Project 38023

Victorian Renewable Energy Terminal: Ecological Existing Conditions Report

Final report

Prepared for Port of Hastings Corporation

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Biosis staff involved in this project were:

- Joshua Orchard & Claire Tingate (assistance in the field)
- Sammy Blades (mapping)
- Katrina Sofo, Mark Venosta & Ian Smales (quality assurance)

SUMMARY

Biosis Pty Ltd was commissioned by Port of Hastings Corporation to undertake a flora and fauna assessment of 5 Long Island Drive which is proposed for development as the Victorian Renewable Energy Terminal. The study area is located within part of the Old Tyabb Reclamation Area, approximately 3 kilometres east of Hastings and approximately 50 kilometres south east of the Melbourne Central Business District.

Ecological values

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

- 3.89 hectares of native vegetation including six patches and two small, scattered trees
- Two ecological vegetation classes (EVCs) within the Gippsland Plain bioregion:
  - Tall Marsh EVC 821, Bioregional Conservation Status (BCS of Least Concern).
  - Damp Sands Herb-rich Woodland EVC 3 (BCS of Vulnerable).
- Presence of one species listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and under the *Flora and Fauna Guarantee Act 1988* (FFG Act):
  - Swamp Skink *Lissolepis coventryi*
- Presence of one species listed as threatened under the FFG Act:
  - Glossy Grass Skink *Pseudemoia rawlinsoni.*
- Potential Habitat for 22 threatened fauna species, including:
  - Eight species listed under the EPBC Act.
  - Fourteen species listed under the FFG Act.
- Potential habitat for listed migratory species, particularly shorebirds and waterbirds.
- Location within and immediately adjacent to the Western Port Ramsar site.

Government legislation and policy

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

Legislation / policy	Relevant ecological feature on site	Permit / approval required	Notes
EPBC Act	Known habitat for one threatened fauna species: • Swamp Skink Potential habitat for eight threatened fauna species: • Australasian Bittern • White-throated Needletail • Bar-tailed Godwit • Australian Fairy Tern • Eastern Curlew • Curlew Sandpiper • Red Knot • Great Knot Potential habitat for migratory shorebirds. Potential impact to the ecological character of the Western Port Ramsar site.	Referral likely to be required	The site supports a population of the Swamp Skink. The site may provide occasional foraging habitat for a number of shorebirds and waterbirds (including migratory species). However, the habitat along the foreshore (adjacent to the study area) has been identified as secondary foraging habitat for waterbirds, with primary habitat and roosting sites located to the north and south of the study area. Impact to the ecological character of the Western Port Ramsar site need to be taken into consideration and avoided and/or minimised.
FFG Act	Native vegetation on site is not a FFG act listed threatened community but contains at least 16 protected flora species. Recorded presence of two FFG Act listed threatened species (Swamp Skink and Glossy Grass Skink), Potential habitat for 14 additional FFG Act listed fauna.	Protected Flora Permit is required. Port of Hastings is a public authority and must consider biodiversity when performing its function.	Site is public land for the purpose of the FFG Act.
Planning & Environment Act	All indigenous vegetation to be removed.	Planning permit required to lop or remove native vegetation.	Permit application needs to address provisions of VPO 2.
CaLP Act	Noxious weeds and pest animals recorded within the study area.	N/A	Comply with requirements to control/eradicate noxious weeds and prevent their spread during works in accordance with the CaLP Act.

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

Based on the current design, the proposed development will require the removal of 3.892 hectares of native vegetation, including two small scattered trees, from within location category 3. Therefore, the planning permit application will be assessed on the detailed assessment pathway. The strategic biodiversity value score of the native vegetation to be removed is between 0.627 – 0.812.

If a permit is granted, the offset requirements would be 0.475 general habitat units and 1.945 species habitat units for the following species:

- Flatback Mangrove Goby – 0.194 species habitat units.
- Tiny Arrowgrass – 1.751 species habitat units.

The general offset must be within the Port Phillip and Westernport Catchment Management Authority area or the Mornington Peninsula Shire Council municipal district and must have a minimum strategic biodiversity value score of 0.520.

It is likely that the required general/species offsets could be generated through management of retained native vegetation within the study area. This would be a 'first party' offset and would require the appropriate vegetation security agreements and a 10 year offset management plan.

Recommendations

The results of this assessment should be used to inform design of the project, by incorporating the flora and fauna mapping information into planning maps and investigating options to retain as much of the mapped vegetation/habitats as possible.

To the extent practicable, future requirements for infrastructure and services must be forecast as part of the project design and allowances made outside any nominated reserves for all construction works. This includes road batters, footpaths, drainage and services (including optic fibre). All areas of vegetation/habitat nominated in the design plan as 'retained' are to be treated as no-go zones and are not to be encroached upon as development progresses. Any runoff associated with the works should also be managed appropriately to avoid impacts on the Western Port Ramsar site.

Targeted surveys for Swamp Skink and Glossy Grass Skink have been completed, with the results indicating that the study area supports a healthy population of both species. An area of particular value appears to be the northern drainage line and surrounding vegetation.

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1. Introduction

1.1. Project background

Biosis Pty Ltd was commissioned by Port of Hastings Corporation to undertake a flora and fauna assessment of 5 Long Island Drive which is proposed for development as the Victorian Renewable Energy Terminal.

1.2. Scope of assessment

The objectives of this investigation are to:

- Describe the vascular flora (ferns, conifers, flowering plants), vertebrate fauna (mammals, birds, reptiles, frogs, fishes) and decapod crustacea (e.g. crayfish).
- Map native vegetation and other habitat features.
- Conduct a vegetation quality assessment.
- Undertake targeted survey for threatened species (Swamp Skink *Lissolepis coventryi* and Glossy Grass Skink *Pseudemoia rawlinsoni*).
- Review potential implications of relevant biodiversity legislation and policy, including Victoria's Guidelines for the removal, destruction or lopping of native vegetation ('the Guidelines').
- Identify high-level potential implications of the proposed development and provide recommendations to assist with development design.
- Recommend any further assessments of the study area that may be required.

1.3. Location of the study area

The study area is located within part of the Old Tyabb Reclamation Area, approximately 3 kilometres east of Hastings and approximately 50 kilometres south, south-east of Melbourne (Figure 1). It encompasses approximately 25 hectares of public land and the adjacent road reserve. It is zoned Port Zone (VC112).

The study area is within the:

- Gippsland Plain Bioregion
- Management area of Melbourne Water
- Mornington Peninsula Shire.

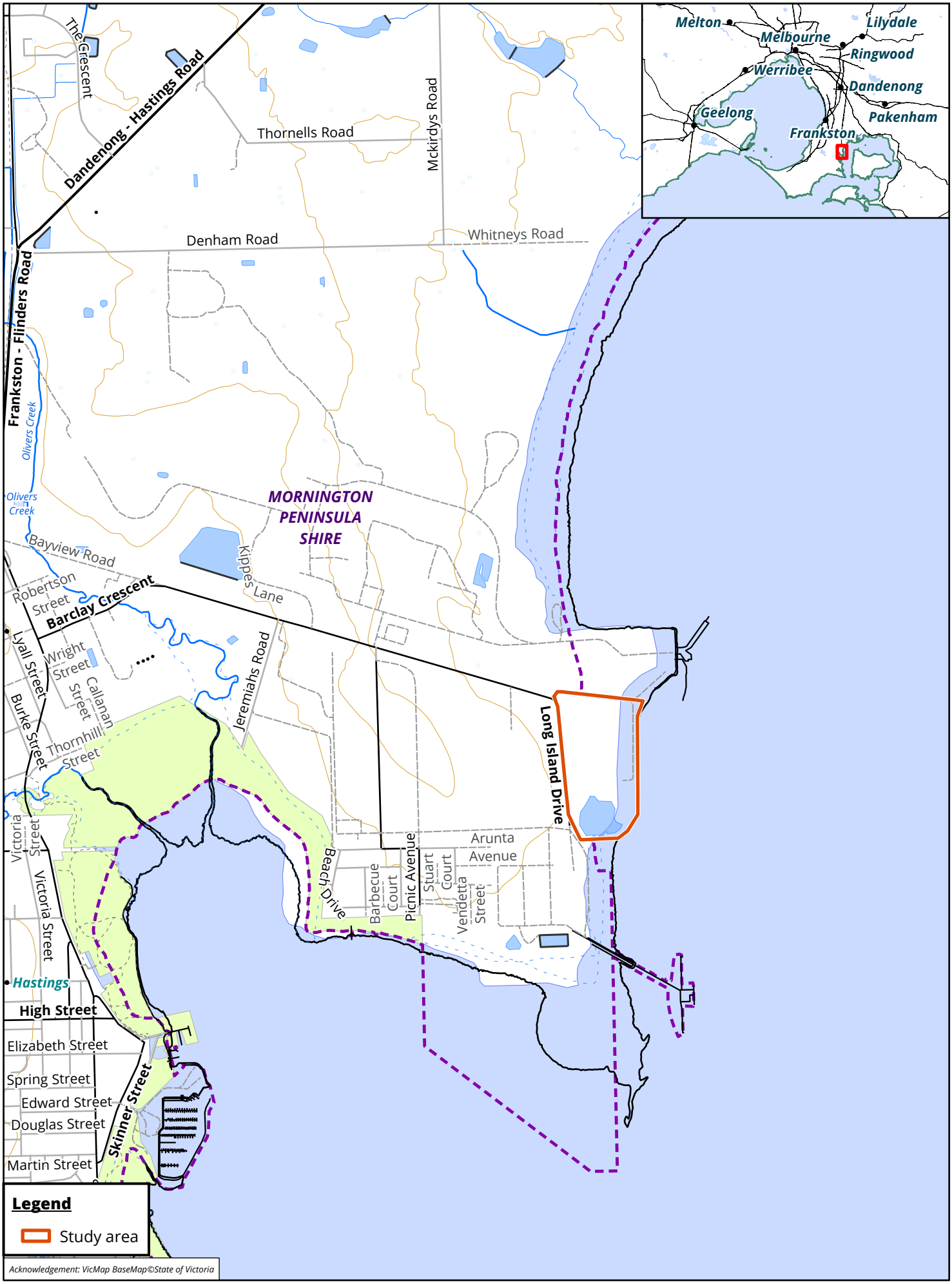

Figure 1 Location of the study area - Long Island Drive, Hastings, Victoria

Matter: 38023,
Date: 31 October 2022 ,
Prepared for: JB, Prepared by: SB, Last edited by: sblades
Layout: 38023_F1_Locality
Project: P:\38000s\38023\Mapping\38023_TerrestrialEcologicalAssessment_PortOfHastings.aprx

0 250 500 750 1,000
Metres
Scale: 1:25,000 @ A4
Coordinate System GDA 1994 MGA Zone 55

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2. Methods

2.1. Database review

In order to provide a context for the study area, information about flora and fauna from within 5 kilometres of the study area (the 'local area') was obtained from relevant biodiversity databases, many of which are maintained by the Victorian Government Department of Energy, Environment and Climate Action (DEECA (formerly DELWP)) or the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW). Records from the following databases were collated and reviewed:

- DEECA'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 *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Other sources of biodiversity information were examined including:

- DEECA's NatureKit mapping tool.
- DEECA's Habitat Importance maps.
- DEECA's Native Vegetation Information Management (NVIM) system.
- DEECA's Ensym NVR Tool Support team was provided with site-based spatial information in order to generate a Native Vegetation Removal Report for the study area.
- Planning Scheme overlays relevant to biodiversity based on http://planningschemes.dpcd.vic.gov.au.
- Birdlife Australia New Atlas.
- Biosis Research 2009. Flora and fauna assessment of Port of Hastings Stage One Investigation Area, Victoria. Report for AECOM Pty Ltd. Authors Mark Venosta, Steve Mueck and Chris Bloink, Biosis Research Pty Ltd, Melbourne. Project no. 7540 & 7930.
- Biosis Research 2011. Port of Hastings Stage 1 Investigation Area: Threatened flora and fauna survey and habitat hectare assessment. Report for Port of Melbourne Corporation. Authors Mark Venosta, Steve Mueck and Chris Bloink, Biosis Research Pty Ltd, Melbourne. Project no. 11173.
- Biosis 2019. Gas Import Jetty and Pipeline Project: Terrestrial and freshwater biodiversity existing conditions and impact assessment. Report for APA and AGL. Biosis Pty Ltd, Melbourne. Project no. 28957.
- Ecocentric 2016. Due diligence report: 2 Long Island Drive, Hastings 3915 (Lot 39 LP3732). Ecocentric, North Melbourne, 1 December 2016.
- Ecocentric 2021. Ecological Due Diligence Assessment: 5 Long Island Drive, Hastings. Ecocentric, North Melbourne, 4 May 2021.

It should be noted that DEECA biodiversity databases have restricted records of many significant reptile species in efforts to protect them from illegal collection. As a consequence, records of threatened Swamp Skink and Glossy Grass Skink within the local area are not available for inclusion in records or mapping in this report.

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/or *Flora and Fauna Guarantee Act 1988* (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

National	Listed as 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. The habitat value for threatened species is calculated by the Habitat Importance Modelling produced by DEECA (DELWP 2017a). Where threatened species are recorded in the study area this is noted in Appendix A (flora) and Appendix B (fauna).

Threatened species which have at least medium likelihood of occurrence are given further consideration in this report. The need for targeted survey for these species is also considered.

2.4. Site investigation

2.4.1. Flora assessment

The flora assessment was undertaken on 29 September 2022 and a list of flora species was collected (#38023). This list will be submitted to DEECA for incorporation into the Victorian Biodiversity Atlas. Planted species have not been recorded unless they are naturalised.

Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs, and grasses' (Clause 73.01).

The Guidelines classify native vegetation into two categories (DELWP 2017a):

- A **patch** of native vegetation (measured in hectares) is either:

- An area of native vegetation, with or without trees, where at least 25% of the total perennial understorey cover is native plants.
- An area with three or more native canopy trees where the drip line (i.e. the outermost boundary of a tree canopy) of each tree touches the drip line of at least one other tree, forming a continuous canopy.
- Any mapped wetland included in the Current wetlands map, available in DEECA systems and tools.

Patch vegetation is classified into ecological vegetation classes (EVCs). An EVC contains one or more floristic (plant) communities and represents a grouping of broadly similar environments. Definitions of EVCs and benchmarks (condition against which vegetation quality at the site can be compared) are determined by DEECA.

- A **scattered tree** is defined as a native canopy tree that does not form part of a patch of native vegetation.

A canopy tree is a mature tree that is greater than three metres in height and is normally found in the upper layer of a vegetation type. Ecological vegetation class descriptions provide a list of the typical canopy species. A scattered tree is defined as either small or large and is determined using the large tree benchmark for the relevant EVC. The extent of a small, scattered tree is the area of a circle with a 10 metre radius (i.e. 0.031 hectares), while the extent of a large scattered tree is a circle with a 15 metre radius (i.e. 0.070 hectares). A condition score is applied to each scattered tree based on information provided by DEECA's NVIM.

A Vegetation Quality Assessment (VQA) was undertaken for all patches of native vegetation identified in the study area. This assessment is consistent with DEECA's habitat hectare method (DSE 2004) and the Guidelines (DELWP 2017a). For the purposes of this assessment the limit of the resolution for identification of a patch of native vegetation was taken to be 0.001 habitat hectares (Hha). That is, if a discrete patch of native vegetation was present with sufficient cover but its condition and extent would not have resulted in the identification of at least 0.001 habitat hectares, the vegetation patch of vegetation was not mapped or included in the assessment.

Where relevant, notes were made on specific issues such as noxious weed infestations, evidence of management works, current grazing impacts and the regeneration capacity of the vegetation.

Species nomenclature for flora follows the Victorian Biodiversity Atlas (VBA).

2.4.2. Fauna assessment

The study area was investigated on 29 September 2022 to determine its values for fauna. These were determined primarily on the basis of the types and qualities of habitat(s) present. All species of fauna observed during the assessment were noted and active searching for fauna was undertaken. This included direct observation, searching under rocks and logs, examination of tracks and scats and identifying calls. Particular attention was given to searching for threatened species and their habitats. Fauna species were recorded with a view to characterising the values of the site and the investigation was not intended to provide a comprehensive survey of all fauna that has potential to utilise the site over time.

In addition to the general fauna assessment, targeted surveys were undertaken for Swamp Skink and Glossy Grass Skink. Tile grids comprising between 25 to 50 roof tiles per grid, were established at three sites within the study area, where suitable habitat for each of these species was identified. There are no DEECA standards on which to base the frequency of checking for either target species, however we have adopted an approach which has been demonstrated by herpetologists that work on both species to be most effective at detecting presence (Jules Farquhar, Monash University *pers comm.*). Tiles were be checked weekly, for a total of five survey days, with the first check conducted on 14 October 2022. During each survey day, tile grids were

checked in the morning and again in the late afternoon. Further details on the surveys methods and results are provided in Section 3.5.

2.4.3. Permits

Biosis undertakes flora and fauna assessments under the following permits and approvals:

- Wildlife Authorisation issued by DEECA under the *Victorian Wildlife Act 1975* (Permit Number 10010193).
- Permit to Take/Keep Protected Flora issued by DEECA under the *Flora and Fauna Guarantee Act 1988* (FFG Act) (Permit Number 10010194).
- Permit to Take Protected Fish issued by DEECA under the *Flora and Fauna Guarantee Act 1988* (FFG Act) (Permit Number 10010195).
- Permit to Conduct Research in areas managed by the Parks Victoria issued by DEECA under the *National Parks Act 1975*, *Crown Land (Reserves) Act 1978* and *Parks Victoria Act 2018* (Permit Number 10010071).
- Permit to catch and release fish issued by the Victorian Fisheries Authority under the *Victorian Fisheries Act 1995* (Permit Number RP 1220, Personal File Number 13041).
- Approvals 18.21 and 20.21 issued by the Wildlife and Small Institutions Animal Ethics Committee of the Victorian Government Department of Economic Development, Jobs, Transport and Resources (DEDJTR).
- Scientific Procedures Fieldwork Licence issued by DEDJTR's Wildlife and Small Institutions Animal Ethics Committee (Licence Number 20020).

2.5. Qualifications

Ecological surveys provide a sampling of flora and fauna at a given time and season. There are a number of reasons why not all species will be detected at a site during survey, such as low abundance, patchy distribution, species dormancy, seasonal conditions, and migration and breeding behaviours. In many cases these factors do not present a significant limitation to assessing the overall biodiversity values of a site.

The current flora and fauna assessment was conducted in spring, which is an optimal time for survey. The site has also been assessed previously by Biosis and any additional species noted by these assessments is also considered by this assessment. There are, therefore, no seasonal external factors which limit the results. However, the high levels of rainfall recently experienced throughout Victoria may have impacted conditions within the study area and resulted in different conditions to those experienced in previous years. Therefore, this has been considered throughout the report and particularly when interpreting the results.

Native Vegetation Removal Reports are prepared through DEECA's NVIM system or requested through DEECA's Ensym NVR Tool Support team. Biosis supplies relevant site-based spatial information as inputs to DEECA and we are entirely reliant on DEECA's output reports for all assessment pathway applications. Biosis makes every effort to ensure site and spatial information entered into the NVIM, or supplied to DELWP, is an accurate reflection of proposed native vegetation removal. The Native Vegetation Removal Report can be viewed in Appendix D.

2.6. Legislation and policy

Biodiversity values of the project site were considered 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.
- Guidelines for the removal, destruction or lopping of native vegetation (DELWP 2017a).
- Native Vegetation Management Plans prepared by Catchment Management Authorities.
- *Planning and Environment Act 1987* – specifically Clauses 12.01-2, 52.17 and 66.02 and Overlays in the Mornington Peninsula Planning Scheme.
- Noxious weeds and pest animals lists under the *Catchment and Land Protection Act 1994* (CaLP Act).
- *Environment Effects Act.*

2.7. Mapping

The Port of Hastings supplied spatial information indicating the extent of the study area.

Mapping was conducted using hand-held GPS-enabled tablets and aerial photo interpretation. The accuracy of this mapping is therefore subject to the accuracy of the tablets (generally ± 7 metres) and dependent on the limitations of aerial photo rectification and registration.

Mapping has been produced using a Geographic Information System (GIS). Electronic GIS files which contain our flora and fauna spatial data are available to incorporate into design concept plans. However, this mapping may not be sufficiently precise for detailed design purposes.

3. Results

The ecological features of the study area are described below and mapped in Figure 2. Photos of the study area are shown in Appendix C.

Species recorded during the flora and fauna assessment are listed in Appendix A (flora) and Appendix B (fauna). Unless of particular note, these species are not discussed further.

Lists of threatened species recorded or predicted to occur in the local area are also provided in those appendices, along with an assessment of the likelihood of the species occurring within the study area.

3.1. Vegetation and fauna habitat

The study area is a constructed environment with this land previously being part of Western Port and the associated foreshore. The current landform was established through the placement of fill and the construction of the southern bund wall, access roads and drainage channels. Most of the vegetation present is therefore not indigenous to the site, having been either planted or colonised within the placement of fill and subsequent sculptured landform. The types of vegetation identified below are mapped in Figure 2.

