 October 2022 ,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F3_ParksandWater
 Project: P:\37500s\37595\Mapping\
 37595_GG_OffshoreWind.aprx

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- Legend**
- Study Area
 - Cable route
 - Wind Farm Area
 - Park/Reserve
- Wetlands**
- 2 - Freshwater meadow
 - 20 - Sewage oxidation basin
 - 3 - Shallow freshwater marsh
 - 4 - Deep freshwater marsh
 - 5 - Permanent open freshwater

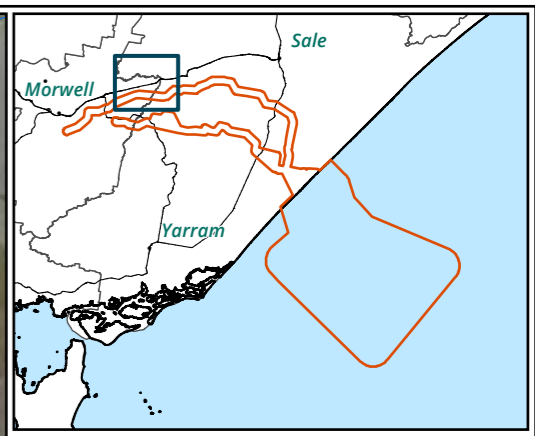
Figure 3.2 - Parks, reserves and wetlands in the Study Area



biosis

Matter: 37595,
 Date: 05 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F3_ParksandWater
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx

Acknowledgements: VicMap BaseMap © State of Victoria



- Legend**
- Study Area
 - Cable route
 - Wind Farm Area
 - Park/Reserve
- Wetlands**
- 2 - Freshwater meadow
 - 20 - Sewage oxidation basin
 - 3 - Shallow freshwater marsh
 - 4 - Deep freshwater marsh
 - 5 - Permanent open freshwater

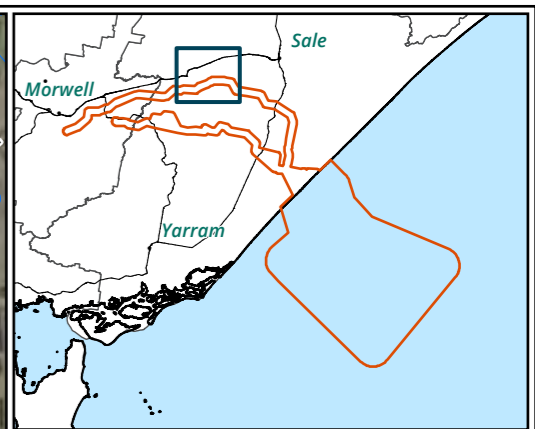
Figure 3.3 - Parks, reserves and wetlands in the Study Area

0 0.6 1.2 1.8 2.4 3
 Kilometers
 Scale: 1:50,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



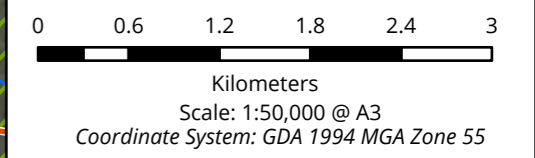
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 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F3_ParksandWater
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx

