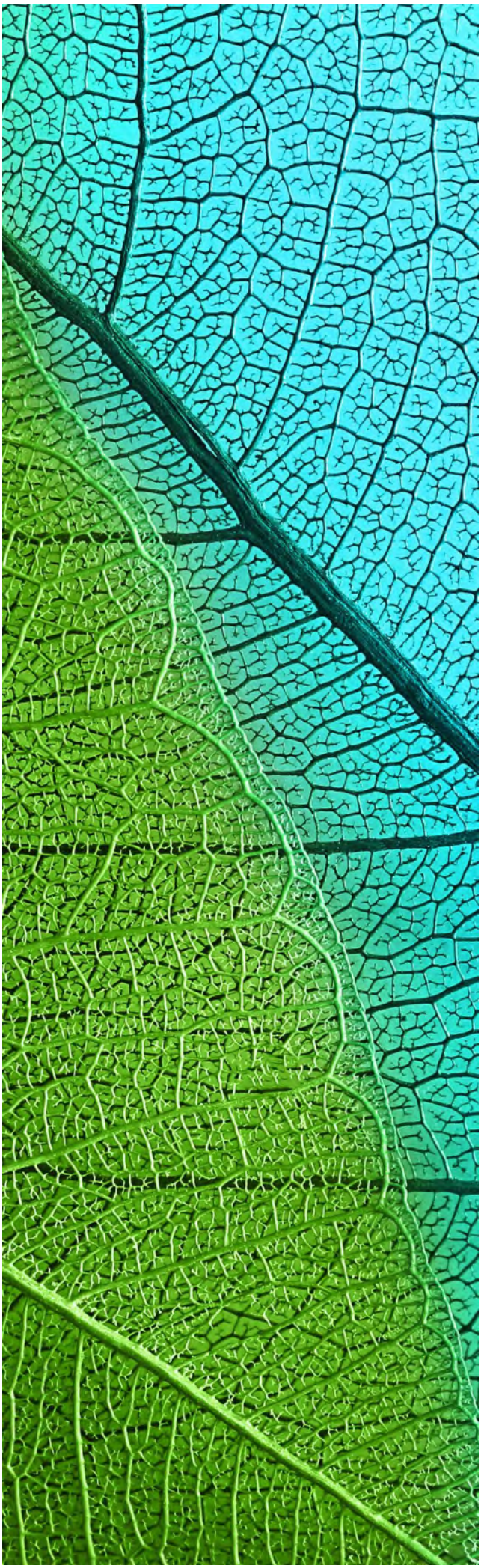

Gelliondale Wind Farm

Matters of National Environmental Significance (MNES) Assessment

Prepared for Synergy Wind Pty Ltd

July 2026
Report No. 14107.17 (1.4)

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Nature Advisory acknowledges the traditional owners and sovereign custodians of the land on which we work from—the Wurundjeri people of the Woi Wurrung language group. We extend our respect to their Ancestors and all First Peoples and Elders past and present.

Executive summary

Synergy Wind Pty Ltd engaged Nature Advisory Pty Ltd to assess the impacts of a proposed Gelliondale wind farm (the 'proposed action') in relation to Matters of National Environmental Significance (MNES). These are matters listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The proposed action will occur on the 621 ha of private land (the 'Action area') in the Gippsland region of Victoria, which is located approximately 13 km south-west from Yarram.

The Action Area and surrounding lands are situated in a region that has been historically cleared of native vegetation for the provision of stock grazing. Other land uses within the Action Area include a rail reserve and several road reserves, as well as Alberton West State Forest to the north and Gelliondale State Forest to the south.

Vegetation in the Action Area primarily consisted of extensive grazing paddocks, supporting an assortment of exotic pasture species. Remnant native vegetation was largely restricted to roadsides and within the extent of windbreaks. This comprised occurrences of Swamp Scrub (EVC 53) and comparatively limited Wet Heathland (EVC 8) vegetation.

A referral under the EPBC Act was submitted in July 2023 for the Gelliondale Wind Farm (GWF) and this project was determined to be a controlled action. The project is being assessed by a Public Environment Report (PER), for which this report provides input regarding potential impacts on MNES.

Relevant Matters of National Environmental Significance

A review of the MNES was undertaken across what was determined as the 'Flora and Fauna Search Area' (the site boundary with a 10 km buffer) to determine whether the project has the potential to cause impacts. A high-level summary of the review is presented in Table 1.

Table 1: High-level summary of MNES Controlling Provisions

Controlling Provision	Reviewed	Potentially impacted?
World heritage	Yes	No, there are no World Heritage-listed sites within or near the study area.
National heritage	Yes	No, there are no National Heritage-listed sites within or near the study area.
Ramsar wetland	Yes	**Yes, the nearest Ramsar site is ~3 km away from the study area. See Sections 0 and 5.**
Threatened species and ecological communities	Yes	**Yes, see Sections 0 and 5.**
Migratory species	Yes	**Yes, see Sections 0 and 5.**
Nuclear	Yes	No, the proposed action is not a nuclear action.
Commonwealth Marine Area	Yes	No, the proposed action is not within a Commonwealth Marine Area.

Controlling Provision	Reviewed	Potentially impacted?
Great Barrier Reef	Yes	No, the proposed action is not within or near the Great Barrier Reef.
Water resources in relation to large coal mining or coal seam gas developments	Yes	No, the proposed action is not a coal mine or coal seam gas development.
Commonwealth land	Yes	No, the study area does not contain any Commonwealth land.
Commonwealth heritage places overseas	Yes	No, the proposed action is not located within a Commonwealth heritage place overseas.
Commonwealth or Commonwealth agency	Yes	No, the proposed action is not being taken by the Commonwealth or a Commonwealth Agency.