The majority of the reclamation area is relatively flat land and supports introduced pasture dominated by Toowoomba Canary-grass *Phalaris aquatica*, Yorkshire Fog *Holcus lanatus*, Tall Fescue *Festuca arundinacea* and a variety of other common pasture weeds. This area supports virtually no indigenous flora species, and as it is regularly slashed presents little value to fauna. Some reptiles may occasionally traverse this area when moving between more favourable habitat patches around the fringe of the study area. During the on-site inspection a single Garden Skink *Lampropholis guichenoti* was observed among the slashed grass, while a large Lowland Copperhead *Austrelaps superbus* was observed within the slashed grass in the southern section of the study area during the first round of tile checks on 14 October 2022. Both Blotched Blue-tongue Lizard *Tiliqua nigrolutea* and Common Blue-tongue Lizard *T. scincoides* were recorded opportunistically in the northern and southern sections of the study area while conducting targeted surveys.

To the south is an area dominated by the introduced species Pampas Grass *Cortaderia selloana*. This also supports scattered occurrences of Common Reed *Phragmites australis*. To the south the land is of lower relief and appears to be more regularly inundated and is influenced by saline conditions. This area is dominated by Spiny Rush *Juncus acutus* although Sea Rush *Juncus kraussii* is also common, however, the band of rush dominated vegetation was not considered to support enough native vegetation cover to be defined as a patch. This area may provide suitable habitat for reptiles and foraging potential for common avifauna.

Where the fill is at its lowest level the reclamation area currently supports a broad area of open water with patches of Common Reed. Previous assessments, including Biosis 2011 and Ecocentric 2021, have classified this area as Coastal Saltmarsh (EVC 9). While this is likely to be accurate when water levels are low, the current level of inundation and species of native vegetation observed is not consistent with that classification. This type of change is not uncommon with wetland vegetation, particularly in un-natural engineered environments. In addition, the high levels of rainfall recently experience may have contributed further to these changes through increasing freshwater input into the system. As the Guidelines require assessments to be conducted based on current conditions, this vegetation is assessed as Tall Marsh (EVC 821). Tall Marsh and particularly the wetland habitat in the southern section may also support wetland birds, amphibians and reptiles. During the site assessment common waterbirds including Black Swan *Cygnus atratus*, Australian White Ibis *Threskiornis molucca*, Pacific Black Duck *Anas superciliosa* and Australian Shell Duck *Tadorna*

tadornoides were regularly seen. In addition, Welcome Swallow *Hirundo neoxena* and Golden-headed Cisticola *Cisticola exilis* were abundant throughout this area. Three species of amphibians were heard calling throughout the marsh including Pobblebonk *Limnodynastes dumerilii*, Spotted Marsh Frog *Limnodynastes tasmaniensis* and Common Froglet *Crinia signifera*. Several species of skink, including the EPBC Act and FFG Act listed Swamp Skink and the FFG Act listed Glossy Grass Skink were recorded along the fringing habitat of the wetland.

An area of Tall Marsh (EVC 821) has established within a drainage channel parallel to the northern boundary of the reclamation area. This seasonally inundated area is dominated by Narrow-leaf Cumbungi *Typha domingensis* and Sea Rush. Pampas Grass and Spiny Rush are common weeds in this environment, which provides habitat for the same amphibian and reptile fauna as recorded in the southern section of the study area. Glossy Grass Skink in particular, were recorded in relatively high numbers along the fringing vegetation of this northern drain as well as Swamp Skink, Weasel Skink *Saproscincus mustelinus*, Garden Skink and Lowland Copperhead. Further detail regarding Swamp Skink and Glossy Grass Skink is provided below.

The northern margin of this area of Tall Marsh has been colonised by a scrub dominated by Coast Tea-tree *Leptospermum laevigatum* and Sallow Wattle *Acacia longifolia* subsp. *longifolia*. While the latter is not a species indigenous to the Mornington Peninsula, it is native to Victoria and can contribute to the definition of a patch of native vegetation. Other native species are rare in this vegetation. Our assessment classified this vegetation as Damp Sands Herb-rich Woodland (EVC 3) which is considered to be the most similar type of natural vegetation in this area.

Similarly, vegetation established along the southern bund wall between the flat portions of the reclamation area, the natural areas of Coastal Saltmarsh, Mangrove Shrubland and Coastal Scrub south of the study area, has been colonised by a number of locally indigenous shrub species including Coast Tea-tree, Hedge Wattle *Acacia paradoxa*, Coast Beard-heath *Leucopogon parviflorus*, Large-leaf Bush-pea *Pultenaea daphnoides* and Drooping Sheoak *Allocasuarina verticillata*. This vegetation also includes a number of ground cover species such as Spear-grass *Austrostipa* spp., Wallaby-grass *Rytidosperma* spp., Black-anther Flax-lily *Dianella revoluta* s.l. and Cranberry Heath *Styphelia humifusa*. Some of these species may have been established as part of historical revegetation works. This vegetation is also classified as Damp Sands Herb-rich Woodland (EVC 3) which is considered to be the most similar type of natural vegetation in this area.

A narrow band of remnant Damp Sands Herb-rich Woodland (EVC 3) also occurs along Long Island Drive. This vegetation is typically associated with the existing powerline easement and is relatively species rich, comprising the highest number of native species recorded for the study area. Common species in this area of native vegetation include Veined Spear-grass *Austrostipa rudis*, Hedge Wattle, Coastal Tea-tree, Cherry Ballart *Exocarpos cupressiformis* and Golden Wattle. The balance of the road reserve of Long Island Drive has been planted with species commonly used in landscape plantings such as Spotted Gum *Corymbia maculata* and Radiata Pine *Pinus radiata* or invaded by non-indigenous species such as Sallow Wattle, Sweet Pittosporum *Pittosporum undulatum*, Flax-leaf Broom *Genista linifolia*, Montpellier Broom *Genista monspessulana*, Boneseed *Chrysanthemoides monilifera* and Common Blackberry *Rubus anglocandicans*. Two scattered native trees, both Manna Gum, were identified within this otherwise planted vegetation.

Vegetation along the northern margin of the reclamation area and along Long Island Drive provides suitable habitat for a range of avifauna and may also support some ground-dwelling fauna including reptiles and small mammals.

The current foreshore of the reclamation area is dominated by rocky fill which has been partly colonised by introduced species such as Pampas Grass and Flax-leaf Broom. While scattered native shrubs occur in this environment, no areas extensive enough to be identified as a patch of native vegetation were identified. The intertidal area immediately beyond the foreshore comprises sand flats which have been mapped previously

as secondary waterbird foraging habitat. During low tide this area may provide some potential foraging opportunities for shorebirds.

3.2. Landscape context

The reclamation area is adjacent to Western Port. While it represents an artificial terrestrial environment and is largely clear of native vegetation, the narrow strip of native and planted vegetation along Long Island Drive does provide a narrow corridor of treed vegetation. This narrow corridor provides some level of habitat connectivity between relatively large areas of remnant native coastal vegetation to the north and similar remnant native vegetation associated with the foreshore of Long Island Point to the south.

3.3. Threatened species and ecological communities

A summary of those species recorded or with a medium or higher likelihood of occurring in the study area is provided in Table 2. Threatened species recorded or predicted to occur within 5 kilometres of the study area or from the relevant catchment (aquatic species) show in Figure 3 (flora) and Figure 4 (fauna) and are listed in Appendix A (flora) and Appendix B (fauna). An assessment of the likelihood of these species occurring in the study area and an indication of where within the site (i.e. which habitats or features of relevance to the species) is included.

Due to the artificial nature of the site and its lack of continuity with Western Port, no threatened flora species are considered likely to occur within the reclamation area.

A total of 24 threatened fauna species are considered to have a medium or higher likelihood of occurrence within the study area including nine EPBC Act and 15 FFG Act listed species (Table 2). Seven of the EPBC Act listed species are also listed under the FFG Act. The bulk of the listed threatened species comprise shorebirds and waterbirds. Western Port is considered to be one of the most important sites for waterbirds in Victoria and is recognized as a wetland of international significance for migratory shorebirds, largely contributing to its listing as a Ramsar site (Kellogg et al 2010). Waterbird habitat throughout Western Port has been mapped extensively to indicate roosting sites as well as primary and secondary foraging habitat (Hansen et al. 2011).

Accordingly, the shoreline habitat adjacent to the study area (along the eastern edge) is considered to be secondary foraging habitat, which may occasionally support waterbirds. Areas of greater importance to waterbirds include Long Island Spit, located approximately one kilometre south of the study area. It provides roosting habitat, and the intertidal area within Hastings Bight which is considered to be primary foraging habitat for waterbirds. In addition, Western Port Coastal Reserve is located approximately four kilometres north-east of the study area and has also been identified as a primary waterbird foraging habitat.

While the study area itself does not provide primary foraging or roosting habitat for waterbirds, it is possible that some of these species may occasionally occur in the adjacent secondary foraging areas and as such, cannot be excluded from consideration. Within the study area itself, the drainage line in the northern section may provide occasional habitat for wetland birds. Furthermore, the Tall Marsh wetland area in the southern portion of the study area, in its current state, may provide occasional habitat for some species of waterbirds. Previously, this area has been mapped as Coastal Salt Marsh, which is likely to be the case when water levels recede. During these phases, this area may provide occasional foraging habitat for migratory and resident shorebird species which forage along sand and mudflats. Given the high levels of rainfall experienced prior to the site assessment, it is recommended to undertake further assessments over longer time periods to accurately assess the value of the wetland area to shorebirds and waterbirds, particularly during drier periods when potential shorebird foraging habitat may be present. Surveys should be focussed during the Summer and Autumn months to overlap with the presence of the majority of migratory shorebird species.

In its current state, it is possible that the wetland could occasionally support species that prefer deeper water, open lake settings such as the FFG Act listed Australasian Shoveler *Spatula rhynchotis*, Hardhead *Aythya australis*, Blue-billed Duck *Oxyura australis* and Musk Duck *Biziura lobata*. Other species of waterbirds such as Black Swan, Pacific Black Duck and Australian Shelduck were consistently seen within this wetland habitat during the site inspection and subsequent targeted surveys for reptiles. However, given the seemingly dynamic nature of the wetland area, particularly the likelihood that it will revert to Salt Marsh when water levels recede, it is unlikely that these species would occur here consistently. As such, we consider these four FFG Act listed species have a low overall likelihood of occurrence within the study area.

White-throated Needletail *Hirundapus caudacutus* may utilise the aerial space above the study area. This species has been recorded to roost overnight in large trees and while there are limited potential roost sites in the study area, there is a possibility that these birds may utilise large trees in the surrounding region. The reclamation area may occasionally support large raptors such as the FFG Act listed White-bellied Sea-Eagle and Little Eagle, with the former having been recorded regularly within the local area.

The reclamation area supports suitable habitat for Swamp Skink and Glossy Grass Skink. As of March 2023, Swamp Skink is listed as endangered under the EPBC Act and both of these species are listed as endangered under the FFG Act. Glossy Grass Skink is currently under assessment for potential listed as threatened under the EPBC Act. The presence of both species has been confirmed through targeted surveys within the reclamation area. Results of the targeted surveys are discussed further in Section 3.5. As noted above, DEECA biodiversity databases have restricted records of significant reptile species and records of Swamp Skink and Glossy Grass Skink within the local area are not available for inclusion in records or mapping in this report. Nonetheless, Biosis has recorded these species within suitable habitats in nearby portions of the Western Port coastal zone.

Table 2 Summary of EPBC Act and FFG Act listed species most likely to occur in the study area

Species name	Listing status	Area of value within the study area
Australasian Bittern	Endangered under EPBC Act Endangered under FFG Act	Tall Marsh within the southern portion of the study area and possibly the northern drainage line.
White-throated Needletail	Vulnerable under EPBC Act Vulnerable under FFG Act	Aerial space above the study area and occasionally may utilise tall trees on the northern boundary and along Long Island drive.
Bar-tailed Godwit	Vulnerable under EPBC Act	Intertidal habitat adjacent to the eastern edge of the study area and potentially may also utilise the wetland habitat in the southern section if the water recedes and provides foraging opportunity.
Australian Fairy Tern	Vulnerable under EPBC Act	Intertidal and sub-tidal habitat to the eastern edge of the study area and may also utilise the current open water within the southern Tall Marsh habitat.
Eastern Curlew	Critically endangered under EPBC Act Vulnerable under FFG Act	Intertidal habitat adjacent to the eastern edge of the study area and potentially may also utilise the wetland habitat in the southern section if the water recedes and provides foraging opportunity.

Species name	Listing status	Area of value within the study area
Curlew Sandpiper	Critically endangered under EPBC Act Critically endangered under FFG Act	Intertidal habitat adjacent to the eastern edge of the study area and potentially may also utilise the wetland habitat in the southern section if the water recedes and provides foraging opportunity.
Red Knot	Endangered under EPBC Act Endangered under FFG Act	Intertidal habitat adjacent to the eastern edge of the study area and potentially may also utilise the wetland habitat in the southern section if the water recedes and provides foraging opportunity.
Great Knot	Critically endangered under EPBC Act Critically endangered under FFG Act	Intertidal habitat adjacent to the eastern edge of the study area and potentially may also utilise the wetland habitat in the southern section if the water recedes and provides foraging opportunity.
Swamp Skink	Endangered under EPBC Act Endangered under FFG Act	Tall Marsh and adjacent habitat in the southern and northern sections of the study area.
Lewin's Rail	Vulnerable under FFG Act	Tall Marsh within the southern portion of the study area and possibly the northern drainage line.
Little Egret	Endangered under FFG Act	Tall Marsh within the southern portion of the study area and possibly the northern drainage line.
Plumed Egret	Vulnerable under FFG Act	Tall Marsh within the southern portion of the study area and possibly the northern drainage line.
Eastern Great Egret	Vulnerable under FFG Act	Tall Marsh within the southern portion of the study area and possibly the northern drainage line.
Little Eagle	Vulnerable under FFG Act	Large trees along the northern boundary and along Long Island drive. Cleared habitat within the centre of the reclamation area may provide opportunities to forage on rabbits.
White-bellied Sea-Eagle	Endangered under FFG Act	Large trees along the northern boundary and along Long Island drive for roosting. May utilise the adjacent marine habitat and the wetland habitat in the southern section of the study area to forage.
Caspian Tern	Vulnerable under FFG Act	Intertidal and sub-tidal habitat to the eastern edge of the study area and may also utilise the current open water within the southern Tall Marsh habitat.
Little Tern	Critically endangered under FFG Act	Intertidal and sub-tidal habitat to the eastern edge of the study area and may also utilise the current open water within the southern Tall Marsh habitat.

Species name	Listing status	Area of value within the study area
Ruddy Turnstone	Endangered under FFG Act	Intertidal habitat adjacent to the eastern edge of the study area and potentially may also utilise the wetland habitat in the southern section if the water recedes and provides foraging opportunity.
Pacific Golden Plover	Vulnerable under FFG Act	Intertidal habitat adjacent to the eastern edge of the study area and potentially may also utilise the wetland habitat in the southern section if the water recedes and provides foraging opportunity.
Whimbrel	Endangered under FFG Act	Intertidal habitat adjacent to the eastern edge of the study area and potentially may also utilise the wetland habitat in the southern section if the water recedes and provides foraging opportunity.
Grey-tailed Tattler	Critically endangered under FFG Act	Intertidal habitat adjacent to the eastern edge of the study area and potentially may also utilise the wetland habitat in the southern section if the water recedes and provides foraging opportunity.
Common Sandpiper	Vulnerable under FFG Act	Intertidal habitat adjacent to the eastern edge of the study area and potentially may also utilise the wetland habitat in the southern section if the water recedes and provides foraging opportunity.
Common Greenshank	Endangered under FFG Act	Intertidal habitat adjacent to the eastern edge of the study area and potentially may also utilise the wetland habitat in the southern section if the water recedes and provides foraging opportunity.
Glossy Grass Skink	Endangered under FFG Act	Tall Marsh and adjacent habitat in the southern and northern sections of the study area.

In addition to the fauna species listed in the table above, recent due diligence assessments of the Old Tyabb Reclamation Area (Ecocentric 2016, 2021) have highlighted the potential for several EPBC Act and FFG Act listed fauna to occur within the site, based on the availability of potentially suitable habitat. Below we provide context for our identification of these species as unlikely to occur within the study area.

- **Orange-bellied Parrot *Neophema chrysogaster*** – Orange-bellied Parrots have been recorded at various locations around Western Port. Orange-bellied Parrots and Blue-winged Parrots sometimes occur as mixed flocks and they have very similar ecological requirements. At present the wetland in the southern portion of the site does not support saltmarsh habitat for the species although it has been known to do so under drier conditions. While the study area may occasionally provide some suitable saltmarsh habitat when the water level recedes, the site currently does not offer substantial habitat to support the species and weed species at the site are not known food plants. Targeted surveys for *Neophema* parrots have previously been conducted both within the reclamation area and surrounds but have not detected the species (Biosis Research 2011). It is considered unlikely that the species occurs within the study area.

- **Blue-winged Parrot *Neophema chrysostoma*** – Blue-winged Parrots have been recorded at various locations around Western Port. Blue-winged Parrots and Orange-bellied Parrots sometimes occur as mixed flocks and they have very similar ecological requirements. At present the wetland in the southern portion of the site does not support saltmarsh habitat for the species although it has been known to do so under drier conditions. While the study area may occasionally provide some suitable saltmarsh habitat when the water level recedes, the site currently does not offer substantial habitat to support the species and weed species at the site are not known food plants. Targeted surveys for *Neophema* parrots have previously been conducted both within the reclamation area and surrounds but have not detected the species (Biosis Research 2011). It is considered unlikely that the species occurs within the study area.

- **Swift Parrot *Lathamus discolor* –** It is possible that Swift Parrot may occasionally occur within the study area during migratory movements between Tasmania and mainland Australia. However, there are no recent records of the species within the local area and the reclamation area does not support habitat suitable for this species. As such, it is unlikely that Swift Parrot utilise the study area.

- **Southern Brown Bandicoot *Isoodon obesulus obesulus* –** Suitable habitat for the species is present on site (i.e. Damp Sands Herb-rich Woodland along property margins, as well as large areas of Pampas Grass and Blackberry thicket). However, targeted surveys conducted within the study area and surrounds (Biosis Research 2009) have not recorded the species. While there are some records from prior to 2009 within the local area (Legg 2006), due to previous land-use disturbances and the general population decline within the Port Phillip and Western Port region, it is considered unlikely they now occur within the study area.

- **Southern Toadlet *Pseudophryne semimarmorata* –** The majority of aquatic habitat within the study area is dominated by Tall Marsh, which is not considered suitable habitat for Southern Toadlet. In addition, despite extensive targeted surveys within the reclamation area and surrounds, the species was not documented and it is therefore concluded that Southern Toadlet are unlikely to occur within the study area.

- **Flatback Mangrove Goby *Mugilogobius platynotus* –** This species was recorded within the Mangrove habitat immediately south of the study area by Biosis Research (2011). However, there appears to be no connectivity between these areas and the inundated Tall Marsh area within the southern section of the study area. While the species is likely to persist in the surrounding mangrove habitat, with no connectivity it is unlikely that Flatback Mangrove Goby occurs within the study area.

3.3.1. DEECA habitat importance modelling for threatened species

To support decision making under the Guidelines, DEECA has produced maps for Victoria showing the modelled extent of habitat for most threatened species. These maps are called 'habitat importance maps' and they assign a 'habitat importance score' to a location based on the importance of that location in the landscape as habitat for a particular threatened species, in relation to other suitable habitat for that species (DELWP 2017a).

Under the Guidelines, these maps form the basis for determining the impact of potential native vegetation removal on threatened species. The maps only apply where a proposal to remove native vegetation is considered on detailed assessment pathway. The habitat importance scores are used to calculate the type and extent of biodiversity offsets required for native vegetation removal that impacts on individual threatened species habitat.

A summary of those species for which habitat is modelled in the study area is provided in the Native Vegetation removal report by DEECA's Ensym NVR Tool Support team (Appendix D). A number of these

species have database records within the local area (Appendix A, Appendix B). However, only two of these species Glossy Grass Skink and Swamp Skink have been recorded recently within the study area during targeted surveys.

Determination of the requirement for a species offset based on the extent of impact to one or more rare or threatened species is addressed in Section 5.

3.3.2. Threatened ecological communities

The artificial nature of the study area means that much of the patches of vegetation present has resulted from the few native species capable of recolonising the artificial habitat created by the land reclamation process. Damp Sands Herb-rich Woodland is considered a vulnerable EVC within the Gippsland Plain Bioregion. However, only the modified remnants of this EVC occurring along Long Island Drive are natural remnants of this EVC and could be considered to have conservation value for native vegetation. Other examples are species poor collections of native species which have colonised an artificial substrate and this EVC is taken as the best fit for allocating a class to this vegetation which otherwise did not exist prior to the placement of fill.

None of the vegetation present represents vegetation identifiable as an EPBC Act listed ecological community.

3.4. Other ecological values

The eastern margin and southern third of the reclamation area is mapped by DEECA as a current wetland. While the eastern margin of the reclamation area is subject to the tidal influence of Western Port Bay, it is not a wetland and doesn't hold any water. It is armoured dry land, engineered to prevent erosion of the balance of the reclamation area.

Within the bounds of the reclamation area, the elevated margins along the south of the reclamation area and along Long Island Drive are terrestrial environments that are not known to form part of any wetland, permanent or ephemeral.

The ephemeral wetland environment present in the lower lying areas in the south of the reclamation area is largely dominated by introduced species and is not classified as a patch of native vegetation, even after having been inundated for a number of months. This ephemeral, seasonally inundated area is likely dependant on rainfall for its wetting and drying cycle and it has no direct connection to the bay and the fill used for the reclamation does not appear to be readily permeable to the adjacent seawater. Areas which do support native vegetation have been assessed as such.