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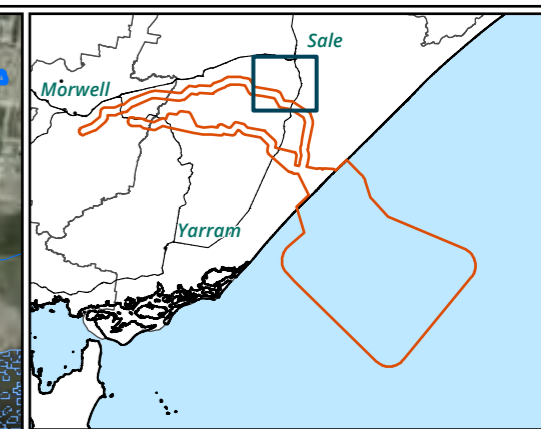
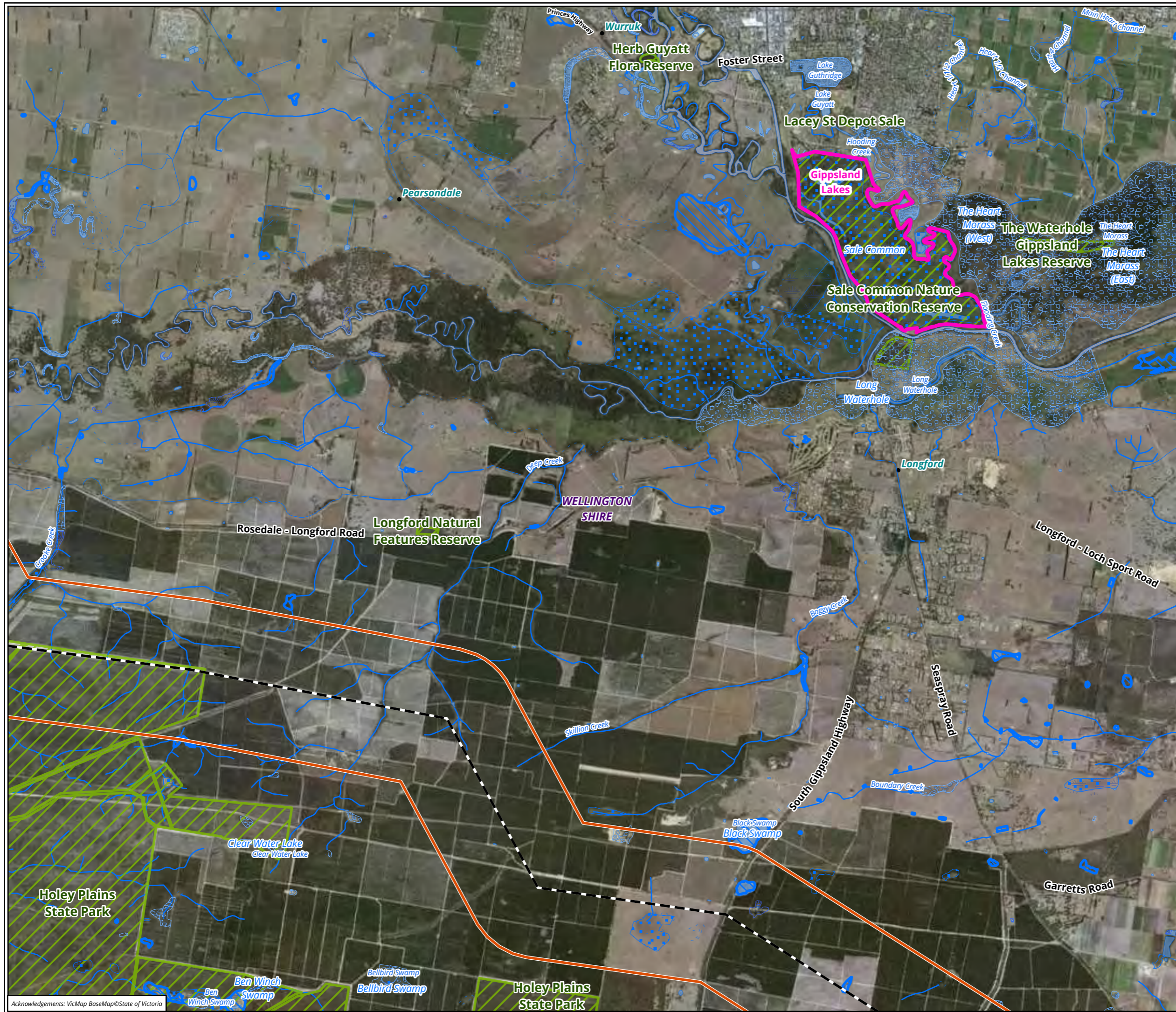
- Legend**
- Study Area
 - Cable route
 - Wind Farm Area
 - Park/Reserve
- Wetlands**
- 2 - Freshwater meadow
 - 20 - Sewage oxidation basin
 - 3 - Shallow freshwater marsh
 - 4 - Deep freshwater marsh
 - 5 - Permanent open freshwater

