17 May 2022

Rosemary O'Brien
Program Director
The University of Melbourne
Level 1, 21 Bedford Street
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Dear Rosemary

Point Nepean Research and Education Field Station – Ecological Advice

Our ref: Matter 35812

Biosis Pty Ltd was commissioned by The University of Melbourne to undertake a terrestrial flora and fauna assessment of the proposed Point Nepean Research and Education Field Station, located on Jacksons Road on the Point Nepean Peninsula (the 'study area'). The study area occurs within the Point Nepean National Park and is situated opposite a large patch of protected native vegetation.

The study area was assessed for flora values on 1 December 2021 and for terrestrial fauna values via a desktop assessment (Biosis 2022). Based on the values identified, an assessment of proposed impacts on the flora and fauna within the terrestrial environments of the study area was completed. An assessment of marine environments and any impacts on the marine environment as a result of the construction or operation of the facility was outside the scope of the project.

Our assessment considered potential impacts on matters of national environmental significance protected under the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act), including threatened flora and fauna, threatened ecological communities, migratory species and Wetlands of international importance (Ramsar sites). No EPBC Act listed species or communities were recorded or considered likely to occur within the study area. The on ground impacts within the study area was considered unlikely to result in a significant impact on a Ramsar site. Therefore, it was concluded that the project (as outlined for the terrestrial environment) was considered unlikely to have a significant impact on a matter of national environmental significance and referral under the EPBC Act for this component of the project is unlikely to be required.

As part of our assessment, Biosis was asked to provide advice in relation to the potential for the project to trigger the need for referral under the *Environment Effects Act* 1978 (EE Act). Based on our assessment of the native vegetation and flora and fauna values of the terrestrial environment and in consideration of the associated on ground construction impacts, the project is considered unlikely to result in a significant effect on the environment. Noting however, that other aspects of the project will need to be considered in conjunction with our advice (i.e. impacts relating to cultural heritage, community safety/health and other environmental factors).

Please contact me if you have any enquiries.

Yours sincerely

Katrina Sofo
Manager – Ecology (Victoria)

Reference

Biosis 2022. Point Nepean Research and Education Centre: Flora and fauna assessment. Report for The University of Melbourne. G. Zacks and Z. Payne. Biosis Pty Ltd, Melbourne. Project no. 35812.

Point Nepean Research and Education Centre:

Flora and fauna assessment

FINAL REPORT

Prepared for The University of Melbourne

13 May 2022

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Document information

Report to:	The University of Melbourne
Prepared by:	Georgina Zacks Zahlia Payne
Biosis project no.:	35812
File name:	35812.FFA.Point.Nepean.FIN01.20220513
Citation:	Biosis 2022. Point Nepean Research and Education Centre: Flora and fauna assessment. Report for The University of Melbourne. G. Zacks and Z. Payne. Biosis Pty Ltd, Melbourne. Project no. 35812

Document control

Version	Internal reviewer	Date issued
Draft version 01	KS	21/12/2021
Final version 01		13/05/2022

Acknowledgements

Biosis acknowledges the contribution of the following people and organisations in undertaking this study:

- The University of Melbourne: Rosemary O'Brien
- Victorian Government Department of Environment, Land, Water and Planning for access to the Victorian Biodiversity Atlas, NatureKit and EnSym/Native Vegetation Information Management tool
- Australian Government Department of Agriculture, Water and the Environment for access to the Protected Matters Search Tool

Biosis staff involved in this project were:

- Michael Knudsen (mapping)
- Katrina Sofo (quality assurance).

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Summary

Biosis Pty Ltd was commissioned by The University of Melbourne (UoM) to undertake a flora and fauna assessment of Point Nepean Research and Education Field Station, located on Jacksons Road on the Point Nepean Peninsula (the 'study area'). The study area is located approximately 20 kilometres west of Rosebud and 60 kilometres south of Melbourne.

It is proposed to construct a new building, undertake construction to allow for the adaptive reuse of Badcoe Hall and install research tanks within the study area. This flora and fauna assessment will support a planning permit application for the proposed works.

Ecological values

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

- Patches of native vegetation within the Coastal Alkaline Scrub Ecological Vegetation Class (EVC) 858, Bioregional Conversation Status (BCS): Vulnerable.
  - This vegetation is consistent with the Coastal Moonah Woodland Community listed under the *Flora and Fauna Guarantee Act 1988* (FFG Act).
- Habitat or potential habitat for the following threatened flora:
  - Coast Wirilda *Acacia uncifolia*, listed as endangered under the FFG Act.
  - Coast Twin-leaf *Roepera billardierei*, listed as endangered under the FFG Act.
  - Coast Saltwort *Salsola tragus* subsp. *pontica*, listed as endangered under the FFG Act.
- Potential habitat for the following threatened fauna:
  - White-throated Needletail *Hirundapus caudacutus*, listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and vulnerable under the FFG Act.
  - Eastern Great Egret *Ardea alba modesta*, listed as vulnerable under the FFG Act.
  - White-bellied Sea-Eagle *Haliaeetus leucogaster*, listed as endangered under the FFG Act.
  - Black Falcon *Falco subniger*, listed as critically endangered under the FFG Act.
  - Caspian Tern *Hydroprogne caspia*, listed as vulnerable under the FFG Act.
  - Little Tern *Sternula albifrons*, listed as critically endangered under the FFG Act.
  - Ruddy Turnstone *Arenaria interpres*, listed as endangered under the FFG Act.
  - White-footed Dunnart *Sminthopsis leucopus*, listed as vulnerable under the FFG Act.

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	The site does not support suitable terrestrial habitat for any EPBC Act listed flora or fauna species.	Referral not recommended	While White-throated Needletail may occasionally occupy airspace above the study area, as a chiefly aerial species it is unlikely to utilise terrestrial habitat within the study area. No native vegetation/habitat for EPBC Act listed species or communities is proposed to be removed.
FFG Act	Protected Flora species include all species listed as threatened and all species that belong to communities listed as threatened (i.e. Coastal Moonah Woodland).	Protected Flora Permit required.	Site is public land.
Planning & Environment Act	Applies to any native vegetation to be removed, destroyed or lopped.	Planning permit is required in Victoria to remove, destroy or lop native vegetation.	No native patch vegetation occurs within the project impact area. Adjacent native patch vegetation (Coastal Alkaline Scrub EVC) will be protected during construction and no direct or indirect impacts from the development are proposed. Therefore, an assessment under the Guidelines is not required.
CaLP Act	Two regionally controlled weeds present.	N/A	Comply with requirements to control/eradicate.
National Parks Act	The Point Nepean National Park and Point Nepean Quarantine Station Management Plan (Parks Victoria 2009) specifies three management zones including Conservation and Recreation Zone, Conservation Zone and Recreation and Education Zone.	Depending on the lease or licencing agreements in place, UoM may require approval for permanent works in the Point Nepean National Park under Section 23 of the Act.	Future flora and fauna research or similar in the National Park would require appropriate permits under the Act.

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

Due to historical modification of the study area and based on the current design, the proposed research and education centre development will not have any direct or indirect impacts on patches of native vegetation or scattered trees. However, a permit may still be required to remove, destroy or lop scattered native vegetation.

The adjacent Coastal Alkaline Scrub within the study area to the east of the impact area will be protected during construction works through use of temporary fencing. Therefore, Clause 52.17 of the Victoria Planning Provisions will not be triggered and any application for site development under other permit triggers will not require assessment under the *Guidelines for the removal, destruction or lopping of native vegetation*.

Recommendations

To avoid any potential indirect impacts, the patch of native vegetation adjacent to the impact area must be protected during construction by erecting temporary fencing. Specific detail relating to preventing impacts to native vegetation and terrestrial habitat adjacent to the study area 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.

