

Kentbruck Green Power Hub:
Preliminary assessment of biodiversity to
accompany referral under the Environment
Effects Act 1978

Attachment 1

FINAL REPORT

Prepared for Neoen Pty Ltd

18 July 2019

Biosis offices

NEW SOUTH WALES

Albury

Phone: (02) 6069 9200
Email: albury@biosis.com.au

Newcastle

Phone: (02) 4911 4040
Email: newcastle@biosis.com.au

Sydney

Phone: (02) 9101 8700
Email: sydney@biosis.com.au

Wollongong

Phone: (02) 4201 1090
Email: wollongong@biosis.com.au

VICTORIA

Ballarat

Phone: (03) 5304 4250
Email: ballarat@biosis.com.au

Melbourne (Head Office)

Phone: (03) 8686 4800
Email: melbourne@biosis.com.au

Wangaratta

Phone: (03) 5718 6900
Email: wangaratta@biosis.com.au

Document information

Report to:	Neoen Australia Pty Ltd
Prepared by:	Ian Smales, Matt Gibson, Michael Goddard
Biosis project no.:	29806
File name:	29806.EES.referral.RPT.20190625
Citation:	Biosis 2019. Kentbruck Green Power Hub: Preliminary Assessment of Biodiversity to accompany referral under the Environment Effects Act. Report for Neoen. Authors: Smales, I. and Goodard, M., Biosis Pty Ltd, Melbourne. Project no. 29806

Document control

Version	Internal reviewer	Date issued
Draft version 01	MSG	03/05/2019
Draft version 02	MSG	25/06/2019
Final version 03	MSG	18/07/2019

Acknowledgements

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

- Matthew Parton (Neoen)
- David Knight (AECOM)
- Department of Environment, Land, Water and Planning for access to the Victorian Biodiversity Atlas and Native Vegetation Information Tools
- Department of the Environment and Energy for access to the Protected Matters Search Tool of the Australian Government
- BirdLife Australia for access to the New Atlas of Australian Birds 1998-2013 and data from the Shorebirds 2020 project.

Biosis staff involved in this project were:

- Jason Prasad (mapping)

© Biosis Pty Ltd

This document is and shall remain the property of Biosis Pty Ltd. The document may only be used for the purposes for which it was commissioned and in accordance with the Terms of the Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Disclaimer:

Biosis Pty Ltd has completed this assessment in accordance with the relevant federal, state and local legislation and current industry best practice. The company accepts no liability for any damages or loss incurred as a result of reliance placed upon the report content or for any purpose other than that for which it was intended.

Contents

Summary	iv
1. Introduction	1
1.1 Project background	1
1.2 Location of the study area	1
1.3 Project description	1
1.4 Scope of this assessment	8
2. Methods	9
2.1 Report scope	9
2.2 Database review	9
2.3 Conservation status	9
2.4 Determining likelihood of occurrence of threatened and migratory species.....	10
2.5 Consultation with government authorities.....	10
2.6 Site investigations.....	10
2.6.1 Flora assessment	10
2.6.2 Fauna assessment	10
2.7 Permits.....	11
2.8 Qualifications	11
2.9 Victorian legislation and policy.....	11
3. Results	1
3.1 Description of the study area and local area.....	1
3.2 Significant species and ecological communities	1
3.2.1 FFG Act listed threatened species.....	1
3.2.2 Ecological Vegetation Classes and FFG Act listed significant ecological communities..	4
3.3 Assessment against referral criteria in the Ministerial Guidelines.....	5
3.3.1 DELWP advisory lists of rare and threatened species	8
References	21
Appendices	22
Appendix 1 Flora	23
Appendix 2 Fauna	29
Appendix 3 Kentbruck Green Power Hub Interim Flora and Fauna Survey Program	49

Tables

Table 1	Summary of FFG Act listed threatened species most likely to occur in the study area	2
Table 2	Assessment of the project against the individual potential environmental effects referral criteria of the <i>Environment Effects Act 1978</i>	6
Table 3	Assessment of the project against the combined potential environmental effects referral criteria of the <i>Environment Effects Act 1978</i>	7

Figures

Figure 1	Location of the study area, Victoria.....	3
Figure 2	Kentbruck Wind Farm site	6
Figure 3	Kentbruck Wind Farm site and external transmission route option envelopes	7
Figure 4	Significant flora within the search area	9
Figure 5	Significant fauna within the search area	13
Figure 6	Significant flora of the underground transmission route options and 5 km radius.....	17
Figure 7	Significant fauna of the underground transmission route options and 5 km radius.....	18
Figure 8	Significant flora of the overhead transmission route options and 5 km radius	19
Figure 9	Significant fauna of the overhead transmission route options and 5 km radius	20

Summary

Neoen Australia Pty Ltd (Neoen) is both a developer and long-term renewable energy generator owner, and asset operator with an established track record of constructing renewable energy projects in Western Australia, South Australia and New South Wales.

Neoen has engaged Biosis Pty Ltd (Biosis) to undertake a range of investigations in relation to the proposed Kentbruck Green Power Hub (the project). The present report has been prepared to accompany a referral under the *Environment Effects Act 1978*.

The project would be located around 330 kilometres west of Melbourne between Portland and Nelson, Victoria. The project would comprise:

- A wind farm, consisting of up to 157 wind turbines and associated infrastructure
- Battery storage facility, comprising a lithium-ion battery with up to 500MW / 1,000MW hours of storage
- A connection to the electricity grid via an overhead and/or underground transmission line connection.

The project would be located wholly within Glenelg Shire.

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.

Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act 1978 (DSE 2006) 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.

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 2006).

An assessment of the project against the individual potential effects criteria is provided in Table 2, and against the combination of potential effects criteria in Table 3.

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.

Biosis has been commissioned by Neoen to provide information about biodiversity of the area of land proposed for the project, including ancillary infrastructure and areas around the proposed developments.

The project would be located wholly within Glenelg Shire.

The various project elements are located within proximity of each other. A detailed description of the project elements is provided in Section 1 *Introduction*, below.

Government legislation and policy

The present report is focussed on matters protected by Victorian legislation and State Government policies. Matters of national environmental significance protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) are covered in a separate report to accompany a referral under the EPBC Act (*Kentbruck Green Power Hub: Preliminary Assessment of Biodiversity to accompany referral under the EPBC Act* (Biosis 2019). For the purposes of a comprehensive evaluation, the two reports should be considered in conjunction.

The project will require assessment against the following key biodiversity legislation and policies.

Legislation / policy	Relevant ecological feature on site	Permit / approval required	Notes
EPBC Act	Wetlands of International Importance Listed threatened species Listed migratory species Listed threatened ecological communities	Referral under EPBC Act	Targeted investigations required as set out in Section 3
Environment Effects Act	Criteria as per <i>Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act</i>	Referral under EE Act	
FFG Act	Listed threatened species Listed threatened ecological communities	Protected Flora Permit required for loss of relevant vegetation on public land	Site includes private and public land Targeted investigations required as set out in Section 3
Planning and Environment Act (Guidelines for the removal, destruction or lopping of native vegetation)	All indigenous vegetation to be removed.	Planning permit required to lop or remove native vegetation.	Permit application needs to address provisions overlays within the scheme. Permit exemption may apply to regrowth vegetation within existing softwood plantation areas.
CaLP Act	Noxious weeds Pest animals	Permit may be required to transport soil/rock off site if property supports a State Prohibited weed	Comply with requirements to control and eradicate noxious weeds during construction and operation.

Recommendations

A variety of targeted investigations are currently underway to better inform decisions in consent processes for the project. The species and ecological values identified for these assessments have been identified in consultation with DELWP. It is recommended that all of the investigations are completed to provide a well-informed ultimate impact assessment. They include many that are matters of national environmental significance protected by the EPBC Act, which are more fully addressed in the separate report *Kentbruck Green Power Hub: Preliminary Assessment of Biodiversity to accompany referral under the EPBC Act* (Biosis 2019).

1. Introduction

1.1 Project background

Neoen is both a developer and long-term renewable energy generator owner, and asset operator with an established Australian track record of constructing renewable energy projects in Western Australia, South Australia and Queensland.

Biosis has been commissioned by Neoen to provide information about biodiversity of the area of land proposed for the Kentbruck Green Power Hub itself; for ancillary infrastructure and for areas around the proposed development. This information will be used to:

- inform forthcoming design of the project in a responsive manner to avoid and minimise impacts; and,
- permit a comprehensive assessment of any residual impacts that may be associated with a final fully developed project design.

1.2 Location of the study area

The proposed Kentbruck Green Power Hub (the project) would be located around 330 kilometres west of Melbourne between Portland and Nelson, Victoria (Figure 1). The study area encompasses a wind farm site of approximately 7,500 hectares of private and public land including some road reserves, a battery storage facility and a transmission line connection to the electricity grid. Two options for both the transmission line connection and battery storage facility are currently being considered (see Section 1.3).

The study area is within the:

- Glenelg Plain and Bridgewater Bioregions
- Glenelg River Basin
- Management area of the Glenelg Hopkins Catchment Management Authority (CMA)
- Glenelg Shire.

A description of the project is provided in the following section.

1.3 Project description

The project would comprise:

- A wind farm, consisting of up to 157 wind turbines and associated infrastructure
- A battery storage, comprising a lithium-ion battery facility with up to 500MW / 1,000MW hours of storage
- A connection to the electricity grid via an overhead and/or underground transmission line connection.

These project elements are located within close proximity of each other, as described in the following sections.

Wind farm

The Portland-Nelson Road bisects the wind farm site in a generally east to west direction. The site is generally bound by forestry to the north, highly-modified land used for grazing purposes to the east and west, Discovery Bay Coastal Park to the south, and the Lower Glenelg National Park and Cobboboonee National Park to the east and north-east (Figure 2).

The proposed wind farm site is approximately 7,500 hectares and comprises 107 individual land parcels. The site is located primarily within an area that has been substantially modified and is used for commercial Radiata Pine softwood forestry production, with a small portion of land used for agricultural purposes (primarily grazing). The plantation area has an existing network of public and private roads.

At this stage, 4 MW to 8 MW wind turbines are proposed to be used and they are expected to have a:

- tip height of up to 270 metres above ground level;
- rotor diameter of up to 190 metres; and
- lower blade sweep height of 45 metres or higher.

Transmission line options

Two transmission line connection options are being considered at this stage: an underground route (option one) and overground route (option two). Both routes extend east of the proposed wind farm. The locations of the routes being considered are described as follows and shown in Figure 3.

1. Option one: underground route

The option one route generally extends between the eastern boundary of the proposed wind farm site and the existing Heywood Terminal Station located inside the western boundary of the Narrawong Flora Reserve (on land owned by Ausnet). This transmission line connection option is approximately 32 kilometres in length. There are two possible route options that will bisect the Cobboboonee National Park for approximately 15 kilometres. Within the Cobboboonee National Park, the transmission line would be located below or immediately adjacent to an existing road that bisects the National Park in an east to west direction. The route would also traverse land used predominantly for grazing on either side of the National Park. To the east of Cobboboonee, Neoen will consider an overhead or underground line option.

2. Option Two: overground route

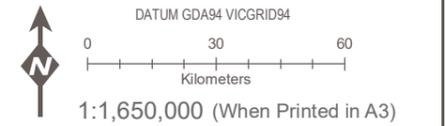
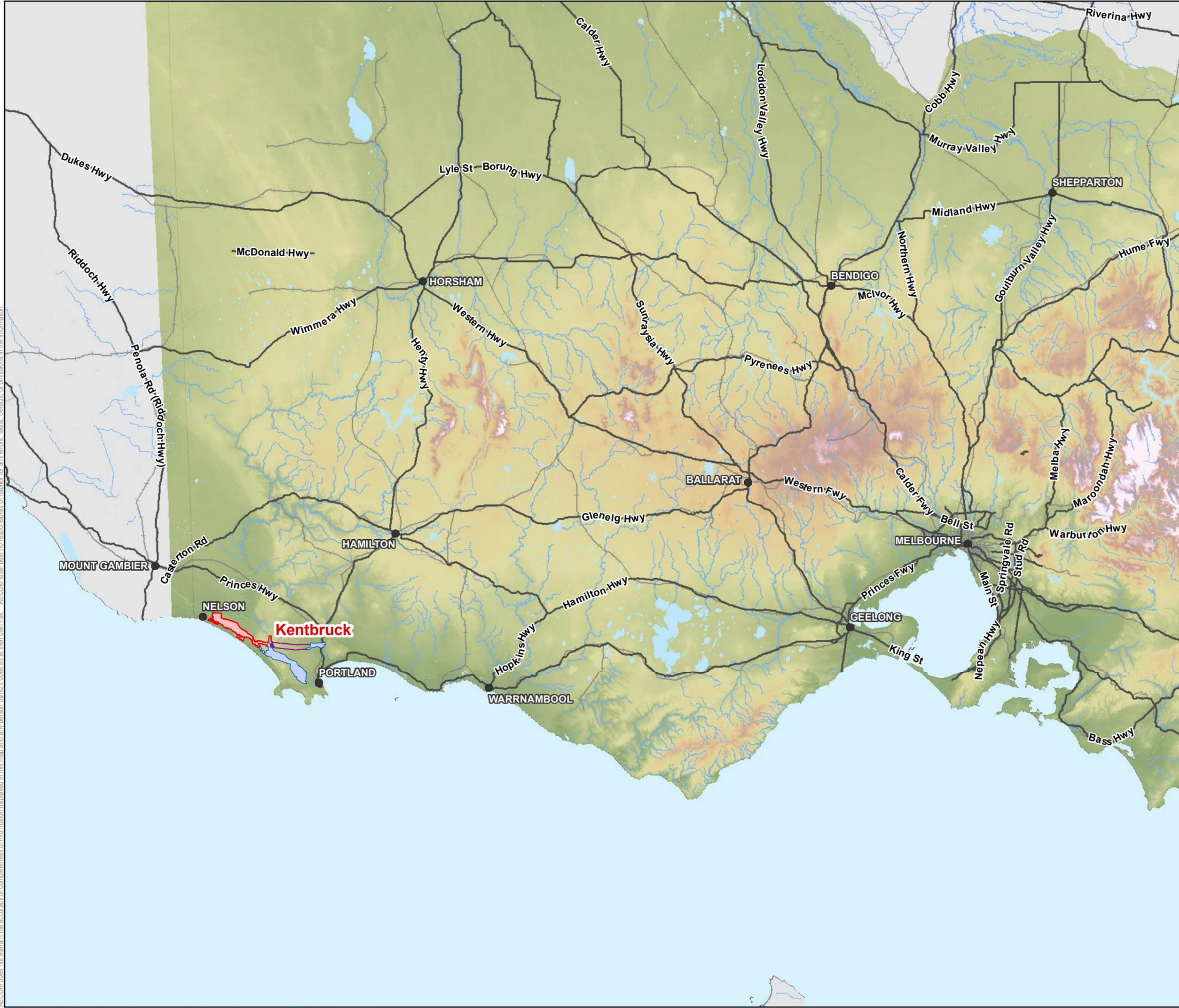
The option two route generally extends between the eastern boundary of the proposed wind farm site to a point on the Heywood-Portland 500kV transmission line north of Portland. The route would be around 45 kilometres in length dependent on the final route selection and would be located primarily within freehold land used for grazing.

Battery storage facility

At this stage, two locations for the battery storage facility are being considered:

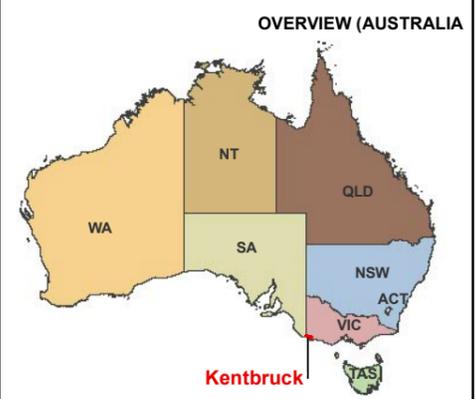
1. Option one: A battery storage facility adjacent to the terminal station that will be located within the proposed wind farm site. The terminal station for the project is anticipated to be located at the eastern end of the site on land currently being used for commercial forestry purposes.
2. Option two: A battery storage facility adjacent to the terminus of the transmission line. This would be either adjacent to the Heywood Terminal Station at Heywood, or on land adjacent to the 500kV line which the project would connect to at a point north of Portland.