Figure 3.4 - Parks, reserves and wetlands in the Study Area



Matter: 37595,
 Date: 05 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F3_ParksandWater
 Project: P:\37500s\37595\Mapping\
 37595_GG_OffshoreWind.aprx

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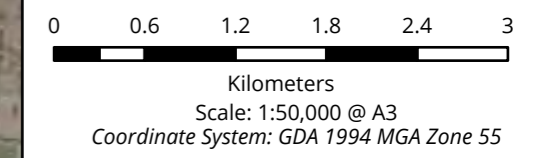
Legend

- Study Area
- Cable route
- Wind Farm Area
- RAMSAR site
- Park/Reserve

Wetlands

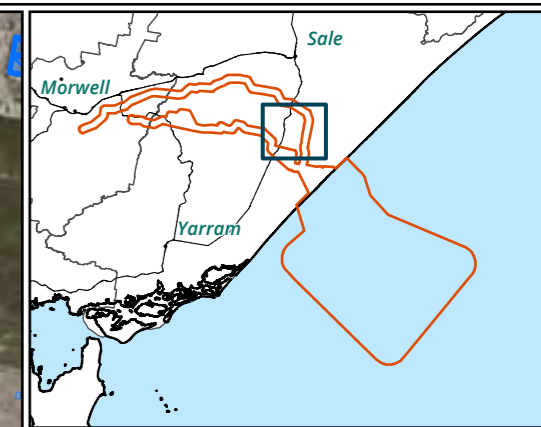
- 2 - Freshwater meadow
- 3 - Shallow freshwater marsh
- 4 - Deep freshwater marsh
- 5 - Permanent open freshwater

Figure 3.5 - Parks, reserves and wetlands in the Study Area



Matter: 37595,
 Date: 05 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F3_ParksandWater
 Project: P:\37500s\37595\Mapping\
 37595_GG_OffshoreWind.aprx

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- Legend**
- Study Area
 - Cable route
 - Wind Farm Area
 - Park/Reserve
- Wetlands**
- 2 - Freshwater meadow
 - 3 - Shallow freshwater marsh
 - 4 - Deep freshwater marsh
 - 5 - Permanent open freshwater