As a result of Nature Advisory's review, the MNES deemed relevant to the Gelliondale Wind Farm (i.e. those that are considered to have the 'potential to occur' or are 'known to occur' in or near the Flora and Fauna Search Area) are summarised in Table 2.

Table 2: Summary of MNES relevant to the project

MNES	VBA/Protected Matters Search Tool results	Number considered to 'potentially occur' or 'known to occur'
Ramsar Wetlands	1	1
Ecological Communities	2	0
Threatened Flora	14	8
Threatened Fauna	35	24
Migratory Species	45	25

MNES significant impact assessment outcomes

Table 3 summarises the MNES significant impact assessment outcomes.

Based on the outcomes of the significant impact assessments, the proposed project has the potential to have a Significant Impact on an MNES. However, the implementation of mitigation measures recommended in this report will result in no significant impact, as outlined in Table 3.

Table 3: Summary of the project's significant impacts on MNES

MNES	Significant Impact Conclusion
Listed threatened flora species	The Flora and Fauna Search Area potentially supports 8 listed flora species: ▪ River Swamp Wallaby-grass (Vulnerable) ▪ Eastern Spider-orchid (Endangered) ▪ Thick-lip Spider-orchid (Vulnerable)

MNES	Significant Impact Conclusion
	▪ Strzelecki Gum (Vulnerable) ▪ Clover Glycine (Vulnerable) ▪ Maroon Leek-orchid (Endangered) ▪ Dense Leek-orchid (Vulnerable) ▪ Metallic Sun-orchid (Endangered) The project will not result in the removal of any individual plants. While analysis showed that these species were likely to occur within the Flora and Fauna Search Area, no individual plants were identified during targeted surveys. Given this, it is considered that **the proposed action will not constitute a Significant Impact on these flora species.**
Listed threatened fauna species	The Flora and Fauna Search Area supports 23 listed threatened fauna species: ***Birds*** ▪ Bar-tailed Godwit subsp. *baueri* (Endangered, Migratory) ▪ Black-tailed Godwit (Endangered, Migratory) ▪ Common Greenshank (Endangered, Migratory) ▪ Curlew Sandpiper (Critically Endangered, Migratory) ▪ Far Eastern Curlew (Critically Endangered, Migratory) ▪ Gang-gang Cockatoo (Endangered) ▪ Great Knot (Vulnerable, Migratory) ▪ Greater Sand Plover (Vulnerable, Migratory) ▪ Grey Plover (Vulnerable, Migratory) ▪ Latham's Snipe (Vulnerable, Migratory) ▪ Lesser Sand Plover (Endangered, Migratory) ▪ Red Knot (Vulnerable, Migratory) ▪ Ruddy Turnstone (Vulnerable, Migratory) ▪ Sharp-tailed Sandpiper (Vulnerable), Migratory ▪ Swift Parrot (Critically Endangered) ▪ Terek Sandpiper (Vulnerable, Migratory) ▪ White-throated Needletail (Vulnerable, Migratory) ***Mammals*** ▪ Grey-headed Flying Fox (Vulnerable) ▪ Long-nosed Potoroo (Vulnerable) ▪ Southern Brown Bandicoot (Endangered) ▪ Swamp Antechinus (Vulnerable) ***Fish*** ▪ Australian Grayling (Vulnerable) ▪ Dwarf Galaxias (Endangered) The project is unlikely to lead to a long-term decrease in the size, reduce the area of occupancy, disrupt breeding, or fragment important populations of these species. The proposed action is unlikely to cause any additional harmful invasive species or disease to establish in wetlands. The proposed action is also unlikely to adversely affect habitat critical to their survival or otherwise interfere with the recovery of the species. Given the unlikelihood of these impacts, the project will not have a Significant Impact on these species.

MNES	Significant Impact Conclusion
	Only the following threatened fauna species have the potential for Significant Impacts (if not mitigated): ▪ Blue-winged Parrot (Vulnerable) This species was observed to regularly fly at rotor swept heights (87 times or 14.8% of all observations for the species), where collision mortality would be expected. This may represent a significant portion of the global population, which is estimated at 10,000 individuals. The species is known elsewhere to collide with wind turbines. The project may therefore result in a Significant Impact on the Blue-winged Parrot. Mitigation measures to be detailed in a BAM Plan will need to be implemented to avoid potential significant impacts. **It is expected that the implementation of mitigation measures will result in no significant impact on the species.**
Listed Migratory Species	The Flora and Fauna Search Area supports 24 fauna species listed as Migratory under the EPBC Act. The following species are unlikely to experience a Significant Impact from the proposed action: ▪ Bar-tailed Godwit subsp. *baueri* (Endangered, Migratory) ▪ Black-tailed Godwit (Endangered, Migratory) ▪ Common Greenshank (Endangered, Migratory) ▪ Common Redshank (Migratory) ▪ Common Sandpiper (Migratory) ▪ Curlew Sandpiper (Critically Endangered, Migratory) ▪ Double-banded Plover (Migratory) ▪ Far Eastern Curlew (Critically Endangered, Migratory) ▪ Great Knot (Vulnerable, Migratory) ▪ Greater Sand Plover (Vulnerable, Migratory) ▪ Grey Plover (Vulnerable, Migratory) ▪ Grey-tailed Tattler (Migratory) ▪ Latham's Snipe (Vulnerable, Migratory) ▪ Lesser Sand Plover (Endangered, Migratory) ▪ Marsh Sandpiper (Migratory) ▪ Pacific Golden Plover (Migratory) ▪ Red Knot (Vulnerable, Migratory) ▪ Red-necked Stint (Migratory) ▪ Ruddy Turnstone (Vulnerable, Migratory) ▪ Sanderling (Migratory) ▪ Sharp-tailed Sandpiper (Vulnerable, Migratory) ▪ Terek Sandpiper (Vulnerable, Migratory) ▪ Whimbrel (Migratory) ▪ White-throated Needletail (Vulnerable, Migratory) The project will not substantially modify or remove any important habitat for any of these species. There is no clear mechanism that exists for the proposed action to result in a harmful invasive species or seriously disrupt the life cycle of an ecologically significant proportion of these species. Given the unlikelihood of these impacts, **the project will not have a Significant Impact on these migratory species.**