AECOM does not warrant the accuracy or completeness of information displayed in this map and any person using it does so at their own risk. AECOM shall bear no responsibility or liability for any errors, faults, defects, or omissions in the information.



Legend

- Layer**
- ▬ Indicative wind farm site boundary
 - ▬ Overhead Line Development
 - ▬ Underground Line Option
 - Town
 - ▬ Freeways/Highways
 - ▬ Railways
 - ▬ Watercourses
 - ▬ Waterbodies



Data Sources:

1. Locality, Railway, Drainage Line, Streets, Features © StreetPro 2014
2. State Controlled Roads © (VICMAP) 2018
3. Essential Habitat © (VICMAP) 2018
4. Conservation Areas © (VICMAP) 2018
5. Protected Area © (VICMAP) 2018
6. Regional Ecosystems v4 © (VICMAP) 2018
7. Protected Plants Flora Survey Trigger © (VICMAP) 2018
8. Waterway Sumer Works © (VICMAP) 2018

Disclaimer:

1. StreetPro © 2014 Pitney Bowes Software Pty Ltd. All rights reserved.
2. Victoria State Government - Environment, Land, Water and Planning © (VICMAP) 2018
3. © Copyright Commonwealth of Australia (Geoscience Australia) 2016. The Commonwealth gives no warranty regarding the accuracy, completeness, currency or suitability for any particular purpose.

Environmental Effects Statement Referrals
Kentbruck Green Power Hub

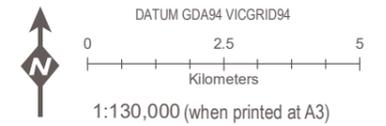
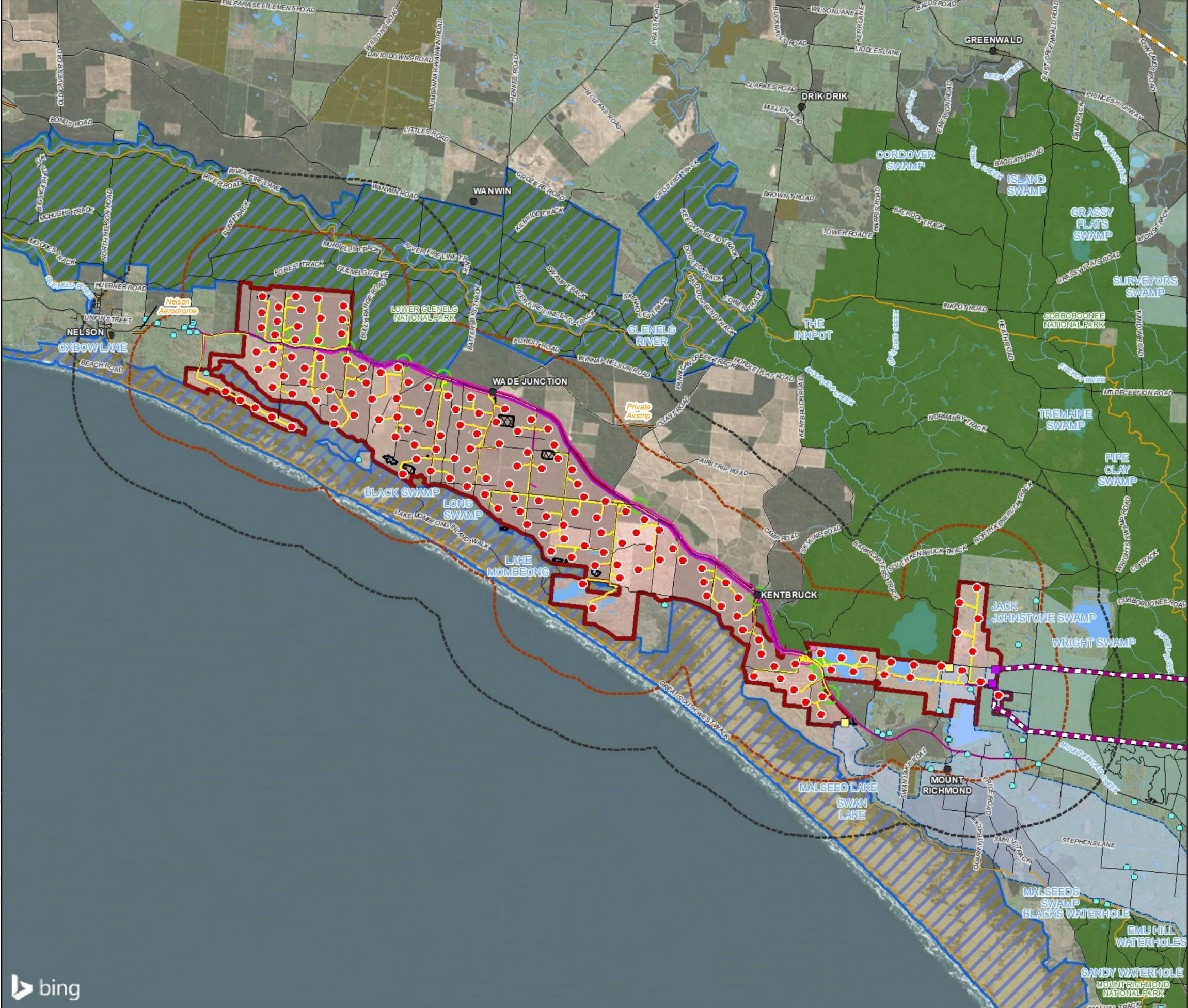
LOCATION PLAN

PROJECT #:	60578607	Figure 1
CREATED BY:	JB	
LAST MODIFIED:	KnightID: 19/07/2019	
VERSION:	1	

The project is in the early stages of development and it is proposed to include (but is not limited to):

- Internal site access tracks and upgrades to existing access points from the public road network
- Hardstand and lay down areas
- Underground electricity cabling
- Overhead power lines (up to 275 kV)
- Electricity collector stations
- Overhead and/or underground electricity cabling and a terminal station to provide connection to the 500 kV transmission line
- Permanent meteorological monitoring masts (met masts)
- An operations and maintenance building
- Temporary infrastructure including construction compounds, concrete batching plants, car parking, site buildings and amenities.

AECOM does not warrant the accuracy or completeness of information displayed in this map and any person using it does so at their own risk. AECOM shall bear no responsibility or liability for any errors, omissions, faults, defects, or inaccuracies in this information.



- Legend**
- Indicative wind farm site boundary
 - 4km Buffer
 - 2km Buffer
 - Work Exclusion Area
- Possible Transmission Infrastructures**
- Collector Overhead Line
 - Collector Underground Line
 - Indicative Wind Turbine
 - Overhead Line Development Envelope
 - Underground Line Option
 - House
 - House - Abandoned
- Crown Land Management**
- National Park
 - Forest Park
 - Reserve
 - Town
 - Proposed Underground Cable
 - Internal Transmission Line
 - Internal access roads
 - Indicative site access locations
 - Existing 500 kV transmission line
 - Great South West Walk
 - Roads
 - Airstrips
 - Watercourses
 - Waterbodies
 - Ramsar Gleneg Estuary and Discovery Bay

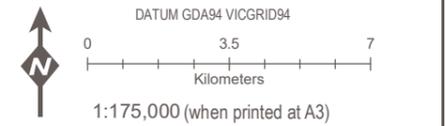
Data Sources:
1. Locality, Railway, Drainage Line, Streets, Features © StreetPro 2014
2. State Controlled Roads © (VICMAP) 2018
3. Essential Habitat © (VICMAP) 2018
4. Conservation Areas © (VICMAP) 2018
5. Protected Areas © (VICMAP) 2018
6. Regional Ecosystems v8 © (VICMAP) 2018
7. Protected Plants Flora Survey Trigger © (VICMAP) 2018
8. Waterway Barrier Works © (VICMAP) 2018

Disclaimer:
1. StreetPro © 2014 Pitney Bowes Software Pty Ltd. All rights reserved.
2. Victoria State Government - Environment, Land, Water and Planning © (VICMAP) 2018
3. © Copyright Commonwealth of Australia. (Geoscience Australia) 2016. The Commonwealth gives no warranty regarding the accuracy, completeness, currency or suitability for any particular purpose.

Environmental Effects Statement Referrals
Kentbruck Green Power Hub
Indicative layout 15 April 2019

INDICATIVE SITE PLAN	
PROJECT #: 60578607	Figure 2
CREATED BY: JB	
LAST MODIFIED: KnightID: 16/07/2019	
VERSION: 1	

AECOM does not warrant the accuracy or completeness of information displayed in this map and any person using it does so at their own risk. AECOM shall bear no responsibility or liability for any errors, omissions, faults, defects, or inaccuracies in the information.



- Legend**
- Indicative wind farm site boundary
 - Work Exclusion
 - Proposed Transmission Infrastructure**
 - Possible Collector Station Options (Overhead Line)
 - Possible Collector Station Options (Underground Line)
 - Existing Terminal Station
 - Overhead Line Development Envelope
 - Underground Line Option
 - Existing Features**
 - National Park
 - Forest Park
 - Reserve
 - Town
 - Existing 500 kV transmission line
 - Roads
 - Airstrips
 - Great South West Walk
 - Watercourses
 - Waterbodies
 - Ramsar Gleneg Estuary and Discovery Bay

Data Sources:

1. Locality, Railway, Drainage Line, Streets, Features © StreetPro 2014
2. State Controlled Roads © (VICMAP) 2018
3. Essential Habitat © (VICMAP) 2018
4. Conservation Areas © (VICMAP) 2018
5. Protected Area © (VICMAP) 2018
6. Regional Ecosystems v8 © (VICMAP) 2018
7. Protected Plants Flora Survey Trigger © (VICMAP) 2018
8. Waterway Barrier Works © (VICMAP) 2018

Disclaimer:

1. StreetPro © 2014 Pitney Bowes Software Pty Ltd. All rights reserved.
2. Victoria State Government - Environment, Land, Water and Planning © (VICMAP) 2018
3. © Copyright Commonwealth of Australia. (Geoscience Australia) 2016. The Commonwealth gives no warranty regarding the accuracy, completeness, currency or suitability for any particular purpose.

Environmental Effects Statement Referrals
 Kentbruck Green Power Hub
 Indicative layout 15 April 2019

PROJECT OVERVIEW

PROJECT #:	60578607	Figure 3
CREATED BY:	JB	
LAST MODIFIED:	KnightID: 16/07/2019	
VERSION:	1	



1.4 Scope of this assessment

Neoen has engaged Biosis to undertake a range of investigations in relation to the proposed project. The present report has been prepared to accompany a referral under the *Environment Effects Act 1978*. The report provides information about biodiversity values in response to 'Determining the need for an EES' in *Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act 1978* (DSE 2006). As set out in the *Ministerial Guidelines*, these include:

- Preliminary environmental information; and,
- Investigation Program.

For the purposes of the assessment set out in this report the 'study area' encompasses all land that may be directly encompassed by the project. This includes properties on which the wind farm and battery storage facility may be located, and along electricity transmission alignments for which the transmission line and battery storage facility options may utilise.

Information about biodiversity values (e.g. species and ecological communities) has been obtained from a broader area that includes land within five kilometres of the study area and this is termed the '**local area**'. In general, it is anticipated that the local area will encompass a zone in which indirect effects of the project could occur. It is not considered likely that the project could have any measurable effects on truly marine environments and the assessment does not include biodiversity values that exist seaward of the low-tide line of the nearby coast.

It is important to note that while investigations have commenced, much of the required program of investigations is planned but has not been completed and some significant elements have not yet commenced. Hence, a principal purpose of this report is to document specific matters that require comprehensive consideration. This report is intended to:

- serve as a checklist of flora and fauna, as well as other ecosystem values of relevance to consideration of the project;
- summarize pre-existing information about such values, and;
- offer a preliminary indication of the potential types of effects and that the project may have on such values.

In the absence of a detailed project design and results for a number of flora and fauna investigations, this report provides a qualified evaluation of the likelihood of significant impacts that may result from the project. Preliminary assessments of effects and risks set out in this report may be refined as further information about project design and results of studies currently underway become available.

2. Methods

2.1 Report scope

As noted above, matters of National Environmental Significance (NES) protected by the Commonwealth EPBC Act, including listed threatened species and ecological communities, listed migratory species and Wetlands of International Importance are the subjects of a separate report (Biosis 2019). Results presented in the current report are concentrated on biodiversity values that are protected under the FFG Act or are included in DELWP Advisory lists of threatened species in Victoria that are not also listed under provisions of the EPBC Act.

2.2 Database review

In order to provide a context for the project study area and the local area, information about flora and fauna from within five kilometres of the study 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 the Environment and Energy (DoEE). Records from the following databases were collated and reviewed:

- DELWP's Victorian Biodiversity Atlas (VBA), including the 'VBA_FLORA25, FLORA100 and FLORA Restricted' and 'VBA_FAUNA25, FAUNA100 and FAUNA Restricted' datasets
- DoEE's Protected Matters Search Tool for matters protected by the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)
- BirdLife Australia Atlas of Australian Birds, including Shorebirds 2020 data extraction.

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
- Planning Scheme overlays relevant to biodiversity based on <http://planningschemes.dpcd.vic.gov.au>.

Multiple published and unpublished documents used in the assessment are listed in References.

2.3 Conservation status

The Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) list species as 'threatened' but does not use IUCN categories of threatened status. Advisory Lists of threatened species in Victoria, prepared by DELWP employ IUCN categories of threatened status (e.g. vulnerable, endangered or critically endangered).

Lists of significant species generated from 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.

2.4 Determining likelihood of occurrence of threatened and migratory 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.

2.5 Consultation with government authorities

In late 2018 and early 2019 Neoen and Biosis have consulted with officers of the Victorian Department of Environment, Land, Water and Planning (DELWP). The consultations have assisted to determine which threatened and migratory species and ecological communities require investigation and to obtain and refine methods and effort for the various studies. The consultations with DELWP included taxa that are matters of NES under provisions of the EPBC Act and taxa that are covered by Victorian legislation and policies.

Neoen and AECOM also met with officers of the Australian Government Department of the Environment and Energy (DoEE) in early 2019 and consulted with them about the project and matters of NES that it might affect.

2.6 Site investigations

As noted above, some field investigations have commenced and a variety of further studies are either underway or are planned to be undertaken to coincide with appropriate seasonal or other conditions during the forthcoming 12 months. An interim survey program is provided in Appendix 3.

For the purposes of assessing species and ecological communities, a program of investigations is being undertaken that is specifically targeted to maximize the potential of obtaining information for particular species and communities. This entails timing of surveys to coincide with times when particular species are likely to be present and/or most likely to be detected, and the use of detection methods that also have the best potential to detect focal taxa.

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

2.6.1 Flora assessment

To-date, detailed surveys for flora species and vegetation communities have not been undertaken. Limited fieldwork has been carried out to broadly characterise the general types of vegetation communities that exist and to evaluate the methods that will be required for detailed investigations when a project design and footprint are available.

2.6.2 Fauna assessment

At the time of preparing this report some targeted field surveys have been carried out for the following fauna species:

- Growling Grass Frog
- Australasian Bittern

- Southern Bent-wing Bat
- Migratory shorebirds

2.7 Permits

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

- Research Permit/Management Authorisation and Permit to Take/Keep Protected Flora and Protected Fish issued by DELWP under the Victorian *Wildlife Act 1975*, *Flora and Fauna Guarantee Act 1988* (FFG Act), *National Parks Act 1975* and *Crown Land (Reserves) Act 1978* (Permit Number 10008711)
- 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 30.17 and 19.18 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).

2.8 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, environmental conditions, and migration and breeding behaviours.

For the project all investigations that are planned or underway are designed to maximise potential to detect relevant taxa. This includes surveys during appropriate seasons and environmental conditions, and the application of relevant methods and survey effort. 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.