1. Introduction

1.1 Project background

Biosis Pty Ltd was commissioned by The University of Melbourne (UoM) to undertake a flora and fauna assessment of Point Nepean Research and Education Field Station, located on Jacksons Road on the Point Nepean Peninsula (the 'study area'). The study area occurs within the Point Nepean National Park and is situated opposite a large patch of protected native vegetation.

It is proposed to construct a new building, undertake construction to allow for the adaptive reuse of Badcoe Hall and install research tanks within the study area. This flora and fauna assessment will support a planning permit application for the proposed works.

1.2 Scope of assessment

The objectives of this investigation are to:

- Describe the terrestrial 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.
- Review the implications of relevant biodiversity legislation and policy, including Victoria's Guidelines for the removal, destruction or lopping of native vegetation ('the Guidelines').
- Identify potential implications of the proposed development and provide recommendations to assist with development design.
- Recommend any further assessments of the site that may be required (such as targeted searches for threatened species).

This assessment incorporates terrestrial environments only, and any proposed impacts on terrestrial flora and fauna associated with the proposed development area. An assessment of marine environments is outside the scope of this report.

1.3 Location of the study area

The study area is located approximately 20 kilometres west of Rosebud and 60 kilometres south of Melbourne (Figure 1). It encompasses 3 hectares of public land within the Point Nepean National Park. The majority of the study area is zoned Public Park and Recreation Zone (PPRZ), with smaller areas of Public Conservation and Resource Zone (PCRZ) to the north and south. It is covered by an Environmental Significance Overlay (ESO24), Heritage Overlay (HO165) and a Bushfire Management Overlay (BMO).

The study area is within the:

- Gippsland Plain Bioregion.
- Management area of the Port Phillip and Westernport Catchment Management Authority (CMA).
- Mornington Peninsula Shire Council.

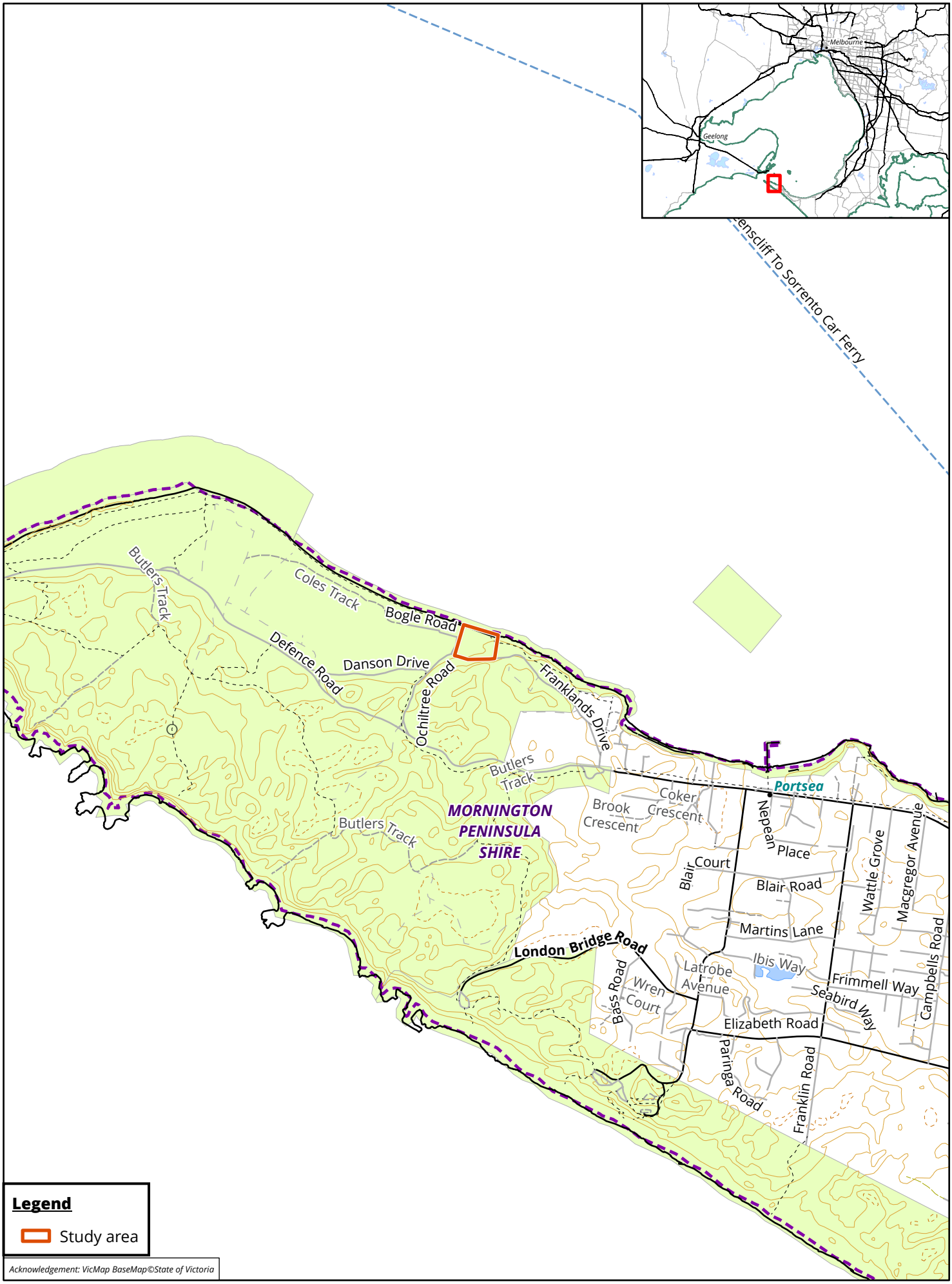


Figure 1 Location of the study area - Point Nepean, Victoria

Matter: 35812,
Date: 13 December 2021 ,
Prepared for: GZ, Prepared by: MK, Last edited by: mknudsen
Layout: 35812_F1_Locality
Project: P:\35800s\35812\Mapping\35812_PointNepean.aprx

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

N

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 Environment, Land, Water and Planning (DELWP) or the Australian Government Department of Agriculture, Water and the Environment (DAWE). Records from the following databases were collated and reviewed:

- DELWP's Victorian Biodiversity Atlas (VBA), including the 'VBA_FLORA25, FLORA100 & FLORA Restricted' and 'VBA_FAUNA25, FAUNA100 & FAUNA Restricted' datasets
- DAWE'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:

- DELWP's NatureKit mapping tool
- DELWP's Habitat Importance maps
- DELWP's Native Vegetation Information Management (NVIM) system
- DELWP'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.

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

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

Lists of threatened species generated from the databases are provided in Appendix 1 (flora) and Appendix 2 (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 1 (flora) and Appendix 2 (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 DELWP (DELWP 2017a). Where threatened species are recorded in the study area this is noted in Appendix 1 (flora) and Appendix 2 (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 1 December 2021 and a list of flora species was collected. This list will be submitted to DELWP 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 percent 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 DELWP 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 DELWP.

- 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 DELWP'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 DELWP'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 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.

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

2.4.2 Fauna assessment

A desktop fauna assessment was undertaken by a zoologist to assess the fauna habitat values of the study area, and to determine the likelihood of threatened fauna species occurring. The desktop fauna assessment incorporated a review of database records of significant fauna species, along with photographs and vegetation descriptions obtained during the flora assessment.

2.4.3 Permits

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

- Permit to Take/Keep Protected Flora issued by DELWP under the *Flora and Fauna Guarantee Act 1988* (FFG Act) (Permit Number 10010194).
- Permit to Conduct Research in areas managed by the Parks Victoria issued by DELWP under the *National Parks Act 1975*, *Crown Land (Reserves) Act 1978* and *Parks Victoria Act 2018* (Permit Number 10010071).
- 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).
- Wildlife Authorisation issued by DELWP under the *Victorian Wildlife Act 1975* (Permit Number 10010193.