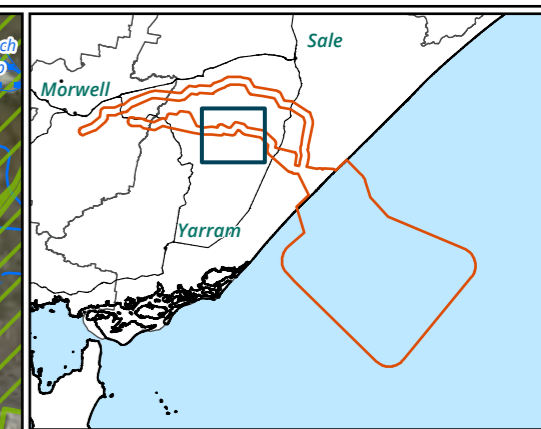
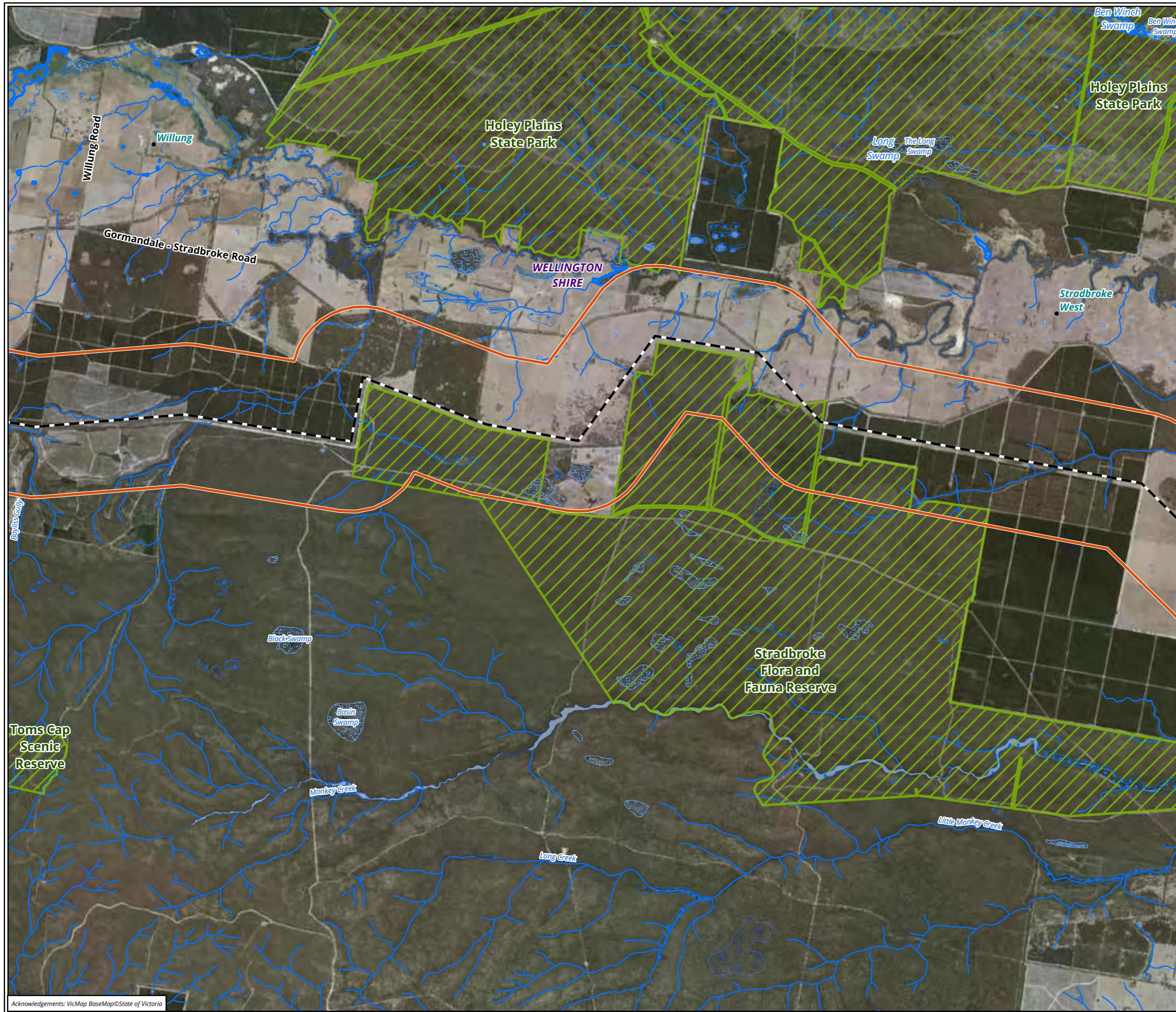
Figure 3.6 - Parks, reserves and wetlands in the Study Area

0 0.6 1.2 1.8 2.4 3
 Kilometers
 Scale: 1:50,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



Matter: 37595,
 Date: 05 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F3_ParksandWater
 Project: P:\37500s\37595\Mapping\
 37595_GG_OffshoreWind.aprx

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Legend

- Study Area
- Cable route
- Wind Farm Area
- Park/Reserve

Wetlands

- 2 - Freshwater meadow
- 3 - Shallow freshwater marsh
- 4 - Deep freshwater marsh
- 5 - Permanent open freshwater