2.9 Victorian legislation and policy

When a detailed design for the project is available and the project is further informed on the basis of results of investigations that have not yet been completed, the implications for the project will be assessed in relation to key biodiversity legislation and policy including:

- 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)
- *Planning and Environment Act 1987* – specifically Clauses 12.01-2, 52.17 and 66.02 and Overlays in the Glenelg Shire Planning Scheme
- Noxious weeds and pest animals lists under the *Catchment and Land Protection Act 1994* (CaLP Act)

3. Results

3.1 Description of the study area and local area

The site of the proposed project located on land south of Portland-Nelson Road between a point approximately 30 kilometres north-west of the town of Portland and a point approximately five kilometres to the east of the township of Nelson in Victoria.

The site is generally bound by forestry to the north, modified land used for grazing purposes to the east and west, Discovery Bay Coastal Park to the south, and the Lower Glenelg National Park and Cobboonee National Park to the east and north-east. Portions of these parks were declared as a Wetland of International Importance listed under the Ramsar Convention, in early 2018.

The proposed wind farm site is approximately 7,500 hectares and comprises 107 individual land parcels. The site is located primarily within an area that has been substantially modified and is used for commercial softwood forestry, with a small part of land used for agricultural grazing purposes.

The commercial forestry operation across the majority of the site produces Radiata Pine *Pinus radiata*. Timber harvesting is on a 35-year rotation cycle, so that the age and size of Radiata Pines varies across the site from areas recently logged to areas with trees at full maturity. The site has an existing network of public and private roads.

For the great majority of its length, the north of the site is bounded by Portland – Nelson Road. Much of the southern boundary is the common boundary between the site and Discovery Bay Coastal Park.

The locations and siting of the battery storage facility options and the transmission line options are as set out in Section 1.3, above.

3.2 Significant species and ecological communities

3.2.1 FFG Act listed threatened species

Information about species listed under provisions of the EPBC Act is provided in a separate report. Table 1 sets out a summary of threatened species listed under the FFG Act from the local and/or project study area.

Pre-existing records of listed species from the wind farm study area, from each of the transmission envelope options and the local area of each are mapped as follows:

Figure 4 – flora of the wind farm and 5 km radius

Figure 5 – fauna of the wind farm and 5 km radius

Figure 6 – flora of the underground transmission route options and 5 km radius

Figure 7 – fauna of the underground transmission route options and 5 km radius

Figure 8 – flora of the overhead transmission route options and 5 km radius

Figure 9 – fauna of the overhead transmission route options and 5 km radius

Lists of all threatened species listed under the FFG Act that have been recorded or are predicted to occur in the local area are also provided in Appendix 1 (flora) and Appendix 2 (fauna), along with an assessment of the likelihood of their occurrence within the study area. Species included in Table 1 are those that have a medium or higher likelihood of occurring in or utilising the wind farm site. The rationale underlying determination of these species is set out in Appendices 1 and 2. Species that are wholly confined to marine environments, such as marine fishes, cetaceans, marine turtles and pelagic birds, are not included in the assessments provided in those appendices.

Table 1 Summary of FFG Act listed threatened species most likely to occur in the study area

Species name	Area of value within the study area
Southern Bent-wing Bat	May fly through the project area. There are 10 known roost caves within 30 km of the project boundary. Exact locations of these caves are not available to the project team, however DELWP have indicated known roost caves at the following locations: McLennans Punt, Currans Creek, Kate's slide and Cave G3, Guano, Amphitheatre, 1886, Dry Creek, Bats Ridge, Portland Cave and the Bridgewater maternity cave.
Swamp Antechinus	Suitable habitat nearby; may utilise limited portions of site.
Southern Brown Bandicoot	Suitable habitat nearby; may utilise limited portions of site.
Heath Mouse	Suitable habitat nearby; may utilise limited portions of site.
Lewin's Rail	Likely to inhabit adjacent wetlands; may occasionally fly over site.
Brolga	Known occurrences at nearby shallow wetlands. No known habitat within site, but likely to fly over site.
Little Egret	Likely to inhabit adjacent wetlands; may occasionally fly over site.
Eastern Great Egret	Likely to inhabit adjacent wetlands; may occasionally fly over site.
Australasian Bittern	May inhabit adjacent wetlands; may occasionally fly over site.
Red-tailed Black-Cockatoo (south-eastern)	Suitable habitat nearby; likely to fly over site occasionally.
Little Bittern	Likely to inhabit adjacent wetlands; may occasionally fly over site.
Freckled Duck	Likely to inhabit adjacent wetlands; may occasionally fly over site.
Blue-billed Duck	Likely to inhabit adjacent wetlands; may occasionally fly over site.
White-bellied Sea-Eagle	Likely to inhabit adjacent wetlands; may occasionally fly over site.
Orange-bellied Parrot	Suitable habitat nearby; likely to fly over site occasionally.

Species name	Area of value within the study area
Latham's Snipe	Likely to inhabit adjacent wetlands; may occasionally fly over site.
Baillon's Crake	Potentially present in wetlands near the study area.
Striped Worm-Lizard	Likely to occur along roadsides and other less-disturbed portions of site.
Swamp Skink	Known from adjacent wet areas; may occur in small patches of remnant habitat within site.
Four-toed Skink	Likely to occur along roadsides and other less-disturbed portions of site.
Growling Grass Frog	Suitable habitat nearby; may utilise limited portions of site.
Limestone Spider-orchid	May occur along roadsides and other less-disturbed portions of site, on sandy soils over limestone.
Colourful Spider-orchid	May occur along roadsides and other less-disturbed portions of site, on calcareous sands and sandy loams.
Scented Spider-orchid	May occur along roadsides and other less-disturbed portions of site, on sandy loams.
Mellblom's Spider-orchid	May occur along roadsides and other less-disturbed portions of site, in remnant patches of coastal heath or heathy woodlands and on margins of wet depressions.
Ornate Pink-fingers	May occur along roadsides and other less-disturbed portions of site, in remnant patches of heathy or grassy woodlands.
Robust Spider-orchid	May occur along roadsides and other less-disturbed portions of site, in remnant patches of coastal heath and heathy woodland.
Coast Helmet-orchid	May occur along roadsides and other less-disturbed portions of site, on sandy soils associated with Coast Tea-tree and/or Moonah.
Late Helmet-orchid	May occur along roadsides and other less-disturbed portions of site, on raised ground in areas of swamp scrub.
Clover Glycine	May occur along roadsides and other less-disturbed portions of site, in remnant patches of grassland or grassy woodland.
Maroon Leek-orchid	May occur along roadsides and other less-disturbed portions of site, in grassland and grassy woodland environments on sandy or black clay loam soils.
Coastal Leek-orchid	May occur along roadsides and other less-disturbed portions of site, in coastal heath on sand over moisture-retentive clays.
Green-striped Greenhood	May occur along roadsides and other less-disturbed portions of site.

Species name	Area of value within the study area
Leafy Greenhood	May occur along roadsides and other less-disturbed portions of site, in remnant and sheltered patches of coastal scrub and heath.
Coast Dandelion	May occur along roadsides and other less-disturbed portions of site, on calcareous soils.
Metallic Sun-orchid	May occur along roadsides and other less-disturbed portions of site, on sandy loams or loamy sands, primarily in coastal heaths, grasslands and woodlands.
Winter Sun-orchid	May occur along roadsides and other less-disturbed portions of site, in coastal heath or, more commonly, heathy woodland.
Swamp Everlasting	May occur on the margins of swamps and wetlands, on black cracking clay soils.
Large White Spider-orchid	May occur along roadsides and other less-disturbed portions of site, in remnant patches of coastal heath and heathy woodland. Existing records in near Portland and Heywood.
Wrinkled Cassinia	Potentially present within Cobboboonee National Park close to the Surrey River and its tributaries.
Swamp Diuris	Relatively recent records in the Cashmore (Bats Ridge Wildlife Reserve) area.
Small Sickie Greenhood	Nearby records are limited to wet areas within Cobboboonee Forest Park.

The process for assessment of potential impacts on Brolga *Antigone rubicunda* is being undertaken in compliance with *Interim guidelines for the assessment, avoidance, mitigation and offsetting of potential wind farm impacts on the Victorian Brolga population 2011* (DSE 2012).

3.2.2. Ecological Vegetation Classes and FFG Act listed significant ecological communities

Detailed vegetation mapping has not yet been conducted within the study area.

Based on the 2005 Ecological Vegetation Class (EVC) layer, the following EVCs may be present within the project area (bioregional conservation status indicated in parentheses):

- EVC 48 – Heathy Woodland (Least Concern)
- EVC 16 – Lowland Forest (Least Concern)
- EVC 23 – Herb-rich Foothill Forest (Vulnerable)
- EVC 3 – Damp Sands Herb-rich Woodland (Vulnerable)
- EVC 8 – Wet Heathland (Least Concern)
- EVC 198 – Sedgy Riparian Woodland (Vulnerable)
- EVC 681 – Deep Freshwater Marsh (Vulnerable)
- EVC 53 – Swamp Scrub (Endangered)

While there may be some native vegetation removal required for the project, it is expected that the extent of direct impact will be low, and any removal is likely to occur in the more common (Least Concern conservation status) EVCs. Vulnerable and endangered EVCs are less widely distributed, and avoidance of direct impacts will be a priority in the detailed design process.

The following ecological communities listed under provisions of the FFG Act may occur in proximity to the study site, but they are not considered likely to occur within the study site itself.

- Coastal Moonah (*Melaleuca lanceolata* subsp. *lanceolata*) Woodland Community
- Red Gum Swamp Community No. 1
- Victorian Temperate Woodland Bird Community (including Red-tailed Black Cockatoo)

Melaleuca lanceolata is known to be present within the vicinity of the study area, but it is considered unlikely that the listed community will be present within the project area. Assessment of the presence of this community will be included within the detailed vegetation mapping of the project footprint.

3.3 Assessment against referral criteria in the Ministerial Guidelines

Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act 1978 (DSE 2006) 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. In accordance with the criteria, 'threatened species' relate to species listed as threatened under the FFG Act, however responses to the various criteria are also applicable to all relevant matters of national environmental significance protected by the EPBC Act..

Tables 2 and 3 set out preliminary assessments of the project against criteria related to biodiversity values that are within the scope of this report.

Table 2 Assessment of the project against the individual potential environmental effects referral criteria of the *Environment Effects Act 1978*

Referral criteria	Referral criteria met?	Comments
<p>Potential clearing of 10 ha or more of native vegetation from an area that:</p> <ul style="list-style-type: none"> • Is of an EVC identified as endangered by DSE (now DELWP) in accordance with Appendix 2 of Victoria's Native Vegetation Management Framework; or • Is, or is likely to be, of very high conservation significance as defined in accordance with Appendix 3 of Victoria's Native Vegetation Management Framework; and • Is not authorised under an approved Forest Management Plan or Fire Protection Plan. 	<p>No</p> <p>No</p> <p>No</p>	<p>At the time of preparing this report, a design of Kentbruck Green Power Hub including the wind farm and power transmission route has not been fully developed and consequently an assessment of potential impacts under the Guidelines is not yet feasible. It is not yet determined whether it will entail clearing of 10 ha or more of native vegetation. However, the great majority of the proposed wind farm site is an existing area of introduced softwood plantation and there is a low likelihood that any EVCs that might be impacted are endangered, of very high conservation significance or are not authorised under an approved Forest Management Plan or Fire Protection Plan.</p> <p>In addition, if the option one transmission line route is selected, the transmission line will be an underground cable below an existing road where this option traverses the Cobboboonee National Park and Cobboboonee Forest Park. This will minimise potential impacts on native vegetation, however DELWP may require inclusion of assumed loss of adjacent trees due to incursion of the trench into tree protection zones. Further discussions are required with DELWP to agree on an assessment approach for the underground cable alignment.</p>
<p>Potential long-term loss of a significant proportion (e.g. 1-5% depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria.</p> <p>[Note that "threatened species" are taken to be those species listed as threatened under the FFG Act.]</p>	<p>No</p>	<p>The great majority of the proposed wind farm site is an existing area of introduced softwood plantation. Preliminary assessments indicate that there is no realistic likelihood that the project would result in the long-term loss of a significant proportion of known remaining habitat or population of any threatened species.</p>
<p>Potential long-term change to the ecological character of a wetland listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia' (Environment Australia 2001).</p>	<p>No</p>	<p>The proposed Kentbruck Green Power Hub is adjacent to parts of the Glenelg Estuary and Discovery Bay Wetland of International Importance (Ramsar site). The ecological character description for the Ramsar site (DELWP 2017b) sets out specific parameters for Limits of Acceptable Change (LAC) for the Ramsar wetlands.</p> <p>The LAC relate to critical components including hydrology, vegetation types, fish diversity, specific threatened plants and ecological connectivity. There are also LAC relating to waterbirds, including presence of a range of waterbird</p>

Referral criteria	Referral criteria met?	Comments
		<p>guilds, Sanderling abundance and ongoing presence of Hooded Plover.</p> <p>The project will not impact upon hydrology of the Ramsar site or influence vegetation types or aquatic species. There is some (considered low) possibility of bird impacts through collisions with turbines, however these are highly unlikely to be of such a scale that the LAC would be exceeded.</p> <p>There is a low likelihood of effects or mechanisms associated with development or operation of the wind farm that have capacity to directly or indirectly result in changes to the Ramsar wetland that would approach or meet the specified Limits of Acceptable Change.</p>
Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term.	No	The site of the proposed wind farm includes no waterways. Investigations of ground- and surface hydrology of the site will be required to fully inform this question, however there do not appear to be mechanisms associated with development or operation of the project that might result in extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term. Refer to the preliminary hydrology report prepared for the project referrals for additional information (AECOM 2019).

Table 3 Assessment of the project against the combined potential environmental effects referral criteria of the *Environment Effects Act 1978*

Referral criteria	Referral criteria met?	Comments
Potential clearing of 10 ha or more of native vegetation, unless authorised under an approved Forest Management Plan or Fire Protection Plan.	No	At the time of preparing this report, a design of Kentbruck Green Power Hub and power transmission route has not been fully developed and consequently an assessment of potential impacts under the Guidelines is not yet feasible. It is not yet determined whether it will entail clearing of 10 ha or more of native vegetation. However, the great majority of the proposed project site is an existing area of introduced softwood plantation and it is expected that impacts to native vegetation can be avoided/minimised during the design process.
Potential loss of matters listed under the FFG Act: <ul style="list-style-type: none"> A significant area of a listed ecological community; or A genetically important population of an endangered or threatened species (listed or nominated for 	No Unlikely	<p>The great majority of the proposed project is an existing area of introduced softwood plantation. Preliminary assessments indicate that there is no realistic likelihood that the project would result in the long-term loss of a significant area of any listed ecological community.</p> <p>The development and operation of the proposed project will entail minimal effects on native vegetation or on habitat for any threatened fauna species. There does not appear to be any</p>