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 early summer, which is a reasonable time for survey in coastal environments as many flora species bear the floral material required for identification purposes although their peak flowering period may have passed. The survey effort was sufficient to assess the general values of the study area.

2.6 Legislation and policy

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

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

- 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).
- *National Parks Act 1975* and the Point Nepean National Park and Point Nepean Quarantine Station Management Plan.

2.7 Mapping

The University of Melbourne supplied design plans (PNF_HSL_A_BaseBuilding - Sheet - A_0107 - L00 KEY PLAN-Sheet - A_0106 - SITE PLAN.dwg and 02516_S139_D1_V2.dwg).

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, along with the impact area for the proposed works.

Species recorded during the flora and fauna assessment are listed in Appendix 1 (flora). Unless of particular note, these species are not discussed further. Threatened species recorded or predicted to occur in the local area is 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 majority of the study area has been highly modified by historical land uses including clearing for grazing and subsequently development of Defence Force grounds and Quarantine Station for the Commonwealth Government.

Ecological features present within the study area are limited to modified patches of native vegetation with a high cover of high-threat weeds and planted non-indigenous and introduced vegetation. These features are described further in Table 2 and mapped in Figure 2.

The study area is on the Nepean Peninsula, on the northern side directly adjacent to Port Phillip Bay. Topography of the study area is gently sloping across the majority of the site with some steeper sea cliffs to the north-east. Elevation ranges from sea level in the north to approximately 20 metres above sea level in the south-east.

Photos are provided below Table 2.

3.2 Landscape context

The study area sits within the Nepean Peninsula, an area that represents the most westerly extent of the Mornington Peninsula and separates Port Philip Bay from Bass Strait. Since European settlement, the coastal vegetation-types of the Nepean Peninsula have been cleared for a range of purposes including grazing, timber collection, limeburning and various uses associated with the Australian Defence Force. Consequently, some areas support relatively little remnant native vegetation.

The western end of the Nepean Peninsula now forms the Point Nepean National Park, with less-modified areas supporting large tracts of relatively intact native vegetation and natural landscape features including beaches, dunes (primary, secondary and tertiary), cliffs and flats.

Point Nepean National Park supports moderate to high quality vegetation including habitat for a number of threatened species (Practical Ecology 2008). In particular, coastal habitat within the Park provides significant roosting, foraging and breeding habitat for a number of shorebirds and coastal birds (Practical Ecology 2008).

The coastal zone along the southern edge of the Peninsula remains undeveloped however, further east along the Peninsula, much of the Nepean Peninsula has been developed for residential housing within Portsea, Sorrento and Blairgowrie townships.

Table 2 Summary of vegetation and habitat types within the study area

Vegetation or habitat type	Description	Location	Significant values
Coastal Alkaline Scrub EVC 858	This EVC is present in two condition states within the study area. **Intact, weedy:** Sparse canopy of Moonah *Melaleuca lanceolata* subsp *lanceolata* to 5 metres tall. Shrubby midstorey dominated by species including Coast Beard-heath *Leucopogon parviflorus*, Coast Tea-tree *Leptospermum laevigatum* and Coast Wattle *Acacia longifolia* subsp. *sophorae*. Sparse native understorey made up of Coast Bonefruit *Threlkeldia diffusa*, Coast Twin-flower *Roepera billardierei* and Bower Spinach *Tetragonia implexicoma*. Very high cover of high threat woody weeds, with species including African Box-thorn *Lycium ferocissimum*, Myrtle-leaf Milkwort *Polygala myrtifolia* and Italian Buckthorn *Rhamnus alaternus*. (Photo 1) **Derived:** Highly modified with canopy component removed. Sparse midstorey cover is to 1 metre tall made up exclusively of Coast Saltbush *Atriplex cinerea*. Understorey cover is made up of forbs and grasses including Rounded Noon-flower *Disphyma crassifolium* subsp. *clavellatum* and Australian Salt-grass *Distichlis distichophylla*. High cover of weeds made up of species including Sea Wheat-grass *Thinopyrum junceiforme,* Buck's-horn Plantain *Plantago coronopus* and Hare's-tail Grass *Lagurus ovatus*. (Photo 2)	**Intact, weedy**: East of the study area. **Derived**: Adjacent to the foreshore in the north of the study area.	Habitat for threatened flora species including Coast Twin-flower within the intact and less disturbed areas of this EVC. Areas of this EVC provide foraging, nesting and dispersal habitat for White-footed Dunnart.
Coastal foreshore	Sandy foreshore area at the interface between terrestrial habitat and the Port Philip Bay marine environment and the habitats it provides.	Northern boundary of the study area	Potential foraging habitat for Eastern Great Egret *Ardea alba modesta*, Caspian Tern *Hydroprogne caspia*, Little Tern *Sternula albifrons* and Ruddy Turnstone *Arenaria interpres,* as well as a range of

Vegetation or habitat type	Description	Location	Significant values
			other locally common shorebirds.
Predominantly introduced vegetation	The majority of the study area has been cleared and now supports introduced grassy vegetation made up of species including Buffalo Grass *Stenotaphrum secundatum*, Rat-tail Grass *Sporobolus africanus*, Onion Grass *Romulea rosea*, Annual Veldt-grass *Ehrharta longiflora* and Flatweed *Hypochaeris radicata*. (Photo 3)	Majority of the study area.	Black Falcon and White-bellied Sea-Eagle may hunt above the study area, including over areas of predominantly introduced vegetation.
Planted vegetation	Previously cleared areas adjacent to buildings, roads and open spaces have been planted with species including Drooping Sheoak *Allocasuarina verticillata*, Monterey Cypress Pines *Hesperocyparis macrocarpa* and *Eucalyptus* spp. (Photo 4)	Adjacent to buildings, roads and open spaces.	May provide nesting and foraging resources for a range of common native and introduced bird species, particularly when in flower/pines are in fruit.

Photo 1 **Intact Coastal Alkaline Scrub EVC 858 within the study area with a high cover of woody weeds. View to south. Photo taken 1 December 2021.**

Photo 2 **Derived Coastal Alkaline Scrub EVC 858 within the study area with shrub cover made up of Coast Saltbush. View to west. Photo taken 1 December 2021.**

Photo 3 **Predominantly introduced vegetation within the study area in areas now used for recreation. View to west. Photo taken 1 December 2021.**

Photo 4 **Planted vegetation (Drooping Sheoaks) within the study area. View to west. Photo taken 1 December 2021**

3.3 Threatened species and ecological communities

Threatened species recorded or predicted to occur within 5 kilometres of the study area or from the relevant catchment (aquatic species) are listed in Appendix 1 (flora) and Appendix 2 (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. A summary of those species recorded or with a medium or higher likelihood of occurring in the study area is provided in Table 3.

Table 3 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
Coast Wirilda	Endangered under FFG Act	Areas of Coastal Alkaline Scrub
Coast Twin-leaf	Endangered under FFG Act	Areas of Coastal Alkaline Scrub
Coast Saltwort	Endangered under FFG Act	Beaches and dunes
White-throated Needletail	Vulnerable under the EPBC Act Vulnerable under the FFG Act	Airspace above the study area
Eastern Great Egret	Vulnerable under the FFG Act	May utilise foreshore for foraging
White-bellied Sea-Eagle	Endangered under FFG Act	May hunt above study area
Black Falcon	Critically endangered under FFG	May hunt above study area
Caspian Tern	Vulnerable under the FFG Act	May utilise foreshore for foraging
Little Tern	Critically endangered under FFG Act	May utilise foreshore for foraging
Ruddy Turnstone	Endangered under FFG Act	May utilise foreshore for foraging
White-footed Dunnart	Vulnerable under the FFG Act	Areas of Coastal Alkaline Scrub

3.3.1 Threatened ecological communities

Three EPBC Act listed ecological communities have been recorded or predicted to occur in the project search area, including:

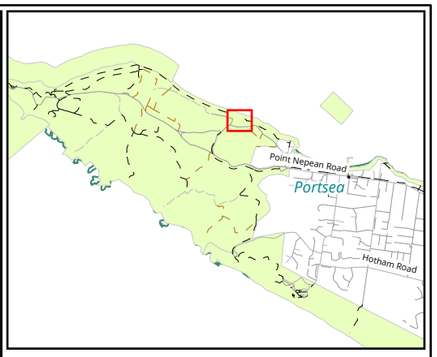
- Giant Kelp Marine Forests of South East Australia
- Natural Damp Grassland of the Victorian Coastal Plains
- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Vegetation within the study area is not consistent with any of the above EPBC Act-listed ecological communities.