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Glossary of terms and acronyms

Term/Acronym	Definition
ACAP	The Agreement on the Conservation of Albatross and Petrels
Action Area	The total area of all lots forming the Project Area, and all portions of crown land utilised for the Project's vehicle access, underground cables and native veg removal
AusWEA	Australian Wind Energy Association
BAM Plan	Bat and Avifauna Management Plan
Bonn	The Bonn Convention, a multilateral international agreement on migratory animals. Also known as the Convention on the Conservation of Migratory Species of Wild Animals.
BUS	Bird Utilisation Surveys
CAMBA	Bilateral agreement on migratory birds, Australia-China
CRM	Collision risk modelling
DAWE	Department of Agriculture, Water and the Environment (Cth.)
DBH	Diameter at breast height, estimated at 1.2 m above the ground
DCCEEW	Department of Climate Change, Energy, Environment and Water (Cth.)
DEE	Department of Environment and Energy (Cth.)
DEECA	Department of Energy, Environment and Climate Action (Vic)
DELWP	Department of Environment, Land, Water and Planning (Vic)
DEWHA	Department of the Environment, Water, Heritage and the Arts (Cth.)
DOC	Department of Conservation (New Zealand)
DoE	Department of Environment (Cth.)
DSE	Department of Sustainability and Environment (Vic)
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (Cth.)
DTP	Department of Transport and Planning (Vic)
DTPLI	Department of Transport, Planning and Local Infrastructure (Vic)
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cth.)
EVC	Ecological Vegetation Class
Flora and Fauna Search Area	Boundary of the wind farm site with a 10 km buffer

Term/Acronym	Definition
GWF	Gelliondale Wind Farm
HZ	Habitat zone, where patches are referred to in alphabetical and numerical characters (e.g. A5, D7, etc.)
Invasive species	"An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species" (DoE 2013a, p.12).
JAMBA	Bilateral agreement on migratory birds, Australia-Japan
MNES	Matters of National Environmental Significance
NA	Nature Advisory
PMST	Protected Matters Search Tool
Population of a species	"A 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to: a geographically distinct regional population, or collection of local populations, or a population, or collection of local populations, that occurs within a particular bioregion" (DoE 2013a, p.12).
Project Area	The area covered by the Project Footprint, plus an additional 100m buffer around each WTG and 25m buffer around all other Project infrastructure, other than native vegetation removal
Project Footprint	The impact area of all development forming part of the Gelliondale Wind Farm, including vegetation removal along the turbine transport route
ROKAMBA	Bilateral agreement on migratory birds, Australia-Republic of Korea
RSA	Rotor swept area
Site boundary	Those land parcels forming the wind farm site.
Study area	The area of land encompassed by a study, with the exact areas varying with the survey (see methods in Section 3.4)
SWIFFT	State-Wide Integrated Flora and Fauna Team (Vic)
TEC	Threatened Ecological Community
TERN	Terrestrial Ecosystem Research Network, Australia
TSSC	Threatened Species Scientific Committee
VBA	Victorian Biodiversity Atlas
WTG	Wind turbine generator
WTNT	White-throated Needletail

1. Introduction

Synergy Wind Pty Ltd engaged Nature Advisory Pty Ltd to assess the impacts of a proposed Gelliondale Wind Farm (the 'proposed action') on Matters of National Environmental Significance (MNES) listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The proposed action is located approximately 13 km south-west of Yarram and 167 km south-east of Melbourne CBD (Figure 1). The area comprises approximately 621 hectares of private and public land in the Gippsland region of Victoria.

A Referral under the EPBC Act was submitted by Synergy in December 2016 for the Alberton Wind Farm (34 turbines), and that project was determined to be a controlled action. The Alberton Wind Farm proposal was a similar project, but was a larger-sized wind farm over a larger area of land. It did encompass the same land upon which the Gelliondale Wind Farm is proposed. The Alberton Wind Farm was assessed and approved under the bilateral agreement between the Commonwealth and the state of Victoria, but it did not go ahead. A new referral under the EPBC Act was submitted in July 2023 for the modified Gelliondale Wind Farm, and this project was determined to be a controlled action. The project is being assessed by a Public Environment Report (PER), for which this report provides input regarding potential impacts on MNES.