3.5. Swamp Skink and Glossy Grass Skink

The Swamp Skink is listed as endangered under the EPBC Act and both it and the Glossy Grass Skink are listed as endangered under the FFG Act.

On 29 September 2022, three grids were established within suitable habitat expected to support these species. Grid 1 was placed along the north-western edge of the Tall Marsh habitat within the southern portion of the study are and comprised 25 tiles (5x5 rows). Grid 3 was placed along the north-eastern edge of this Tall Marsh habitat and comprised 25 tiles (5x5 rows). Grid 3 was placed in a straight line along the northern drainage line and comprised a line of 50 tiles. A total of five targeted surveys were subsequently carried out at each of the three grids between 14 October 2022 and 21 November 2022. During each survey, grids were checked by two suitably qualified ecologists during the morning and again during the late afternoon and all

vertebrate species observed under the tiles recorded. The final results of the targeted surveys are provided in Table 3.

Both Swamp Skink and Glossy Grass Skink were recorded within the study area during targeted surveys for the two species. Locations of the Swamp Skink and Glossy Grass Skink records are shown in Figure 5. A large Swamp Skink was observed along the edge of Grid 1 during the late afternoon check of 14 October 2022. A large Swamp Skink was again recorded in Grid 1 during the morning check on 4 November 2022. Given the territoriality of this species and the large size of the specimen in both observations, it is likely that this was the same individual. Swamp Skink were also recorded consistently in Grid 3 along the northern drainage line, during the third, fourth and fifth surveys with three observations typically recorded per survey across the morning and afternoon checks. No Swamp Skink were recorded in Grid 2. Swamp Skink have previously been recorded to the south of the study area, along the rock wall supporting the Long Island Jetty (Biosis Research 2011). The species is known to occur in coastal habitat to the south of Hastings and is also likely to occur in similar habitat to the north of the study area.

Glossy Grass Skink were recorded consistently across surveys, particularly within Grid 3 along the northern drainage line, where up to 13 individuals were recorded during a single survey. Glossy Grass Skink were also recorded within Grids 1 and 2 in 60% of the surveys, although the species was recorded in substantially lower numbers (one to two observations per survey). In general, a greater number of Glossy Grass Skinks were recorded during the morning checks compared with the afternoon checks. This could be due to increased activity during the afternoon following a rise in ambient temperature, but may also reflect a response to disturbance (i.e. lifting of tiles).

Other reptile species consistently recorded within the tile grids were Weasel Skink, Garden Skink and Lowland Copperhead, while a single Common Blue-tongue Lizard and a single Common Froglet were recorded under tiles in Grid 3. Several Common Blue-tongue and Blotched Blue-tongue Lizards were also recorded in the area surrounding the tile grids.

Overall, the results of the targeted surveys indicate that the study area provides suitable habitat for a range of reptile species, including the threatened Swamp Skink and Glossy Grass Skink. In particular, the vegetation surrounding the drainage line in the north of the study area supports a substantial population of both of these species.

Table 3 Summary of results for Swamp Skink and Glossy Grass Skink targeted surveys

Survey	Date	Check	Grid #	Species recorded (# recorded)
Survey 1	14/10/2022	AM check	1	Weasel Skink (1)
			2	Glossy Grass Skink (1)
			3	Glossy Grass Skink (11) Weasel Skink (9) Lowland Copperhead (1)
		PM check	1	Swamp Skink (1) Weasel Skink (2)
			2	Weasel Skink (1)
			3	Glossy Grass Skink (5) Weasel Skink (4) Lowland Copperhead (1)

Survey	Date	Check	Grid #	Species recorded (# recorded)
Survey 2	28/10/2022	AM check	1	Weasel Skink (1) Glossy Grass Skink (1)
			2	Weasel Skink (4)
			3	Glossy Grass Skink (6) Weasel Skink (12) Garden Skink (4) Lowland Copperhead (3) Common Froglet (1)
		PM check	1	Weasel Skink (4)
			2	-
			3	Glossy Grass Skink (1) Weasel Skink (5) Garden Skink (3) Lowland Copperhead (1)
Survey 3	04/11/2022	AM check	1	Swamp Skink (1) Weasel Skink (4)
			2	Glossy Grass Skink (2)
			3	Glossy Grass Skink (11) Swamp Skink (2) Weasel Skink (16) Garden Skink (12) Lowland Copperhead (1)
		PM check	1	Weasel Skink (2) Garden Skink (2)
			2	Weasel Skink (2)
			3	Glossy Grass Skink (1) Swamp Skink (1) Weasel Skink (11) Garden Skink (3)
Survey 4	15/11/2022	AM check	1	Glossy Grass Skink (1)
			2	Weasel Skink (2)
			3	Glossy Grass Skink (6) Swamp Skink (1) Weasel Skink (3) Garden Skink (6) Lowland Copperhead (1) Common Blue-tongue Lizard (1)

Survey	Date	Check	Grid #	Species recorded (# recorded)
		PM check	1	Weasel Skink (1) Garden Skink (1)
			2	-
			3	Glossy Grass Skink (2) Swamp Skink (2) Weasel Skink (8) Garden Skink (4) Lowland Copperhead (2)
Survey 5	21/11/2022	AM check	1	Weasel Skink (2) Garden Skink (1)
			2	Weasel Skink (5)
			3	Glossy Grass Skink (5) Swamp Skink (2) Weasel Skink (12) Garden Skink (3) Lowland Copperhead (3)
		PM check	1	Glossy Grass Skink (1) Weasel Skink (1)
			2	Glossy Grass Skink (1) Weasel Skink (2)
			3	Glossy Grass Skink (13) Swamp Skink (1) Weasel Skink (5) Garden Skink (11) Lowland Copperhead (2)

3.6. Further survey recommendations

As surveys were conducted under optimal seasonal conditions, the current surveys, in conjunction with other surveys, such as Biosis Research 2011, provide a comprehensive assessment of the biodiversity values present.

However, given the high levels of rainfall experienced prior to undertaking the site assessment and the seemingly dynamic nature of the wetland within the southern section, further assessment may be required to determine the value of the site to shorebirds and waterbirds. Additional surveys of the wetland are part of a program of waterbird surveys for the project that have included summer of 2022-23 and will potentially extend to include further periods when water levels within the wetland recede and potentially provide some resources for waders.

Survey	Date	Check	Grid #	Species recorded (# recorded)
		PM check	1	Weasel Skink (1) Garden Skink (1)
			2	-
			3	Glossy Grass Skink (2) Swamp Skink (2) Weasel Skink (8) Garden Skink (4) Lowland Copperhead (2)
Survey 5	21/11/2022	AM check	1	Weasel Skink (2) Garden Skink (1)
			2	Weasel Skink (5)
			3	Glossy Grass Skink (5) Swamp Skink (2) Weasel Skink (12) Garden Skink (3) Lowland Copperhead (3)
		PM check	1	Glossy Grass Skink (1) Weasel Skink (1)
			2	Glossy Grass Skink (1) Weasel Skink (2)
			3	Glossy Grass Skink (13) Swamp Skink (1) Weasel Skink (5) Garden Skink (11) Lowland Copperhead (2)

3.6. Further survey recommendations

As surveys were conducted under optimal seasonal conditions, the current surveys, in conjunction with other surveys, such as Biosis Research 2011, provide a comprehensive assessment of the biodiversity values present.

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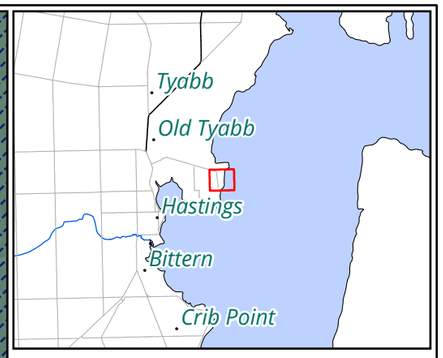


Legend

- Study area
- Scattered tree
- Western Port Ramsar Wetland

Ecological Vegetation Class

- (GipP0003) Damp Sands Herb-rich Woodland
- (GipP0821) Tall Marsh

Figure 2 Ecological features of the study area

0 20 40 60 80 100

Metres

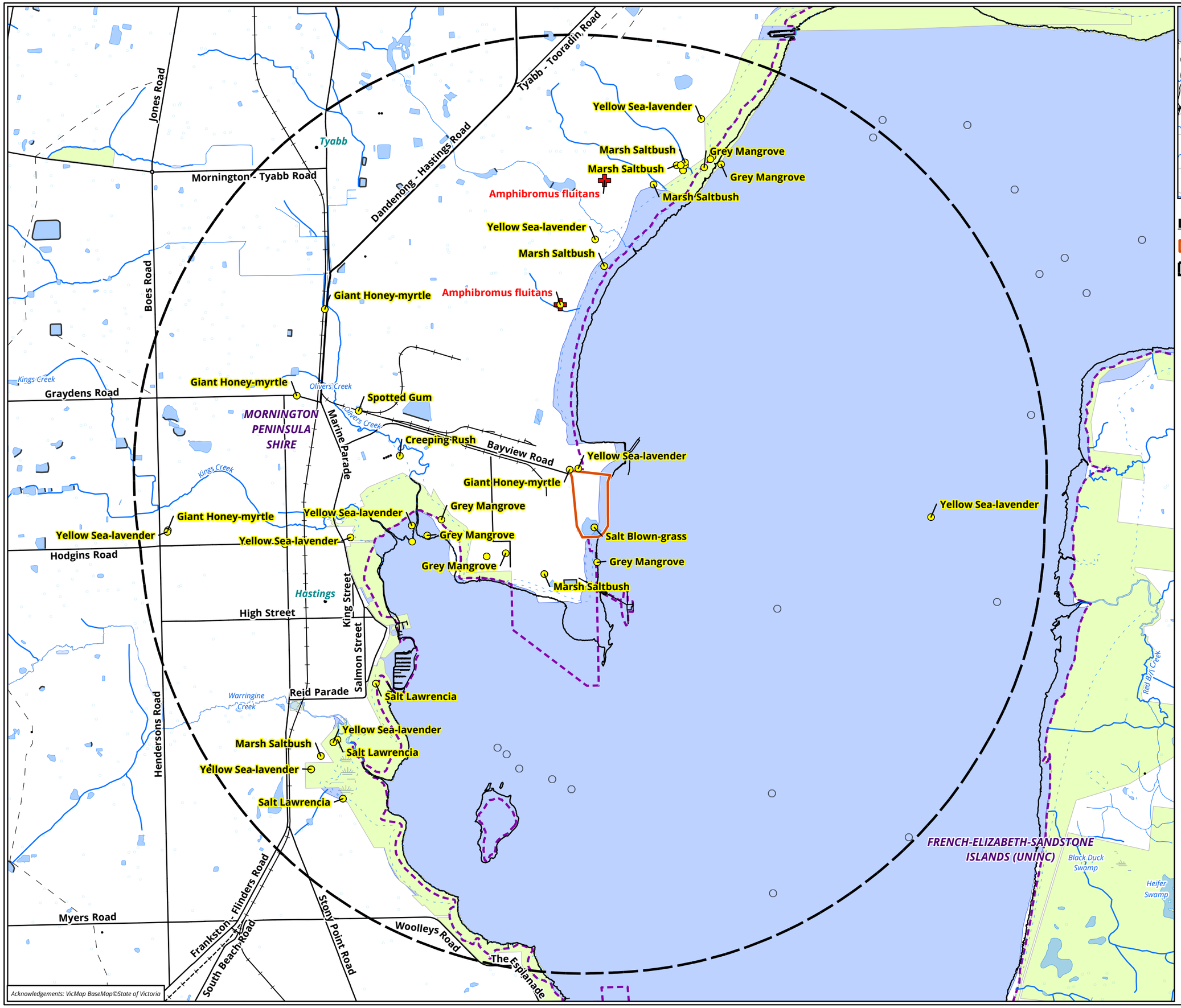
Scale: 1:3,000 @ A3

Coordinate System: GDA 1994 VICGRID94

N

biosis

Matter: 38023,
Date: 10 November 2022,
Prepared for: SM, Prepared by: SB, Last edited by: sblades
Layout: 38023_F2_EcoFeatures
Project: P:\38000s\38023\Mapping\
38023_TerrestrialEcologicalAssessment_PortOfHastings.aprx



Acknowledgements: VicMap BaseMap©State of Victoria

Figure 3 Threatened flora within 5km of the study area

Matter: 38023,
Date: 31 October 2022,
Prepared for: SM, Prepared by: SB, Last edited by: sblades
Layout: 38023_F3_ThrFlora5km
Project: P:\38000s\38023\Mapping\
38023_TerrestrialEcologicalAssessment_PortOfHastings.aprx

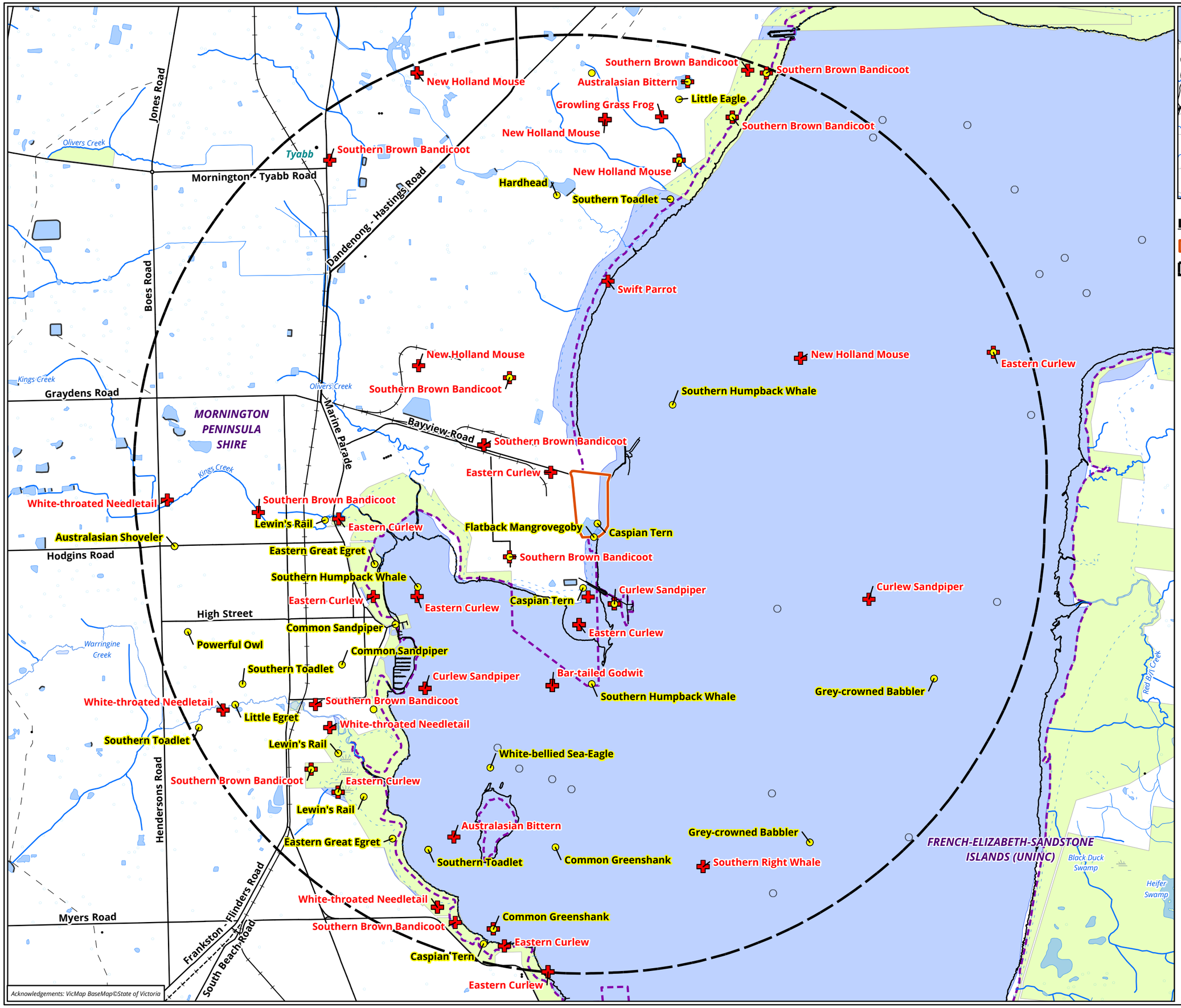
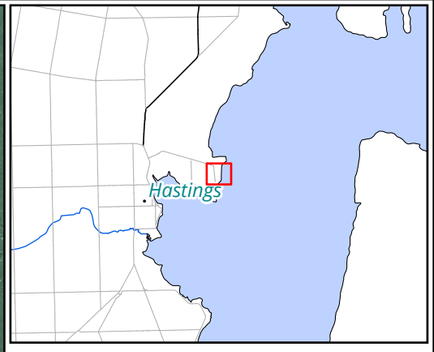


Figure 4 Threatened fauna within 5km of the study area

biosis

Matter: 38023,
Date: 31 October 2022,
Prepared for: SM, Prepared by: SB, Last edited by: sblades
Layout: 38023_F4_ThrFauna5km
Project: P:\38000s\38023\Mapping\38023_TerrestrialEcologicalAssessment_PortOfHastings.aprx



Legend

Study area

Glossy Grass Skink records

AM surveys

PM surveys

Swamp Skink records

PM surveys

Figure 5.1 Survey 1

0 25 50 75 100

Metres

Scale: 1:3,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

N

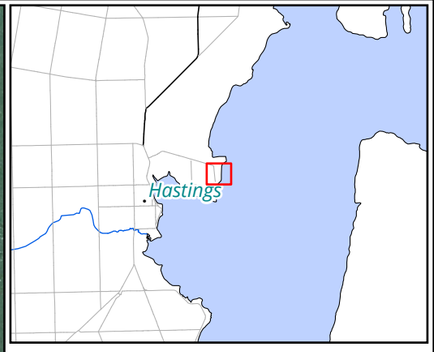
Acknowledgements: VicMap BaseMap©State of Victoria

Matter: 38023,
Date: 11 January 2023,
Prepared for: SM, Prepared by: SB, Last edited by: jturner
Layout: 38023_F5_SkinkSurveys
Project: P:\38000s\38023\Mapping\
38023_TerrestrialEcologicalAssessment_PortOfHastings.aprx

Figure 5.2 Survey 2

biosis

Matter: 38023,
Date: 11 January 2023,
Prepared for: SM, Prepared by: SB, Last edited by: jturner
Layout: 38023_F5_SkinkSurveys
Project: P:\38000s\38023\Mapping\
38023_TerrestrialEcologicalAssessment_PortOfHastings.aprx



Legend

Study area

Glossy Grass Skink records

AM surveys

PM surveys

Swamp Skink records

AM surveys

PM surveys

Figure 5.3 Survey 3

0 25 50 75 100

Metres

Scale: 1:3,000 @ A3

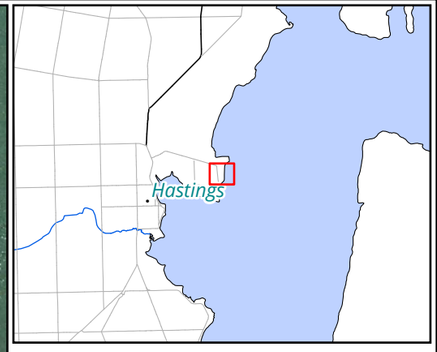
Coordinate System: GDA 1994 MGA Zone 55

N

biosis

Matter: 38023,
Date: 11 January 2023,
Prepared for: SM, Prepared by: SB, Last edited by: jturner
Layout: 38023_F5_SkinkSurveys
Project: P:\38000s\38023\Mapping\
38023_TerrestrialEcologicalAssessment_PortOfHastings.aprx

Acknowledgements: VicMap BaseMap©State of Victoria



Legend

Study area

Glossy Grass Skink records

AM surveys

PM surveys

Swamp Skink records

AM surveys

PM surveys

Figure 5.4 Survey 4

0 25 50 75 100

Metres

Scale: 1:3,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

N

biosis

Matter: 38023,
Date: 11 January 2023,
Prepared for: SM, Prepared by: SB, Last edited by: jturner
Layout: 38023_F5_SkinkSurveys
Project: P:\38000s\38023\Mapping\
38023_TerrestrialEcologicalAssessment_PortOfHastings.aprx

4. Biodiversity legislation and government policy

This section provides an assessment of the project in relation to key biodiversity legislation and government policy. This section does not describe the legislation and policy in detail. Where available, links to further information are provided.

4.1. Commonwealth

4.1.1. 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.

Further information including a guide to the referral process is available at http://www.environment.gov.au/epbc/index.html

The MNES relevant to the project are summarised in Table 4. It includes a general assessment against the EPBC Act policy statements published by the Australian Government which provide guidance on the practical application of EPBC Act. Further studies of waterbirds and shorebirds are underway and results of that work are being reported separately. Species-specific assessments against each criterion for significant impacts (as defined by EPBC Act policies) will be feasible when a project design is available and potential impacts can be evaluated.