Coastal Moonah (*Melaleuca lanceolata* subsp. *lanceolata*) Woodland community is listed as threatened under the FFG Act. Intact areas of Coastal Alkaline Scrub EVC 858 within the study area are consistent with the description of this community, although they are in a low-moderate condition state due to the high cover of high threat woody weeds.

3.4 Further survey recommendations

No further surveys are recommended.



Legend

Study area

Impact area

Ecological vegetation class (ECV)

(GipP0858) Coastal Alkaline Scrub

Figure 2 Ecological features of the study area

0 10 20 30 40 50

Metres

Scale: 1:1,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

N

Acknowledgements: VicMap BaseMap©State of Victoria

Matter: 35812,
Date: 15 December 2021 ,
Prepared for: GZ, Prepared by: MK, Last edited by: mknudsen
Layout: 35812_F2_Ecofeatures
Project: P:\35800s\35812\Mapping\
35812_PointNepean.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.

The proposed works include construction of a new building, construction to allow for the adaptive reuse of Badcoe Hall and installation of research tanks within the study area. This proposed impact area is shown in Figure 2.

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.

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

MNES relevant to the project are summarised in Table 4. It includes an assessment against the EPBC Act policy statements published by the Australian Government which provide guidance on the practical application of EPBC Act.

Table 4 Assessment of project in relation to the EPBC Act

MNES	Project specifics	Assessment against significant impact guidelines
EPBC Act listed species	Nine listed flora and 52 listed fauna species have been recorded or predicted to occur in the project search area. The likelihood of these species occurring in the study area is assessed in Appendix 1 (flora) and Appendix 2 (fauna).	Most of these species are not likely to occur and development unlikely to constitute a significant impact. White-throated Needletail is a predominantly aerial species, and while it may utilise airspace above the study area, it is unlikely to utilise terrestrial habitat within the study area. Consequently the capacity for the proposed works to significantly impact on this species is negligible.
EPBC Act listed ecological communities	Three EPBC Act listed ecological communities have been recorded or predicted to occur in the project search area: • Giant Kelp Marine Forests of South East Australia. • Natural Damp Grassland of the Victorian Coastal Plains. • White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland.	Vegetation within the study area is not consistent with any of these communities.

MNES	Project specifics	Assessment against significant impact guidelines
Migratory species	58 migratory species have been recorded or predicted to occur in the project search area (Appendix 2).	While some of these species would be expected to use the study area on occasions, and some of them may do so regularly or may be resident, it does not provide important habitat for an ecologically significant proportion of any of these species.
Wetlands of international importance (Ramsar sites).	The study area is identified as being within the catchment of one Ramsar site: Port Philip Bay (Westernport Shoreline) and Bellarine Peninsula	The study area is within 10 kilometres of this Ramsar site, but given the strict environmental management protocol that will be employed during construction including sediment and erosion controls, the potential for the proposed works to have a significant impact on it is considered to be negligible.

On the basis of criteria outlined in the relevant *Significant Impact Guidelines* it is considered unlikely that a significant impact on a MNES would result from the proposed action. Referral of the proposed action to the Australian Government Minister for the Environment to determine whether the action requires approval under the EPBC Act is therefore unlikely to be required. However, UoM may choose to refer the project for legal certainty.

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 DELWP 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 consistent with the Coastal Moonah Woodland FFG Act listed threatened community, and all species that belong to this community are Protected. Additionally, the study area supports habitat for flora and fauna species listed as threatened under the FFG Act (Appendix 1 and 2 respectively).

The study area is on Crown Land or land owned by or vested in a public authority (Parks Victoria), and is therefore public land for the purposes of the FFG Act. Protected flora species and a threatened flora community is present (Appendix 1), and a protected flora permit from DELWP would be required if any of these species will be affected by the proposal.

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 1. The University of Melbourne 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.

Link for further information: 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 DELWP as a recommending referral authority if any of the following apply:

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

The need for a permit to remove native vegetation may also be triggered by overlays within the Scheme. The location of the overlays in relation to the study area can be determined via the following link: http://planningschemes.dpcd.vic.gov.au. The provisions of the following overlays apply to the study area:

Environmental Significance Overlay - Schedule 24 (ESO24) covers the entire study area and relates to Sites of Scientific Significance. These sites are of either:

- archaeological significance;
- botanical significance;
- geological significance; or
- zoological significance.

The objectives of this overlay are to ensure the conservation and maintain the environmental context of these significant sites, and additional application requirements and decision guidelines for applications under Clause 42.01 must be considered by the responsible authority.

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'.

Due to the lack of native vegetation in the impact area within the study area, and the development having neither direct nor indirect impacts on native vegetation, an assessment of the implications for the project under the Guidelines is not required.

4.2.4 National Parks Act 1975

The *National Parks Act 1975* makes provision for National and other parks and for their management, the appointment of a Director of National Parks and the appointment of a National Parks Advisory Council and park advisory committees. The primary purpose of the *National Parks Act 1975* is for the preservation and protection of the natural environment.

Depending on the lease or licencing agreements in place, UoM may require approval for permanent works in the Point Nepean National Park under Section 23 of the Act.

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 all areas of native vegetation by designing the works to occur in an area that does not contain native vegetation.
- Locating temporary site storage and compounds on existing disturbed land to avoid impacts to native vegetation.
- Adjacent native patch vegetation will be protected by erecting temporary fencing around this area for the duration of construction works.

5.1 Proposed removal of native vegetation

There are no direct or indirect native vegetation losses associated with this project (Figure 2).

5.2 Determining the assessment pathway

There are no direct or indirect native vegetation losses associated with this project.

5.3 Offset requirements

Not applicable.

5.4 Proposed offset strategy

Not applicable.

6. Key ecological values and recommendations

The majority of the study area has been highly modified due to removal of native vegetation for historical use of the area including construction of the existing buildings and open space. Small areas of native vegetation persist at the eastern edge of the study area and in a modified state along the shoreline, with scattered locally common native plant species across other areas of the site (Figure 2).

The study area contains some foraging habitat value for locally common and highly mobile fauna species, but the lack of native vegetation in the study area means it is of limited habitat value for most bird, mammal and reptile species. The foreshore may provide foraging habitat for a number of threatened coastal birds (e.g. Terns), while remnant patch vegetation may provide nesting, foraging and dispersal habitat for White-footed Dunnart. Black Falcon and White-bellied Sea-Eagle may hunt over the study area on occasion.

The proposed impact area does not intersect with any areas of remnant patch vegetation (Figure 2). 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 5.

Table 5 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	There are no direct or indirect impacts to native vegetation expected from this development. The application will not need to be assessed under the Guidelines.	No impacts from removal of native vegetation. In accordance with the Guidelines, the design of the impact footprint has been done in a manner to avoid nearby native patch vegetation. Avoid impacts to adjacent native patch vegetation. These areas should be fenced off, signed and treated as no-go zones. Avoid indirect impacts to adjacent coastal and marine environments, by developing and implementing a project-specific Construction Environmental Management Plan.
Threatened species and ecological communities	Given the generally highly modified condition of the proposed impact area, the development is deemed to pose very little risk of impact on threatened species and ecological communities (as identified in Table 3).	