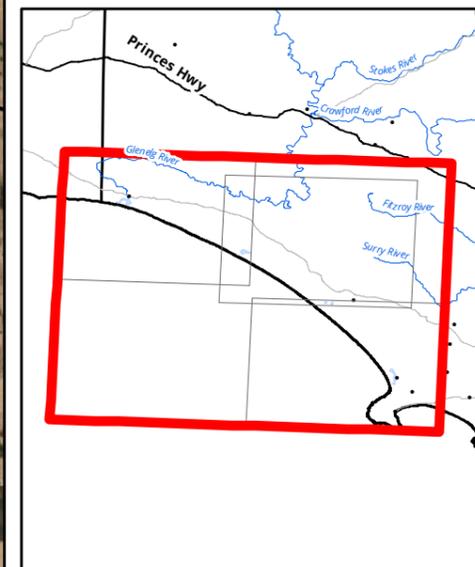
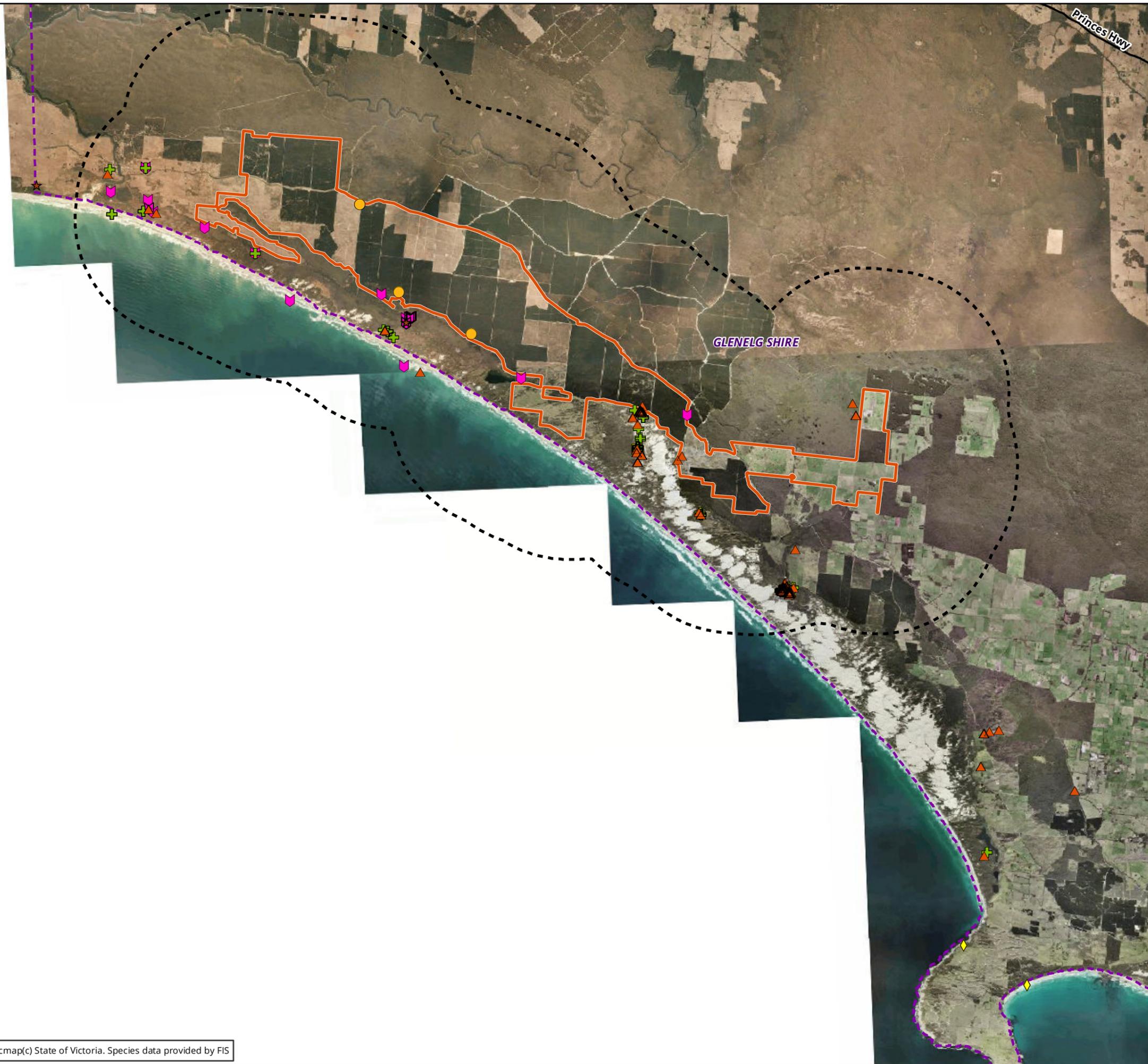
Referral criteria	Referral criteria met?	Comments
listing) including as a result of the loss or fragmentation of habitats; or <ul style="list-style-type: none"> • Critical habitat; or • Habitat values of a wetland supporting migratory bird species. 	No No	realistic potential for loss or significant impact on any genetically important population of any endangered or threatened species. There is no declared critical habitat within Victoria. The proposed project is adjacent to portions of the Glenelg Estuary and Discovery Bay Wetland of International Importance (Ramsar site). Wetlands and the coast within the Ramsar site support migratory bird species. The ecological character description for the Ramsar site (DELWP 2017b) sets out specific parameters for Limits of Acceptable Change for the Ramsar wetlands, including specific measures of change for specific migratory bird species. There are no effects or mechanisms associated with development or operation of the wind farm that have capacity to directly or indirectly result in changes to those measures that would approach or meet the specified Limits of Acceptable Change.

3.3.1 DELWP advisory lists of rare and threatened species

Victoria's Guidelines for the removal, destruction or lopping of native vegetation (DELWP 2017a 'the Guidelines') provide the mechanism for protection of rare or threatened species listed under Advisory Lists of threatened flora and fauna published by DELWP. To support decision making under the Guidelines, DELWP has produced maps for Victoria showing the modelled extent of habitat for most listed rare or 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 rare or threatened species, in relation to other suitable habitat for that species (DELWP 2017a).

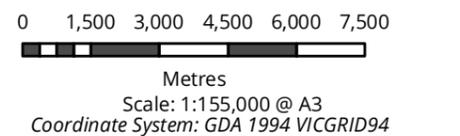
Under the Guidelines, these maps form the basis for determining the impact of potential native vegetation removal on rare and threatened species. The maps only apply where a proposal to remove native vegetation is considered on the detailed assessment pathway. The habitat importance scores are used to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

At the time of preparing this report, a design of the wind farm and power transmission line has not been fully developed and consequently an assessment of potential impacts under the Guidelines is not yet feasible. The Guidelines and associated habitat modelling will be followed as the prescribed process for conservation of Advisory List species that may be impacted by development of the project.



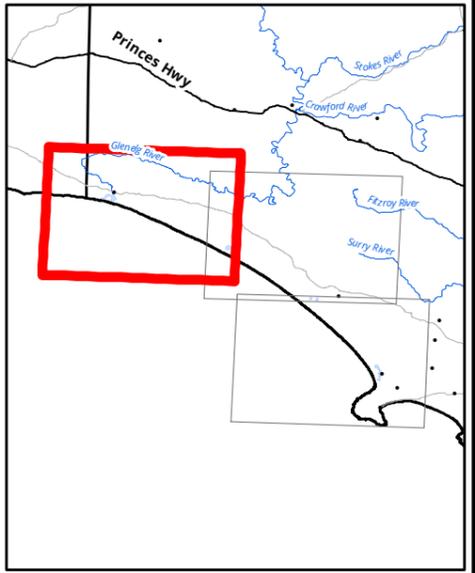
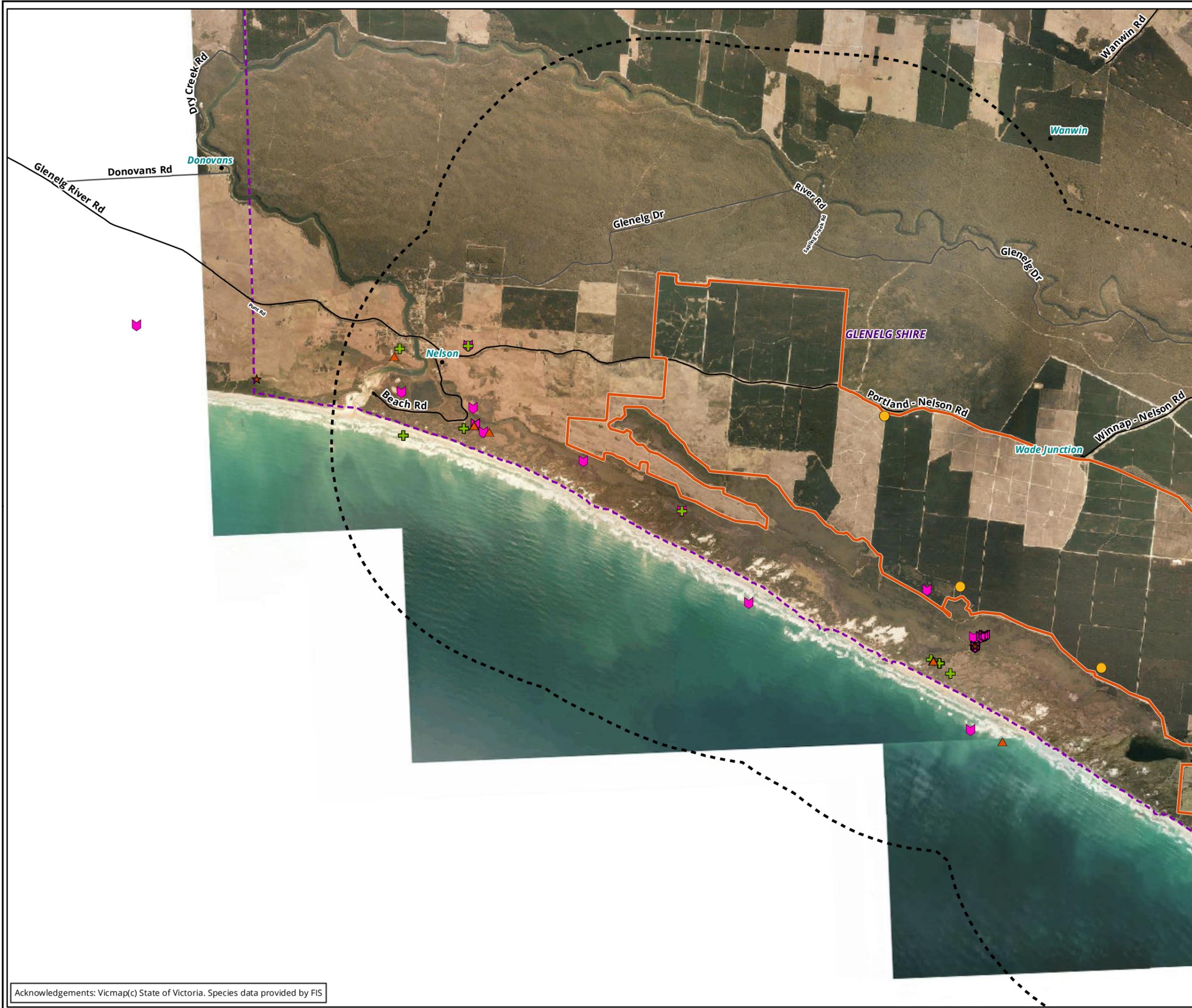
- Species list**
- Study area
 - Search area
- State significant flora**
- *Adriana quadripartita*
 - *Caladenia bicallata* subsp. *bicallata*
 - ▲ *Caladenia fragrantissima*
 - ★ *Corybas* sp. aff. *diemenicus* (Coastal)
 - ◆ *Ixodia achillaeoides* subsp. *arenicola*
 - + *Prasophyllum litorale*
 - ♥ *Pterostylis tenuissima*

Significant flora within the search area



Acknowledgements: Vicmap(c) State of Victoria. Species data provided by FIS

Matter: 28916
 Date: 03 May 2019,
 Checked by: mjones, Drawn by: Auto gen, Last edited by: jturner
 Location: \\bio-data-01\matters\129800s\129806\mapping\29086_working_flora



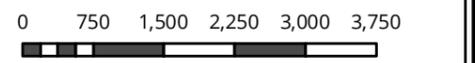
Species list

-  Study area
-  Search area

State significant flora

-  *Adriana quadripartita*
-  *Caladenia fragrantissima*
-  *Corybas* sp. aff. *diemenicus* (Coastal)
-  *Prasophyllum litorale*
-  *Pterostylis tenuissima*

Significant flora within the search area



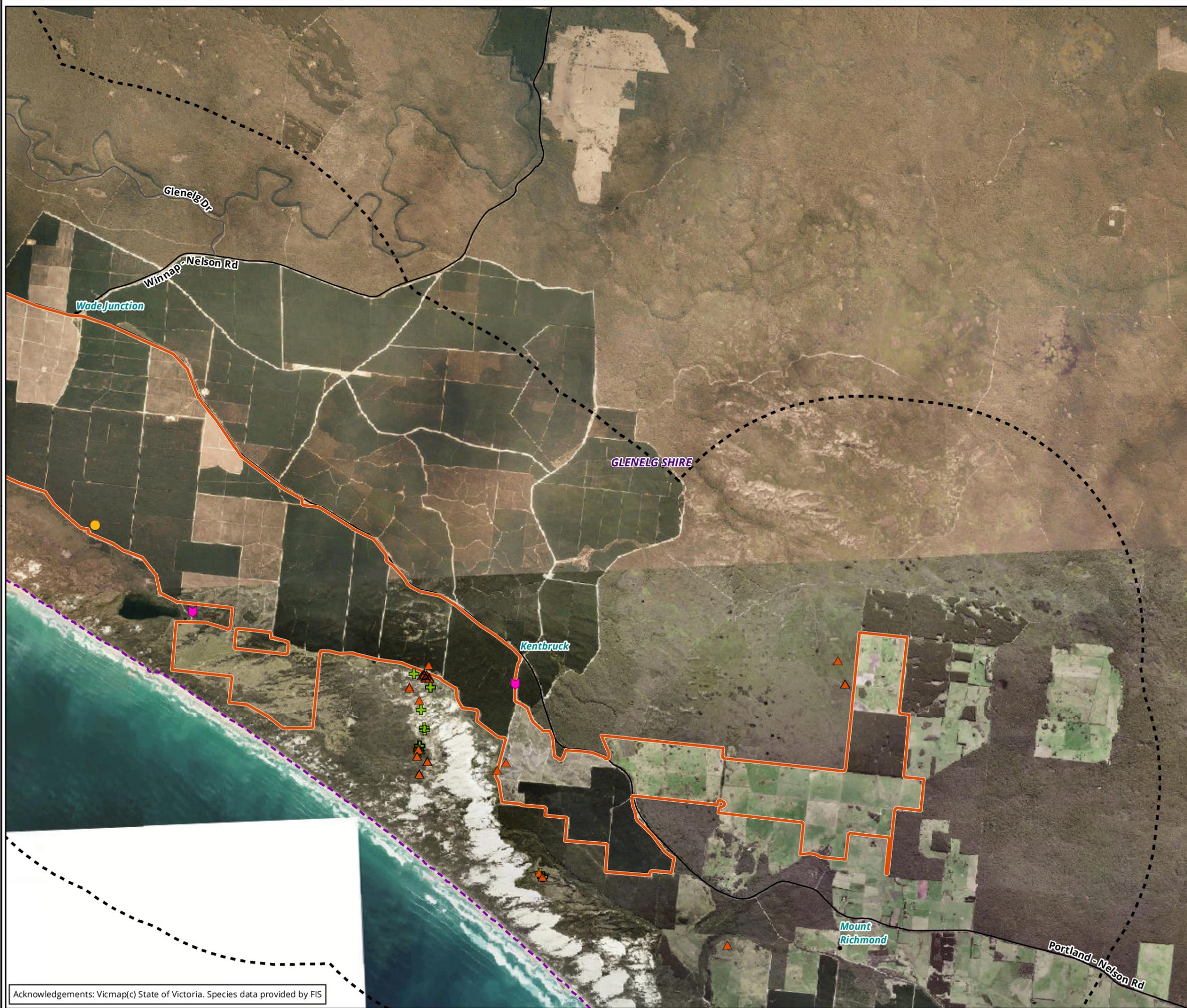
Metres
Scale: 1:75,000 @ A3
Coordinate System: GDA 1994 VICGRID94



Albury, Ballarat, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

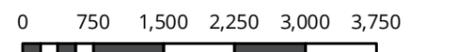
Acknowledgements: Vicmap(c) State of Victoria. Species data provided by FIS

Matter: 28916
Date: 03 May 2019,
Checked by: m.jones, Drawn by: Auto gen, Last edited by: j.turner
Location: \\bio-data-01\matters\129800s\129806\mapping\29086_working_flora



- Species list**
-  Study area
 -  Search area
- State significant flora**
-  *Adriana quadripartita*
 -  *Caladenia bicallata* subsp. *bicallata*
 -  *Caladenia fragrantissima*
 -  *Prasophyllum litorale*
 -  *Pterostylis tenuissima*