Table 4 Assessment of project in relation to the EPBC Act

MNES	Project specifics	Assessment against significant impact guidelines
EPBC Act listed threatened species	Seventy (70) EPBC Act listed species (nine flora and 61 fauna species) have been recorded or are predicted to occur in the project search area (study area buffered by 5 kilometres). The likelihood of these species occurring in the study area is assessed in Appendix A (flora) and Appendix B (fauna).	Most of these species are not likely to occur and development is unlikely to constitute a significant impact. Species of potential concern include Swamp Skink and waterbirds and shorebirds. The Swamp Skink occurs in a drainage line across the north of the site and in a wetland in the southern portion of the site. Threatened shorebirds may utilise the adjacent foreshore environment and periodically may utilise the wetland habitat when it is either dominated by Tall Marsh vegetation or Salt Marsh vegetation. However, the adjacent foreshore has been identified as secondary foraging habitat for waterbirds, while primary foraging and roosting habitat exists to the north and south of the study area.

MNES	Project specifics	Assessment against significant impact guidelines
EPBC Act listed ecological communities	Two EPBC Act listed ecological communities have been recorded or predicted to occur in the project search area.	These communities do not occur within the study area and the project is unlikely to have a significant impact on any occurrences of these communities which may occur in the local area.
Migratory species	Sixty two (62) migratory species have been recorded or predicted to occur in the project search area (Appendix B, Table 15).	While some of these species would be expected to use the study area on occasions, and some of them may do so regularly, it does not provide important habitat for an ecologically significant proportion of most of these species. It is possible that the study area may occasionally support migratory shorebirds and may provide foraging habitat to these species. However, the available foraging habitat adjacent to the study area is considered to be secondary foraging habitat and may not support significant proportions of the populations of shorebirds and waterbirds.
Wetlands of international importance (Ramsar sites).	The study area is within the catchment of a Ramsar site: Western Port.	The study area does not appear to drain directly into the Western Port Ramsar site, but given the close proximity to the foreshore, the development of port infrastructure may impact significantly on the ecological character of the Ramsar site. The Western Port Ramsar site is especially recognised for its value to a range of shorebirds and other waterbirds.

On the basis of criteria outlined in the relevant Significant Impact Guidelines it is considered possible that a significant impact on a Matter of National Environmental Significance would result from the proposed action. This primarily relates to the potential for impacts on Swamp Skink and the Western Port Ramsar site. It would thus be prudent to refer the proposed action to the Australian Government Minister for the Environment to determine whether the action requires approval under the EPBC Act.

If the project is determined to be a controlled action under the EPBC Act, the policy for the provision of offsets under the EPBC Act may be applicable to addressing residual impacts on the Swamp Skink. The offsets policy is set out on the DCCEEW website at: https://www.dcceew.gov.au/environment/epbc/publications/epbc-act-environmental-offsets-policy. Once a decision has been made about whether or not the project is a controlled action, discussion with DCCEEW would be advisable to determine whether, in principle, an offset may be applicable. If it is, then design of the project would need to reach a stage at which any residual impacts on the species can be quantified as a precursor to determining the nature of any offset requirements.

4.2. State

4.2.1. 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. Under the FFG Act a permit is required from DEECA to 'take' protected flora species. Permit exemptions under the FFG Act generally apply to the non-commercial removal of protected flora from private land, unless there is 'critical habitat' that has been declared on the land. Authorisation under the FFG Act is required to collect, kill, injure or disturb listed fish on private or public land.

Link for further information: https://www.environment.vic.gov.au/conserving-threatened-species/victorias-framework-for-conserving-threatened-species

The FFG Act defines public land as Crown land or land owned by, or vested in, a public authority, while private land is defined as any land other than public land. A public authority is defined in the FFG Act as a body established for a public purpose by or under any Act and includes:

- An Administrative Office
- A Government Department
- A municipal council
- A public entity
- A State-owned enterprise.

Native vegetation on site is not a FFG act listed threatened community but contains at least 16 protected flora species and two recorded FFG Act listed threatened species (Glossy Grass Skink and Swamp Skink), as well as habitat for a number of other FFG Act listed fauna (Appendix B).

The study area is on Crown Land or land owned by or vested in a public authority (Port of Hastings Corporation) and is therefore public land for the purposes of the FFG Act. At least 16 protected flora species are present (Appendix B), and therefore a protected flora permit from DEECA would be required for the proposed development.

In addition to the requirement for a protected flora permit, it is a requirement of the FFG Act that a public authority, in performing its functions, must consider the objectives of the FFG Act and the impact on biodiversity. Public authorities are also required to consider the Biodiversity 2037 targets (DELWP 2017b), action statements, critical habitat determinations and management plans made under the FFG Act.

4.2.2. Catchment and Land Protection Act 1994 (CaLP Act)

The CaLP Act identifies and classifies certain species as noxious weeds or pest animals and provides a system of controls on noxious species.

Declared noxious weeds identified in the study area are listed in Appendix A (Table 10) and established pest animals are listed in Appendix B (Table 13).

The proponent must take all reasonable steps to eradicate regionally prohibited weeds, prevent the growth and spread of regionally controlled weeds, and prevent the spread of and as far as possible eradicate established pest animals. The State is responsible for eradicating State prohibited weeds from all land in Victoria.

Further information is at http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds.

4.2.3. 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 development proposal are controls relating to the removal, destruction or lopping of native vegetation contained within the Mornington Peninsula 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 State 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.

Clause 52.17 (Native Vegetation) requires a planning permit to remove, destroy or lop native vegetation including some dead native vegetation. Decision guidelines that must be considered by the referral or responsible authority are contained in Section 7 of the Guidelines, and referred to in Clause 52.17-4. Clause 52.17 does not apply if a Native Vegetation Precinct Plan corresponding to the land is incorporated in the Scheme. It should be noted that where native vegetation does not meet the definition of a patch or scattered tree, as described in Section 3.1, the Guidelines do not apply. However, a permit may still be required to remove, destroy or lop native vegetation under the provisions of the Scheme.

Clause 65.02 requires consideration of native vegetation retention in a subdivision application and siting of open space areas.

Under Clause 66.02 a permit application to remove, destroy or lop native vegetation is required to be referred to DEECA 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.

The study area is not covered by any overlays relevant to biodiversity under the Scheme.

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

The Guidelines are incorporated into the Victoria Planning Provisions and all planning schemes in Victoria (DELWP 2017a). The Guidelines replaced the previous incorporated document titled Permitted clearing of native vegetation – Biodiversity assessment guidelines (DEPI 2013) on 12 December 2017.

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'.

A detailed assessment of the implications for the project under the Guidelines is provided in Section 5 of this report. Under the Guidelines, there are three assessment pathways for assessing an application for a permit to remove native vegetation: basic, intermediate and detailed.

A detailed determination of the assessment pathway for the planning application relevant to the proposed development is provided in Section 5.2. In summary, the planning application for removal of native vegetation must meet the requirements of, and be assessed in, the detailed assessment pathway.

4.2.4. 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 2005b).

The *Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act 1978* (DSE 2005b) provide a range of criteria that can be used to determine whether an EES may be required for a project. These criteria relate to individual potential environmental effects and a combination of (two or more) potential environmental effects.

An assessment of the project against the individual potential effects and against the combination of potential effects criteria has not been undertaken within this report as the level of impact has not yet been determined. Once further information is provided on the level of impact, an assessment against the criteria can be undertaken.

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.

5. Victoria's Guidelines for the removal, destruction or lopping of native vegetation

The Guidelines were introduced in December 2017. They set out and describe the application of Victoria's statewide policy in relation to assessing and compensating for the removal of native vegetation in order to achieve the objective of 'no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation'.

This objective is to be achieved through Victoria's planning system using an assessment approach that relies on strategic planning and the permit and offset system. The key policy for achieving no net loss to biodiversity is the three-step approach of avoid, minimise and offset:

- **Avoid** the removal, destruction or lopping of native vegetation to ensure that the important biodiversity values of native vegetation continue to be delivered into the future.
- **Minimise** impacts resulting from the removal of native vegetation that cannot be avoided.
- Provide an **offset** to compensate for the biodiversity impact resulting from the removal of native vegetation.

The steps that have been taken during the design of the development to ensure that impacts on biodiversity from the removal of native vegetation have been minimised include:

- Avoiding higher quality areas of native vegetation adjacent to Long Island Drive
- Locating temporary site storage and compounds on existing disturbed land to minimise impacts to native vegetation

DEECA has provided biodiversity information tools to assist with determining the assessment pathway associated with the removal of native vegetation and the contribution that native vegetation within the study area makes to Victoria's biodiversity.

All planning permit applications to remove native vegetation are assigned to an assessment pathway determined by the extent and location of proposed native vegetation removal. The assessment pathway will dictate the information to be provided in a planning permit application and the decision guidelines the responsible authority (e.g. Council) and/or DEECA as a referral authority will use to assess the permit application.

The biodiversity information tools have two components:

Site-based information

The site-based information is observable at a particular site. Biosis has collected the requisite site-based information for the assessment against the Guidelines.

Landscape scale information

Landscape scale information requires consideration of information beyond the site. This information is managed by DEECA and can be accessed via the NVIM.

The following section summarises the results of the site-based assessment and the outputs generated by the Native Vegetation Removal Report, which identifies the assessment pathway on which the planning application will be assessed.

5.1. Proposed removal of native vegetation

The extent of native vegetation patches, the location of large trees within patches and any scattered trees were mapped within the study area (Figure 2) and the condition was assessed in relation to standard methods provided by DSE (2004) and pre-determined EVC benchmarks: https://www.environment.vic.gov.au/biodiversity/bioregions-and-evc-benchmarks.

The proposed removal of native vegetation associated with this project has yet to be defined. As such two clearing scenarios are provided including a loss of all native vegetation within 5 Long Island Drive and the loss of all native vegetation within 5 Long Island Drive and the adjacent vegetation of the road reserve for Long Island Drive.

Spatial data (shapefiles) of proposed vegetation removal were submitted to DEECA's native vegetation support team, who provided a Native Vegetation Removal Report for the project. This is provided in Appendix D and summarised in the following sections.

5.1.1. Habitat hectares

A continuous area of the same EVC is termed a 'habitat zone'. Different habitat zones exists where there are different EVCs present and/or discrete (non-continuous) patches of the same EVC. A separate vegetation quality assessment was conducted for each habitat zone. The vegetation quality assessment score was multiplied by the extent of the habitat zone to give a value in habitat hectares.

Four habitat zones were identified (Table 5). The results of the vegetation quality assessment are provided with the number of habitat hectares in each habitat zone.

There are no large trees within patches of native vegetation within the study area.

There are two scattered small trees within the study area. For applications that propose to remove scattered trees, the extent of scattered trees is calculated using the standard extents described in Section 2.4.1. A condition score is applied to each scattered tree based on information provided by DEECA's NVIM. Scattered trees within the study area equate to 0.062 habitat hectares (Table 6). The locations of scattered trees within the study area are shown in Figure 2.

Table 5 Habitat hectares of native vegetation within the study area

Site ID			1	1	1	1
Habitat Zone ID			A	B	C	D (RR)
EVC #: Name			821 Tall Marsh	821 Tall Marsh	3 Damp Sands Herb-rich Woodland	3 Damp Sands Herb-rich Woodland
		Max Score	**Score**	**Score**	**Score**	**Score**
Site Condition	Large Trees	10	NA	NA	0	0
	Tree Canopy Cover	5	NA	NA	0	0
	Lack of Weeds	15	7	11	4	4
	Understorey	25	15	5	5	10
	Recruitment	10	10	6	3	5
	Organic Matter	5	5	5	3	5
	Logs	5	NA	NA	0	0
	Total Site Score		50.45	36.82	15	24
Landscape Value	Patch Size	10	1	2	1	1
	Neighbourhood	10	0	1	0	0
	Distance to Core Area	5	3	3	3	3
	Total Landscape Score		4	6	4	4
Habitat points = #/100		100	54.45	42.82	18	28
CONDITION SCORE			0.545	0.428	0.18	0.28
Habitat Zone area (ha)			0.4499	2.2541	0.9779	0.2109
Habitat hectares (Hha)			0.245	0.965	0.176	0.059

Table 6 Habitat hectare conversion for scattered trees within the study area

	Number within study area	Condition score	Standard extent (ha)	Habitat hectares (Hha)
Small scattered trees	2	0.20	0.031 ha	0.006

5.2. Determining the assessment pathway

Applications to remove native vegetation are categorised into one of three assessment pathways: basic, intermediate or detailed. Two factors are used to determine the assessment pathway for a permit application, the **location** and **extent** of the native vegetation proposed to be removed. Location has been divided into three possible categories by DEECA, and has been pre-determined by DEECA for all locations in Victoria. The location of a particular site is determined using the location map available in the Native Vegetation Information Management (NVIM) system (http://nvim.depi.vic.gov.au).

The extent of native vegetation proposed to be removed determines the assessment pathway by considering the following:

- The total area (hectares) of native vegetation (including any patches and scattered trees) proposed to be removed.
- Whether any large trees are proposed to be removed, either as scattered trees or occurring in patches.

Subject to final design, the proposed development may require the removal of native vegetation. The study area includes areas classified as location category 1, 2 & 3 and depending on the extent of vegetation proposed for removal, the application for removal of this native vegetation is likely to be assessed in the detailed pathway. These requirements are provided in Appendix D.

The proposed removal of native vegetation is assessed in detail in Section 5.1 and summarised below.

5.3. Offset requirements

To ensure a gain to Victoria's biodiversity that is equivalent to the loss resulting from the proposed removal of native vegetation, compensatory offsets are required. Losses and gains are measured in general or species habitat scores or units. The offset must also include at least one large tree for every large tree removed.

The results of the two scenarios for species-general offset test are provided in Appendix D and summarized in Table 7 and Table 8.

Table 7 Summary of DEECA Native Vegetation Removal Report considering clearing scenario 1 - loss of all native vegetation within 5 Long Island Drive and the adjacent vegetation of the road reserve for Long Island Drive.

Attribute	Outcome	Notes
Location category	3	High location risk
Native vegetation removal extent	3.892 hectares	6 patches, 2 small, scattered trees
Assessment pathway	Detailed	Location 3 and removal of > 0.5 hectares of native vegetation
Strategic Biodiversity Value Score	0.627 – 0.812	Range for multiple habitat zones
Modelled habitat for threatened species	Yes	Modelled habitat for 65 species (Appendix D)
Offset type	General and species	
Offset multiplier	1.5 X – General 2 X – Species	
Offset amount: general habitat units	0.475 general habitat units	
General offset vicinity	The offset site must be located within the Port Phillip and Westernport Catchment Management Authority (CMA) or Mornington Peninsula Shire Council.	

Attribute	Outcome	Notes
General offset minimum Strategic Biodiversity Value Score	0.520	
Offset amount: Species habitat units	1.945 Species habitat units	Flatback Mangrove Goby – 0.194 species units Tiny Arrowgrass – 1.751 species units
Large tree attributes	0 large trees	The offset must include protection of at least one large tree for every large tree to be removed.

Table 8 Summary of DEECA Native Vegetation Removal Report considering clearing scenario 2 - loss of all native vegetation within 5 Long Island Drive excluding the adjacent vegetation of the road reserve for Long Island Drive (HZ 1d).

Attribute	Outcome	Notes
Location category	3	High location risk
Native vegetation removal extent	3.681 hectares	4 patches, 2 small, scattered trees
Assessment pathway	Detailed	Location 3 and removal of > 0.5 hectares of native vegetation
Strategic Biodiversity Value Score	0.627 – 0.640	Range for multiple habitat zones
Modelled habitat for threatened species	Yes	Modelled habitat for 65 species (Appendix D)
Offset type	General and species	
Offset multiplier	1.5 X – General 2 X – Species	
Offset amount: general habitat units	0.399 general habitat units	
General offset vicinity	The offset site must be located within the Port Phillip and Westernport Catchment Management Authority (CMA) or Mornington Peninsula Shire Council.	
General offset minimum Strategic Biodiversity Value Score	0.507	
Offset amount: Species habitat units	1.945 Species habitat units	Flatback Mangrove Goby – 0.194 species units Tiny Arrowgrass – 1.751 species units
Large tree attributes	0 large trees	The offset must include protection of at least one large tree for every large tree to be removed.

5.4. Proposed offset strategy

If offsets are required Port of Hastings Corporation intends to purchase the general offset credits from the Victorian native vegetation credit register.

Once the project design has been determined, and if offsets are required (depending on whether exemptions are followed), there are a number of options to secure the required offsets to compensate for the losses of native vegetation and threatened species habitat.

6. Key ecological values and recommendations

This section identifies the key ecological features of the study area.

The primary measure to reduce potential impacts to biodiversity values within the study area is to avoid and minimise removal of native vegetation and terrestrial and aquatic habitat. However, possible impacts cannot be foreseen until a project design is available. The present report describes ecological values of the site and it is critical that these be considered when key decisions are made during the design phase of the project. The results of this assessment should therefore be incorporated into the project design, by adding the flora and fauna mapping information into the planning maps and investigating options to retain as much of the mapped vegetation/habitats as possible.

The design phase is also the time during which future requirements for infrastructure and services must be forecast and allowance made outside any nominated reserves for all construction works, such as road batters, footpaths, drainage and all services.

The highest priority species known to inhabit the site is the EPBC Act and FFG Act endangered Swamp Skink. It utilises the same micro-environment as the FFG Act endangered Glossy Grass Skink.

A summary of potential implications of development of the study area and recommendations to minimise impacts during the **design phase** of the project is provided in Table 9.

Table 9 Summary of key ecological values, potential implications of developing the study area and recommendations to minimise ecological impacts during the design phase.

Ecological feature (Figure 2)	Implications of development	Recommendations
Native vegetation	The permanent removal of up to 3.892 hectares of patch vegetation and two small scattered trees. The application will be assessed on the detailed assessment pathway. Proportional impacts to native vegetation above the species offset threshold for 2 species: • Flatback Mangrove Goby • Tiny Arrowgrass	Develop the project design to avoid and minimise removal of native vegetation in accordance with the Guidelines. Refer to Section 5. Retained vegetation should be fenced off and treated as no-go zones. Identify and implement appropriate offsets for vegetation losses as outlined in Section 5.3. There is an opportunity to provide offsets within the land parcel in an area adjoining the proposed development site. If native vegetation is to be retained within the proposed development area, development of an offset management plan will be required.
Threatened species and ecological communities	Removal of known/potential habitat for threatened fauna species (as identified in Table 2).	Avoid and minimise removal of habitat for Swamp Skink and Glossy Grass Skink. Understanding and predicting future infrastructure requirements is essential to ensure sufficient habitat is retained if possible. Alternatively salvage and relocation may be required.

Ecological feature (Figure 2)	Implications of development	Recommendations
Aquatic habitat features	Impacts to the ecological character of the Western Port Ramsar site.	Protect key values by retaining features and including appropriate buffers into design. In particular, the foreshore habitat adjacent to the reclamation area may provide occasional foraging habitat for shorebirds which should be taken into consideration. Run-off of any waste-water associated with project works should be appropriately managed to avoid impacts to the Ramsar site.

Construction and post-construction management

Specific detail relating to preventing impacts to retained native vegetation and aquatic and terrestrial habitat should be addressed in a site-specific Construction Environmental Management Plan. This will include issues relating to contractors such as environmental inductions, installation of temporary fencing/signage, drainage and sediment control.

An Ecological Management Plan should be prepared by an ecological consultant to provide detailed advice on the ongoing protection and long-term management of retained vegetation/ habitat, creation of linkages and other habitat features such as wetlands, if proposed.

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APPENDICES

Appendix A. Flora

The following abbreviations and symbols are relevant to this Appendix.