Construction and post-construction management

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

References

DELWP 2017a. Guidelines for the removal, destruction or lopping of native vegetation, Department of Environment, Land, Water, and Planning. East Melbourne, Victoria. https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/91146/Guidelines-for-the-removal,-destruction-or-lopping-of-native-vegetation,-2017.pdf.

DELWP 2017b. Protecting Victoria's Environment - Biodiversity 2037, Victorian Government Department of Environment, Land, Water and Planning. Melbourne.

DEPI 2013. *Permitted clearing of native vegetation - Biodiversity assessment guidelines*, Victorian Government Department of Environment and Primary Industries. Melbourne, Victoria.

DEPI 2014. *Advisory List of Rare or Threatened Plants in Victoria - 2014*, Victorian Government Department of Environment and Primary Industries. East melbourne, Victoria.

DSE 2004. *Native Vegetation: Sustaining a living landscape. Vegetation Quality Assessment Manual – Guidelines for applying the Habitat hectares scoring method. Version 1.3*, Victorian Government Department of Sustainability and Environment. Melbourne, Victoria.

DSE 2005a. Index of Stream Condition: The Second Benchmark of Victorian River Condition, Victoria Government Department of Sustainability and Environment. East Melbourne, Victoria.

DSE 2005b. *Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978 Seventh edition 2006*, Victorian Government Department of Sustainability and Environment. Melbourne, Victoria.

DSE 2009. *Advisory List of Threatened Invertebrate Fauna in Victoria - 2009*, Victorian Government Department of Sustainability and Environment. East Melbourne, Victoria.

DSE 2013. *Advisory List of Threatened Vertebrate Fauna in Victoria – 2013*, Victorian Government Department of Sustainability and Environment. Melbourne, Victoria.

Fairfull S & Witheridge G 2003. *Why do fish need to cross the road: fish passage requirements for waterway crossings*, NSW Fisheries, Cronulla, NSW.

Practical Ecology 2008. Point Nepean Flora and Fauna Survey. Report authors: G. Ehmke, A. Picone, M. Legg, P. Bertuch, G. Walker, I. Douglas and C. Moxham.

RBGV 2020. *Flora of Victoria*, *VICFLORA-Royal Botanic Gardens Victoria*, accessed 26 March 2020, https://vicflora.rbg.vic.gov.au/flora/taxon/92359bf9-5cfa-4dcf-8b4b-f0e62fcdc70c.

SAC 2013. *Flora and Fauna Guarantee Act 1988 – Threatened List: Characteristics of Threatened Communities*, Victorian Government Department of Environment, Land, Water and Planning, Melbourne.

Witheridge G 2002. *Fish passage requirements for waterway crossings - Engineering guidelines*, Catchment and Creeks Pty ltd. Brisbane, Queensland.

Appendices

Appendix 1 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 and DELWP Advisory List)		
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,[1])		
SP	State prohibited species	Victorian *Catchment and Land Protection Act 1994* (CaLP Act)
RP	Regionally prohibited species	
RC	Regionally controlled species	
Other		
#	Native species outside its natural range	Victorian Biodiversity Atlas (VBA)

[1] The DELWP Advisory List for Rare or Threatened Plants was revoked in 2021 and are superseded by the current list of threatened species under the FFG Act 1988.

A1.1 Flora species recorded from the study area

Table A1.1 Flora species recorded from the study area

Status	Scientific Name	Common Name
Indigenous species		
P	*Acacia longifolia* subsp. *sophorae*	Coast Wattle
e, P, r	*Acacia uncifolia*	Coast Wirilda
	Allocasuarina verticillata	Drooping Sheoak
	Atriplex cinerea	Coast Saltbush
	Austrostipa rudis	Veined Spear-grass
	Austrostipa spp.	Spear Grass
	Carex breviculmis	Common Grass-sedge
	Clematis microphylla s.l.	Small-leaved Clematis
	Dianella revoluta s.l.	Black-anther Flax-lily
	Dichondra repens	Kidney-weed
	Disphyma crassifolium subsp. *clavellatum*	Rounded Noon-flower
	Distichlis distichophylla	Australian Salt-grass
	Leptospermum laevigatum	Coast Tea-tree
P	*Leucopogon parviflorus*	Coast Beard-heath
	Melaleuca lanceolata	Moonah
	Microlaena stipoides var. *stipoides*	Weeping Grass
	Myoporum insulare	Common Boobialla
	Oxalis exilis	Shade Wood-sorrel
	Pomaderris paniculosa	Scurfy Pomaderris
	Rhagodia candolleana subsp. *candolleana*	Seaberry Saltbush
e, r	*Roepera billardierei*	Coast Twin-leaf
	Rytidosperma spp.	Wallaby Grass
	Tetragonia implexicoma	Bower Spinach
	Threlkeldia diffusa	Coast Bonefruit
	Wahlenbergia spp.	Bluebell
Introduced species		
	Aloe spp.	Aloe
	Arctotheca calendula	Cape Weed
	Avena barbata	Bearded Oat
	Briza maxima	Large Quaking-grass
	Cenchrus clandestinus	Kikuyu
	Cerastium vulgare	Common Mouse-ear Chickweed
RC	*Cirsium vulgare*	Spear Thistle
	Cynodon dactylon var. *dactylon*	Couch
	Dactylis glomerata	Cocksfoot
	Ehrharta erecta	Panic Veldt-grass
	Ehrharta longiflora	Annual Veldt-grass

Status	Scientific Name	Common Name
	Euphorbia lathyris	Caper Spurge
	Euphorbia peplus	Petty Spurge
	Gazania spp.	Gazania
	Hordeum spp.	Barley Grass
	Hypochaeris radicata	Flatweed
	Lagurus ovatus	Hare's-tail Grass
	Lolium rigidum	Wimmera Rye-grass
RC	*Lycium ferocissimum*	African Box-thorn
	Medicago polymorpha	Burr Medic
	Medicago spp.	Medic
	Plantago coronopus	Buck's-horn Plantain
	Polygala myrtifolia	Myrtle-leaf Milkwort
	Rhamnus alaternus	Italian Buckthorn
	Romulea rosea	Onion Grass
	Sonchus oleraceus	Common Sow-thistle
	Sporobolus africanus	Rat-tail Grass
	Stenotaphrum secundatum	Buffalo Grass
	Thinopyrum junceiforme	Sea Wheat-grass
	Trifolium scabrum	Rough Clover
	Trifolium spp.	Clover
	Vulpia spp.	Fescue

A1.2 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 24 November 2021). 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 A1.2 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			PMST	Swampy areas, mainly along the Murray River between Wodonga and Echuca with scattered records from southern Victoria.	**Negligible**	No suitable swampy habitat within the study area.
Dodonaea procumbens	Trailing Hop-bush	VU			PMST	Sandy or clay soils in low-lying, winter-wet areas in grasslands, woodlands, and low-open forest.	**Negligible**	No suitable low-lying or seasonally wet habitat within the study area.
Glycine latrobeana	Clover Glycine	VU	v		PMST	Grasslands and grassy woodlands, particularly those dominated by Kangaroo Grass.	**Negligible**	No suitable native grassland habitat within the study area.
Lachnagrostis adamsonii	Adamson's Blown-grass	EN	e		PMST	Low-lying, seasonally wet or swampy areas of plains communities, often in slightly saline conditions.	**Negligible**	No suitable low-lying or seasonally wet 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					
Prasophyllum spicatum	Dense Leek-orchid	VU	cr		PMST	Heath and heathy woodlands.	**Negligible**	No suitable heathy woodland habitat within the study area.
Pterostylis chlorogramma	Green-striped Greenhood	VU	e		PMST	Heathy woodland; more specific habitat requirements are poorly known.	**Negligible**	No suitable heathy woodland habitat within the study area.
Pterostylis cucullata	Leafy Greenhood	VU		2004	PMST	Sand dune scrubs in coastal areas, and inland on slopes and river flats in moist foothill and montane forests.	**Low**	No suitable habitat within the study area due to previous landscape disturbance and weed invasion.
Senecio macrocarpus	Large-headed Fireweed	VU	cr		PMST	Grassland, shrubland and woodland habitats on heavy soils subject to waterlogging and/or drought conditions in summer.	**Negligible**	No suitable waterlogged soil to provide habitat within the study area.
Senecio psilocarpus	Swamp Fireweed	VU			PMST	Seasonally inundated herb-rich swamps, growing on peaty soils or volcanic clays.	**Negligible**	No suitable peaty soil or volcanic clay habitat within the study area.
State significance								
Acacia uncifolia	Coast Wirilda		e	2016		On coastal dunes or near saltmarsh, chiefly on calcareous sand and sandy loams.	**Recorded**	Recorded with the study area during the field assessment.