Significant flora within the search area



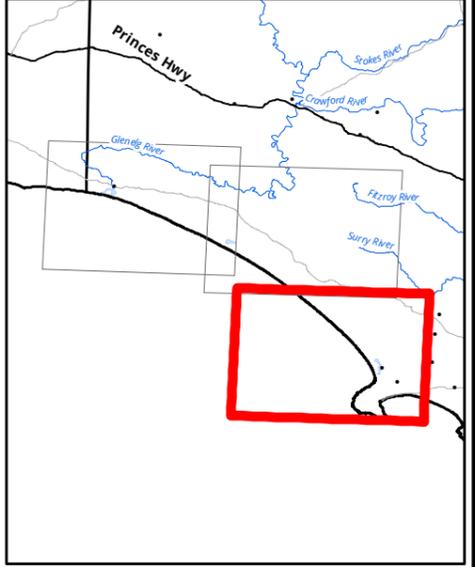
Metres
 Scale: 1:75,000 @ A3
 Coordinate System: GDA 1994 VICGRID94



Albury, Ballarat, Melbourne, Newcastle,
 Sydney, Wangaratta & Wollongong

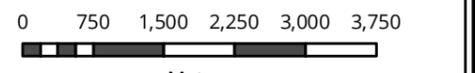
Matter: 28916
 Date: 03 May 2019,
 Checked by: mjones, Drawn by: Auto gen, Last edited by: jturner
 Location: \\bio-data-01\matters\129800s\29806\mapping\29086_working_flora

Acknowledgements: Vicmap(c) State of Victoria. Species data provided by FIS



- Species list**
- ▣ Search area
 - State significant flora**
 - ▲ *Caladenia fragrantissima*
 - ◆ *Ixodia achillaeoides* subsp. *arenicola*
 - ⊕ *Prasophyllum litorale*

Significant flora within the search area

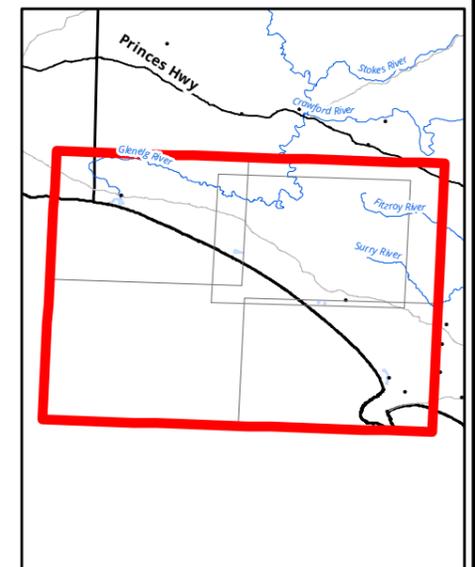
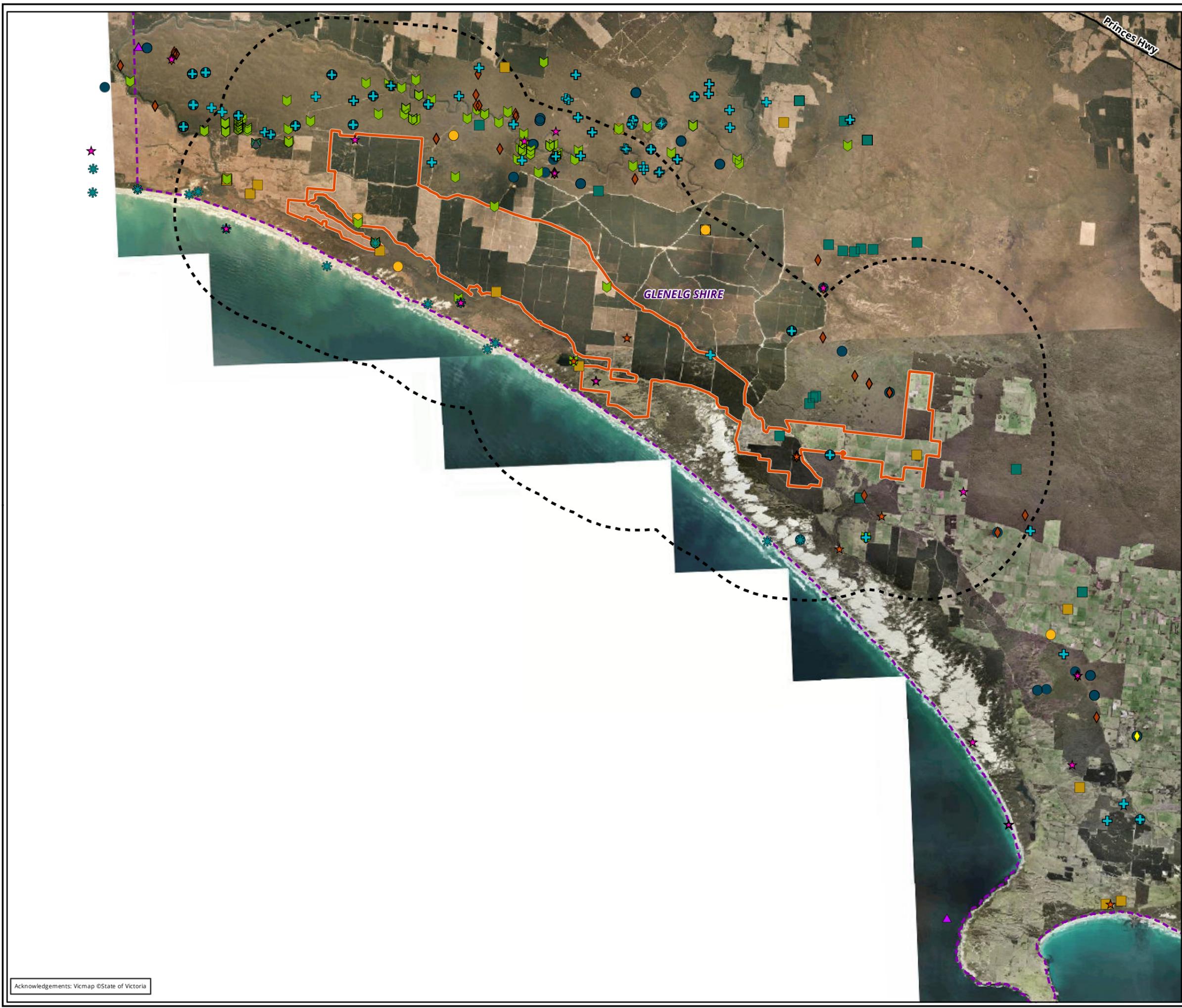


Metres
 Scale: 1:75,000 @ A3
 Coordinate System: GDA 1994 VICGRID94



Albury, Ballarat, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 28916
 Date: 03 May 2019,
 Checked by: m.jones, Drawn by: Auto gen, Last edited by: j.turner
 Location: \\bio-data-01\matters\129800s\129806\mapping\29086_working_flora



Legend

- Study area
- Search area

Fauna

- Australasian Bittern
- Brolga
- ▲ Southern Bent-wing Bat
- ★ Growling Grass Frog
- ◆ Heath Mouse
- + Long-nosed Potoroo
- ✱ Orange-bellied Parrot
- ▼ Red-tailed Black-Cockatoo
- Southern Brown Bandicoot
- Southern Toadlet
- ▲ Spot-tailed Quoll
- ★ Swamp Antechinus
- ◆ White-footed Dunnart

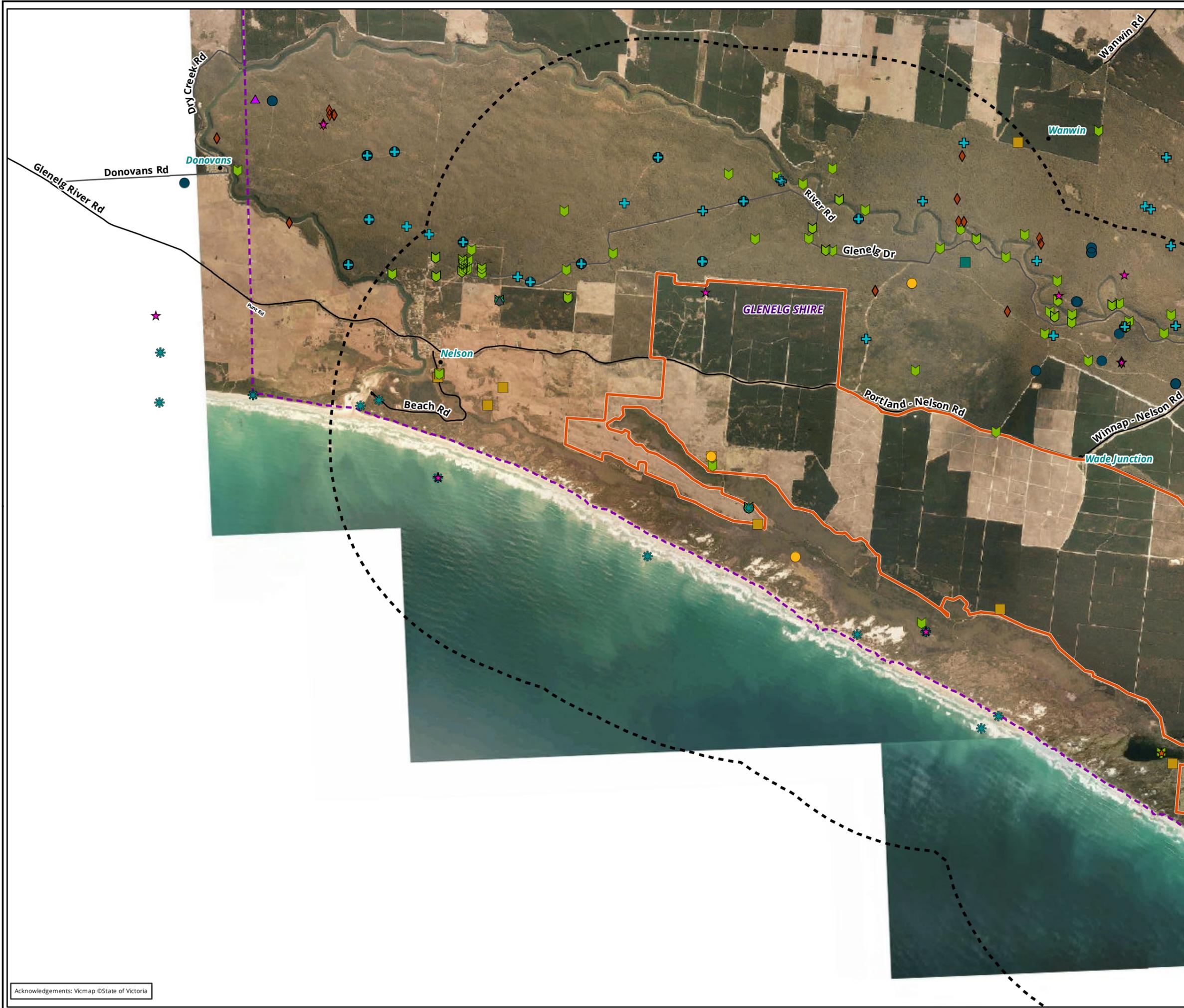
Threatened Fauna within the search area

0 1,500 3,000 4,500 6,000 7,500
 Metres

Scale: 1:155,000 @ A3
 Coordinate System: GDA 1994 VICGRID94

Biosis Pty Ltd
 Albury, Ballarat, Melbourne, Newcastle
 Sydney, Wangaratta & Wollongong

Matter:
 Date: 03 May 2019,
 Checked by: mjones, Drawn by: GIS, Last edited by: jturner
 Location: \\bio-data-01\matters\129800s\129806\Mapping\29086_working_fauna



Legend

- Study area
- Search area

Fauna

- Australasian Bittern
- Brolga
- ▲ Southern Bent-wing Bat
- ★ Growling Grass Frog
- ◆ Heath Mouse
- + Long-nosed Potoroo
- ✱ Orange-bellied Parrot
- ▾ Red-tailed Black-Cockatoo
- Southern Brown Bandicoot
- Southern Toadlet
- ▲ Spot-tailed Quoll
- ★ Swamp Antechinus

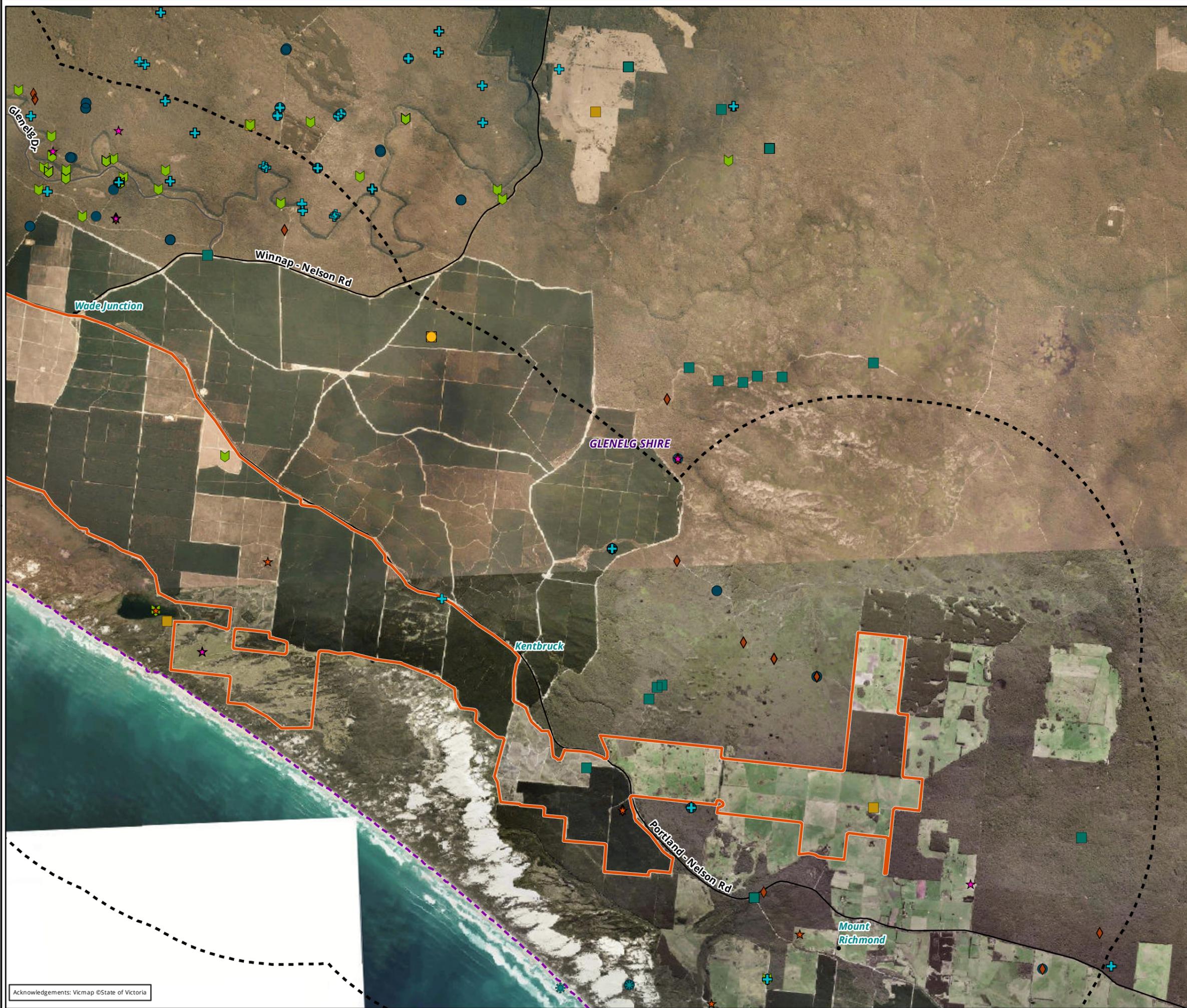
Threatened Fauna within the search area

0 750 1,500 2,250 3,000 3,750
Metres

Scale: 1:75,000 @ A3
Coordinate System: GDA 1994 VICGRID94

Biosis Pty Ltd
Albury, Ballarat, Melbourne, Newcastle
Sydney, Wangaratta & Wollongong

Matter:
Date: 03 May 2019,
Checked by: mjones, Drawn by: GIS, Last edited by: jturner
Location: \\bio-data-01\matters\129800s\129806\Mapping\29086_working_fauna