Code	Meaning	Reference
National listings (EPBC Act)		
EX	Extinct	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
CR	Critically endangered	
EN	Endangered	
VU	Vulnerable	
PMST	Protected Matters Search Tool	
State listings (FFG Act)		
x	Extinct	Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act)
cr	Critically endangered	
e	Endangered	
v	Vulnerable	
t	Threatened	
P	Protected (public land only)	
Weed status (CaLP Act, DAWE Weeds of National Significance and DELWP Advisory List)		
SP	State prohibited species	Victorian Catchment and Land Protection Act 1994 (CaLP Act)
RP	Regionally prohibited species	
RC	Regionally controlled species	
R	Restricted species	
Other		
#	Native species outside its natural range	Victorian Biodiversity Atlas (VBA)

Appendix A.1. Flora species recorded from the study area

Table 10 Flora species (69 native, 68 introduced) recorded from the study area

Status	Scientific Name	Common Name
Indigenous species		
P	*Acacia mearnsii*	Black Wattle
P	*Acacia mucronata* subsp. *longifolia*	Narrow-leaf Wattle
	Acacia paradoxa	Hedge Wattle
P	*Acacia pycnantha*	Golden Wattle
P	*Acacia stricta*	Hop Wattle
	Acaena novae-zelandiae	Bidgee-widgee
	Allocasuarina paludosa	Scrub Sheoak
	Allocasuarina verticillata	Drooping Sheoak
	Amyema pendula	Drooping Mistletoe
	Austrostipa mollis	Supple Spear-grass
	Austrostipa rudis	Veined Spear-grass
	Bossiaea prostrata	Creeping Bossiaea
	Burchardia umbellata	Milkmaids
	Carex breviculmis	Common Grass-sedge
	Cassytha glabella	Slender Dodder-laurel
	Cassytha melantha	Coarse Dodder-laurel
	Centrolepis fascicularis	Tufted Centrolepis
	Centrolepis strigosa subsp. *strigosa*	Hairy Centrolepis
	Clematis microphylla s.s.	Small-leaved Clematis
	Comesperma volubile	Love Creeper
P	*Cotula australis*	Common Cotula
	Crassula decumbens var. *decumbens*	Spreading Crassula
P	*Cyathea australis*	Rough Tree-fern
	Dianella revoluta	Black-anther Flax-lily
	Drosera auriculata	Sundew
	Eleocharis acuta	Common Spike-sedge
P	*Epacris impressa*	Common Heath
	Epilobium billardiereanum	Variable Willow-herb
P	*Euchiton japonicus* s.s.	Creeping Cudweed
	Exocarpos cupressiformis	Cherry Ballart
	Ficinia nodosa	Knobby Club-sedge
	Gahnia radula	Thatch Saw-sedge
P	*Gnaphalium indutum*	Tiny Cudweed
	Gonocarpus tetragynus	Common Raspwort
	Hibbertia riparia	Erect Guinea-flower
	Hypericum gramineum	Small St John's Wort
	Isolepis fluitans	Floating Club-sedge
	Isolepis cernua	Nodding Club Sedge

Status	Scientific Name	Common Name
	Isolepis hookeriana	Grassy Club-sedge
	Juncus kraussii subsp. *australiensis*	Sea Rush
	Kennedia prostrata	Running Postman
	Kunzea ericoides s.l.	Burgan
	Lepidosperma semiteres	Wire Rapier-sedge
	Leptospermum continentale	Prickly Tea-tree
	Leptospermum laevigatum	Coast Tea-tree
P	*Leucopogon parviflorus*	Coast Beard-heath
	Lomandra filiformis	Wattle Mat-rush
	Lomandra longifolia	Spiny-headed Mat-rush
	Lythrum hyssopifolia	Small Loosestrife
	Melaleuca ericifolia	Swamp Paperbark
	Microlaena stipoides var. *stipoides*	Weeping Grass
P	*Microtis* spp.	Onion Orchid
	Myoporum insulare	Common Boobialla
P	*Ozothamnus ferrugineus*	Tree Everlasting
	Phragmites australis	Common Reed
	Pimelea octophylla	Wooly Rice-flower
	Pultenaea daphnoides	Large-leaf Bush-pea
	Samolus repens	Creeping Brookweed
	Schoenus apogon	Common Bog-sedge
	Schoenus nitens	Shiny Bog-sedge
P	*Senecio glomeratus*	Annual Fireweed
P	*Senecio* spp.	Groundsel
	Solanum laciniatum	Large Kangaroo Apple
P	*Styphelia humifusa*	Cranberry Heath
	Suaeda australis	Austral Seablite
P	*Thelymitra* spp.	Sun Orchid
	Triglochin striata	Streaked Arrowgrass
	Typha domingensis	Narrow-leaf Cumbungi
P	*Xanthorrhoea minor* subsp. *lutea*	Small Grass-tree
Introduced species		
# P	*Acacia longifolia* subsp. *longifolia*	Sallow Wattle
	Agrostis capillaris	Brown-top Bent
R	*Allium triquetrum*	Angled Onion
	Anthoxanthum odoratum	Sweet Vernal-grass
	Arctotheca calendula	Cape Weed
R	*Asparagus asparagoides*	Bridal Creeper
	Bellardia latifolia	Red Bartsia
	Billardiera heterophylla	Bluebell Creeper
	Briza maxima	Large Quaking-grass
	Briza minor	Lesser Quaking-grass

Status	Scientific Name	Common Name
#	*Cassinia sifton*	Drooping Cassinia
	Cenchrus clandestinus	Kikuyu
	Centaurium erythraea	Common Centaury
	Cerastium glomeratum s.s.	Sticky Mouse-ear Chickweed
RC	*Chrysanthemoides monilifera*	Boneseed
	Cicendia quadrangularis	Square Cicendia
RC	*Cirsium vulgare*	Spear Thistle
	Cortaderia selloana subsp. *selloana*	Pampas Grass
# v	*Corymbia maculata*	Spotted Gum
	Cupressus spp.	Cypress
	Cynodon dactylon	Couch
	Dactylis glomerata	Cocksfoot
	Ehrharta erecta	Panic Veldt-grass
	Ehrharta longiflora	Annual Veldt-grass
	Erica lusitanica	Spanish Heath
	Euphorbia peplus	Petty Spurge
	Festuca arundinacea	Tall Fescue
	Freesia spp.	Freesia
	Galium murale	Small Goosegrass
	Gamochaeta purpurea s.s.	Spiked Cudweed
RC	*Genista linifolia*	Flax-leaf Broom
RC	*Genista monspessulana*	Montpellier Broom
	Gladiolus spp.	Gladiolus
	Holcus lanatus	Yorkshire Fog
RC	*Hypericum perforatum* subsp. *veronense*	St John's Wort
	Hypochaeris radicata	Flatweed
	Isolepis hystrix	Awned Club-sedge
RC	*Juncus acutus* subsp. *acutus*	Spiny Rush
	Juncus articulatus subsp. *articulatus*	Jointed Rush
	Juncus capitatus	Capitate Rush
	Lolium perenne	Perennial Rye-grass
	Lophopyrum ponticum	Tall Wheat-grass
	Lotus spp.	Trefoil
	Lysimachia arvensis var. *arvensis*	Scarlet Pimpernel
	Medicago polymorpha	Burr Medic
	Medicago sativa subsp. *sativa*	Lucerne
	Moenchia erecta	Erect Chickweed
R	*Oxalis pes-caprae*	Soursob
	Oxalis purpurea	Large-flower Wood-sorrel
	Phalaris aquatica	Toowoomba Canary-grass
	Pinus radiata	Radiata Pine

Status	Scientific Name	Common Name
#	*Pittosporum undulatum*	Sweet Pittosporum
	Plantago lanceolata	Ribwort
	Poa annua s.s.	Annual Meadow-grass
	Prunella vulgaris	Self-heal
	Ranunculus muricatus	Sharp Buttercup
	Romulea minutiflora	Small-flower Onion-grass
	Romulea rosea	Onion Grass
RC	*Rubus anglocandicans*	Common Blackberry
	Rumex crispus	Curled Dock
	Soliva sessilis	Jo Jo
	Sonchus oleraceus	Common Sow-thistle
	Sporobolus africanus	Rat-tail Grass
	Trifolium dubium	Suckling Clover
	Vicia sativa	Common Vetch
	Vulpia bromoides	Squirrel-tail Fescue
	Watsonia meriana	Bugle Lily
	Westringia spp.	Westringia (Garden escape)

Appendix A.2. Listed flora species

The following table includes threatened flora species that have potential to occur within the study area. The list of threatened species is sourced from the VBA and PMST (accessed on 30 September 2022). Where years are specified for the most recent database records, these refer to records from the VBA unless otherwise specified. Where no year is specified, the PMST has predicted that the species has potential to occur. A proportion of the flora habitat descriptions have been reproduced with permission from the Royal Botanic Gardens Victoria (RBGV 2020).

Table 11 Threatened flora species recorded or predicted to occur within 5 km of the study area

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
National significance								
Amphibromus fluitans	River Swamp Wallaby-grass	VU		2014	PMST	Swampy areas, mainly along the Murray River between Wodonga and Echuca with scattered records from southern Victoria.	Negligible	No freshwater habitat present.
Caladenia orientalis	Eastern Spider-orchid	EN	e		PMST	Heath and heathy woodlands in coastal areas between the Mornington Peninsula and Wilsons Promontory.	Negligible	No suitable habitat present.
Glycine latrobeana	Clover Glycine	VU	v		PMST	Grasslands and grassy woodlands, particularly those dominated by Kangaroo Grass.	Negligible	No suitable habitat present.
Lepidium aschersonii	Spiny Peppercress	VU	e		PMST	Heavy clay soils near salt lakes on the volcanic plains; disjunct records near Lake Omeo.	Negligible	No suitable habitat present.
Prasophyllum spicatum	Dense Leek-orchid	VU	cr		PMST	Heath and heathy woodlands.	Negligible	No suitable habitat present.
Pterostylis chlorogramma	Green-striped Greenhood	VU	e		PMST	Heathy woodland. More specific habitat requirements are poorly known.	Negligible	No suitable habitat present.
Pterostylis cucullata	Leafy Greenhood	VU	e		PMST	Sand dune scrubs in coastal areas, and inland on slopes and river flats in moist foothill and montane forests.	Negligible	No suitable habitat present.
Senecio psilocarpus	Swamp Fireweed	VU	v		PMST	Seasonally inundated herb-rich swamps, growing on peaty soils or volcanic clays.	Negligible	No freshwater habitat present.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Xerochrysum palustre	Swamp Everlasting	VU	cr		PMST	Sedge-swamps and shallow freshwater marshes and swamps in lowlands, on black cracking clay soils.	Negligible	No freshwater habitat present.
State significance								
Acacia howittii	Sticky Wattle		v	2017		Moist forest. Natural occurrences are confined to South Gippsland and Central Highlands.	Negligible	Outside the natural range of this species.
Atriplex paludosa subsp. paludosa	Marsh Saltbush		e	2018		Boggy, saline soils on coastal or near-coastal saltmarshes and tidal-flats.	Negligible	Saline vegetation is on fill and has no direct connection to the bay.
Avicennia marina subsp. australasica	Grey Mangrove		e	2014		Low energy coastlines in the inter-tidal zone.	Negligible	Saline vegetation is on fill and has no direct connection to the bay.
Corymbia maculata	Spotted Gum		v	2008		In Victoria, naturally confined to a small population near Mt Tara in the east of the state.	Recorded	Outside the natural range of this species. Occurrences are landscape plantings.
Exocarpos syrticola	Coast Ballart		e	1988		Calcareous sands of coastal dunes and cliffs. Semi-parasitic on the roots of nearby plants.	Negligible	No dune environment present.
Juncus revolutus	Creeping Rush		e	2008		Saltmarshes and other similarly saline inland habitats.	Negligible	Saline vegetation is on fill and has no direct connection to the bay.
Lachnagrostis robusta	Salt Blown-grass		e	2008		Confined to saline swamps and lake edges but widespread across the Victorian Volcanic Plain and occasionally in the southern Wimmera.	Negligible	Outside the natural range of this species.
Lawrencia spicata	Salt Lawrencia		e	2021		Fringe habitats of coastal saltmarsh communities.	Negligible	Saline vegetation is on fill and has no direct connection to the bay.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Limonium australe var. australe	Yellow Sea-lavender		e	2008		In Victoria apparently confined to mangrove and saltmarsh communities near Western Port, Shallow Inlet and Corner Inlet.	Negligible	Saline vegetation is on fill and has no direct connection to the bay.
Melaleuca armillaris	Giant Honey-myrtle		e	2017		Near coastal heath/scrub, rocky coast and foothill outcrops.	Negligible	Outside the natural range of this species.
Pterostylis X toveyana	Mentone Greenhood		e	1969		Coastal scrub and moist areas of open-forest.	Negligible	No suitable habitat present.
Triglochin minutissima	Tiny Arrowgrass		e	1992		Scattered occurrences on damp saline soils near salt-lakes and forming part of herbfields in coastal saltmarshes.	Low	Saline vegetation is on fill and has no direct connection to the bay.
Xanthosia tasmanica	Southern Xanthosia		e	2014		Occurring mainly in coastal areas in heath on sand.	Low	Minor areas of disturbed habitat adjacent to Long Island Drive disturbed by powerline maintenance.

Appendix A.3. Threatened ecological communities

The following table includes the threatened ecological communities that have potential to occur within the project area. The list of threatened ecological communities has been compiled with reference to characteristics of FFG Act threatened communities (SAC 2013) and predictive output from the PMST (accessed on 30 September 2022).

Table 12 Threatened ecological communities predicted to occur within 5 km of the project area.

Community Name	Conservation status	Source	Comments
National significance			
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	PMST	Not present. Study area is a land based environment established by the artificial placement of fill.
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	PMST	No natural examples of this community are present. Saltmarsh vegetation present has colonised after the placement of fill.
State significance			
Sedge Rich *Eucalyptus camphora* Swamp Community	Threatened		Not present. This community requires the presence of a freshwater environment which is not present within the study area.

Appendix B. Fauna

The following abbreviations and symbols are relevant to this Appendix:

Code	Meaning	Reference
National listings (EPBC Act)		
EX	Extinct	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
CR	Critically endangered	
EN	Endangered	
VU	Vulnerable	
NT	Near threatened	
CD	Conservation dependent	
PMST	Protected Matters Search Tool	
State listings (FFG Act)		
x	Extinct	Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act)
cr	Critically endangered	
e	Endangered	
v	Vulnerable	
t	Threatened	
P	Protected (fish only)	
Pest animal status (CaLP Act and Fisheries Act)		
PS	Declared pest animal	Victorian Catchment and Land Protection Act 1994 (CaLP Act)
N	Declared noxious aquatic species	Victorian Fisheries Act 1995
Other		
*****	Introduced species	Victorian Biodiversity Atlas (VBA)
‡‡	New record of aquatic species for catchment	
D	Diadromous species (migrates between freshwater and saltwater during lifecycle)	
E	Euryhaline species (capable of occurring in marine and freshwater environments)	
P	Present but abundance not recorded	

Appendix B.1. Fauna species recorded from the study area

Table 13 Vertebrate fauna recorded from the study area (present assessment)

Status	Scientific Name	Common Name
Indigenous species		
	Acanthiza pusilla	Brown Thornbill
	Acanthorhynchus tenuirostris	Eastern Spinebill
	Anas superciliosa	Pacific Black Duck
	Austrelaps superbus	Lowland Copperhead
	Chroicocephalus novaehollandiae	Silver Gull
	Circus approximans	Swamp Harrier
	Cisticola exilis	Golden-headed Cisticola
	Corvus coronoides	Australian Raven
	Crinia signifera	Common Froglet
	Cygnus atratus	Black Swan
	Gymnorhina tibicen	Australian Magpie
	Hirundo neoxena	Welcome Swallow
	Lampropholis guichenoti	Garden Skink
nt	*Larus pacificus*	Pacific Gull
	Limnodynastes dumerilii dumerilii	Pobblebonk Frog
	Limnodynastes tasmaniensis	Spotted Marsh Frog (race unknown)
EN, e	*Lissolepis coventryi*	Swamp Skink
	Malurus cyaneus	Superb Fairy-wren
	Pelecanus conspicillatus	Australian Pelican
	Phylidonyris novaehollandiae	New Holland Honeyeater
e	*Pseudemoia rawlinsoni*	Glossy Grass Skink
	Sericornis frontalis	White-browed Scrubwren
	Tachyglossus aculeatus	Short-beaked Echidna
	Tadorna tadornoides	Australian Shelduck
	Threskiornis molucca	Australian White Ibis
	Tiliqua nigrolutea	Blotched Blue-tongued Lizard
	Tiliqua scincoides	Common Blue-tongued Lizard
	Vanellus miles	Masked Lapwing
Introduced species		
PS*	*Oryctolagus cuniculus*	European Rabbit
PS*	*Vulpes vulpes*	Red Fox

Appendix B.2. Listed fauna species

The following table includes a list of threatened fauna species that have potential to occur within the study area. The list of threatened species is sourced from the VBA and PMST (accessed on 30 September 2022). Where years are specified for the most recent database records, these refer to records from the VBA unless otherwise specified. Where no year is specified, the PMST has predicted that the species has potential to occur.

Table 14 Threatened fauna species recorded or predicted to occur within 5 km of the study area

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
National significance								
Rostratula australis	Australian Painted-snipe	EN	cr		PMST	Shallows of well-vegetated freshwater wetlands.	Low	Some suitable habitat within the study area, but nearest recent records are from wetlands north of Frankston. Species is considered rare in southern Victoria.
Botaurus poiciloptilus	Australasian Bittern	EN	cr	2007	PMST	Shallow freshwater and brackish wetlands with abundant emergent aquatic vegetation.	Medium	Some suitable habitat within the study area and scattered recent and historic records of the species on the Mornington Peninsula.
Falco hypoleucos	Grey Falcon	VU	v		PMST	Lightly timbered plains and Acacia scrub.	Negligible	No suitable habitat in the study area and beyond the species normal distribution.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Callocephalon fimbriatum	Gang-gang Cockatoo	EN			PMST	S Vic to E NSW. Forests and woodlands from coast to alpine areas. Autumn-winter dispersal from highlands to lower elevations. Forages in eucalypts, acacias and some exotic garden trees and shrubs.	Low	Wide ranging species, some potentially suitable foraging trees present but no nearby VBA or Birdlife Australia records. May occasionally pass over the study area but unlikely utilise habitat within the study area.
Neophema chrysogaster	Orange-bellied Parrot	CR	cr	1987	PMST	Coastal vegetation including saltmarshes, dunes, pastures, shrublands, sewage plants, saltworks, islands, and beaches.	Low	Some suitable habitat present within the study area but typically of low quality. Population and important habitat areas for this species area generally well monitored and no recent records of the species within the local area.
Neophema chrysostoma	Blue-winged Parrot	VU			PMST		Low	Some suitable habitat present within the study area but typically of low quality.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Lathamus discolor	Swift Parrot	CR	cr	1905	PMST	A range of forests and woodlands, especially those supporting nectar-producing tree species. Also well-treed urban areas.	Low	Limited suitable foraging trees within the study area and surrounding area. However, no recent records of the species within the local area.
Hirundapus caudacutus	White-throated Needletail	VU	v	2007	PMST	An almost exclusively aerial species within Australia, occurring over most types of habitat, particularly wooded areas.	Medium	May utilise aerial space above study area and occasionally may use large trees surrounding the study. Numerous records from the local area.
Diomedea antipodensis gibsoni	Gibson's Albatross	VU			PMST	A marine, pelagic species that ranges widely throughout the Pacific region of the Southern Ocean. It visits off-shore waters of southern Australia.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port Bay but this is unlikely.
Fregetta grallaria grallaria	Storm-Petrel (Australasian)	VU			PMST	Pelagic bird, breeding occurs in the Lord Howe Island group.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port Bay but this is unlikely.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Pachyptila turtur subantarctica	Fairy Prion (southern)	VU			PMST	Open ocean over continental shelves and slopes, and rarely coming close to shore except at breeding islands and during rough weather.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.
Pterodroma leucoptera leucoptera	Gould's Petrel	EN			PMST	The Gould's Petrel is a marine pelagic spending the majority of its time at sea. It has breeding colonies on Cabbage Tree Island and Boondelbah Island.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.
Thalassarche bulleri platei	Northern Buller's Albatross	VU			PMST	Buller's Albatross breeds in New Zealand and is a seasonal visitor to Victorian coastal waters where it occurs in pelagic and inshore waters.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Diomedea exulans	Wandering Albatross	VU	cr		PMST	Occurs from Antarctic to subtropical areas in the southern hemisphere. In Australia, observed over continental shelves often in areas of continental upwellings.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.
Thalassarche melanophris	Black-browed Albatross	VU		1980	PMST	Breeds in Antarctic and sub-Antarctic islands, but commonly occurs in pelagic waters off the coast of Victoria.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.
Thalassarche carteri	Indian Yellow-nosed Albatross	VU	e		PMST	Sub-Antarctic to subtropical waters off southern Australia, mostly in winter. Often close inshore. Breeds on Indian Ocean sub-Antarctic islands.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Thalassarche chrysostoma	Grey-headed Albatross	EN	e		PMST	Occurs in warmer areas over winter, its breeding grounds are found in the Antarctic and subantarctic islands. Generally, forages over the open oceans. There have been a small number of records over inshore and offshore areas along the Victorian coast.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.
Thalassarche cauta	Shy Albatross	EN	e	1980	PMST	Sub-Antarctic to temperate waters off southern Australia, in all months. Often close inshore. Breeds on Albatross Is. (Bass Strait); the Mewstone & Pedra Branca Is. (S. Tas.).	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.
Phoebetria fusca	Sooty Albatross	VU	cr		PMST	Subantarctic and subtropical marine waters.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Macronectes giganteus	Southern Giant-Petrel	EN	e	1980	PMST	Adults of this species are present all year round at Antarctic breeding colonies, from where immature birds disperse, some as far north as subtropical areas.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.
Thalassarche bulleri	Buller's Albatross	VU	e		PMST	Pelagic sub-antarctic to subtropical waters off SE Australia, mostly Mar - June. Infrequent in Bass Strait. Breeds on NZ islands.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.
Macronectes halli	Northern Giant-Petrel	VU	e		PMST	Breeds in coastal habitats on subantarctic islands. Dispersal movements of juveniles are poorly known but have been observed along temperate coastal areas of Australia. Often seen around sewer outfalls or seal and penguin colonies.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Diomedea epomophora	Southern Royal Albatross	VU	cr		PMST	Pelagic sub-antarctic to temperate waters off SE Australia, may occur in all months but mostly Jul - Oct. Breeds on NZ islands.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.
Diomedea sanfordi	Northern Royal Albatross	EN			PMST	Pelagic sub-antarctic to temperate waters off SE Australia, may occur in all months but mostly May - Sept. Breeds Chatham Is. and single mainland site in NZ.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.
Diomedea antipodensis	New Zealand Wandering Albatross	VU			PMST	A marine, pelagic species that ranges widely throughout the Pacific region of the Southern Ocean. It visits off-shore waters of southern Australia.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Thalassarche salvini	Salvin's Albatross	VU			PMST	Infrequent occurrence in pelagic sub-antarctic to temperate waters off southern Australia. Breeds on Indian Ocean and NZ islands.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.
Thalassarche steadi	White-capped Albatross	VU			PMST	Infrequent occurrence in pelagic sub-antarctic to temperate waters off southern Australia. May be more common off southern NSW. Breeds on Auckland Is group, NZ.	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.
Thalassarche impavida	Campbell Albatross	VU			PMST	Antarctic to subtropical waters from pelagic to shelf-break water including off-shore waters of southern and eastern Australia, mostly in winter. Breeds on Campbell Is. (NZ).	Negligible	Pelagic seabird, no suitable habitat in study area. May occasionally occur within Western Port but this is unlikely.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Limosa lapponica baueri	Bar-tailed Godwit (baueri)	VU		1981	PMST	Bar-tailed Godwits inhabit estuarine mudflats, beaches and mangroves. They are common in coastal areas around Australia. They are social birds and are often seen in large flocks and in the company of other waders.	Medium	Scattered historic and recent records of the species throughout Western Port. Suitable secondary foraging habitat immediately adjacent to the study area and potentially within the salt marsh when not inundated. May occasionally occur within the study area.
Sternula nereis nereis	Australian Fairy Tern	VU			PMST	Fairy Terns inhabit coastal environments including intertidal mudflats, sand flats and beaches. Nests above high-water mark on sandy shell-grit beaches.	Medium	Scattered historic and recent records of the species throughout Western Port. Suitable secondary foraging habitat immediately adjacent to the study area and potentially within the salt marsh when not inundated. May occasionally occur within the study area.
Thinornis cucullatus	Hooded Plover	VU	v		PMST	Year-round resident. Sandy ocean beaches, margins of estuaries and coastal lakes.	Low	Limited suitable sandy beach habitat within the study area. And no records of the species within the northern sections of Western Port (north of Stony Point).