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					
Althenia marina	Sea Water-mat		cr	1889		Occurs in marine intertidal (mid-eulittoral) areas of western Port Phillip Bay on muddy substrates	**Negligible**	No suitable habitat within the study area (aquatic species).
Colobanthus apetalus var. *apetalus*	Coast Colobanth		e	2006		Coastal areas, typically on sheltered dune slopes or in swales.	**Low**	Habitat within the study area substantially modified due to previous disturbance.
Corybas sp. aff. *diemenicus (Coastal)*	Late Helmet-orchid		cr	2008		Raised clumps of ground in wet areas of Swamp Scrub, which have a dense overstorey of Woolly Tea Tree or Scented Paperbark.	**Negligible**	No suitable habitat within the study area.
Heterozostera nigricaulis	Australian Grass-wrack		e	2003		Forms large meadows in shallow coastal waters to a depth of c. 15m.	**Negligible**	No suitable habitat within the study area (aquatic species).
Heterozostera tasmanica	Eelgrass		e	1889		Locally common in shallow waters to a depth of c. 8m in sandy soil.	**Negligible**	No suitable habitat within the study area (aquatic species).
Melaleuca armillaris subsp. *armillaris*	Giant Honey-myrtle		e	2010		Near coastal heath/scrub, rocky coast and foothill outcrops.	**Negligible**	Natural distribution restricted to eastern Victoria, east of Marlo.

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					
Olearia sp. *2*	Peninsula Daisy-bush		e	2006		Coastal dunes and calcareous sands near the coast.	**Low**	Suitable habitat likely previously present however species unlikely to occur due to habitat modification through historical disturbance.
Oxalis rubens	Dune Wood-sorrel		e	2006		Near coastal sites, often on sand dunes.	**Low**	Suitable habitat likely previously present however species unlikely to occur due to habitat modification through historical disturbance.
Poa billardierei	Coast Fescue		e	2006		Coastal dunes.	**Low**	Habitat within the study area substantially modified due to previous disturbance.
Poa halmaturina	Dwarf Coast Poa		e	2016		Known in Victoria from near Cape Bridgewater and Port Fairy in the far south-west and occurring on coastal calcareous sands, usually overlying dune limestone or sometimes basalt.	**Low**	Habitat within the study area substantially modified due to previous disturbance.

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					
Poa poiformis var. *ramifer*	Dune Poa		e	2010		Scattered areas along the coast.	**Low**	Habitat within the study area substantially modified due to previous disturbance.
Pterostylis cucullata subsp. *cucullata*	Leafy Greenhood		e	2006		Protected areas of stabilised coastal sand dunes within scrub communities with an open ground layer; occasionally in Coastal Manna Gum woodland.	**Low**	Habitat within the study area substantially modified due to previous disturbance.
Pultenaea canaliculata	Coast Bush-pea		e	2006		Coastal dunes and limestone cliffs.	**Low**	Some suitable habitat within the study area however it is substantially modified due to previous disturbance and woody weed invasion.
Roepera billardierei	Coast Twin-leaf		e	2015		Dunes and limestone cliffs in scrubby vegetation.	**Recorded**	Recorded with the study area during the field assessment.

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					
Salsola tragus subsp. *pontica*	Coast Saltwort		e	2010		Saline, coastal environments.	**Medium**	Some suitable habitat within the study area despite previous disturbance.
Tragus australianus	Small Burr-grass		e	2006		Sandy sites in far north-west Victoria.	**Negligible**	Study area not within species known distribution.

Appendix 2 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)[2]		
x	Extinct	Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act)
cr	Critically endangered	
e	Endangered	
v	Vulnerable	
t	Threatened	
P	Protected (fish only)	

[2] The DELWP Advisory Lists for Threatened Terrestrial and Invertebrate Fauna were revoked in 2021 and are superseded by the current list of threatened species under the FFG Act 1988.