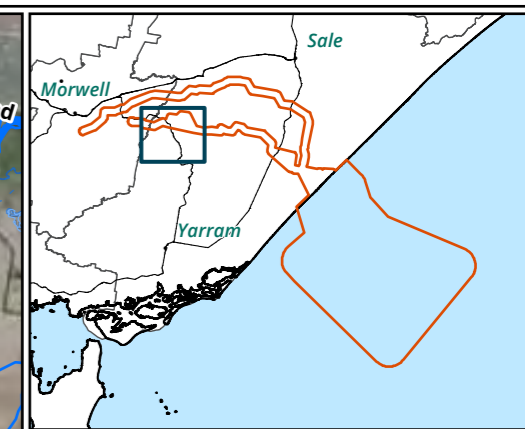
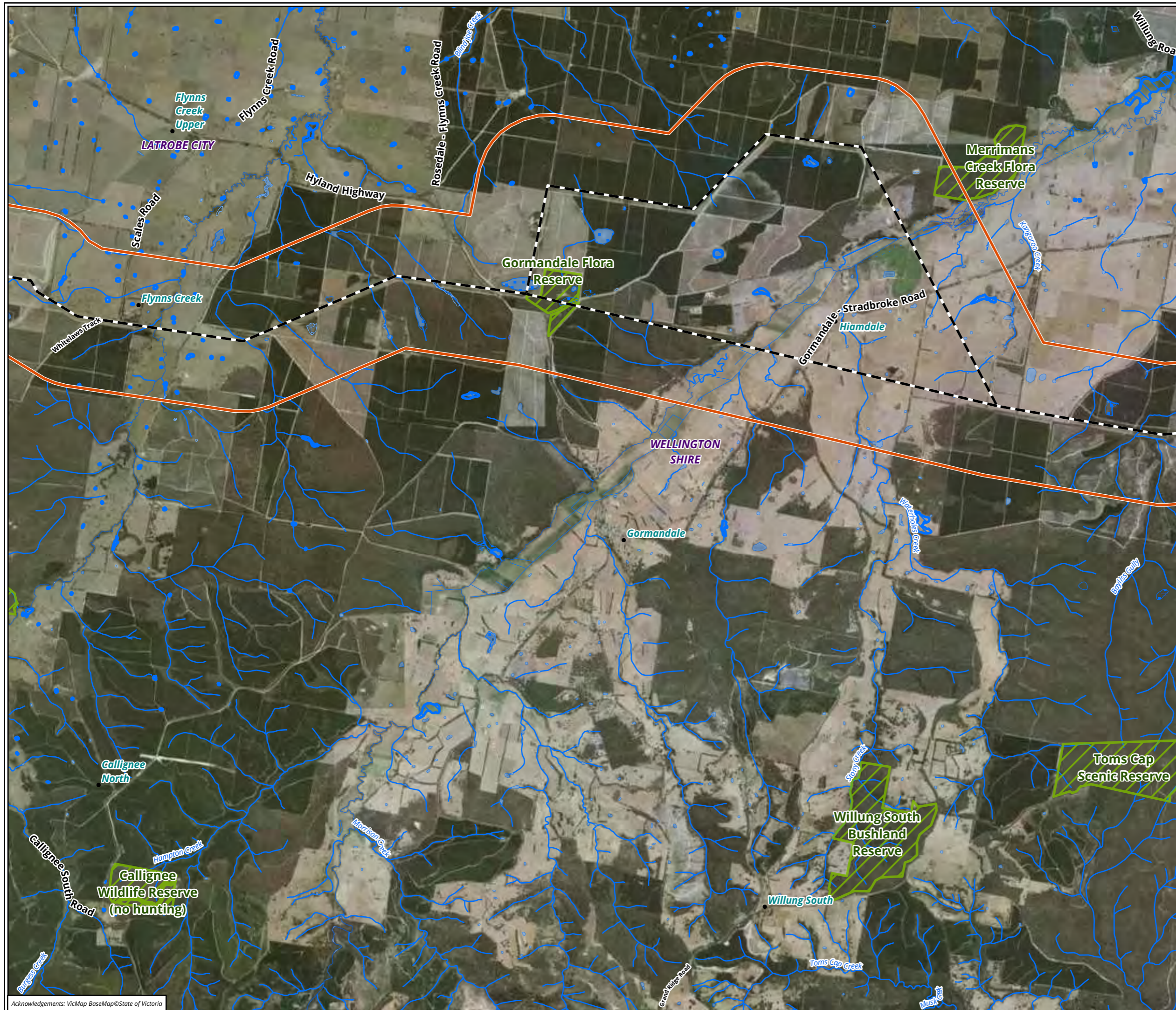
Figure 3.7 - Parks, reserves and wetlands in the Study Area