Legend

Study area
 Search area

Fauna

- Australasian Bittern
- Brolga
- Growling Grass Frog
- Heath Mouse
- Long-nosed Potoroo
- Orange-bellied Parrot
- Red-tailed Black-Cockatoo
- Southern Brown Bandicoot
- Southern Toadlet
- Swamp Antechinus
- White-footed Dunnart

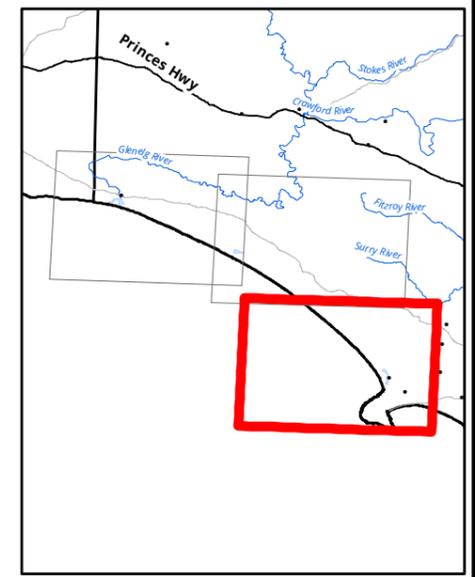
Threatened Fauna within the search area

0 750 1,500 2,250 3,000 3,750
 Metres
 Scale: 1:75,000 @ A3
 Coordinate System: GDA 1994 VICGRID94

biosis.
 Biosis Pty Ltd
 Albury, Ballarat, Melbourne, Newcastle
 Sydney, Wangaratta & Wollongong

Matter:
 Date: 03 May 2019,
 Checked by: mjones, Drawn by: GIS, Last edited by: jturner
 Location: \\bio-data-01\matters\129800s\129806\Mapping\29086_working_fauna

Acknowledgements: Vicmap ©State of Victoria



Legend

--- Search area

Fauna

- Australasian Bittern
- Brolga
- ▲ Southern Bent-wing Bat
- ★ Growling Grass Frog
- ◆ Heath Mouse
- ⊕ Long-nosed Potoroo
- ✱ Orange-bellied Parrot
- ▾ Red-tailed Black-Cockatoo
- Southern Brown Bandicoot
- Southern Toadlet
- ★ Swamp Antechinus
- ◆ White-footed Dunnart

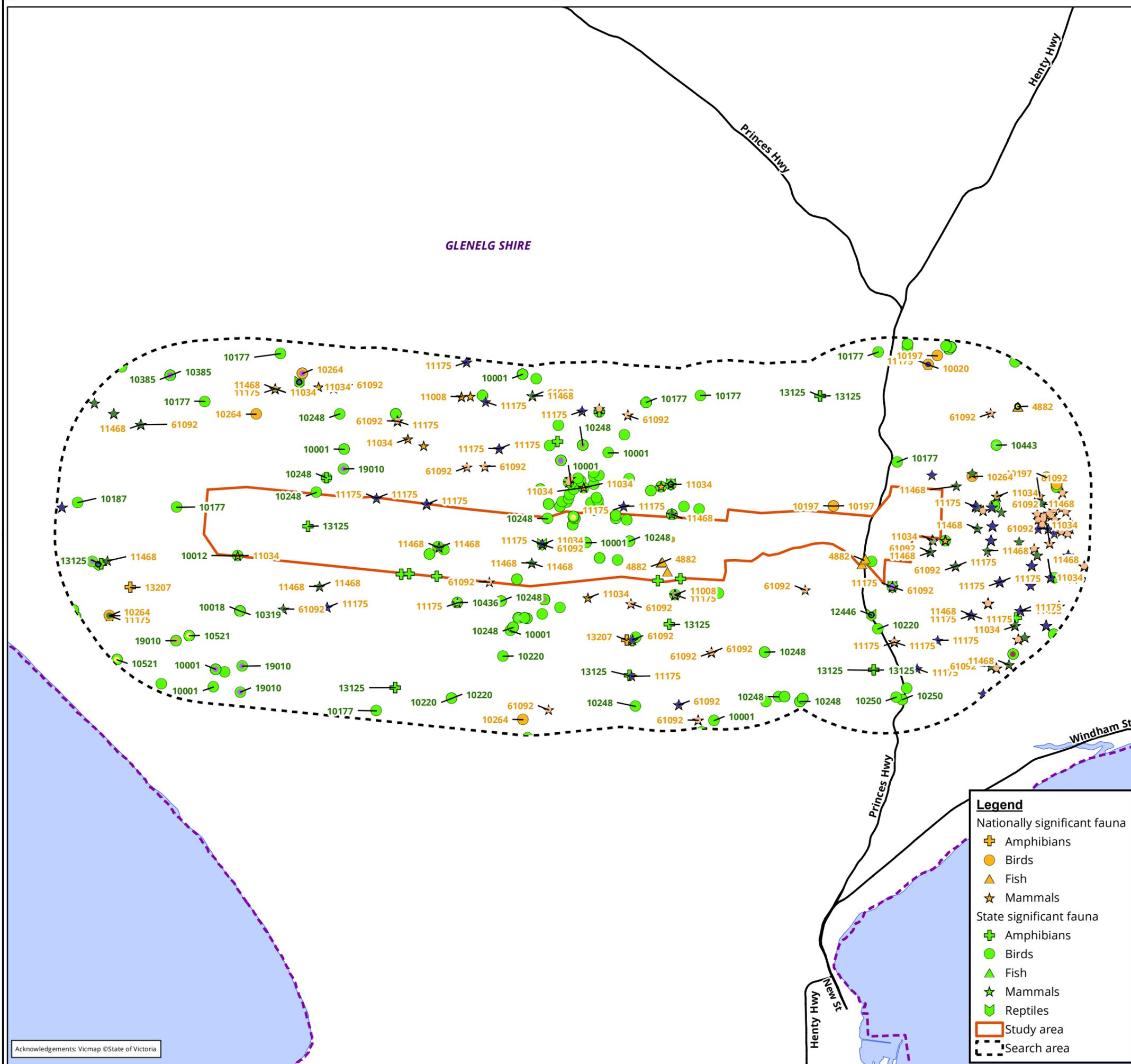
Threatened Fauna within the search area

0 750 1,500 2,250 3,000 3,750
Metres

Scale: 1:75,000 @ A3
Coordinate System: GDA 1994 VICGRID94

biosis. N
Biosis Pty Ltd
Albury, Ballarat, Melbourne, Newcastle
Sydney, Wangaratta & Wollongong

Matter:
Date: 03 May 2019,
Checked by: mjones, Drawn by: GIS, Last edited by: jturner
Location: \\bio-data-01\matters\129800s\129806\mapping\29086_working_fauna



Species list

Amphibians

- 13125.0 - Southern Toadlet
- 13207.0 - Growling Grass Frog

Birds

- 10001.0 - Emu
- 10012.0 - King Quail
- 10018.0 - Little Button-quail
- 10020.0 - Plains-wanderer
- 10085.0 - Common Diving-Petrel
- 10099.0 - Pied Cormorant
- 10177.0 - Brolga
- 10181.0 - Royal Spoonbill
- 10187.0 - Great Egret
- 10197.0 - Australasian Bittern
- 10199.0 - Magpie Goose
- 10212.0 - Australasian Shoveler
- 10214.0 - Freckled Duck
- 10215.0 - Hardhead
- 10216.0 - Blue-billed Duck
- 10217.0 - Musk Duck
- 10220.0 - Grey Goshawk
- 10246.0 - Barking Owl
- 10248.0 - Powerful Owl
- 10250.0 - Masked Owl
- 10264.0 - Red-tailed Black-Cockatoo (south-eastern)
- 10270.0 - Major Mitchell's Cockatoo
- 10319.0 - Azure Kingfisher
- 10385.0 - Hooded Robin
- 10436.0 - Spotted Quail-thrush
- 10443.0 - Grey-crowned Babbler
- 10498.0 - Chestnut-rumped Heathwren
- 10521.0 - Rufous Bristlebird
- 19010.0 - Rufous Bristlebird (Coorong)
- 60555.0 - Brown Treecreeper

Fish

- 4882.0 - Yarra Pygmy Perch
- 903034.0 - Little Galaxias

Mammals

- 11008.0 - Spot-tailed Quoll
- 11034.0 - Swamp Antechinus
- 11069.0 - White-footed Dunnart
- 11150.0 - Eastern Pygmy-possum
- 11175.0 - Long-nosed Potoroo
- 11468.0 - Heath Mouse
- 61092.0 - Southern Brown Bandicoot
- 61341.0 - Common Bent-wing Bat

Reptiles

- 12407.0 - Swamp Skink

Legend

Nationally significant fauna

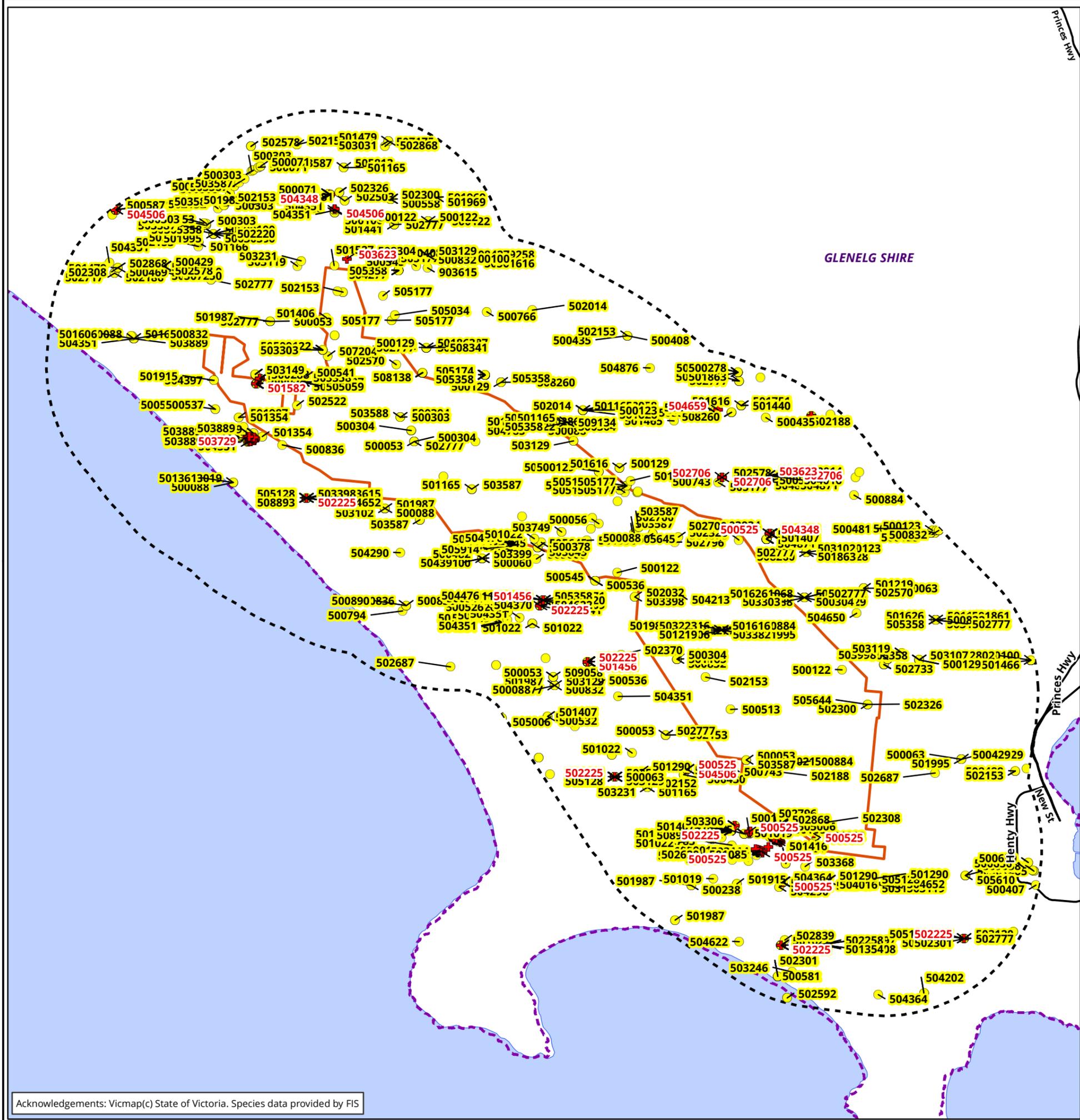
- ⊕ Amphibians
- Birds
- ▲ Fish
- ★ Mammals

State significant fauna

- ⊕ Amphibians
- Birds
- ▲ Fish
- ★ Mammals
- Reptiles

Study area (orange line)

Search area (dashed line)



- Species list**
- Nationally significant flora**
- ✚ 500525.0 - *Caladenia calcicola*
 - ✚ 501456.0 - *Glycine latrobeana*
 - ✚ 501582.0 - *Haloragis exalata* var. *exalata*
 - ✚ 502225.0 - *Muehlenbeckia australis*
 - ✚ 502706.0 - *Prasophyllum diversiflorum*
 - ✚ 502709.0 - *Prasophyllum frenchii*
 - ✚ 502819.0 - *Pterostylis tenuissima*
 - ✚ 503623.0 - *Amphibromus fluitans*
 - ✚ 503729.0 - *Caladenia colorata*
 - ✚ 503763.0 - *Xerochrysum palustre*
 - ✚ 504343.0 - *Caladenia ornata*
 - ✚ 504348.0 - *Caladenia hastata*
 - ✚ 504358.0 - *Cassinia rugata*
 - ✚ 504506.0 - *Prasophyllum spicatum*
 - ✚ 504659.0 - *Senecio psilocarpus*

Figure 4: Significant flora within m of the study area

0 1,250 2,500 3,750 5,000 6,250
 Metres
 Scale: 1:125,000 @ A3
 Coordinate System: GDA 1994 VICGRID94



Acknowledgements: Vicmap(c) State of Victoria. Species data provided by FIS

Matter: 28916
 Date: 29 May 2019
 Checked by: mjones, Drawn by: Auto gen, Last edited by: mjones
 Location: P:\28900s\28916\Mapping\28916_F4_ThrFlora_autoGen

References

- Biosis 2019. *Kentbruck Green Power Hub: Preliminary Assessment of Biodiversity to accompany referral under the EPBC Act*. Report to Neoen Australia Pty Ltd. Authors: Smales I. and Goddard, M. Biosis Pty Ltd, Melbourne. Project no. 29806.
- DELWP 2017a. *Guidelines for the removal, destruction or lopping of native vegetation*. Victorian Government Department of Land, Water and Planning, Melbourne (December 2017).
- DELWP 2017b. *Glenelg Estuary and Discovery Bay Ramsar Site. Management Plan Summary*. Department of Environment, Land, Water and Planning, East Melbourne, Victoria.
- DEPI 2014. *Advisory List of Rare or Threatened Plants in Victoria – 2014*. Victorian Government Department of Environment and Primary Industries, East Melbourne.
- 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.
- DSE 2006. *Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act 1978*. Victorian Government Department of Sustainability and Environment, Melbourne.
- DSE 2009. *Advisory List of Threatened Invertebrate Fauna in Victoria - 2009*. Department of Sustainability and Environment, East Melbourne, Victoria.
- DSE 2010. *Victorian Biodiversity Atlas 'VBA_FAUNA25, FAUNA100 and FAUNARestricted, FLORA25, FLORA100 and FLORARestricted'* August 2010 © The State of Victoria. Victorian Government Department of Sustainability and Environment, Melbourne.
- DSE 2012. *Interim guidelines for the assessment, avoidance, mitigation and offsetting of potential wind farm impacts on the Victorian Brolga population*. Victorian Government Department of Sustainability and Environment, Melbourne.
- DSE 2013. *Advisory List of Threatened Vertebrate Fauna in Victoria – 2013*. Victorian Government Department of Environment and Primary Industries, Melbourne.