A2.1 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 24 November 2021). 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 A2.3 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**	No suitable habitat.
Botaurus poiciloptilus	Australasian Bittern	EN	cr		PMST	Shallow freshwater and brackish wetlands with abundant emergent aquatic vegetation.	**Low**	No suitable habitat.
Falco hypoleucos	Grey Falcon	VU	v		PMST	Lightly timbered plains and Acacia scrub.	**Negligible**	No records in surrounding area with species found in semi-arid to arid regions.
Neophema chrysogaster	Orange-bellied Parrot	CR	cr	1981	PMST	Coastal vegetation including saltmarshes, dunes, pastures, shrublands, sewage plants, saltworks, islands, and beaches.	**Negligible**	Recent records on Swan Island, north-west of study area. No suitable habitat in 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					
Lathamus discolor	Swift Parrot	CR	cr		PMST	A range of forests and woodlands, especially those supporting nectar-producing tree species. Also well-treed urban areas.	**Low**	Recent records concentrated around Ocean Grove on the Bellarine Peninsula, with no records on Nepean Peninsula.
Hirundapus caudacutus	White-throated Needletail	VU	v	2006	PMST	An almost exclusively aerial species within Australia, occurring over most types of habitat, particularly wooded areas.	**Medium**	Records exist within surrounding area, however this highly mobile species is unlikely to utilise the terrestrial space of the study area.
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**	Marine species. No records in the surrounding area.
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**	Marine species. Records in the surrounding area, unlikely to utilise 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					
Fregetta grallaria grallaria	Storm-Petrel (Australasian)	VU			PMST	Occurs across sub-tropical and tropical waters in the Tasman Sea, Coral Sea and, possibly, the central Pacific Ocean. In the non-breeding season, it forages over near-shore waters along the continental shelf of mainland Australia and breeds on offshore islets and rocks in the Lord Howe Island group.	**Negligible**	Marine species. No records in the surrounding area.
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**	Marine species. No records in the surrounding area.
Pterodroma mollis	Soft-plumaged Petrel	VU			PMST	A marine, oceanic species that breeds on islands including islands off Tasmania. Burrows among tussock grass and ferns on slopes and valleys.	**Negligible**	Marine species. No records in the surrounding area.
Halobaena caerulea	Blue Petrel	VU		1985	PMST	A marine species, usually pelagic but sometimes observed over shallow waters. A regular visitor to southern Australian waters.	**Negligible**	Records in the surrounding area, unlikely to utilise the study area.
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. Regularly recorded	**Negligible**	Historic records in the surrounding area, unlikely to utilise 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					
						feeding in sheltered harbours, often gathering at sewerage outfalls.		
Thalassarche melanophris	Black-browed Albatross	VU		2018	PMST	Breeds in antarctic and sub-antarctic islands, but commonly occurs in pelagic waters off the coast of Victoria.	**Negligible**	Recent records in the surrounding area, unlikely to utilise the study area.
Thalassarche chrysostoma	Grey-headed Albatross	EN	e	1950	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**	Records in the surrounding area, unlikely to utilise the study area.
Thalassarche cauta	Shy Albatross	VU	e	2000	PMST	The Shy Albatross is a marine pelagic species inhabiting sub-Antarctic and subtropical waters, spending the majority of their time at sea. Occasionally it is observed in continental shelf waters in bays and harbours.	**Negligible**	Recent records in the surrounding area, however unlikely to utilise the study area.
Phoebetria fusca	Sooty Albatross	VU	cr		PMST	Subantarctic and subtropical marine waters.	**Negligible**	Records in the surrounding area, however unlikely to utilise 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					
Macronectes giganteus	Southern Giant-Petrel	EN	e	1971	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**	Records in the surrounding area, unlikely to utilise the study area.
Thalassarche bulleri	Buller's Albatross	VU	e		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**	No records in the surrounding area.
Macronectes halli	Northern Giant-Petrel	VU	e	2019	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**	Records in the surrounding area, unlikely to utilise the study area.
Diomedea epomophora	Southern Royal Albatross	VU	cr		PMST	The range of the Southern Royal Albatross extends throughout the oceans of the Southern Hemisphere. The Southern Royal Albatross nests almost exclusively on the Chatham Islands, located hundreds of miles east of New Zealand.	**Negligible**	No records in the surrounding area.
Diomedea sanfordi	Northern Royal Albatross	EN			PMST	The Northern Royal Albatross is marine, pelagic species and its habitat includes	**Negligible**	No records in the surrounding 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					
						subantarctic, subtropical, and occasionally Antarctic waters.		
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**	No records in the surrounding area.
Thalassarche salvini	Salvin's Albatross	VU			PMST	Salvin's Albatross is a marine species occurring in subantarctic and subtropical waters.	**Negligible**	No records in the surrounding area.
Thalassarche steadi	White-capped Albatross	VU			PMST	The White-capped Albatross is a marine species and occurs in subantarctic and subtropical waters. Birds nest on slopes vegetated with tussock and succulents on Auckland Island.	**Negligible**	No records in the surrounding area.
Thalassarche impavida	Campbell Albatross	VU			PMST	The Campbell Albatross is a marine sea bird inhabiting sub-Antarctic and subtropical waters from pelagic to shelf-break water habitats.	**Negligible**	No records in the surrounding area.
Sternula nereis nereis	Fairy Tern	VU	cr	1986	PMST	Fairy Terns inhabit coastal environments including intertidal mudflats, sand flats and beaches. Nests above high-water mark on sandy shell-grit beaches.	**Low**	No records on Nepean Peninsula, however recent records in surrounding area. Limited habitat present along foreshore of 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					
Thinornis cucullatus	Hooded Plover	VU	v	2019	PMST	Sandy ocean beaches, estuaries and inland lakes.	**Low**	Recent records in the local area, however records are mostly on beaches on the south of Nepean Peninsula.
Charadrius leschenaultii	Greater Sand Plover	VU	v	1999		Intertidal mudflats and sandbanks of sheltered bays and estuaries.	**Low**	Recent records on Mud Island and Swan Bay. No suitable habitat in study area.
Numenius madagascariensis	Eastern Curlew	CR	cr	2000	PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	**Low**	Records concentrated on the Bellarine Peninsula and Mud Islands. No suitable habitat present in study area.
Limosa lapponica	Bar-tailed Godwit	VU	v	1999	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.	**Low**	Records concentrated on the Bellarine Peninsula and Mud Islands. No suitable habitat present in 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	1970	PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	**Low**	Records concentrated on the Bellarine Peninsula and Mud Islands. No suitable habitat present in study area.
Calidris canutus	Red Knot	EN	e	1999	PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	**Low**	Records concentrated on the Bellarine Peninsula and Mud Islands. No suitable habitat present in 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 records in the surrounding area, with no suitable habitat present in the study area.
Anthochaera phrygia	Regent Honeyeater	CR	cr		PMST	A range of dry woodlands and forests dominated by nectar-producing tree species.	**Negligible**	No records in the surrounding area, with no suitable habitat present 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					
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll	EN	e		PMST	Rainforest and wet and dry sclerophyll forests and woodlands.	**Negligible**	No records in the surrounding area, with no suitable habitat present in the study area.
Antechinus minimus maritimus	Swamp Antechinus	VU	v		PMST	Dense wet heath and heathy woodland, sedgeland and dense tussock grassland.	**Low**	No records in the surrounding area, with known populations in Anglesea. No suitable habitat in the study area.
Mirounga leonina	Southern Elephant Seal	VU		2002		Occurs in antarctic and subantarctic areas. Victorian records likely to be of vagrants, which have been found on rare occasions along the entire Victorian coast, including Port Phillip and Hobsons Bay.	**Negligible**	Occasional records within Port Philip Bay, unlikely to utlise the study area.
Eubalaena australis	Southern Right Whale	EN	e	2018	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. The coast 8 km east of Warrnambool is a locally important calving and nursing site until late October or early November.	**Negligible**	Marine species.

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					
Balaenoptera musculus	Blue Whale	EN	e		PMST	Found throughout the Southern Ocean, though migration paths appear to be diffuse and widespread. Often enters coastal waters, including Victoria (particularly the smaller subspecies Balaenoptera physalus).	**Negligible**	Marine species.
Balaenoptera physalus	Fin Whale	VU		2017		Occurs worldwide with populations in the southern hemisphere undergoing extensive north-south migrations. Only one record in Victoria.	**Negligible**	Marine species.
Megaptera novaeangliae australis	Southern Humpback Whale	VU	cr	2017	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.
Isoodon obesulus obesulus	Southern Brown Bandicoot	EN	e		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**	No records on Nepean Peninsula and highly fragmented from known populations.

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					
Pteropus poliocephalus	Grey-headed Flying-fox	VU	v	1987	PMST	Rainforest, wet and dry sclerophyll forest, woodland and urban areas.	**Low**	No recent records on Nepean Peninsula, with no suitable foraging trees within 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. Green Turtles spend their first five to ten years drifting on ocean currents.	**Negligible**	Marine species.
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.
Caretta caretta	Loggerhead Turtle	EN		2013	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.

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		PMST	Still or slow-flowing waterbodies and surrounding terrestrial vegetation.	**Negligible**	No records on Nepean Peninsula, with no wetland habitat present in study area.
Carcharodon carcharias	Great White Shark	VU	e		PMST	Near coastal and offshore waters.	**Negligible**	Marine species.
Prototroctes maraena	Australian Grayling	VU	e		PMST	Adults inhabit cool, clear, freshwater streams.	**Negligible**	No records on Nepean Peninsula, with no wetland/watercourse habitat present in study area.
Galaxiella pusilla	Dwarf Galaxias	VU	e		PMST	Slow-flowing or still freshwater wetlands such as swamps, drains and backwaters of streams.	**Negligible**	No records on Nepean Peninsula, with no wetland/watercourse habitat present in study area.
Nannoperca obscura	Yarra Pygmy Perch	VU	v		PMST	Lakes, pools and slow-flowing streams with abundant aquatic vegetation.	**Negligible**	No records on Nepean Peninsula, with no wetland/watercourse habitat present in study area.
State significance								