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Charadrius mongolus	Lesser Sand Plover	EN	e		PMST	Intertidal mudflats and sandbanks of sheltered bays and estuaries.	Low	Scattered historic records of the species throughout Western Port but no recent records of the species to the north of Stony Point.
Charadrius leschenaultii	Greater Sand Plover	VU	v		PMST	Intertidal mudflats and sandbanks of sheltered bays and estuaries.	Low	Scattered historic records of the species throughout Western Port but no recent recordsof the species to the north of Stony Point.
Numenius madagascariensis	Eastern Curlew	CR	cr	2014	PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	Medium	Scattered historic and recent records of the species throughout Western Port. Suitable secondary foraging habitat immediately adjacent to the study area and potentially within the salt marsh when not inundated. May occasionally occur within the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Calidris ferruginea	Curlew Sandpiper	CR	cr	1992	PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	Medium	Scattered historic and recent records of the species throughout Western Port. Suitable secondary foraging habitat immediately adjacent to the study area and potentially within the salt marsh when not inundated. May occasionally occur within the study area.
Calidris canutus	Red Knot	EN	e		PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	Medium	Scattered historic and recent records of the species throughout Western Port. Suitable secondary foraging habitat immediately adjacent to the study area and potentially within the salt marsh when not inundated. May occasionally occur within the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Calidris tenuirostris	Great Knot	CR	cr		PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	Medium	Scattered historic and recent records of the species throughout Western Port. Suitable secondary foraging habitat immediately adjacent to the study area and potentially within the salt marsh when not inundated. May occasionally occur within the study area.
Pycnoptilus floccosus	Pilotbird	VU			PMST	E Vic to SE NSW. Largely ground-dwelling among leaf litter, logs and lower storey vegetation of wet sclerophyll forests and rainforest. Less often, alpine and coastal woodlands.	Negligible	No suitable habitat in the study area.
Grantiella picta	Painted Honeyeater	VU	v		PMST	Dry open woodlands and forests. Typically forages for fruit and nectar in mistletoes and in tree canopies.	Negligible	No suitable habitat in the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Anthochaera phrygia	Regent Honeyeater	CR	cr		PMST	A range of dry woodlands and forests dominated by nectar-producing tree species.	Negligible	No suitable habitat in the study area and species is now regionally reduced to NE Victoria.
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll	EN	e		PMST	Rainforest and wet and dry sclerophyll forests and woodlands.	Negligible	No suitable habitat in the study area.
Megaptera novaeangliae	Humpback Whale	VU			PMST	Migrate between summer feeding grounds in the Southern Ocean to Northern waters where birthing and mating occurs. Increasingly recorded along the Victorian coast, occasionally entering Port Phillip and Western Port.	Negligible	Marine species, no suitable habitat within the study area.
Antechinus minimus maritimus	Swamp Antechinus	VU	v		PMST	Dense wet heath and heathy woodland, sedgeland and dense tussock grassland.	Low	Some suitable habitat present within the study area but no records in the local area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Petaurus australis	Yellow-bellied Glider	VU			PMST	Sclerophyll forest with large hollow-bearing trees, prefers mature eucalypt dominated forest and woodland. Distributed along South-eastern Australia.	Negligible	No suitable habitat within the study area and no records within the local area.
Potorous tridactylus trisulcatus	Long-nosed Potoroo	VU	v		PMST	Forest, heathy woodlands and heathlands.	Negligible	No suitable habitat within the study area and no records within the local area. Species recorded on French Island.
Pseudomys novaehollandiae	New Holland Mouse	VU	e	1972	PMST	Coastal heathland, heathy woodland and dry sclerophyll forest.	Negligible	No suitable habitat within the study area and no recent records within the local area.
Eubalaena australis	Southern Right Whale	EN	e	2017	PMST	Migrates between summer feeding grounds in the Southern Ocean to warmer northern waters over winter, where it can be found along the Victorian coastline.	Negligible	Marine species, no suitable habitat within the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Isoodon obesulus obesulus	Southern Brown Bandicoot	EN	e	2011	PMST	Heathland, shrubland, sedgeland, heathy open forest and woodland; also exotic vegetation, such as blackberry thickets and rank grasses where native vegetation has been removed.	Low	Recent records in the local areas and some suitable habitat present within the study area. However, despite extensive targeted surveys within the study area and surrounds, the species has not been recorded and is unlikely to be present.
Pteropus poliocephalus	Grey-headed Flying-fox	VU	v		PMST	Rainforest, wet and dry sclerophyll forest, woodland and urban areas.	Low	Scattered recent records of the species along the Mornington Peninsula but no suitable roosting habitat within the study area.
Chelonia mydas	Green Turtle	VU			PMST	Marine species with a pan-tropical distribution throughout the world. More abundant along the tropical coasts of Australia and the Great Barrier Reef.	Negligible	Marine species, no suitable habitat within the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Dermochelys coriacea	Leathery Turtle	EN	cr		PMST	Marine species usually sighted along the eastern seaboard often in bays, estuaries and rivers. No major nesting events have been recorded in Australia.	Negligible	Marine species, no suitable habitat within the study area.
Caretta caretta	Loggerhead Turtle	EN			PMST	Loggerhead Turtles forage widely in the waters of coral and rocky reefs, seagrass beds and muddy bays throughout eastern, northern and western Australia. Nesting occurs in coastal environments of northern WA, NT and QLD.	Negligible	Marine species, no suitable habitat within the study area.
Lissolepis coventryi	Swamp Skink	EN	e	2018	PMST	Densely vegetated swamps and associated watercourses, and adjacent wet heaths, sedgelands and saltmarshes.	Recorded	Species recorded during targeted surveys on site.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Litoria raniformis	Growling Grass Frog	VU	v	1999	PMST	Still or slow-flowing waterbodies and surrounding terrestrial vegetation.	Low	Some suitable habitat present within the study area but no recent records within the immediate surrounding area.
Thunnus maccoyii	Southern Bluefin Tuna	CD	cd		PMST	The species is highly migratory, occurring globally in waters between 30-50 degrees Celsius.	Negligible	Marine species, no suitable habitat within the study area.
Carcharodon carcharias	Great White Shark	VU	e		PMST	Near coastal and offshore waters.	Negligible	Marine species, no suitable habitat within the study area.
Prototroctes maraena	Australian Grayling	VU	e		PMST	Adults inhabit cool, clear, freshwater streams.	Negligible	No suitable habitat in the study area and no records of the species along the Mornington Peninsula.
Galaxiella pusilla	Dwarf Galaxias	VU	e		PMST	Slow-flowing or still freshwater wetlands such as swamps, drains and backwaters of streams.	Low	Suitable habitat present in the study area and records along the Mornington Peninsula. However, no records of the species in waterways of the study area and surrounds, despite extensive targeted survey.
Nannoperca obscura	Yarra Pygmy Perch	VU	v		PMST	Lakes, pools and slow-flowing streams with abundant aquatic vegetation.	Low	Some suitable habitat within the study area, but no records of the species along the Mornington Peninsula.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Seriolella brama	Blue Warehou	CD	cd		PMST	The species occurs predominantly in coastal shelf, upper continental slope and seamount waters offshore from New South Wales, Tasmania, Victoria and South Australia.	Negligible	Marine species, no suitable habitat within the study area.
Synemon plana	Golden Sun Moth	VU	v		PMST	Natural temperate grassland, grassy woodland and pasture supporting spear grasses and wallaby grasses and exotic grassland dominated by Chilean needle grass.	Negligible	No suitable habitat in the study area and beyond the species normal distribution.
State significance								
Lewinia pectoralis	Lewin's Rail		v	2018		Swamps, dense riparian vegetation and saltmarsh.	Medium	Some suitable habitat within the study area and numerous recent and historic records of the species on the Mornington Peninsula.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Egretta garzetta	Little Egret		e	2019		Swamps, billabongs, floodplain pools, mudflats, mangroves and channels; breeds in trees standing in water.	Medium	Some suitable habitat within the study area and numerous recent and historic records of the species on the Mornington Peninsula.
Ardea intermedia plumifera	Plumed Egret		cr	1981		Densely-vegetated freshwater wetlands including lakes, swamps and billabongs. Breeds in trees standing in water.	Medium	Some suitable habitat within the study area and scattered records of the species on the Mornington Peninsula.
Ardea alba modesta	Eastern Great Egret		v	2019		Flooded crops, pasture, swamps, lagoons, saltmarsh, sewage ponds, estuaries, dams, roadside ditches. Breeds in trees standing in water.	Medium	Some suitable habitat within the study area and numerous recent and historic records of the species on the Mornington Peninsula.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Spatula rhynchotis	Australasian Shoveler		v	2007		Prefers large, permanent lakes and swamps with deep water, stable conditions and abundant aquatic vegetation.	Low	Some suitable habitat presently available within the study area. However, this species typically prefers large permanent lake systems and wetland habitat within the study area may not be suitable for extensive periods.
Aythya australis	Hardhead		v	2000		A mainly aquatic species preferring large, deep freshwater environments with abundant aquatic vegetation, including slow moving areas of rivers.	Low	Some suitable habitat presently available within the study area. However, this species typically prefers large permanent lake systems and wetland habitat within the study area may not be suitable for extensive periods.
Oxyura australis	Blue-billed Duck		v	2007		Open or densely vegetated wetlands.	Low	Some suitable habitat presently available within the study area. However, this species typically prefers large permanent lake systems and wetland habitat within the study area may not be suitable for extensive periods.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Biziura lobata	Musk Duck		v	2007		A largely aquatic species preferring deep water on large, permanent swamps, lakes and estuaries with abundant aquatic vegetation.	Low	Some suitable habitat presently available within the study area. However, this species typically prefers large permanent lake systems and wetland habitat within the study area may not be suitable for extensive periods.
Hieraaetus morphnoides	Little Eagle		v	1998		Woodland and open areas. Rabbits are a key component of their diet. Nesting occurs in mature trees in open woodland or riparian vegetation.	Medium	Scattered records of the species along the Mornington Peninsula and some suitable cleared foraging habitat within the study area. May occasionally occur within the study area.
Haliaeetus leucogaster	White-bellied Sea-Eagle		e	2015		Coastal areas such as beaches and estuaries, inland wetlands and major inland streams.	Medium	Scattered records of the species along the Mornington Peninsula and some suitable habitat within the study area. May occasionally occur within the study area.
Ninox strenua	Powerful Owl		v	2013		Eucalypt forests and woodlands, well-treed urban areas.	Low	Scattered records of the species along the Mornington Peninsula but habitat within the study area and surrounds is not suitable.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Hydroprogne caspia	Caspian Tern		v	2019		Estuaries, inlets, bays, lagoons, inland lakes, flooded pasture, sewage ponds.	High	Numerous recent records of the species within coastal habitats of Western Port and previously recorded within the study area (2010). Some suitable foraging habitat within the study area and surrounds.
Sternula albifrons	Little Tern		cr		PMST	This bird is mostly recorded in sheltered coastal environments, including bays, lagoons and estuaries. Nests on sandy substrates containing much shell-grit, which provides good camouflage for their eggs.	Medium	Scattered historic and recent records of the species throughout Western Port. Suitable secondary foraging habitat immediately adjacent to the study area and potentially within the salt marsh when not inundated. May occasionally occur within the study area.
Arenaria interpres	Ruddy Turnstone		e	1991	PMST	Mainly found on coastal beaches, exposed reefs, and rock platforms.	Medium	Scattered historic and recent records of the species throughout Western Port. Suitable secondary foraging habitat immediately adjacent to the study area and potentially within the salt marsh when not inundated. May occasionally occur within the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Pluvialis squatarola	Grey Plover		v		PMST	Mudflats, saltmarsh, tidal reefs and estuaries.	Low	Scattered historic records of the species throughout Western Port, but not considered a frequent inhabitant.
Pluvialis fulva	Pacific Golden Plover		v	1982	PMST	A range of coastal habitats including mudflats, sandflats rocky shores and saltmarsh.	Medium	Scattered historic and recent records of the species throughout Western Port. Suitable secondary foraging habitat immediately adjacent to the study area and potentially within the salt marsh when not inundated. May occasionally occur within the study area.
Numenius phaeopus	Whimbrel		e	1992	PMST	Coastal environments on mudflats, sandy shores and the crevices of rock platforms. The species is rarely recorded inland.	Medium	Scattered historic and recent records of the species throughout Western Port. Suitable secondary foraging habitat immediately adjacent to the study area and potentially within the salt marsh when not inundated. May occasionally occur within the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Tringa glareola	Wood Sandpiper		e		PMST	Well-vegetated shallow freshwater wetlands with emergent aquatic plants and dense fringing vegetation.	Low	Occasional records of the species in Western Port, but not considered a frequent inhabitant.
Tringa brevipes	Grey-tailed Tattler		cr	1991	PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	Medium	Scattered historic and recent records of the species throughout Western Port. Suitable secondary foraging habitat immediately adjacent to the study area and potentially within the salt marsh when not inundated. May occasionally occur within the study area.
Actitis hypoleucos	Common Sandpiper		v	2019	PMST	Migrates to Australia from Eurasia in August where it inhabits a wide variety of coastal and inland wetlands with muddy margins before departing north in March.	Medium	Scattered historic and recent records of the species throughout Western Port. Suitable secondary foraging habitat immediately adjacent to the study area and potentially within the salt marsh when not inundated. May occasionally occur within the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Tringa nebularia	Common Greenshank		e	1991	PMST	A variety of ephemeral and permanent inland wetlands and sheltered coastal wetlands.	Medium	Scattered historic and recent records of the species throughout Western Port. Suitable secondary foraging habitat immediately adjacent to the study area and potentially within the salt marsh when not inundated. May occasionally occur within the study area.
Tringa stagnatilis	Marsh Sandpiper		e		PMST	Permanent or ephemeral wetlands, mudflats and saltmarshes in coastal and inland environments.	Low	Occasional records of the species in Western Port, but not considered a frequent inhabitant.
Xenus cinereus	Terek Sandpiper		e	1979	PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	Low	Occasional records of the species in Western Port, but not considered a frequent inhabitant.
Pomatostomus temporalis	Grey-crowned Babbler		v	1965		Open forests and woodlands.	Negligible	No recent records of the species in the surrounding area and no suitable habitat in the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Calamanthus pyrrhopygius	Chestnut-rumped Heathwren		v	1980		Woodland habitat with a dense, shrubby understorey.	Negligible	No recent records of the species in the surrounding area and no suitable habitat in the study area.
Megaptera novaeangliae australis	Southern Humpback Whale		cr	2013		Migrate between summer feeding grounds in the Southern Ocean to Northern waters where birthing and mating occurs. Increasingly recorded along the Victorian coast, occasionally entering Port Phillip and Western Port.	Negligible	Marine species, no suitable habitat in the study area.
Pseudemoia rawlinsoni	Glossy Grass Skink		e	2018		Damp environments like drainage lines, soaks and the margins of creeks, particularly in dense vegetation including rank grass, reeds and sedges. Also the fringes of coastal saltmarshes.	Recorded	Species recorded during targeted surveys on site.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Pseudophryne semimarmorata	Southern Toadlet		e	2007		A wide variety of woodland, forest and grassland habitats, where it shelters under leaf litter and other debris in moist soaks and depressions. Breeds in swamps and inundated habitats, and along creek lines.	Low	Potentially suitable habitat within the study area and recent records in surrounding areas. However, despite extensive targeted surveys, the species has not been recorded within the study area and surrounds.
Mugilogobius platynotus	Flatback Mangrove Goby		e	2009		Tidal mangrove forests of estuaries.	Low	Species recorded immediately south of the study area, However, no connection between salt marsh/ tall marsh wetland (potentially suitable habitat) and surrounding marine/mangrove habitat.
Michelea microphylla	Michelea Species 5256		cr	1965		Intertidal mudflat habitat.	Negligible	No suitable habitat within the study area.
Pseudocalliax tooradin	Ghost shrimp		e	1965		Intertidal mudflat habitat.	Negligible	No suitable habitat within the study area.

Appendix B.3. Migratory species (EPBC Act listed)

Table 15 Migratory fauna species recorded or predicted to occur within 5 km of the study area

Scientific name	Common name	Most recent record
Migratory species		
Actitis hypoleucos	Common Sandpiper	2019
Gallinago megala	Swinhoe's Snipe	PMST
Gallinago stenura	Pin-tailed Snipe	PMST
Limicola falcinellus	Broad-billed Sandpiper	PMST
Gallinago hardwickii	Latham's Snipe	2013
Pandion cristatus	Eastern Osprey	2017
Hirundapus caudacutus	White-throated Needletail	2007
Apus pacificus	Fork-tailed Swift	PMST
Ardenna grisea	Sooty Shearwater	PMST
Ardenna carneipes	Flesh-footed Shearwater	PMST
Diomedea exulans	Wandering Albatross	PMST
Thalassarche melanophris	Black-browed Albatross	1980
Thalassarche carteri	Indian Yellow-nosed Albatross	PMST
Thalassarche chrysostoma	Grey-headed Albatross	PMST
Thalassarche cauta	Shy Albatross	1980
Phoebetria fusca	Sooty Albatross	PMST
Macronectes giganteus	Southern Giant-Petrel	1980
Thalassarche bulleri	Buller's Albatross	PMST
Macronectes halli	Northern Giant-Petrel	PMST
Diomedea epomophora	Southern Royal Albatross	PMST
Diomedea sanfordi	Northern Royal Albatross	PMST
Diomedea antipodensis	New Zealand Wandering Albatross	PMST
Thalassarche salvini	Salvin's Albatross	PMST
Thalassarche steadi	White-capped Albatross	PMST
Thalassarche impavida	Campbell Albatross	PMST
Hydroprogne caspia	Caspian Tern	2019
Thalasseus bergii	Crested Tern	2014
Sternula albifrons	Little Tern	PMST
Arenaria interpres	Ruddy Turnstone	1991
Pluvialis squatarola	Grey Plover	PMST
Pluvialis fulva	Pacific Golden Plover	1982
Charadrius mongolus	Lesser Sand Plover	PMST
Charadrius bicinctus	Double-banded Plover	2000
Charadrius leschenaultii	Greater Sand Plover	PMST
Numenius madagascariensis	Eastern Curlew	2014
Numenius phaeopus	Whimbrel	1992
Numenius minutus	Little Curlew	PMST

Scientific name	Common name	Most recent record
Limosa lapponica	Bar-tailed Godwit	1981
Tringa glareola	Wood Sandpiper	PMST
Tringa brevipes	Grey-tailed Tattler	1991
Tringa incana	Wandering Tattler	PMST
Tringa nebularia	Common Greenshank	1991
Tringa stagnatilis	Marsh Sandpiper	PMST
Xenus cinereus	Terek Sandpiper	1979
Calidris ferruginea	Curlew Sandpiper	1992
Calidris ruficollis	Red-necked Stint	2000
Calidris acuminata	Sharp-tailed Sandpiper	2019
Calidris canutus	Red Knot	PMST
Calidris tenuirostris	Great Knot	PMST
Calidris melanotos	Pectoral Sandpiper	PMST
Motacilla flava	Yellow Wagtail	PMST
Rhipidura rufifrons	Rufous Fantail	2007
Myiagra cyanoleuca	Satin Flycatcher	2007
Lagenorhynchus obscurus	Dusky Dolphin	PMST
Megaptera novaeangliae	Humpback Whale	PMST
Eubalaena australis	Southern Right Whale	2017
Caperea marginata	Pygmy Right Whale	PMST
Chelonia mydas	Green Turtle	PMST
Dermochelys coriacea	Leathery Turtle	PMST
Caretta caretta	Loggerhead Turtle	PMST
Lamna nasus	Porbeagle	PMST
Carcharodon carcharias	Great White Shark	PMST

Appendix C. Photos of the study area

Photo 1 **Tall Marsh in the northern drain.**

Photo 2 **Tall Marsh in the northern drain.**

Photo 3 **Open pasture dominates the northern two thirds of the study area.**

Photo 4 **Non-indigenous trees and shrubs along the eastern margin of Long Island Drive.**

Photo 5 **Damp Sands Herb-rich Woodland adjacent to Long Island Drive.**

Photo 6 **Non-indigenous trees and shrubs along the eastern margin of Long Island Drive.**

Photo 7 A scattered Manna Gum among the planted non-indigenous trees and shrubs along Long Island Drive.