The following species are listed in the PER Guidelines for the Gelliondale Wind Farm project (EPBC 2023/09577) as to be addressed:

Migratory Birds

- Lesser Sand Plover
- Fork-tailed Swift
- Sharp-tailed Sandpiper
- Grey-tailed Tattler
- Ruff (Reeve)
- Pacific Golden Plover
- Little Curlew, Little Whimbrel
- Pin-tailed Snipe
- Latham's Snipe, Japanese Snipe

Other Birds

- White-throated Needletail (VU)
- Gang-gang Cockatoo (EN)
- Eastern Curlew, Far Eastern Curlew (CE)
- Blue-winged Parrot (VU)
- Curlew Sandpiper (CE)
- Swift Parrot (CE)
- Orange-bellied Parrot (CE)
- Regent Honeyeater (CE)
- Australian Painted Snipe (EN)
- Red Knot, Knot (EN)
- Pilotbird (VU)
- Grey Falcon (VU)
- Painted Honeyeater - (VU)
- Greater Sand Plover (VU)
- Campbell Albatross (VU)
- Antipodean Albatross (VU)
- Northern Royal Albatross (EN)
- Southern Royal Albatross (VU)
- Wandering Albatross (VU)
- Gibson's Albatross (VU)
- Nunivak Bar-tailed Godwit (VU)
- Fairy Prion (southern) (VU)
- Sooty Albatross (VU)
- Australian Fairy Tern (VU)
- Indian Yellow-nosed Albatross (VU)
- Shy Albatross (EN)
- Eastern Hooded Plover (VU)
- White-capped Albatross (VU)

Reptiles

- Swamp Skink (EN)

Frogs

- Growling Grass Frog (VU)

Fish

- Australian Grayling (VU)
- Eastern Dwarf Galaxias (VU)

Mammals

- Grey-headed Flying-fox (VU)

Vegetation

- River Swamp Wallaby-grass (VU)
- Swamp Everlasting (VU)

Nature Advisory undertook detailed flora and fauna assessments of the Flora and Fauna Search Area between 2015 and 2025, as outlined in Section 3.3. This included bird and bat utilisation surveys over two years and targeted surveys of Swift Parrots, Gang-gang Cockatoos, White-throated Needletails, Grey-headed Flying-fox and Migratory Shorebirds (see Table 4).

Table 4: Ecological surveys undertaken 2015-2025

Survey	2015				2016				2020				2021				2023	2024				2025			
	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp
Overview flora and fauna assessment		■		■			■																		
Detailed native vegetation assessment								■								■					■				
Bird utilisation surveys	■																■	■	■	■	■	■	■	■	
Bat surveys	■																■	■	■	■	■	■	■	■	
White-throated Needletail													■	■				■	■						
Swift Parrot and Gang Gang Cockatoo										■				■	■				■	■					
Grey-headed Flying-fox																						■	■		
Migratory shorebirds (Corner Inlet)	■																					■		■	

This investigation was undertaken by a team from Nature Advisory comprising Arend Kwak (Botanist), Ezra Janetski (Botanist), Peter Lansley (Zoologist), Malan Bothma (Zoologist), Curtis Doughty (Senior Zoologist), Guille Mayor (Senior Zoologist), Luke Halpin (Zoologist), Michael Sebastian (Zoologist), Robin Leppitt (Senior Zoologist), Liz Brown (Zoologist), Joab Wilson (Senior Ornithologist), Lotus Hackenberger (Project Officer), Mike Hitchcock (Senior Zoologist and Project Manager), Kylie Patrick (Senior Ecologist and Project Manager), and Inga Kulik (Project Director).

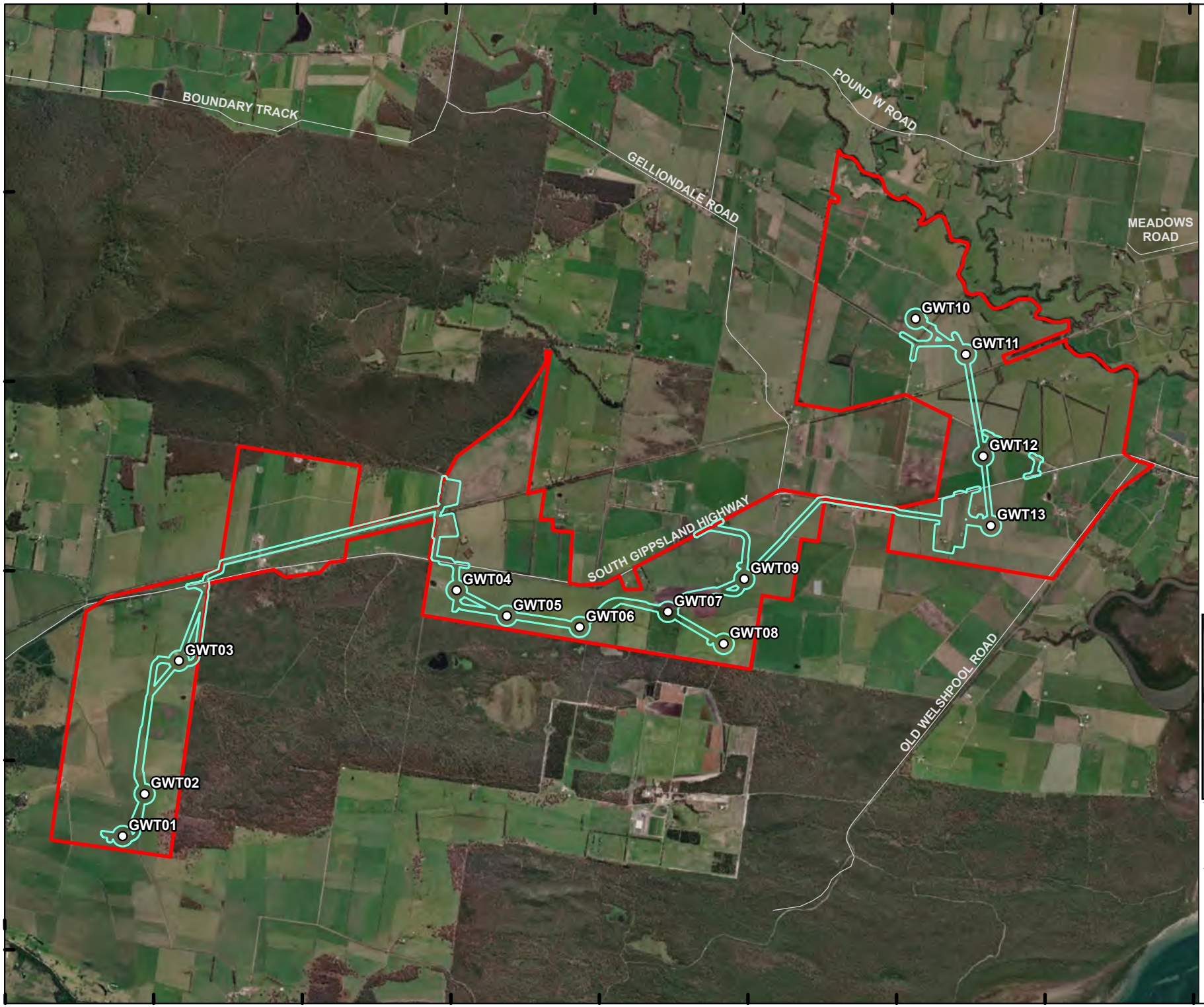
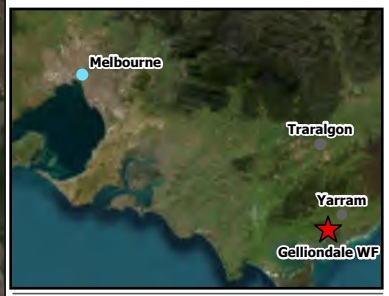