Appendices

Appendix 1 Flora

Notes to tables:

FFG Act:

L - listed as threatened under FFG Act
P - protected under the FFG Act (public land only)

DEPI 2014a: e

- endangered
v - vulnerable
r - rare
k - poorly known

Noxious weed status:

SP - State prohibited species
RP - Regionally prohibited species
RC - Regionally controlled species
RR - Regionally restricted species

- Native species outside natural range

A1.1 Listed flora species

The following table includes flora species listed under the FFG Act or on a DELWP Advisory List that have potential to occur within the study area. The list of species is sourced from the Victorian Biodiversity Atlas (accessed on 23.11.2018).

Table A1.1 Listed flora species recorded / predicted to occur within 5 km of the study area

Scientific name	Common name	Listing status		Most recent database record	Other records	Habitat description	Likelihood of occurrence	Rationale for likelihood ranking
		EPBC	FFG					
<i>Atriplex billardiarei</i>	Glistening Saltbush		L	1980		Scattered along sandy seashores from the western to eastern extremities of Victoria.	Low	No suitable habitat
<i>Caladenia calcicola</i>	Limestone Spider-orchid	VU	L	1983	PMST	Heathy woodland on sandy soils over limestone.	Medium	May occur along roadsides and other less-disturbed portions of site, on sandy soils over limestone.
<i>Caladenia colorata</i>	Colourful Spider-orchid	EN	L	2003	PMST	Open areas in low, mixed eucalypt woodland with heathy understorey on calcareous sands and sandy loams.	Medium	May occur along roadsides and other less-disturbed portions of site, on calcareous sands and sandy loams.
<i>Caladenia fragrantissima</i>	Scented Spider-orchid		L	2015		Known only from far south-west Victoria, between Nelson and Portland, where it grows in coastal and near-coastal heath or heathy woodland in sandy loam.	Medium	May occur along roadsides and other less-disturbed portions of site, on sandy loams.
<i>Caladenia hastata</i>	Mellblom's Spider-orchid	EN	L	2013	PMST	Dense coastal heath and heathy woodlands, commonly on the margins of swampy depressions.	Medium	May occur along roadsides and other less-disturbed portions of site, in remnant patches of coastal heath or heathy woodlands and on margins of wet depressions.

Scientific name	Common name	Listing status		Most recent database record	Other records	Habitat description	Likelihood of occurrence	Rationale for likelihood ranking
		EPBC	FFG					
<i>Caladenia ornata</i>	Ornate Pink-fingers	VU	L	2003	PMST	Heathy and grassy woodlands.	Medium	May occur along roadsides and other less-disturbed portions of site, in remnant patches of heathy or grassy woodlands.
<i>Caladenia valida</i>	Robust Spider-orchid		L	2012		Coastal or near coastal heaths and heathy woodland.	Medium	May occur along roadsides and other less-disturbed portions of site, in remnant patches of coastal heath and heathy woodland.
<i>Caladenia venusta</i>	Large White Spider-orchid		L	1944		Heath and heathy woodlands primarily in coastal areas, extending inland in Western Victoria.	Medium	May occur along roadsides and other less-disturbed portions of site, in remnant patches of coastal heath and heathy woodland. Existing records in near Portland and Heywood.
<i>Carex tasmanica</i>	Curly Sedge		L	2015		Seasonally wet areas, such as around drainage lines and freshwater swamps, on fertile, clay soils derived from basalt.	Low	Limited suitable habitat within the study area.
<i>Cassinia rugata</i>	Wrinkled Cassinia	VU	L		PMST	Damp, low open forest or dense heathy scrub	Medium	Potentially present within Cobboboonee National Park close to the Surrey River and its tributaries.
<i>Comesperma polygaloides</i>	Small Milkwort		L	1991		Grasslands on the western basalt plains; less commonly in grassy woodlands between Bendigo and the Wimmera.	Low	Limited suitable habitat

Scientific name	Common name	Listing status		Most recent database record	Other records	Habitat description	Likelihood of occurrence	Rationale for likelihood ranking
		EPBC	FFG					
<i>Corybas despectans</i>	Coast Helmetorchid		L	2016		Sandy soils in moist, shady situations within coastal scrubs of Coast Tea-tree <i>Leptospermum laevigatum</i> and Moonah <i>Melaleuca lanceolata</i> .	Medium	May occur along roadsides and other less-disturbed portions of site, on sandy soils associated with Coast Tea-tree and/or Moonah.
<i>Corybas sp. aff. diemenicus (Coastal)</i>	Late Helmetorchid		L	2008		Raised clumps of ground in wet areas of Swamp Scrub, which have a dense overstorey of Woolly Tea Tree or Scented Paperbark.	Medium	May occur along roadsides and other less-disturbed portions of site, on raised ground in areas of swamp scrub.
<i>Diuris palustris</i>	Swamp Diuris		L	1994		Scattered in higher rainfall parts of western Victoria. Typically occurs in swampy depressions.	Medium	Relatively recent records in the Cashmore (Bats Ridge Wildlife Reserve) area.
<i>Eucalyptus leucoxydon subsp. megalocarpa</i>	Large-fruit Yellow-gum		L	2010		Coastal, near Nelson.	Low	Limited suitable habitat
<i>Euphrasia scabra</i>	Rough Eyebright		L	1770		Grassy woodlands and clearings in subalpine woodlands or sclerophyll forests.	Low	No suitable habitat
<i>Glycine latrobeana</i>	Clover Glycine	VU	L	2015	PMST	Grasslands and grassy woodlands, particularly those dominated by Kangaroo Grass.	Medium	May occur along roadsides and other less-disturbed portions of site, in remnant patches of grassland or grassy woodland.
<i>Prasophyllum diversiflorum</i>	Gorae Leek-orchid	EN	L	1947		Along watercourses and around swamps in open forests, and in Western Basalt Plains	Low	Generally limited to basalt soils subject to seasonal

Scientific name	Common name	Listing status		Most recent database record	Other records	Habitat description	Likelihood of occurrence	Rationale for likelihood ranking
		EPBC	FFG					
<i>Prasophyllum frenchii</i>	Maroon Leek-orchid	EN	L	2009	PMST	Grasslands. Habitat characteristics vary, however, all known locations are subject to seasonal inundation. Grassland and grassy woodland environments on sandy or black clay loam soils, that are generally damp but well drained.	Medium	inundation. No suitable habitat. May occur along roadsides and other less-disturbed portions of site, in grassland and grassy woodland environments on sandy or black clay loam soils.
<i>Prasophyllum litorale</i>	Coastal Leekorchid		L	2016		Coastal scrub and heath on sand hills or headlands, in sand over moisture-retentive clays.	Medium	May occur along roadsides and other less-disturbed portions of site, in coastal heath on sand over moisture-retentive clays.
<i>Prasophyllum pallidum s.l.</i>	Pale Leek-orchid	VU	L	1980		Inland woodlands	Low	Not a recognised taxon within Victoria.
<i>Pterostylis chlorogramma</i>	Greenstriped Greenhood	VU	L		PMST	Heathy woodland; more specific habitat requirements are poorly known.	Medium	May occur along roadsides and other less-disturbed portions of site.
<i>Pterostylis cucullata</i>	Leafy Greenhood	VU	L		PMST	Sand dune scrubs in coastal areas, and inland on slopes and river flats in moist foothill and montane forests.	Low	May occur along roadsides and other less-disturbed portions of site, in remnant and sheltered patches of coastal scrub and heath.

Scientific name	Common name	Listing status		Most recent database record	Other records	Habitat description	Likelihood of occurrence	Rationale for likelihood ranking
		EPBC	FFG					
<i>Pterostylis cucullata subsp. cucullata</i>	Leafy Greenhood		L	2001		Protected areas of stabilised coastal sand dunes within scrub communities with an open ground layer; occasionally in Coastal Manna Gum woodland.	Medium	May occur along roadsides and other less-disturbed portions of site, in remnant and sheltered patches of coastal scrub and heath.
<i>Pterostylis lustra</i>	Small Sickie Greenhood		L	2001		In shaded, damp to wet areas along stream banks, in wet soaks and swamps.	Medium	Nearby records are limited to wet areas within Cobboboonee Forest Park.
<i>Taraxacum cygnorum</i>	Coast Dandelion	VU	L	1991	PMST	Confined to woodlands and scrub on calcareous soils.	Medium	May occur along roadsides and other less-disturbed portions of site, on calcareous soils.
<i>Thelymitra epipactoides</i>	Metallic Sunorchid	EN	L	2000	PMST	Moist or dry sandy loams or loamy sands, primarily in coastal heaths, grasslands and woodlands, but also in similar communities at drier inland sites.	Medium	May occur along roadsides and other less-disturbed portions of site, on sandy loams or loamy sands, primarily in coastal heaths, grasslands and woodlands.
<i>Thelymitra hiemalis</i>	Winter Sunorchid		L	2006		Brown Stringybark Eucalyptus baxteri or Promontory Peppermint E. willisii woodland, typically with a heathy understorey.	Medium	May occur along roadsides and other less-disturbed portions of site, in coastal heath or, more commonly, heathy woodland.
<i>Xerochrysum palustre</i>	Swamp Everlasting	VU	L		PMST	Sedge-swamps and shallow freshwater marshes and swamps in lowlands, on black cracking clay soils.	Medium	May occur on the margins of swamps and wetlands, on black cracking clay soils.

Appendix 2 Fauna

Notes to tables:

FFG Act:

L - listed as threatened under FFG Act

N - nominated for listing as threatened

I - determined ineligible for listing

DSE 2009, DSE 2013:

ex - extinct

cr - critically

endangered en -

endangered vu -

vulnerable nt - near

threatened dd - data

deficient rx - regionally

extinct

Introduced species

PS - pest species listed under the CaLP Act

* - introduced species

Most recent database records are from the Victorian Biodiversity Atlas unless otherwise specified as follows

PMST – Protected Matters Search Tool

BA – Birds Australia

A2.1 Listed fauna species

The following table includes fauna species listed under the FFG Act or on a DELWP Advisory List that have potential to occur within the study area. The list of species is sourced from the Victorian Biodiversity Atlas (accessed on 23.11.2018).

Table A2.1 Listed fauna species recorded, or predicted to occur, within 5 km of the study area

Note – Additional bird and bat species recorded within 30 km of the study area have also been included

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Accipiter novaehollandiae</i>	Grey Goshawk		v	L	2000		Rainforest, gallery forest, tall wet forest and woodland. Also partially cleared agricultural land.	Low	Little suitable habitat
<i>Actitis hypoleucos</i>	Common Sandpiper		v		2015	PMST	Coastal and inland wetlands with muddy margins.	Negligible	No suitable habitat
<i>Alcedo azurea</i>	Azure Kingfisher		nt		2006		Well-vegetated freshwater wetlands and slow-flowing creeks and rivers	Negligible	No streams offering suitable habitat
<i>Anseranas semipalmata</i>	Magpie Goose		nt	L	2008	PMST	Swamps, lakes, sewage ponds, flooded pasture, dams.	Low	May use adjacent wetlands; may fly over site occasionally
<i>Antechinus minimus</i>	Swamp Antechinus	VU	nt	L	2006	PMST	Wet heath, dense grassland and sedgeland, including Brown Stringybark woodland.	Medium	Suitable habitat nearby; may utilise limited portions of site

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Anthochaera phrygia</i>	Regent Honeyeater	CR	cr	L	1958		Dry box-ironbark and woodland areas mostly inland of the great dividing range.	Negligible	No suitable habitat
<i>Aprasia striolata</i>	Striped Worm-Lizard		nt	L	2010		Open woodlands and heathlands with abundant leaf litter on loamy soils.	High	Likely to occur along roadsides and other less disturbed portions of site.
<i>Ardea alba modesta</i>	Eastern Great Egret		v	L	2015	PMST	Permanent and ephemeral wetlands..	High	Likely in adjacent wetlands; likely to fly over site occasionally
<i>Ardea intermedia plumifera</i>	Intermediate Egret		e	L	2012		Permanent and ephemeral wetlands.	Low	Rare in S Victoria; may use adjacent wetlands; may fly over site occasionally
<i>Arenaria interpres</i>	Ruddy Turnstone		v		2005	PMST	Exposed coastal beaches, reefs and rock platforms.	Negligible	No suitable habitat

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Aythya australis</i>	Hardhead		v		2014		Large, permanent lakes and swamps with deep water.	High	Likely in adjacent wetlands; likely to fly over site occasionally
<i>Biziura lobata</i>	Musk Duck		v		2015		Large, permanent lakes and swamps with deep water.	High	Likely in adjacent wetlands; likely to fly over site occasionally
<i>Botaurus poiciloptilus</i>	Australasian Bittern	EN	e	L	1992	PMST	Shallow freshwater and brackish wetlands with abundant emergent aquatic vegetation.	Medium	Suitable habitat nearby; likely to fly over site occasionally
<i>Burhinus grallarius</i>	Bush Stonecurlew		e	L	1978		Open woodland, treed farmland.	Low	May occur in adjacent land; may fly over site occasionally
<i>Calamanthus pyrrhopygius</i>	Chestnut rumped Heathwren		v	L	1980		Woodland habitat with a dense, shrubby understorey.	Negligible	No suitable habitat
<i>Calidris alba</i>	Sanderling		nt		2015	PMST	Sandy beaches and foraging among piles of seaweed.	Negligible	No suitable habitat

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Calidris canutus</i>	Red Knot	EN	e		2001	PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	Negligible	Suitable habitat nearby; but unlikely to fly over site
<i>Calidris ferruginea</i>	Curlew Sandpiper	CR	e		2006	PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	Negligible	Suitable habitat nearby; but unlikely to fly over site
<i>Calidris melanotos</i>	Pectoral Sandpiper		nt			PMST	Large intertidal sandflats, estuaries, inlets and bays.	Negligible	No suitable habitat
<i>Calidris tenuirostris</i>	Great Knot	CR	e	L	2012	10165	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	Negligible	Suitable habitat nearby; but unlikely to fly over site
<i>Calyptorhynchus banksii graptogyne</i>	Red-tailed Black-Cockatoo (south-eastern)	EN	e	L	2014	PMST	Desert Stringybark, Brown Stringybark and Buloke woodlands.	Medium	Suitable habitat nearby; likely to fly over site occasionally
<i>Cercartetus nanus</i>	Eastern Pygmy possum		nt	I	2006		Subalpine woodland, wet forest, Box Ironbark Forest, coast scrub, heathy woodland.	Low	Known from adjacent coastal heaths, but little suitable habitat on site.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Charadrius leschenaultii</i>	Greater Sand Plover	VU	e		1980	10141	Intertidal mudflats and sandbanks of sheltered bays and estuaries.	Negligible	Suitable habitat nearby; but unlikely to fly over site
<i>Chlidonias hybridus</i>	Whiskered Tern		nt		2000		Breeding migrant to Australia from September to March. Wetlands with sedges, reeds and rushes.	Low	Known from adjacent wetlands; may fly over site
<i>Chrysococcyx osculans</i>	Black-eared Cuckoo		nt		1978	PMST	Open eucalypt woodlands and shrubland; in Victoria, mainly north of the Great Dividing Range and in Western Victoria.	Low	Sparse occurrence in region
<i>Chthonicola sagittatus</i>	Speckled Warbler		v	L	1940		Open forest and Box Ironbark Woodlands, with scattered shrubs.	Low	Little suitable habitat
<i>Cinlosoma punctatum</i>	Spotted Quailthrush		nt		2012		Dry forests, woodlands and scrub	Negligible	No suitable habitat
<i>Circus assimilis</i>	Spotted Harrier		nt		2001		Open and wooded country; occasional to coastal Victoria.	Low	Little suitable habitat
<i>Climacteris picumnus</i>	Brown Treecreeper		nt		2000		Open eucalypt forests, woodlands and mallee	Negligible	No suitable habitat