0 0.6 1.2 1.8 2.4 3
 Kilometers
 Scale: 1:50,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



Matter: 37595,
 Date: 05 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F3_ParksandWater
 Project: P:\37500s\37595\Mapping\
 37595_GG_OffshoreWind.aprx

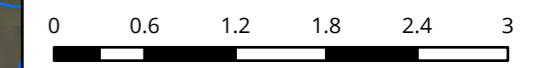
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Legend

-  Study Area
 -  Cable route
 -  Wind Farm Area
 -  Park/Reserve
- Wetlands**
-  2 - Freshwater meadow
 -  3 - Shallow freshwater marsh
 -  4 - Deep freshwater marsh
 -  5 - Permanent open freshwater

Figure 3.8 - Parks, reserves and wetlands in the Study Area

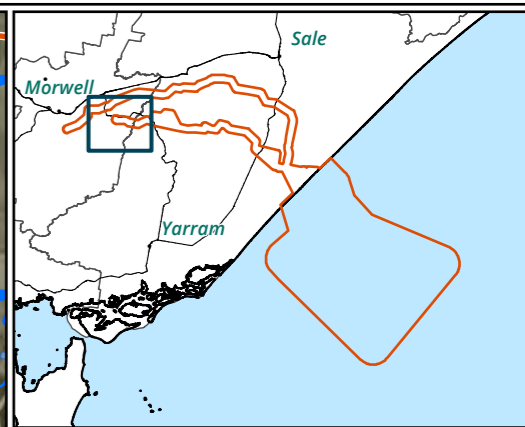


Kilometers
 Scale: 1:50,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



Matter: 37595,
 Date: 05 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F3_ParksandWater
 Project: P:\37500s\37595\Mapping\37595_GG_OffshoreWind.aprx

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- Legend**
- Study Area
 - Cable route
 - Wind Farm Area
 - Park/Reserve
- Wetlands**
- 2 - Freshwater meadow
 - 3 - Shallow freshwater marsh
 - 4 - Deep freshwater marsh
 - 5 - Permanent open freshwater