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					
Lewinia pectoralis	Lewin's Rail		v	1986		Swamps, dense riparian vegetation and saltmarsh.	**Low**	Recent records in the surrounding area. However, no suitable habitat present in study area.
Ardea alba modesta	Eastern Great Egret		v	2018		Flooded crops, pasture, swamps, lagoons, saltmarsh, sewage ponds, estuaries, dams, roadside ditches. Breeds in trees standing in water.	**Medium**	Recent records in the surrounding area, may utilise the foreshore for foraging.
Anseranas semipalmata	Magpie Goose		v	1994		Swamps, lakes, sewage ponds, flooded pasture, dams.	**Low**	Records in the surrounding area, concentrated on the Bellarine Peninsula. No suitable habitat present in study area.
Spatula rhynchotis	Australasian Shoveler		v	1999		Prefers large, permanent lakes and swamps with deep water, stable conditions and abundant aquatic vegetation. Less commonly recorded in small or shallow waters, such as billabongs, sewage ponds, freshwater rivers and densely vegetated farm dams.	**Negligible**	Records in the surrounding area, concentrated on the Bellarine Peninsula. No suitable habitat present in 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					
Aythya australis	Hardhead		v	2002		A mainly aquatic species preferring large, deep freshwater environments with abundant aquatic vegetation, including slow moving areas of rivers. Also occurs in brackish wetlands and may be found in deep dams and water storage ponds. Occasionally in estuarine and littoral habitats such as saltpans, coastal lagoons and sheltered inshore waters.	**Low**	Records in the surrounding area, concentrated on the Bellarine Peninsula. Suitable habitat along foreshore.
Oxyura australis	Blue-billed Duck		v	1998		Open or densely vegetated wetlands.	**Negligible**	Records in the surrounding area, however no suitable habitat present in study area.
Accipiter novaehollandiae	Grey Goshawk		e	1960		Rainforest, gallery forest, tall wet forest and woodland. Also partially cleared agricultural land.	**Low**	Records exist within surrounding area, mostly on Bellarine Peninsula, however no suitable habitat present in 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					
Haliaeetus leucogaster	White-bellied Sea-Eagle		e	2017		Coastal areas such as beaches and estuaries, inland wetlands and major inland streams.	**Medium**	Recent records in local area, with study area likely to be utilised for foraging. However unlikely to provide important habitat for nesting.
Falco subniger	Black Falcon		cr	2005		Woodlands, open country and around terrestrial wetlands areas, including rivers and creeks. Mostly hunts over open plains and undulating land with large tracts of low vegetation.	**Medium**	Recent records in local area, with study area likely to be utilised for foraging. However unlikely to provide important habitat for nesting.
Pelagodroma marina	White-faced Storm-Petrel		e	1907		Coastal in pelagic and inshore waters; breeding colonies on Mud and South Channel Islands in Port Phillip Bay.	**Low**	Breeding colony on Mud Island north east of study area. However, study area unlikely to provide suitable habitat resources.
Gelochelidon macrotarsa	Australian Gull-billed Tern		e	1964		Floodplains, saltmarsh, claypans and flooded pasture.	**Low**	No recent records in the surrounding area. No suitable habitat present in 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					
Hydroprogne caspia	Caspian Tern		v	2018		Estuaries, inlets, bays, lagoons, inland lakes, flooded pasture, sewage ponds.	**Medium**	High number of recent records in local area, with limited suitable habitat along foreshore of study area.
Sternula albifrons	Little Tern		cr	2018	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**	Records in surrounding area, with suitable habitat along foreshore of study area.
Arenaria interpres	Ruddy Turnstone		e	2019		Mainly found on coastal beaches, exposed reefs, and rock platforms.	**Medium**	No records on Nepean Peninsula, however recent records in surrounding area. Suitable habitat present along foreshore of 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 fulva	Pacific Golden Plover		v	1999		A range of coastal habitats including mudflats, sandflats rocky shores and saltmarsh.	**Low**	No records on Nepean Peninsula, however recent records in surrounding area. No suitable habitat present in study area.
Actitis hypoleucos	Common Sandpiper		v		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.	**Low**	No records on Nepean Peninsula, closest records in wetlands on Bellarine Peninsula.
Tringa nebularia	Common Greenshank		e	1970	PMST	A variety of ephemeral and permanent inland wetlands and sheltered coastal wetlands.	**Low**	No records on Nepean Peninsula, with recent records present in wetlands of Bellarine Peninsula.
Sminthopsis leucopus	White-footed Dunnart		v	2014		Lowland heathy woodland and forest, coastal scrub and coastal grasslands.	**Medium**	Recent records in surrounding area, with suitable habitat present in the Coastal-alkaline Scrub.

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					
Arctophoca forsteri	Long-nosed Fur Seal		v	2020		Breeds on islands off the southern Australian coast.	**Low**	One isolated record on Observatory Point. May visit the area on occasion but unlikely to utilise the study area.
Tursiops australis	Burrunan Dolphin		cr	2015		Marine waters in Port Phillip and the Gippsland Lakes.	**Negligible**	Marine species.
Bassethullia glypta	Chiton 5254		cr	1986		Under rocks, at and below tide level, to a depth of 6 m.	**Low**	No recent records and no suitable habitat present in study area.

A2.2 Migratory species (EPBC Act listed)

Table A2.4 Migratory fauna species recorded or predicted to occur within 5 km of the study area

Scientific name	Common name	Most recent record
Migratory species		
Gallinago hardwickii	Latham's Snipe	PMST
Hirundapus caudacutus	White-throated Needletail	2006
Apus pacificus	Fork-tailed Swift	2006
Pandion haliaetus	Osprey	PMST
Oceanites oceanicus	Wilson's Storm-Petrel	1986
Ardenna pacifica	Wedge-tailed Shearwater	1985
Ardenna grisea	Sooty Shearwater	PMST
Ardenna tenuirostris	Short-tailed Shearwater	2007
Ardenna carneipes	Flesh-footed Shearwater	1884
Diomedea exulans	Wandering Albatross	PMST
Thalassarche melanophris	Black-browed Albatross	2018
Thalassarche chrysostoma	Grey-headed Albatross	1950
Thalassarche cauta	Shy Albatross	2000
Phoebetria fusca	Sooty Albatross	PMST
Stercorarius parasiticus	Arctic Jaeger	1983
Macronectes giganteus	Southern Giant-Petrel	1971
Thalassarche bulleri	Buller's Albatross	PMST
Stercorarius longicaudus	Long-tailed Jaeger	1965
Macronectes halli	Northern Giant-Petrel	2019
Stercorarius pomarinus	Pomarine Jaeger	1965
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	2018
Thalasseus bergii	Crested Tern	2010
Sternula albifrons	Little Tern	2018
Arenaria interpres	Ruddy Turnstone	2019
Pluvialis fulva	Pacific Golden Plover	1999
Charadrius leschenaultii	Greater Sand Plover	1999
Charadrius veredus	Oriental Plover	1960
Numenius madagascariensis	Eastern Curlew	2000
Limosa lapponica	Bar-tailed Godwit	1999
Actitis hypoleucos	Common Sandpiper	PMST
Tringa nebularia	Common Greenshank	1970

Scientific name	Common name	Most recent record
Calidris ferruginea	Curlew Sandpiper	1970
Calidris ruficollis	Red-necked Stint	1980
Calidris acuminata	Sharp-tailed Sandpiper	1970
Calidris canutus	Red Knot	1999
Limnodromus semipalmatus	Asian Dowitcher	1974
Calidris melanotos	Pectoral Sandpiper	PMST
Motacilla flava	Yellow Wagtail	PMST
Rhipidura rufifrons	Rufous Fantail	PMST
Myiagra cyanoleuca	Satin Flycatcher	PMST
Megaptera novaeangliae	Humpback Whale	PMST
Lagenorhynchus obscurus	Dusky Dolphin	PMST
Eubalaena australis	Southern Right Whale	2018
Caperea marginata	Pygmy Right Whale	PMST
Balaenoptera musculus	Blue Whale	PMST
Balaenoptera physalus	Fin Whale	2017
Orcinus orca	Killer Whale	2007
Chelonia mydas	Green Turtle	PMST
Dermochelys coriacea	Leathery Turtle	PMST
Caretta caretta	Loggerhead Turtle	2013
Lamna nasus	Porbeagle	PMST
Carcharodon carcharias	Great White Shark	PMST