Figure 1: Study area and wind farm layout - overview

Project No: 14107_17
Project: Gelliondale Wind Farm, VIC
Date: 1/04/2026

- Site boundary
- Project footprint
- Wind turbine generator
- Road

Source: Esri, Maxar, Earthstar Geographics



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GDA2020 MGA Zone 55

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2. PER Guidelines

2.1. Controlling provisions

The controlling provisions are the matters protected under Part 3 of the EPBC Act, which the proposed action may have a significant impact on. These are the focus of the current assessment:

- The ecological character of a declared Ramsar wetland (Sections 16 and 17B)
- Listed threatened species and communities (Sections 18 and 18A)
- Listed migratory species (Sections 20 and 20A)

2.2. PER Guidelines requirements

The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) provided '*Guidelines for the content of a draft Public Environment Report'* on 22 January 2024 (Appendix 5).

The requirements from the PER Guidelines relevant to this MNES report are show in Table 5, as well as where they are discussed within the report.

Table 5: PER Guidelines for the content of a draft Public Environment Report, relevant to this MNES report.

PER Guidelines	Description of content requirements	Relevant section(s) of this MNES report
Section 3 General information	Background and context of the action.	Section 3.1 About the project
Section 6 Description of the environment	Description of the existing environment of the proposed action area and the surrounding areas that may be affected by the action.	Section 4.1 Existing site condition description Section 4.2 Matters of National Environmental Significance (MNES)
Section 7 Matters of National Environmental Significance		
7.1 Corner Inlet Ramsar Wetland	Describe the ecological character of the Corner Inlet Ramsar Wetland adjacent to the project area.	Section 4.2.1 Corner Inlet Ramsar Wetland
7.2 Ramsar Wetland Impact Assessment	Describe and assess the impacts (direct and indirect) on the Corner Inlet Ramsar wetland.	Section 5.1 Potential Impact Pathways Section 5.2 Impacts to Corner Inlet Ramsar Wetland
7.2.1 Statutory requirements	Actions and mitigation measures relating to the Ramsar Wetlands are consistent with the principles of Schedule 6 of the EPBC Regulations.	Section 5.2 Impacts to Corner Inlet Ramsar Wetland Section 6 Recommendations
7.3 Ramsar wetland water quality impacts	Discussion on hydrology and water quality impacts should include an assessment of potential alterations to water quality and potential	Section 5.2 Impacts to Corner Inlet Ramsar Wetland – this section includes a discussion hydrological and contamination impacts affecting MNES,

PER Guidelines	Description of content requirements	Relevant section(s) of this MNES report
	hydrological changes on the Corner Inlet Ramsar Wetland	drawing from details in other reports (Accent 2025b, Alluvium 2025).
7.4 Ramsar wetland mitigation measures	Detailed descriptions of measures proposed to be undertaken by the proponent to avoid, mitigate and manage relevant direct and indirect impacts of the proposed action on the Corner Inlet Ramsar Wetland.	Section 5.2 Impacts to Corner Inlet Ramsar Wetland Section 6 Recommendations
7.5 Listed threatened species and listed migratory species And 7.6 General information required for MNES listed threatened species	Details the species requiring consideration and the specific information requiring discussion around their presence, survey effort, and mapping requirements.	Appendix 3 Likelihood of occurrence of listed fauna species – this section addresses the potential for listed species to occur within the Flora and Fauna Search Area. Only those listed as likely to occur are then addressed in detail throughout the report. Section 4.2 Matters of National Environmental Significance (MNES) Section 5.5 Impacts on threatened fauna species Section 5.6 Impacts on listed migratory species
7.7 Information required for specific MNES listed threatened species	Details the information and assessment requirements specific to the White-throated Needletail, Gang-gang Cockatoo, and Grey-headed Flying-fox.	Section 4.2 Matters of National Environmental Significance (MNES) Section 5.5 Impacts on threatened fauna species
8.1 General impact information	Description of all the relevant impacts of the action.	Section 5.1 Potential Impact Pathways
8.2 Impacts to threatened species	Assessment requirements around threatened species.	Section 4.2 Matters of National Environmental Significance (MNES) Section 5.4 Impacts on listed flora species Section 5.5 Impacts on threatened fauna species
8.3 Impacts to listed migratory species	Assessment requirements around listed migratory species.	Section 4.2 Matters of National Environmental Significance (MNES) Section 5.6 Impacts on listed migratory species