Photo 8 A large area dominated by Pampas Grass north of Habitat Zone 1B.

Photo 9 **Looking west over the Spiny Rush dominated wetland into HZ1B.**

Photo 10 **Vegetation associated with HZ1C.**

Photo 11 Looking into HZ1B from the southern boundary of the site.

Photo 12 Landscape plantings and weeds along the southern edge of Long Island Drive.

Photo 13 **A narrow band of Damp Sands Herb-rich Woodland along the margin of Long Island Drive.**

Photo 14 **A narrow band of Damp Sands Herb-rich Woodland along the margin of Long Island Drive.**

Photo 15 The rocky edge of the fill on the bayside of the study area looking north.

Photo 16 The rocky edge of the fill on the bayside of the study area looking south.

Appendix D. Native vegetation removal report

Scenario test – native vegetation removal

This report provides offset requirements for internal testing of different proposals to remove native vegetation. **This report DOES NOT support an application to remove, destroy or lop native vegetation under Clause 52.16 or 52.17 of planning schemes in Victoria.** A report must be obtained from the Department of Environment, Land, Water and Planning (DELWP).

Date of issue: **25/10/2022**
Time of issue: **12:28 pm**

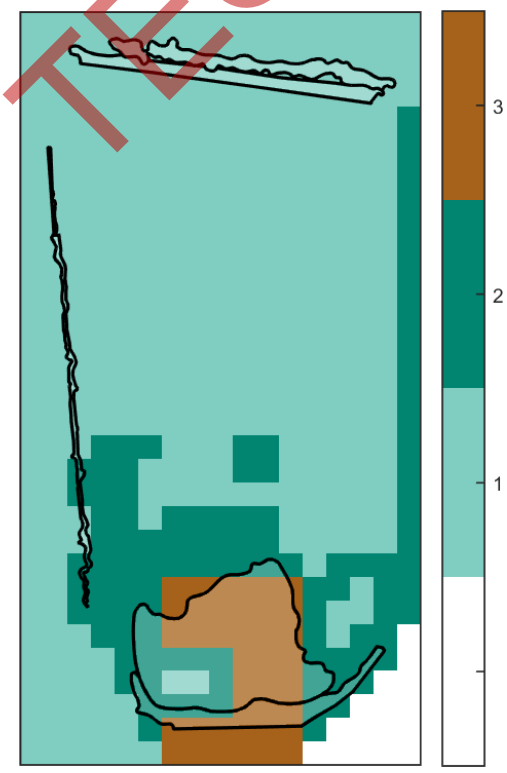
Report ID: Scenario Testing

Project ID	38023_PortOfHastings_VegRemoval_CompleteLoss

Assessment pathway

Assessment pathway	**Detailed Assessment Pathway**
Extent including past and proposed	3.892 ha
Extent of past removal	0.000 ha
Extent of proposed removal	3.892 ha
No. Large trees proposed to be removed	0
Location category of proposed removal	Location 3 The native vegetation is in an area where the removal of less than 0.5 hectares could have a significant impact on habitat for one or more rare or threatened species.The native vegetation is also in an area mapped as a wetland designated under the Convention on Wetlands of International Importance (the Ramsar Convention); and a wetland listed in the Directory of Important Wetlands of Australia; and an internationally important site for Migratory Shorebirds of the East Asian-Australasian Flyway.

1. Location map



Scenario test – native vegetation removal

Offset requirements if a permit is granted

Any approval granted will include a condition to obtain an offset that meets the following requirements:

General offset amount[1]	0.475 general habitat units
Vicinity	Port Phillip and Westernport Catchment Management Authority (CMA) or Mornington Peninsula Shire Council
Minimum strategic biodiversity value score[2]	0.520
Large trees*	0 large trees
Species offset amount[3]	0.194 species units of habitat for Flatback Mangrovegoby, *Mugiligobius platynotus* 1.751 species units of habitat for Tiny Arrowgrass, *Triglochin minutissima*
Large trees*	0 trees
*** The total number of large trees that the offset must protect**	0 large trees to be protected in either the general, species or combination across all habitat units protected

NB: values within tables in this document may not add to the totals shown above due to rounding

Appendix 1 includes information about the native vegetation to be removed

Appendix 2 includes information about the rare or threatened species mapped at the site.

Appendix 3 includes maps showing native vegetation to be removed and extracts of relevant species habitat importance maps

1 The general offset amount required is the sum of all general habitat units in Appendix 1.

2 Minimum strategic biodiversity score is 80 per cent of the weighted average score across habitat zones where a general offset is required

3 The species offset amount(s) required is the sum of all species habitat units in Appendix 1.

Scenario test – native vegetation removal

Next steps

Any proposal to remove native vegetation must meet the application requirements of the Detailed Assessment Pathway and it will be assessed under the Detailed Assessment Pathway.

This report DOES NOT support an application to remove, destroy or lop native vegetation under Clause 52.16 or 52.17 of planning schemes in Victoria.

If you wish to remove the mapped native vegetation you must submit the related shapefiles to the Department of Environment, Land, Water and Planning (DELWP) for processing, by email to ensymnvrtool.support@delwp.vic.gov.au. DELWP will provide a *Native vegetation removal report* that is required to meet the permit application requirements in accordance with *Guidelines for the removal, destruction or lopping of native vegetation* (Guidelines).

Appendix 1: Description of native vegetation to be removed

The species-general offset test was applied to your proposal. This test determines if the proposed removal of native vegetation has a proportional impact on any rare or threatened species habitats above the species offset threshold. The threshold is set at 0.005 per cent of the mapped habitat value for a species. When the proportional impact is above the species offset threshold a species offset is required. This test is done for all species mapped at the site. Multiple species offsets will be required if the species offset threshold is exceeded for multiple species.

Where a zone requires species offset(s), the species habitat units for each species in that zone is calculated by the following equation in accordance with the Guidelines:

Species habitat units = extent x condition x species landscape factor x 2, where the species landscape factor = 0.5 + (habitat importance score/2)

The species offset amount(s) required is the sum of all species habitat units per zone

Where a zone does not require a species offset, the general habitat units in that zone is calculated by the following equation in accordance with the Guidelines:

General habitat units = extent x condition x general landscape factor x 1.5, where the general landscape factor = 0.5 + (strategic biodiversity value score/2)

The general offset amount required is the sum of all general habitat units per zone.

Native vegetation to be removed

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	**Type**	**BioEVC**	**BioEVC conservation status**	**Large tree(s)**	**Partial removal**	**Condition score**	**Polygon Extent**	**Extent without overlap**	**SBV score**	**HI score**	**Habitat units**	**Offset type**
0-a	Patch	gipp0821	Endangered	0	no	0.550	0.450	0.450	0.627		0.302	General
0-c	Patch	gipp0003	Vulnerable	0	no	0.180	0.438	0.438	0.640		0.097	General
0-d	Patch	gipp0003	Vulnerable	0	no	0.280	0.023	0.023	0.812		0.009	General
0-b	Patch	gipp0821	Endangered	0	no	0.430	2.253	2.253	0.947	0.642	1.591	503446 Tiny Arrowgrass *Triglochin minutissima*
0-c2	Patch	gipp0003	Vulnerable	0	no	0.180	0.540	0.540	0.799	1.000	0.194	5029 Flatback Mangrovegoby *Mugiligobius platynotus*
										0.315	0.161	503446 Tiny Arrowgrass *Triglochin minutissima*
0-d2	Patch	gipp0003	Vulnerable	0	no	0.280	0.188	0.188	0.711		0.068	General

Appendix 2: Information about impacts to rare or threatened species' habitats on site

This table lists all rare or threatened species' habitats mapped at the site.

Species common name	Species scientific name	Species number	Conservation status	Group	Habitat impacted	% habitat value affected
Flatback Mangrovegoby	*Mugiligobius platynotus*	5029	Vulnerable	Highly Localised Habitat	Habitat importance map ; special site	0.4986
Tiny Arrowgrass	*Triglochin minutissima*	503446	Rare	Dispersed	Habitat importance map	0.0138
Coast Fescue	*Poa billardierei*	501361	Rare	Dispersed	Habitat importance map	0.0046
Coast Twin-leaf	*Zygophyllum billardierei*	503615	Rare	Dispersed	Habitat importance map	0.0038
Coast Wirilda	*Acacia uncifolia*	504210	Rare	Dispersed	Habitat importance map	0.0030
Coast Bitter-bush	*Adriana quadripartita*	504755	Vulnerable	Dispersed	Habitat importance map	0.0029
Grey Plover	*Pluvialis squatarola*	10136	Endangered	Dispersed	Habitat importance map	0.0022
Marsh Saltbush	*Atriplex paludosa subsp. paludosa*	500326	Rare	Dispersed	Habitat importance map	0.0022
Hooded Plover	*Thinornis rubricollis rubricollis*	10138	Vulnerable	Dispersed	Habitat importance map	0.0018
Creeping Rush	*Juncus revolutus*	501839	Rare	Dispersed	Habitat importance map	0.0018
Grey Mangrove	*Avicennia marina subsp. australasica*	500345	Rare	Dispersed	Habitat importance map	0.0016
Dune Poa	*Poa poiformis var. ramifer*	504826	Rare	Dispersed	Habitat importance map	0.0016
Ruddy Turnstone	*Arenaria interpres*	10129	Vulnerable	Dispersed	Habitat importance map	0.0014
Dune Wood-sorrel	*Oxalis rubens*	502390	Rare	Dispersed	Habitat importance map	0.0010
Common Sandpiper	*Actitis hypoleucos*	10157	Vulnerable	Dispersed	Habitat importance map	0.0009
Pacific Golden Plover	*Pluvialis fulva*	10137	Vulnerable	Dispersed	Habitat importance map	0.0008
Lesser Sand Plover	*Charadrius mongolus*	10139	Critically endangered	Dispersed	Habitat importance map	0.0008
Eastern Curlew	*Numenius madagascariensis*	10149	Vulnerable	Dispersed	Habitat importance map	0.0007
Coast Helmet-orchid	*Corybas despectans*	500836	Vulnerable	Dispersed	Habitat importance map	0.0006

Greater Sand Plover	*Charadrius leschenaultii*	10141	Critically endangered	Dispersed	Habitat importance map	0.0006
Curlew Sandpiper	*Calidris ferruginea*	10161	Endangered	Dispersed	Habitat importance map	0.0006
Salt Lawrencia	*Lawrencia spicata*	501888	Rare	Dispersed	Habitat importance map	0.0005
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	10226	Vulnerable	Dispersed	Habitat importance map	0.0005
Glossy Grass Skink	*Pseudemoia rawlinsoni*	12683	Vulnerable	Dispersed	Habitat importance map	0.0005
Red Knot	*Calidris canutus*	10164	Endangered	Dispersed	Habitat importance map	0.0004
Black-tailed Godwit	*Limosa limosa*	528553	Vulnerable	Dispersed	Habitat importance map	0.0004
Little Egret	*Egretta garzetta nigripes*	10185	Endangered	Dispersed	Habitat importance map	0.0004
Australasian Bittern	*Botaurus poiciloptilus*	10197	Endangered	Dispersed	Habitat importance map	0.0003
Growling Grass Frog	*Litoria raniformis*	13207	Endangered	Dispersed	Habitat importance map	0.0003
Blue-billed Duck	*Oxyura australis*	10216	Endangered	Dispersed	Habitat importance map	0.0003
Green Leek-orchid	*Prasophyllum lindleyanum*	502702	Vulnerable	Dispersed	Habitat importance map	0.0003
Intermediate Egret	*Ardea intermedia*	10186	Endangered	Dispersed	Habitat importance map	0.0002
Freckled Duck	*Stictonetta naevosa*	10214	Endangered	Dispersed	Habitat importance map	0.0002
Eastern Great Egret	*Ardea modesta*	10187	Vulnerable	Dispersed	Habitat importance map	0.0002
Musk Duck	*Biziura lobata*	10217	Vulnerable	Dispersed	Habitat importance map	0.0002
Lewin's Rail	*Lewinia pectoralis pectoralis*	10045	Vulnerable	Dispersed	Habitat importance map	0.0002
Leafy Twig-sedge	*Cladium procerum*	500786	Rare	Dispersed	Habitat importance map	0.0002
Purple Blown-grass	*Lachnagrostis punicea subsp. punicea*	504206	Rare	Dispersed	Habitat importance map	0.0002
Marsh Sandpiper	*Tringa stagnatilis*	10159	Vulnerable	Dispersed	Habitat importance map	0.0002
Dense Leek-orchid	*Prasophyllum spicatum*	504506	Endangered	Dispersed	Habitat importance map	0.0002
Veined Spear-grass	*Austrostipa rudis subsp. australis*	504940	Rare	Dispersed	Habitat importance map	0.0002
Golden Cowslips	*Diuris behrii*	501061	Vulnerable	Dispersed	Habitat importance map	0.0002
Parsley Xanthosia	*Xanthosia leiophylla*	504562	Rare	Dispersed	Habitat importance map	0.0002

Baillon's Crake	*Porzana pusilla palustris*	10050	Vulnerable	Dispersed	Habitat importance map	0.0002
Australasian Shoveler	*Anas rhynchotis*	10212	Vulnerable	Dispersed	Habitat importance map	0.0002
Hardhead	*Aythya australis*	10215	Vulnerable	Dispersed	Habitat importance map	0.0002
Whimbrel	*Numenius phaeopus*	10150	Vulnerable	Dispersed	Habitat importance map	0.0001
Great Knot	*Calidris tenuirostris*	10165	Endangered	Dispersed	Habitat importance map	0.0001
Rough Blown-grass	*Lachnagrostis rudis subsp. rudis*	500159	Endangered	Dispersed	Habitat importance map	0.0001
Elegant Parrot	*Neophema elegans*	10307	Vulnerable	Dispersed	Habitat importance map	0.0001
Finger-leaved Daisy	*Brachyscome exilis*	500457	Rare	Dispersed	Habitat importance map	0.0001
Grey Goshawk	*Accipiter novaehollandiae novaehollandiae*	10220	Vulnerable	Dispersed	Habitat importance map	0.0001
Mauve-tuft Sun-orchid	*Thelymitra malvina*	503374	Vulnerable	Dispersed	Habitat importance map	0.0001
Clover Glycine	*Glycine latrobeana*	501456	Vulnerable	Dispersed	Habitat importance map	0.0001
Gull-billed Tern	*Gelochelidon nilotica macrotarsa*	10111	Endangered	Dispersed	Habitat importance map	0.0001
Australian Painted Snipe	*Rostratula australis*	10170	Critically endangered	Dispersed	Habitat importance map	0.0001
Common Greenshank	*Tringa nebularia*	10158	Vulnerable	Dispersed	Habitat importance map	0.0001
Chestnut-rumped Heathwren	*Calamanthus pyrrhopygius*	10498	Vulnerable	Dispersed	Habitat importance map	0.0000
Swamp Skink	*Lissolepis coventryi*	12407	Vulnerable	Dispersed	Habitat importance map	0.0000
Black Falcon	*Falco subniger*	10238	Vulnerable	Dispersed	Habitat importance map	0.0000
Common Bent-wing Bat (eastern ssp.)	*Miniopterus schreibersii oceanensis*	61342	Vulnerable	Dispersed	Habitat importance map	0.0000
White-throated Needletail	*Hirundapus caudacutus*	10334	Vulnerable	Dispersed	Habitat importance map	0.0000
Lace Monitor	*Varanus varius*	12283	Endangered	Dispersed	Habitat importance map	0.0000
Little Tern	*Sterna albifrons sinensis*	10117	Vulnerable	Dispersed	Habitat importance map	0.0000
Sand Brome	*Bromus arenarius*	500497	Rare	Dispersed	Habitat importance map	0.0000

Habitat group

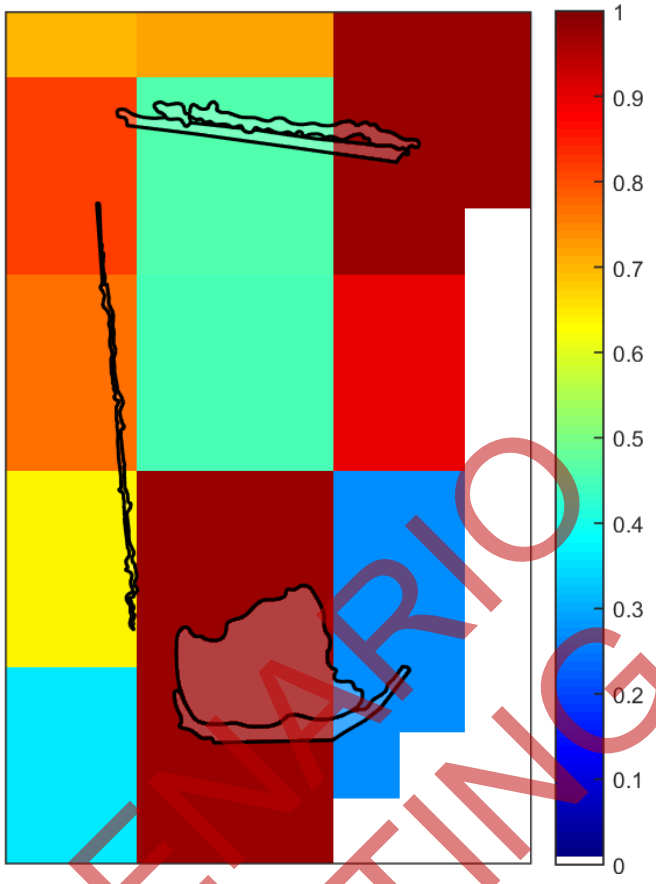
- Highly localised habitat means there is 2000 hectares or less mapped habitat for the species
- Dispersed habitat means there is more than 2000 hectares of mapped habitat for the species

Habitat impacted

- Habitat importance maps are the maps defined in the Guidelines that include all the mapped habitat for a rare or threatened species
- Top ranking maps are the maps defined in the Guidelines that depict the important areas of a dispersed species habitat, developed from the highest habitat importance scores in dispersed species habitat maps and selected VBA records
- Selected VBA record is an area in Victoria that represents a large population, roosting or breeding site etc.

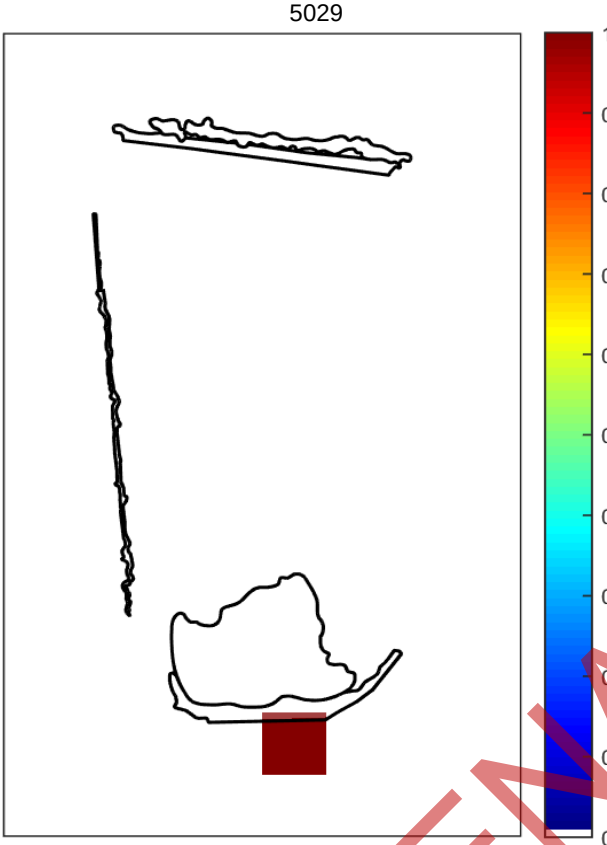
Appendix 3 – Images of mapped native vegetation

2. Strategic biodiversity values map

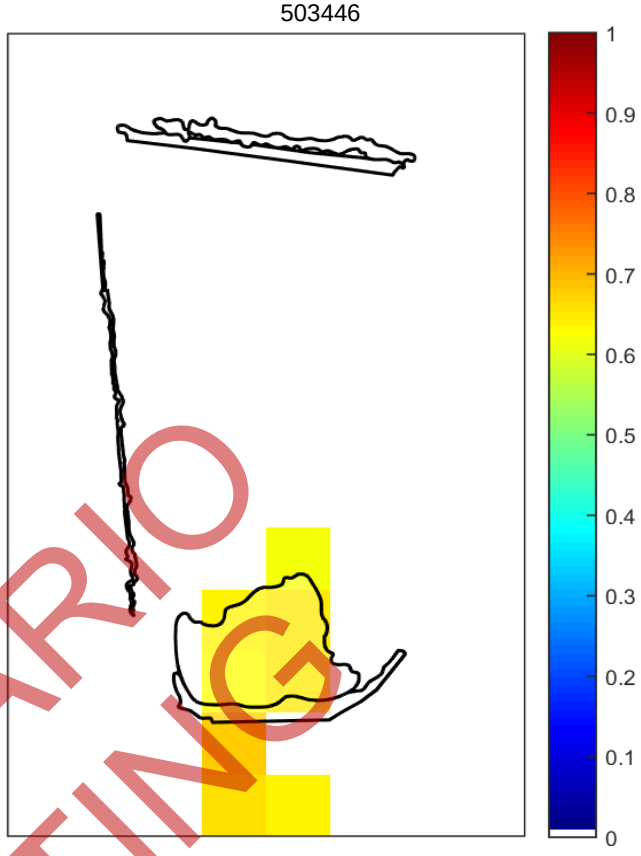


3. Habitat importance maps

Flatback Mangrovegoby
Mugiligobius platynotus
5029



Tiny Arrowgrass
Triglochin minutissima
503446



Scenario test – native vegetation removal

This report provides offset requirements for internal testing of different proposals to remove native vegetation. **This report DOES NOT support an application to remove, destroy or lop native vegetation under Clause 52.16 or 52.17 of planning schemes in Victoria.** A report must be obtained from the Department of Environment, Land, Water and Planning (DELWP).