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Dasyornis broadbenti</i>	Rufous Bristlebird		nt	L	2015		Dense coastal heathlands and undergrowth of wet forests.	Low	Known from adjacent coastal heaths, but little suitable habitat on site.
<i>Dasyurus maculatus</i>	Spot-tailed Quoll	EN	e	L	1999	PMST	Rainforest and wet and dry sclerophyll forests and woodlands.	Low	Suitable habitat nearby; may occasionally visit limited portions of site
<i>Dromaius novaehollandiae</i>	Emu		nt		2015		Most rural environments, moving in response to seasonal conditions.	High	Suitable habitat
<i>Egretta garzetta</i>	Little Egret		e	L	2005		Permanent and ephemeral wetlands.	High	Likely in adjacent wetlands; likely to fly over site occasionally
<i>Engaeus sericatus</i>	Hairy Burrowing Crayfish		v		2008		Adjacent to creeks or on floodplains. Most records from an area between the Otways to Port Fairy and Ballarat.	Low	Little potential habitat
<i>Engaeus strictifrons</i>	Portland Burrowing Crayfish		v		2014		Creeks, swamps, and in drainage channels. Most often in soils with heavy clay component.	Negligible	No streams offering habitat on-site.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Euastacus bispinosus</i>	Glenelg Spiny Crayfish	EN	e	L	2015	PMST	Cool, shaded, flowing areas of rivers and streams, which have intact riparian vegetation and high water quality.	Negligible	No streams offering suitable habitat
<i>Falco subniger</i>	Black Falcon		v	L	2010		Woodlands, open country and around terrestrial wetlands areas.	Negligible	Infrequent occurrence in region
<i>Galaxiella pusilla</i>	Dwarf Galaxias	VU	e	L		PMST	Slow-flowing or still freshwater wetlands such as swamps, drains and backwaters of streams.	Negligible	No streams offering suitable habitat
<i>Galaxiella toourtkoourt</i>	Little Galaxias		v		1991		Shallow lakes, billabongs, small creeks.	Negligible	No streams offering habitat on-site.
<i>Gallinago hardwickii</i>	Latham's Snipe		nt		2008	PMST	Permanent and ephemeral freshwater wetlands. Forages in in vegetated edges of wetlands and low-lying paddocks	Medium	Likely to inhabit adjacent wetlands; may occasionally fly over site
<i>Gelochelidon nilotica macrotarsa</i>	Gull-billed Tern		e	L	1999		Floodplains, saltmarsh, claypans and flooded pasture.	Low	Likely to inhabit adjacent wetlands; may fly over site

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Geocharax falcata</i>	NE Grampians Bush Yabby		e		1999		Permanent swamps or creeks and drains connected to swamps.	Low	Known from wetlands in adjacent land. Little suitable habitat on-site.
<i>Geopelia cuneata</i>	Diamond Dove		nt	L	1941		Drier woodlands and scrub, spinifex and mulga.	Negligible	Rare in the region.
<i>Grus rubicunda</i>	Brolga		v	L	2011		Shallow freshwater and brackish wetlands, crops, grassland and pasture.	High	Known from adjacent wetlands; likely to fly over site occasionally
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher		nt		2014		Rocky coastal shorelines and sandy beaches between rocky headlands.	Negligible	No suitable habitat
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle		v	L	2005	PMST	Coastal areas such as beaches and estuaries, inland wetlands and major inland streams.	Medium	Likely in adjacent wetlands; likely to fly over site occasionally

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Hemiergis peronii</i>	Four-toed Skink		nt		2006		Forest, shrubland.	High	Likely to occur along roadsides and other less disturbed portions of site.
<i>Hemiphysalis mirabilis</i>	Ancient Greenling Damselfly		e	L	2008		Permanent freshwater ponds, riverine lagoons and swamps that may seasonally dry out.	Low	Known from adjacent wetlands but little suitable habitat on-site.
<i>Hirundapus caudacutus</i>	White-throated Needletail		v		2009	PMST	An almost exclusively aerial species, occurring over most types of habitat.	High	Likely to fly over site during migration period in Australia
<i>Hydroprogne caspia</i>	Caspian Tern		nt	L	2012		Estuaries, inlets, bays, lagoons, inland lakes, flooded pasture, sewage ponds.	Low	Likely to inhabit adjacent wetlands; may fly over site
<i>Hygrobia australasiae</i>	Squeak beetle		v	L	1973		Still and ephemeral freshwater habitats, with coarse and sandy substrates.	Negligible	No streams offering habitat on-site.
<i>Hyridella (Protohyridella) glenelgensis</i>	Glenelg Mussel	CR	e	L	2015		Freshwater streams with coarse sandy substrates, instream debris and overhanging riparian vegetation.	Negligible	No streams offering suitable habitat

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Isoodon obesulus</i>	Southern Brown Bandicoot	EN	nt	L	2013	PMST	Heath, shrubland and heathy forest and woodland, especially on well-drained soils	Medium	Suitable habitat nearby; may utilise limited portions of site
<i>Ixobrychus dubius</i>	Little Bittern		e	L	1949		Freshwater swamps, lakes and rivers with dense reed beds, saltmarsh and coastal lagoons.	Medium	Likely in adjacent wetlands; likely to fly over site occasionally
<i>Larus pacificus</i>	Pacific Gull		nt		2005		Coastal bays, estuaries and lagoons. May occur up to 10 kms inland at wetlands.	Low	Likely to inhabit adjacent wetlands; may fly over site
<i>Lathamus discolor</i>	Swift Parrot	CR	e	L	2011	PMST	A range of forests and woodlands, especially those supporting nectar-producing tree species. Also well-treed urban areas.	Negligible	No suitable habitat
<i>Lewinia pectoralis</i>	Lewin's Rail		v	L	1981		Swamps, dense riparian vegetation and saltmarsh.	Medium	Likely to inhabit adjacent wetlands; may occasionally fly over site

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Limosa lapponica</i>	Bar-tailed Godwit	VU			2012		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.	Negligible	Suitable habitat nearby; but unlikely to fly over site
<i>Limosa limosa</i>	Black-tailed Godwit		v		2006		Coastal bays, estuaries and lagoons with intertidal mudflats Also shallow, sparsely vegetated, near-coastal, wetlands.	Negligible	No suitable habitat
<i>Lissolepis coventryi</i>	Swamp Skink		v	L	2005		Densely vegetated swamps and watercourses; wet heaths, sedgeland and saltmarshes.	Medium	Known from adjacent wet areas; may occur in small patches of remnant habitat within site.
<i>Litoria raniformis</i>	Growling Grass Frog	VU	e	L	2002	PMST	Still or slow-flowing waterbodies and surrounding terrestrial vegetation.	Medium	Suitable habitat nearby; may utilise limited portions of site

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Lophocroa leadbeateri</i>	Major Mitchell's Cockatoo		v	L	1957		Mallee, mulga, treed farmland, cereal crops and Callitris spp. woodland.	Negligible	Outside regular distributional range of the species
<i>Lophoictinia isura</i>	Square-tailed Kite		v	L	1978		Eucalypt woodlands, open forest and partially cleared farmland.	Low	Infrequent occurrence in region
<i>Melanodryas cucullata</i>	Hooded Robin		nt	L	1994		Woodlands of eucalypt, mallee, semi-cleared farmland.	Low	Little suitable habitat
<i>Miniopterus schreibersii bassanii</i>	Common Bent-wing Bat (southern ssp.)	CR	e	L	2012	PMST	Breeds and roosts in caves and rock crevices; forages widely over various treed environments.	High	Suitable habitat nearby; likely to fly within site
<i>Myotis macropus</i>	Southern Myotis		nt		2004		Roosts in caves, tunnels and tree hollows and feeds over water bodies.	Low	May fly over limited portions of site when moving between suitable habitats
<i>Nannoperca obscura</i>	Yarra Pygmy Perch	VU	v	L	1991	PMST	Lakes, pools and slow-flowing streams with abundant aquatic vegetation.	Negligible	No streams offering suitable habitat

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Nannoperca variegata</i>	Variegated Pygmy Perch	VU	v	L	2001	PMST	Shallow freshwater streams with moderate to high water flow and a high cover of aquatic vegetation.	Negligible	No streams offering suitable habitat
<i>Neophema chrysogaster</i>	Orange-bellied Parrot	CR	e	L	2000	PMST	Coastal vegetation including saltmarshes, dunes, pastures, shrublands, sewage plants, saltworks, islands, and beaches.	Medium	Suitable habitat nearby; likely to fly over site occasionally
<i>Neophema elegans</i>	Elegant Parrot		v		2005		Woodlands, open woody grasslands, saltmarsh.	Negligible	Rare in the region.
<i>Neophoca cinerea</i>	Australian Sea Lion	VU			1987	PMST	Near coastal and offshore waters.	Negligible	No suitable habitat
<i>Ninox connivens</i>	Barking Owl		e	L	2003		Open woodland forest habitats often where forests adjoin open land. Rare in SW Victoria.	Negligible	Little suitable habitat
<i>Ninox strenua</i>	Powerful Owl		v	L	2013		Eucalypt forests and woodlands, well-treed urban areas.	Negligible	Little suitable habitat

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Numenius madagascariensis</i>	Eastern Curlew	CR	v		2005	PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	Negligible	Suitable habitat nearby; but unlikely to fly over site
<i>Numenius phaeopus</i>	Whimbrel		v		1949		Coastal mudflats, sandy shores and rock platforms. Rarely recorded inland.	Negligible	No suitable habitat
<i>Nycticorax caledonicus</i>	Nankeen Night Heron		nt		2001		Estuarine and terrestrial wetlands.	High	Likely in adjacent wetlands; likely to fly over site occasionally
<i>Oxyura australis</i>	Blue-billed Duck		e	L	1999		Open or densely vegetated wetlands.	High	Likely in adjacent wetlands; likely to fly over site occasionally
<i>Pedionomus torquatus</i>	Plains-wanderer	CR	e	L		PMST	Native grassland with a sparse, open structure.	Negligible	Outside known range; no suitable habitat
<i>Pezoporus occidentalis</i>	Night Parrot	EN	rx			PMST	Low vegetation in arid and semi-arid areas dominated by <i>Triodia</i> spp., chenopod, and samphire shrublands.	Negligible	Outside known range; no suitable habitat

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Pezoporus wallicus</i>	Ground Parrot		e	L	2001		Coastal heathland and swamps.	Negligible	May occur in adjacent coastal heaths, but little suitable habitat on site.
<i>Phalacrocorax fuscescens</i>	Black-faced Cormorant		nt		2013		Marine and estuarine habitats and forages over inshore waters and reefs.	Negligible	Rarely flies inland of coast
<i>Phalacrocorax varius</i>	Pied Cormorant		nt		2009		Marine and coastal waters including beaches also lakes and billabongs.	Medium	Likely to inhabit adjacent wetlands; may fly over site
<i>Platalea regia</i>	Royal Spoonbill		nt		2015		Permanent and ephemeral wetlands.	High	Likely in adjacent wetlands; likely to fly over site occasionally
<i>Pluvialis squatarola</i>	Grey Plover		e		2010		Mudflats, saltmarsh, tidal reefs and estuaries.	Negligible	No suitable habitat
<i>Pomatostomus temporalis</i>	Grey-crowned Babbler		e	L	1950		Open forests and woodlands.	Negligible	No suitable habitat
<i>Prototroctes maraena</i>	Australian Grayling	VU	v	L		PMST	Adults inhabit cool, clear, freshwater streams.	Negligible	No streams offering suitable habitat

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Porzana pusilla palustris</i>	Baillon's Crake		v	L	2000		Vegetated wetlands including swamps, billabongs, lakes and temporarily inundated areas.	Medium	Potentially present in wetlands near the study area.
<i>Pseudomys fumeus</i>	Smoky Mouse	EN	e	L	2005	PMST	Coastal heath and heathy woodland, wet forest, sub-alpine heath and dry sclerophyll forest.	Negligible	Outside known range; no suitable habitat
<i>Pseudomys shortridgei</i>	Heath Mouse	EN	nt	L	2010	PMST	Lowland heathland and heathy sclerophyll forest.	Medium	Suitable habitat nearby; may utilise limited portions of site
<i>Pseudophryne semimarmorata</i>	Southern Toadlet		v		2011		Moist soaks and depressions in open forests, lowland woodlands and heathlands.	High	Likely to occur in low-lying roadsides and other less disturbed portions of site.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	VU	v	L		PMST	Rainforest, wet and dry sclerophyll forest, woodland and urban areas.	Negligible	Outside known range
<i>Rostratula australis</i>	Australian Painted-snipe	EN	e	L		PMST	Shallows of well-vegetated freshwater wetlands.	Low	Suitable habitat nearby; likely to fly over site occasionally

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Sminthopsis leucopus</i>	White-footed Dunnart		nt	L	1978		Lowland heathy woodland and forest, coastal scrub and coastal grasslands.	Low	Little suitable habitat.
<i>Sminthopsis murina murina</i>	Common Dunnart		v		1962		Dry sclerophyll forest; open woodlands; mallee heath with high rock and crevice density.	Low	Little suitable habitat.
<i>Spatula rhynchotis</i>	Australasian Shoveler		v		2011		Large, permanent lakes and swamps with deep water.	High	Likely in adjacent wetlands; likely to fly over site occasionally
<i>Sterna striata</i>	White-fronted Tern		nt		1992		Regular migrant from March to October, to offshore waters, bays, reefs and Islands.	Negligible	No suitable habitat
<i>Sternula albifrons sinensis</i>	Little Tern		v	L	2004	PMST	Costal bays, lagoons and estuaries.	Negligible	No suitable habitat
<i>Sternula nereis</i>	Fairy Tern	VU	e	L	2000	PMST	Fairy Terns inhabit coastal environments including intertidal mudflats, sand flats and beaches. Nests above high-water mark on sandy shell-grit beaches.	Negligible	Suitable habitat nearby; but unlikely to fly over site

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Stictonetta naevosa</i>	Freckled Duck		e	L	2003		Large freshwater wetlands, generally with dense vegetation.	Medium	Likely in adjacent wetlands; likely to fly over site occasionally
<i>Synoicus chinensis</i>	King Quail		e	L	1966		Wet heath environments; less commonly coastal heath.	Negligible	Outside regular distributional range of the species
<i>Thinornis rubricollis rubricollis</i>	Hooded Plover	VU	v	L	2011	PMST	Mainly occurs on wide beaches backed by dunes with large amounts of seaweed and jetsam, creek mouths and inlet entrances. Nests are found above the high water mark on flat beaches, on stony terraces, or on sparsely vegetated dunes.	Negligible	Suitable habitat nearby; but unlikely to fly over site
<i>Tringa brevipes</i>	Grey-tailed Tattler		e	L	1980		Large intertidal mudflats, estuaries, inlets, and bays.	Negligible	No suitable habitat
<i>Tringa glareola</i>	Wood Sandpiper		v		2001		Well-vegetated shallow freshwater wetlands.	Negligible	No suitable habitat
<i>Tringa nebularia</i>	Common Greenshank		v		2015	PMST	Ephemeral and permanent inland wetlands and sheltered coastal wetlands.	Negligible	No suitable habitat

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likelihood of occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Tringa stagnatilis</i>	Marsh Sandpiper		v		2003	PMST	Ephemeral and permanent wetlands and sheltered coastal wetlands.	Negligible	No suitable habitat
<i>Turnix velox</i>	Little Buttonquail		nt		1980		Summer migrant to Victoria mostly occurring in riverine areas but with scattered records throughout the north and west of the state.	Low	May occur occasionally
<i>Tyto novaehollandiae</i>	Masked Owl		e	L	2002		A variety of lowland forests and woodlands.	Negligible	Little suitable habitat
<i>Xenus cinereus</i>	Terek Sandpiper		e	L	2000		Large intertidal sandflats, estuaries, inlets and bays.	Negligible	No suitable habitat

Appendix 3 Kentbruck Green Power Hub Interim Flora and Fauna Survey Program

The following interim list of species have been identified as potentially requiring targeted survey for the KGPH project. To allow for forward planning, seasonal detectability periods have been assessed and potential timing of surveys (should they be required) have been identified. The majority of surveys are planned to coincide with the 12 month monitoring program for Southern Bent-wing Bat, commencing in October 2019.

The requirement for surveys will be determined after an initial design for the project has been completed, to ensure surveys are targeted at those species with potential to be directly or indirectly impacted. It is expected that many of the species identified in this interim list will not require survey, as key habitat areas are likely to be completely avoided during the design development process.

Potential detectability periods, where surveys may be conducted, are indicated by gray shading.

Proposed survey periods (should surveys be required for the corresponding species) are indicated by black shading.