PER Guidelines	Description of content requirements	Relevant section(s) of this MNES report
8.4 Impacts to listed threatened and migratory bird and bat species associated with wind turbines	Discussion and information on the utilisation of the project site and its surrounds by the listed threatened and migratory bird and bat species at risk of turbine strike and barotrauma.	Section 4.2 Matters of National Environmental Significance (MNES) Section 5.1 Potential Impact Pathways Section 5.5 Impacts on threatened fauna species Section 5.6 Impacts on listed migratory species
9 Proposed safeguards and mitigation measures	Information and substantiation on proposed safeguards and mitigation measures to deal with the relevant impacts of the action.	Section 5.5 Impacts on threatened fauna species Section 5.6 Impacts on listed migratory species Section 6 Recommendations

3. Existing information and methods

3.1. About the project

This section describes the proposed action.

3.1.1. Project title

Gelliondale Wind Farm

3.1.2. Location of proposed action

The Action Area for this investigation was approximately 621 hectares of private and public land located at Alberton West, approximately 13 km south-west of Yarram and 167 km south-east of Melbourne CBD (Figure 1).

3.1.3. Proposed action details

The proposed development will involve the construction of 13 wind turbines (each with an adjacent hardstand required for construction), access tracks, underground cabling, a substation and battery energy storage system, and four construction compounds/operations and maintenance areas.

The extent of the area of impact for the current proposal was considered to include the outermost boundaries of the following (see further details in Synergy Wind Pty. Ltd. 2025):

- 13 wind turbines –each composed of a tower, a nacelle, a 3-blade rotor (82 blades), and a central hub:
    - Rotor swept area (RSA) extends from 40 m to 210 m above the ground.
- 13 hardstands beside each wind turbine to facilitate construction by crane – 60 x 90 m;
- Two to three permanent meteorological masts – 120 m high;
- Access tracks, both new and upgraded – 5.5-6 m wide;
    - Includes 13 access points from the existing road network.
- Underground cabling and associated trenching – 14 km long, 3-4 m wide, 1.5 m deep;
- One large electrical substation and associated 40 MW/40 MWh battery energy storage system;
- Two construction compounds and two operations/maintenance areas – 7.45 ha combined;
- Two operations and maintenance facilities – 8.2 ha combined;
- Ancillary components, including minor road upgrades, signage, and standing water tanks.

Predominant land use within the site is for agricultural operations. This land use will continue during and after wind farm construction.

3.2. Sources of existing information

Database searches were undertaken for the 'Flora and Fauna Search Area', defined here as the wind farm site boundary with a 10-kilometre buffer. The following sources of information were reviewed to collate existing information:

- Wellington Planning Scheme (DTPLI 2015);
- Victorian Biodiversity Atlas (DEECA 2025a);

- The Commonwealth EPBC Act Protected Matters Search Tool, PMST (accessed 25 March 2026, Appendix 1; DCCEEW 2025);
- NatureKit (DEECA 2025b);
- Birdata database (Birdlife Australia 2025);
- BirdLife Shorebirds database (Birdlife Australia 2025);
- Atlas of Living Australia (ALA 2025);
- Corner Inlet Ramsar Wetland Ecological Character Description (RSIS 2020);
- Pre-1750 (pre-European settlement) vegetation mapping administered by DEECA was reviewed to determine the type of native vegetation likely to occur in the Action Area and surrounds. Information on Ecological Vegetation Classes (EVCs) was obtained from published EVC benchmarks;
- Relevant EVC benchmarks for the Gippsland Plain bioregion (DSE 2004); and
- Previous reports:
    - Alberton Wind Farm: Flora and Fauna Assessment (8.0) (BL&A 2017);
    - Gelliondale Wind Farm: Flora and Fauna Assessment (4.4) (Nature Advisory 2025) (provided in Appendix 8);
    - Gelliondale Wind Farm Flood, Erosion and Sediment Run-off Impact Assessment (Alluvium 2025);
    - Gelliondale Wind Farm and BESS: Contamination report (Accent 2025);
    - Gelliondale Wind Farm: Flood, erosion and sediment run-off impact assessment (Alluvium 2025; and
    - Gelliondale Wind Farm: Marine invasive species risk assessment (Fathom Pacific 2025).

3.3. Survey summary and timing

Table 6 summarises the field assessments conducted to date. For detailed methodologies of these assessments, refer to Section 3.4.

Table 6: Summary of surveys already completed for the proposed Gelliondale WF

Field survey	Dates
Overview assessment	▪ 2015, 2016
Native vegetation assessments	▪ 21, 23 September 2016 ▪ 20–23 September 2021 ▪ 16–18 September 2024
Targeted flora and ecological communities	▪ 2–4 November 2016 ▪ 16–18 September 2024 (ecological communities only)
Bird utilisation	▪ Spring 2023 (13–16 November 2023) ▪ Summer 2024 (12–19 February 2024) ▪ Autumn 2024 (13–18 April 2024) ▪ Winter 2024 (7–12 August 2024) ▪ Spring 2024 (12–16 November 2024) ▪ Summer 2025 (3–6 February 2025) ▪ Autumn 2025 (24–28 March 2025) ▪ Winter 2025 (2–8 June 2025)
Bat utilisation	▪ Summer 2015 (26 February to 11 March) ▪ Spring/Summer 2023 (8–10 November to 11–12 Dec) ▪ Summer/Autumn 2024 (20–21 February to 2–4 April)