Date of issue: **25/10/2022**
Time of issue: **12:33 pm**

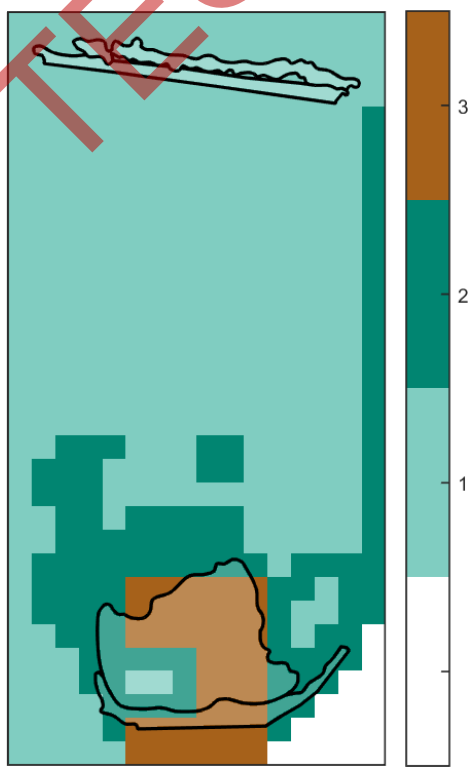
Report ID: Scenario Testing

Project ID	38023_PortOfHastings_VegRemoval_ExcludingHZ1d

Assessment pathway

Assessment pathway	**Detailed Assessment Pathway**
Extent including past and proposed	3.681 ha
Extent of past removal	0.000 ha
Extent of proposed removal	3.681 ha
No. Large trees proposed to be removed	0
Location category of proposed removal	Location 3 The native vegetation is in an area where the removal of less than 0.5 hectares could have a significant impact on habitat for one or more rare or threatened species.The native vegetation is also in an area mapped as a wetland designated under the Convention on Wetlands of International Importance (the Ramsar Convention); and a wetland listed in the Directory of Important Wetlands of Australia; and an internationally important site for Migratory Shorebirds of the East Asian-Australasian Flyway.

1. Location map



Scenario test – native vegetation removal

Offset requirements if a permit is granted

Any approval granted will include a condition to obtain an offset that meets the following requirements:

General offset amount[1]	0.399 general habitat units
Vicinity	Port Phillip and Westernport Catchment Management Authority (CMA) or Mornington Peninsula Shire Council
Minimum strategic biodiversity value score[2]	0.507
Large trees*	0 large trees
Species offset amount[3]	0.194 species units of habitat for Flatback Mangrovegoby, *Mugiligobius platynotus* 1.751 species units of habitat for Tiny Arrowgrass, *Triglochin minutissima*
Large trees*	0 trees
*** The total number of large trees that the offset must protect**	0 large trees to be protected in either the general, species or combination across all habitat units protected

NB: values within tables in this document may not add to the totals shown above due to rounding

Appendix 1 includes information about the native vegetation to be removed

Appendix 2 includes information about the rare or threatened species mapped at the site.

Appendix 3 includes maps showing native vegetation to be removed and extracts of relevant species habitat importance maps

1 The general offset amount required is the sum of all general habitat units in Appendix 1.

2 Minimum strategic biodiversity score is 80 per cent of the weighted average score across habitat zones where a general offset is required

3 The species offset amount(s) required is the sum of all species habitat units in Appendix 1.

Scenario test – native vegetation removal

Next steps

Any proposal to remove native vegetation must meet the application requirements of the Detailed Assessment Pathway and it will be assessed under the Detailed Assessment Pathway.

This report DOES NOT support an application to remove, destroy or lop native vegetation under Clause 52.16 or 52.17 of planning schemes in Victoria.

If you wish to remove the mapped native vegetation you must submit the related shapefiles to the Department of Environment, Land, Water and Planning (DELWP) for processing, by email to ensymnvrtool.support@delwp.vic.gov.au. DELWP will provide a *Native vegetation removal report* that is required to meet the permit application requirements in accordance with *Guidelines for the removal, destruction or lopping of native vegetation* (Guidelines).

Appendix 1: Description of native vegetation to be removed

The species-general offset test was applied to your proposal. This test determines if the proposed removal of native vegetation has a proportional impact on any rare or threatened species habitats above the species offset threshold. The threshold is set at 0.005 per cent of the mapped habitat value for a species. When the proportional impact is above the species offset threshold a species offset is required. This test is done for all species mapped at the site. Multiple species offsets will be required if the species offset threshold is exceeded for multiple species.

Where a zone requires species offset(s), the species habitat units for each species in that zone is calculated by the following equation in accordance with the Guidelines:

Species habitat units = extent x condition x species landscape factor x 2, where the species landscape factor = 0.5 + (habitat importance score/2)

The species offset amount(s) required is the sum of all species habitat units per zone

Where a zone does not require a species offset, the general habitat units in that zone is calculated by the following equation in accordance with the Guidelines:

General habitat units = extent x condition x general landscape factor x 1.5, where the general landscape factor = 0.5 + (strategic biodiversity value score/2)

The general offset amount required is the sum of all general habitat units per zone.

Native vegetation to be removed

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	**Type**	**BioEVC**	**BioEVC conservation status**	**Large tree(s)**	**Partial removal**	**Condition score**	**Polygon Extent**	**Extent without overlap**	**SBV score**	**HI score**	**Habitat units**	**Offset type**
0-a	Patch	gipp0821	Endangered	0	no	0.550	0.450	0.450	0.627		0.302	General
0-c	Patch	gipp0003	Vulnerable	0	no	0.180	0.438	0.438	0.640		0.097	General
0-b	Patch	gipp0821	Endangered	0	no	0.430	2.253	2.253	0.947	0.642	1.591	503446 Tiny Arrowgrass *Triglochin minutissima*
0-c2	Patch	gipp0003	Vulnerable	0	no	0.180	0.540	0.540	0.799	1.000	0.194	5029 Flatback Mangrovegoby *Mugiligobius platynotus*
										0.315	0.161	503446 Tiny Arrowgrass *Triglochin minutissima*

Appendix 2: Information about impacts to rare or threatened species' habitats on site

This table lists all rare or threatened species' habitats mapped at the site.

Species common name	Species scientific name	Species number	Conservation status	Group	Habitat impacted	% habitat value affected
Flatback Mangrovegoby	*Mugiligobius platynotus*	5029	Vulnerable	Highly Localised Habitat	Habitat importance map ; special site	0.4986
Tiny Arrowgrass	*Triglochin minutissima*	503446	Rare	Dispersed	Habitat importance map	0.0138
Coast Fescue	*Poa billardierei*	501361	Rare	Dispersed	Habitat importance map	0.0046
Coast Twin-leaf	*Zygophyllum billardierei*	503615	Rare	Dispersed	Habitat importance map	0.0036
Coast Wirilda	*Acacia uncifolia*	504210	Rare	Dispersed	Habitat importance map	0.0029
Coast Bitter-bush	*Adriana quadripartita*	504755	Vulnerable	Dispersed	Habitat importance map	0.0028
Grey Plover	*Pluvialis squatarola*	10136	Endangered	Dispersed	Habitat importance map	0.0022
Marsh Saltbush	*Atriplex paludosa subsp. paludosa*	500326	Rare	Dispersed	Habitat importance map	0.0022
Hooded Plover	*Thinornis rubricollis rubricollis*	10138	Vulnerable	Dispersed	Habitat importance map	0.0018
Creeping Rush	*Juncus revolutus*	501839	Rare	Dispersed	Habitat importance map	0.0017
Grey Mangrove	*Avicennia marina subsp. australasica*	500345	Rare	Dispersed	Habitat importance map	0.0016
Dune Poa	*Poa poiformis var. ramifer*	504826	Rare	Dispersed	Habitat importance map	0.0016
Ruddy Turnstone	*Arenaria interpres*	10129	Vulnerable	Dispersed	Habitat importance map	0.0014
Dune Wood-sorrel	*Oxalis rubens*	502390	Rare	Dispersed	Habitat importance map	0.0009
Common Sandpiper	*Actitis hypoleucos*	10157	Vulnerable	Dispersed	Habitat importance map	0.0009
Lesser Sand Plover	*Charadrius mongolus*	10139	Critically endangered	Dispersed	Habitat importance map	0.0008
Pacific Golden Plover	*Pluvialis fulva*	10137	Vulnerable	Dispersed	Habitat importance map	0.0008
Eastern Curlew	*Numenius madagascariensis*	10149	Vulnerable	Dispersed	Habitat importance map	0.0007
Greater Sand Plover	*Charadrius leschenaultii*	10141	Critically endangered	Dispersed	Habitat importance map	0.0006

Curlew Sandpiper	*Calidris ferruginea*	10161	Endangered	Dispersed	Habitat importance map	0.0006
Coast Helmet-orchid	*Corybas despectans*	500836	Vulnerable	Dispersed	Habitat importance map	0.0005
Salt Lawrencia	*Lawrencia spicata*	501888	Rare	Dispersed	Habitat importance map	0.0005
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	10226	Vulnerable	Dispersed	Habitat importance map	0.0005
Red Knot	*Calidris canutus*	10164	Endangered	Dispersed	Habitat importance map	0.0004
Glossy Grass Skink	*Pseudemoia rawlinsoni*	12683	Vulnerable	Dispersed	Habitat importance map	0.0004
Black-tailed Godwit	*Limosa limosa*	528553	Vulnerable	Dispersed	Habitat importance map	0.0004
Little Egret	*Egretta garzetta nigripes*	10185	Endangered	Dispersed	Habitat importance map	0.0004
Australasian Bittern	*Botaurus poiciloptilus*	10197	Endangered	Dispersed	Habitat importance map	0.0003
Growling Grass Frog	*Litoria raniformis*	13207	Endangered	Dispersed	Habitat importance map	0.0003
Blue-billed Duck	*Oxyura australis*	10216	Endangered	Dispersed	Habitat importance map	0.0003
Green Leek-orchid	*Prasophyllum lindleyanum*	502702	Vulnerable	Dispersed	Habitat importance map	0.0002
Intermediate Egret	*Ardea intermedia*	10186	Endangered	Dispersed	Habitat importance map	0.0002
Freckled Duck	*Stictonetta naevosa*	10214	Endangered	Dispersed	Habitat importance map	0.0002
Eastern Great Egret	*Ardea modesta*	10187	Vulnerable	Dispersed	Habitat importance map	0.0002
Musk Duck	*Biziura lobata*	10217	Vulnerable	Dispersed	Habitat importance map	0.0002
Marsh Sandpiper	*Tringa stagnatilis*	10159	Vulnerable	Dispersed	Habitat importance map	0.0002
Lewin's Rail	*Lewinia pectoralis pectoralis*	10045	Vulnerable	Dispersed	Habitat importance map	0.0002
Leafy Twig-sedge	*Cladium procerum*	500786	Rare	Dispersed	Habitat importance map	0.0002
Purple Blown-grass	*Lachnagrostis punicea subsp. punicea*	504206	Rare	Dispersed	Habitat importance map	0.0002
Golden Cowslips	*Diuris behrii*	501061	Vulnerable	Dispersed	Habitat importance map	0.0002
Baillon's Crake	*Porzana pusilla palustris*	10050	Vulnerable	Dispersed	Habitat importance map	0.0002
Parsley Xanthosia	*Xanthosia leiophylla*	504562	Rare	Dispersed	Habitat importance map	0.0002
Dense Leek-orchid	*Prasophyllum spicatum*	504506	Endangered	Dispersed	Habitat importance map	0.0002

Veined Spear-grass	*Austrostipa rudis subsp. australis*	504940	Rare	Dispersed	Habitat importance map	0.0002
Australasian Shoveler	*Anas rhynchotis*	10212	Vulnerable	Dispersed	Habitat importance map	0.0002
Hardhead	*Aythya australis*	10215	Vulnerable	Dispersed	Habitat importance map	0.0002
Whimbrel	*Numenius phaeopus*	10150	Vulnerable	Dispersed	Habitat importance map	0.0001
Great Knot	*Calidris tenuirostris*	10165	Endangered	Dispersed	Habitat importance map	0.0001
Rough Blown-grass	*Lachnagrostis rudis subsp. rudis*	500159	Endangered	Dispersed	Habitat importance map	0.0001
Elegant Parrot	*Neophema elegans*	10307	Vulnerable	Dispersed	Habitat importance map	0.0001
Finger-leaved Daisy	*Brachyscome exilis*	500457	Rare	Dispersed	Habitat importance map	0.0001
Grey Goshawk	*Accipiter novaehollandiae novaehollandiae*	10220	Vulnerable	Dispersed	Habitat importance map	0.0001
Clover Glycine	*Glycine latrobeana*	501456	Vulnerable	Dispersed	Habitat importance map	0.0001
Mauve-tuft Sun-orchid	*Thelymitra malvina*	503374	Vulnerable	Dispersed	Habitat importance map	0.0001
Gull-billed Tern	*Gelochelidon nilotica macrotarsa*	10111	Endangered	Dispersed	Habitat importance map	0.0001
Australian Painted Snipe	*Rostratula australis*	10170	Critically endangered	Dispersed	Habitat importance map	0.0001
Common Greenshank	*Tringa nebularia*	10158	Vulnerable	Dispersed	Habitat importance map	0.0001
Chestnut-rumped Heathwren	*Calamanthus pyrrhopygius*	10498	Vulnerable	Dispersed	Habitat importance map	0.0000
Swamp Skink	*Lissolepis coventryi*	12407	Vulnerable	Dispersed	Habitat importance map	0.0000
Black Falcon	*Falco subniger*	10238	Vulnerable	Dispersed	Habitat importance map	0.0000
Common Bent-wing Bat (eastern ssp.)	*Miniopterus schreibersii oceanensis*	61342	Vulnerable	Dispersed	Habitat importance map	0.0000
White-throated Needletail	*Hirundapus caudacutus*	10334	Vulnerable	Dispersed	Habitat importance map	0.0000
Lace Monitor	*Varanus varius*	12283	Endangered	Dispersed	Habitat importance map	0.0000
Little Tern	*Sterna albifrons sinensis*	10117	Vulnerable	Dispersed	Habitat importance map	0.0000
Sand Brome	*Bromus arenarius*	500497	Rare	Dispersed	Habitat importance map	0.0000

Habitat group

- Highly localised habitat means there is 2000 hectares or less mapped habitat for the species
- Dispersed habitat means there is more than 2000 hectares of mapped habitat for the species

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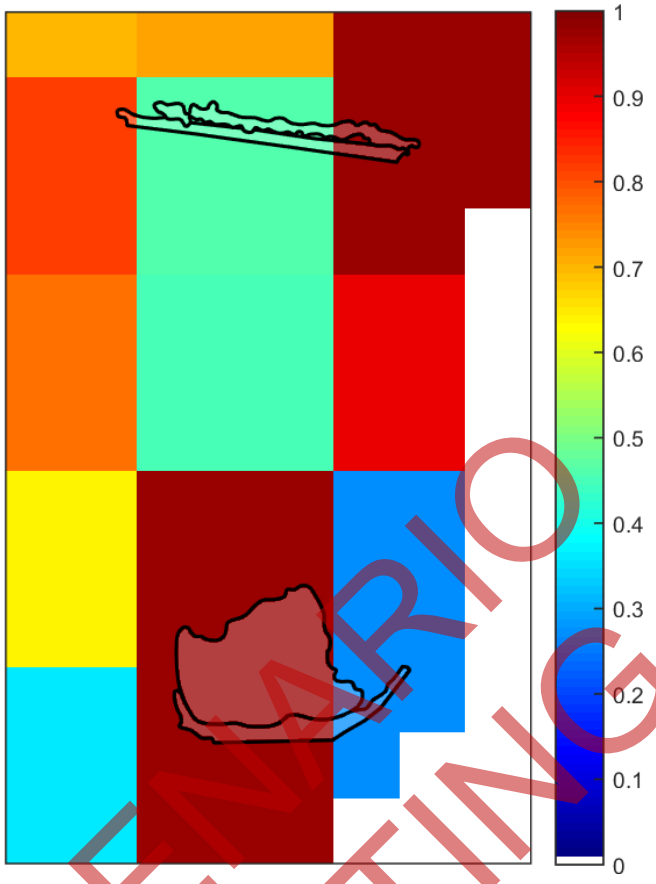
- Habitat importance maps are the maps defined in the Guidelines that include all the mapped habitat for a rare or threatened species
- Top ranking maps are the maps defined in the Guidelines that depict the important areas of a dispersed species habitat, developed from the highest habitat importance scores in dispersed species habitat maps and selected VBA records
- Selected VBA record is an area in Victoria that represents a large population, roosting or breeding site etc.

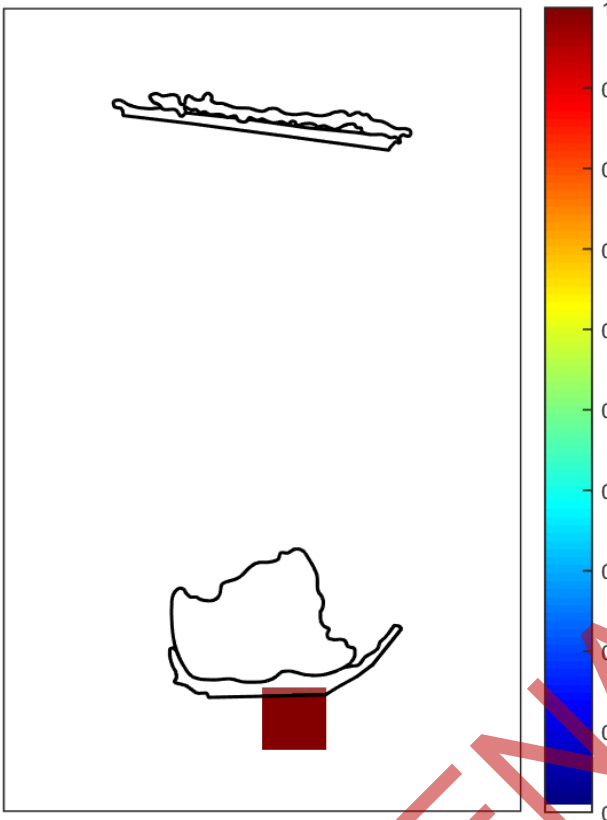
Appendix 3 – Images of mapped native vegetation

2. Strategic biodiversity values map

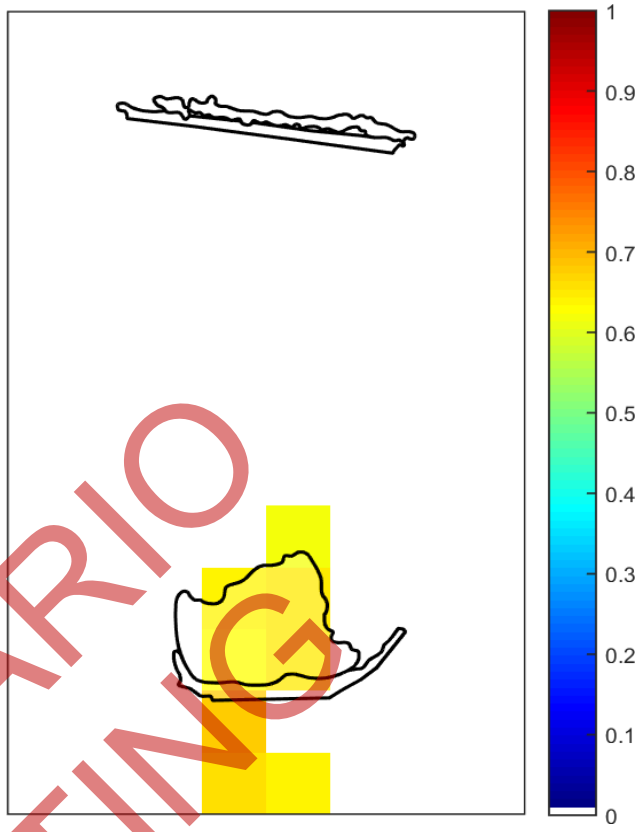


3. Habitat importance maps

Flatback Mangrovegoby
Mugiligobius platynotus
5029



Tiny Arrowgrass
Triglochin minutissima
503446



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