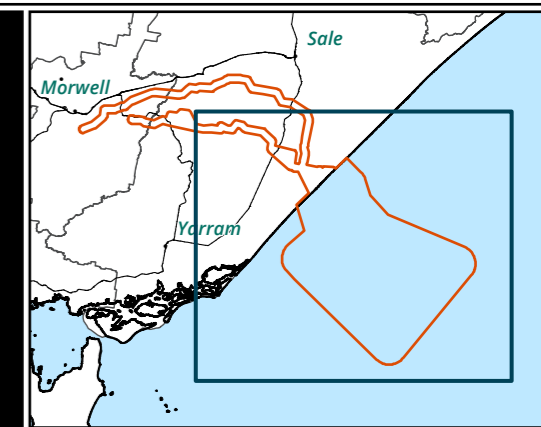
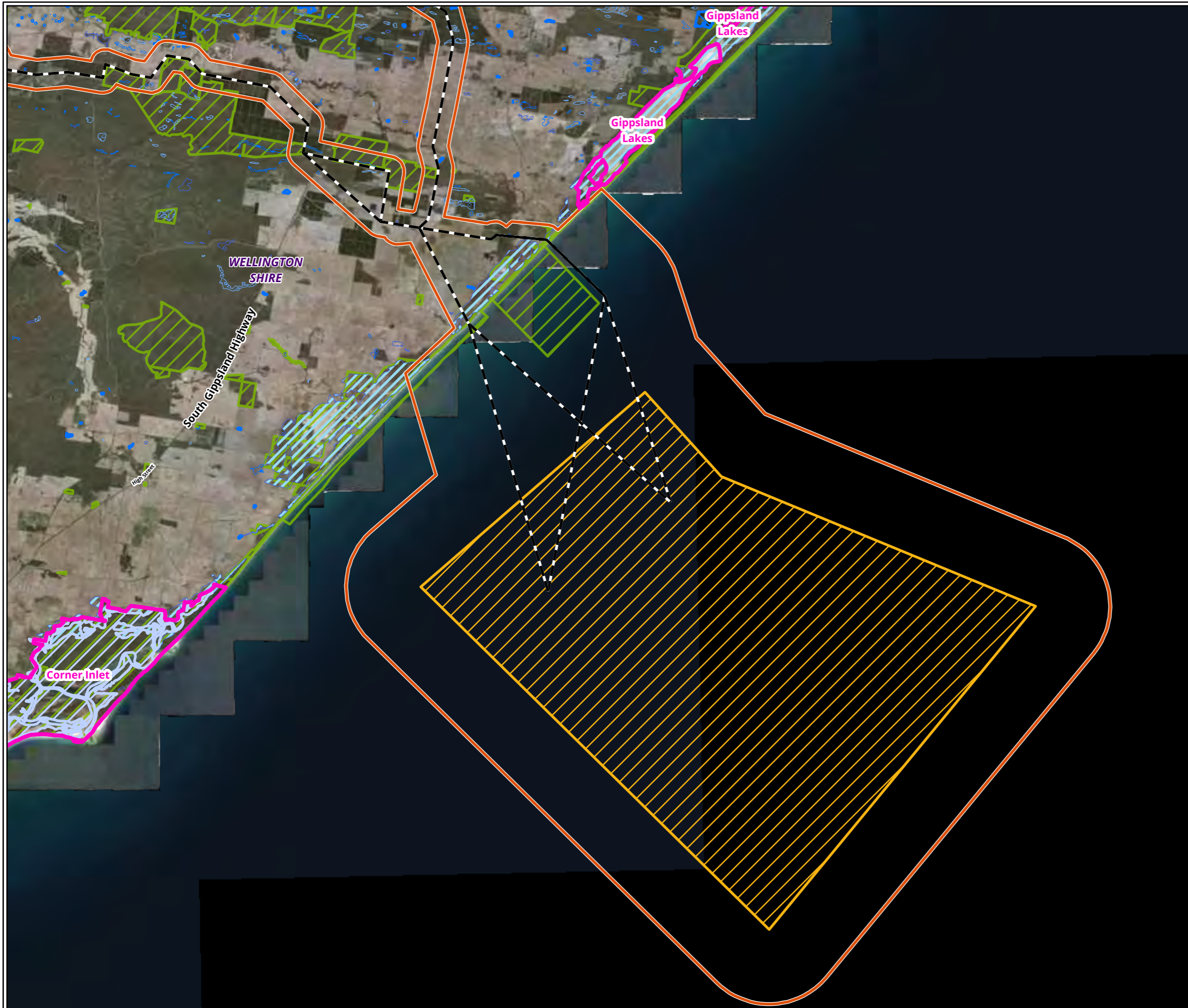
Figure 3.9 - Parks, reserves and wetlands in the Study Area

0 0.6 1.2 1.8 2.4 3
 Kilometers
 Scale: 1:50,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



Matter: 37595,
 Date: 05 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F3_ParksandWater
 Project: P:\37500s\37595\Mapping\
 37595_GG_OffshoreWind.aprx

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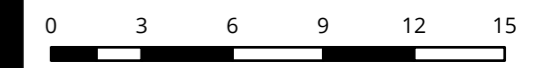
Legend

- Study Area
- Cable route
- Wind Farm Area
- RAMSAR site
- Park/Reserve

Wetlands

- 2 - Freshwater meadow
- 3 - Shallow freshwater marsh
- 4 - Deep freshwater marsh
- 5 - Permanent open freshwater
- 6 - Semi-permanent saline
- 7 - Permanent saline

Figure 3.10 - Parks, reserves and wetlands in the Study Area



Scale: 1:250,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



Matter: 37595,
 Date: 05 October 2022,
 Prepared for: JB, Prepared by: MK, Last edited by: sblades
 Layout: 37595_F3_ParksandWater
 Project: P:\37500s\37595\Mapping\
 37595_GG_OffshoreWind.aprx