Field survey	Dates
	▪ Winter/Spring 2024 (5–6 August to 9–10 September) ▪ Spring/Summer 2024 (11–12 November to 18–19 December) ▪ Summer/Autumn 2025 (5–6 February to 12–13 March) – call analysis in progress ▪ Autumn/Winter 2025 (28 March to 8 June) – call analysis in progress
Swift Parrot and Gang-Gang Cockatoo	▪ 28 April – 2 May 2020 (incl. habitat assessment) ▪ 12–14 April 2021 ▪ 3–5, 24–26 May 2021 ▪ 22–24 June 2021 ▪ 21–23 July 2021 ▪ 2–5, 15–17 April 2024 ▪ 27–29 May 2024 ▪ 11–13 June 2024 ▪ 10–12 July 2024
White-throated Needletail	▪ 7–11 December 2020 ▪ 22–26 March 2021 ▪ 25–29 April 2021 ▪ 26–29 February 2024 ▪ 1–8 and 18–22 March 2024
Migratory shorebirds	▪ 25–27 February 2015 (exploratory survey) ▪ 17–19 December 2024 (summer, spring tide) ▪ 20–22 January 2025 (summer, transitioning tide) ▪ 3–5 February 2025 (summer, neap tide) ▪ 19–20 February 2025 (summer, spring tide) ▪ 18–19 June 2025 (winter, spring tide)
Grey-headed Flying-fox	▪ 20-23 January 2025 ▪ 12-13 May 2025

3.4. Methods

Overview Assessment (2015, 2016)

The Overview Assessment was undertaken in the initial stages of the associated Alberton Wind Farm, to determine general biodiversity values and considerations. Subsequent surveys and detailed assessments were undertaken at Gelliondale Wind Farm based on this initial overview, with these more recent studies considered to take precedence and supersede the earlier assessment. While the 2016 Overview Assessment provided important background context and justification for subsequent studies, the database searches originally undertaken for that assessment were updated on 22 July 2024 to ensure the use of current information for GWF. The present MNES assessment is based primarily on these updated searches and the detailed investigations undertaken subsequently. The Overview assessment is included here for its context provided to the current MNES assessment.

During the overview assessment, broad-scale mapping and high-level characterisation of existing flora and fauna habitats within the development footprint were undertaken across the Flora and Fauna Search Area. The key objective was to identify habitats that could support the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or the *Flora and Fauna Guarantee Act 1988* (FFG Act)--listed threatened flora and fauna species, which would thus be considered to have the potential to occur within the disturbance footprint, and to assess the likelihood of significant impacts to such species.

The techniques below were used to detect fauna species utilising the Action Area during the initial fauna survey in 2016:

- Incidental searches for mammal scats, tracks and signs (e.g., diggings, signs of feeding and nests/burrows);
- Turning over logs/rocks and other ground debris for reptiles, frogs and mammals;
- Bird observation during the day, in addition to transect surveys in relevant habitats in association with the proposed wind farm;
- General searches for reptiles and frogs, including identification of frog calls in seasonally wet areas; and
- General searches for bat habitat, including waterbodies, potential commuting corridors, foraging sites and potential roosting sites such as caves, trees with hollows and lifted bark for crevice-dwelling species.

The broader Flora and Fauna Search Area's habitat connectivity (i.e., degree of isolation/fragmentation), including linkages to other habitats in the region, was determined using field observations, recent aerial photography and *NatureKit* (DEECA 2025b).

Wherever appropriate, a precautionary approach was adopted in determining the likelihood of occurrence of fauna listed under the Commonwealth EPBC Act and Victorian FFG Act. That is, where insufficient evidence was available on the potential occurrence of a listed species, it is assumed that it could be in an area of suitable habitat.

This report details the following information (provided in Appendix 13):

- High-level assessment of the nature and quality of native fauna habitat, identifying areas of high, moderate and low ecological value for fauna;
- Assessment of the likelihood of occurrence of listed fauna in the Flora and Fauna Search Area;
- Fauna susceptibility and risk assessment following the procedure for risk assessment of AS ISO 31000:2018 (ISO 2018), which includes:
    - Short-listing species or groups of concern based on their likelihood of occurrence;
    - Assessment of preliminary potential impact pathways; and
    - Determination of the risk level for each species or group of concern, consistent with a risk matrix.
- Consideration of possible implications of the wind farm development on these listed species and their habitat.

Native vegetation assessments (2016, 2021, 2024)

A detailed habitat hectare assessment of the Alberton Wind Farm was undertaken on 21st and 23rd September 2016. The layout that now forms the Gelliondale Wind Farm required an additional native vegetation field survey of 603 hectares, which occurred on 20–23 September 2021. Further detailed native vegetation assessments were consequently conducted in the Project Area and transport route between 16–18th September 2024, to confirm the validity of lapsed habitat hectare assessments and identify any additional areas of native vegetation.

During these assessments, the Action Area was surveyed initially by vehicle and areas supporting native vegetation were inspected in more detail on foot. The areas surveyed comprised several buffer areas around intersections (both private and public land) and some selected roadsides where wind farm infrastructure impacts native vegetation.

Sites found to support native vegetation (patches or scattered trees) were mapped through a combination of aerial photograph interpretation and ground-truthing using a hand-held GPS (accurate to approximately 5 m). Species and ecological communities listed as threatened under the EPBC Act or FFG Act (where they occurred on public land) were also mapped using the same method.

Native vegetation condition was assessed using the Victorian Vegetation Quality Assessment (VQA) habitat hectare method (Parkes *et al.* 2003; DSE 2004), whereby components of each patch (e.g. tree canopy, understorey and ground cover) are assessed against an EVC benchmark. The score effectively measures the percentage resemblance of the vegetation to its original condition.

All details of habitat hectare scoring are provided in Appendix 10. Details of all large trees in patches and scattered trees are provided in Appendix 11.

Targeted flora and ecological communities (2016)

The likelihood of occurrence for listed flora and ecological communities was initially addressed through a desktop assessment (see Overview Assessment methodology, above). Species/communities deemed likely were further investigated through field assessments.

Listed flora

A targeted flora survey in the study area for EPBC Act listed species and ecological communities was undertaken on 2nd to 4th of November 2016 (BL&A 2017) to determine the potential for native vegetation to support the following:

- River Swamp Wallaby-grass *Amphibromus fluitans* (Vulnerable)
- Eastern Spider-orchid *Caladenia orientalis* (Endangered)
- Thick-lip Spider-orchid *Caladenia tessellata* (Vulnerable)
- Strzelecki Gum *Eucalyptus strzeleckii* (Vulnerable)
- Clover Glycine *Glycine latrobeana* (Vulnerable)
- Maroon Leek-orchid *Prasophyllum frenchii* (Endangered)
- Dense Leek-orchid *Prasophyllum spicatum* (Vulnerable)
- Metallic Sun-orchid *Thelymitra epipactoides* (Endangered)

Experienced botanists visually searched along transects spaced approximately five metres apart. This spacing was considered appropriate for detecting all eight species. The timing of the survey was timed to coincide with published periods of flowering or high detectability for the above species (RBGV 2026; DoE 2013b). The survey was completed in accordance with the *Draft survey Guidelines for Australia's threatened orchids* (DoE 2013b). As such, the below requirements were met:

- A systematic targeted search of all appropriate habitat for the orchid species was conducted using parallel transects spaced 5 m apart.
- The target species were selected through a likelihood occurrence analysis based on a PMST search (undertaken 22 July 2024, Appendix 1), which determined the species that were 'likely' or had 'potential' to occur in the impact area.
- Surveys were conducted in appropriate orchid habitat at an appropriate time of year – early November, which coincides with the published flowering times in the *Draft survey Guidelines for Australia's threatened orchids* for all five target orchid species (DoE 2013b).

The area was also assessed against published descriptions of relevant listed ecological communities modelled to potentially occur in the Action Area.

The timing of the survey and the condition of the vegetation were considered appropriate to determine the presence or absence of these species.

Targeted surveys for threatened flora species were not repeated in 2021 and 2024, given that no suitable habitat for these listed species will be impacted.

Listed ecological communities

Threatened ecological community surveys were undertaken in conjunction with the native vegetation assessments described above. Native vegetation in the Action Area was assessed against published descriptions of relevant listed ecological communities modelled to potentially occur in the Action Area. Reviewed ecological community descriptions comprised identification criteria and condition thresholds from listing advice for EPBC Act communities, as well as FFG Act-listed community descriptions (DEECA 2024a).

Field surveys assessed the likelihood of:

- Natural Damp Grassland of the Victorian Coastal Plains (Critically Endangered)

Bird utilisation surveys (2023 – 2025)

Bird utilisation surveys were undertaken in accordance with the requirements for a "Level One" bird risk assessment in accordance with *Wind Farms and Birds - Interim Standards for Risk Assessment* (AusWEA 2005). This guidance is aligned with the recently drafted *Onshore Wind Farm Guidance - best practice approaches when seeking approval under Australia's national environment law* (DCCEEW 2024d).

Experienced zoologists undertook eight pre-construction bird utilisation surveys between November 2023 and June 2025 (Table 7). Each season was sampled twice to account for seasonal differences in bird activity and species presence (e.g., migratory species).

Ten survey sites were classified as impact (within 200 m of the proposed WTG, N = 8) or reference (at least 400 m away from the proposed WTG, N = 2). At the request of DEECA (2024b), an additional reference site was added (summer/winter 2024, autumn/winter 2025) and an extra impact (winter 2024, autumn/winter 2025). The extra impact sites were within proximity of the proposed WTGs, and the reference point was placed within the nearby Gelliondale State Forest (Figure 16). The study area for BUS thus represents the visible and audible range around these points when using 10x binoculars, depending on species, which can be up to a 2 km radius.

Survey sites were located on ridges or vantage points with at least 180-degree views of the surrounding landscape. Survey sites were spread across the site as evenly as possible (subject to access constraints) and within habitats representative of those across the site. All survey sites were visited equally at different times of day to allow for time-of-day differences in bird movements and activity.

The BUS involves the fixed-point bird count survey methodology, a standard and effective method for estimating bird species diversity (number of species) and the abundance of individuals counted for each species. For each fixed-point bird count, the surveyor stands in one place for 20 minutes and records all bird species and the number of individual birds observed, as far as the eye can see.

During this period, the diversity (number) of bird species and the abundance of individuals counted for each species were recorded. For each record, the distance of the bird from the observer and the bird's height when first observed were documented. For species of concern (listed threatened, migratory species and raptor species), the minimum and maximum heights were recorded along with geospatially

referenced flight paths. In the circumstances where a flock of birds were observed flying in the same direction and moving closely with each other, these were recorded as one observation. Flight height is presented as below, at or above the rotor swept area (RSA) height, detailed below.

- A = Below RSA (< 40 m above ground).
- B = At RSA (40 – 210 m above ground).
- C = Above RSA (> 210 m above ground).

Incidental observations of species of concern (e.g. threatened species, migratory species, raptors) and birds at RSA were recorded while moving between survey points within and outside the study area.

Table 7: Survey effort for bird utilisation surveys.

Survey period	Dates	Survey sites (impact/reference)	Surveys (# reps)	Survey length (min)	Total effort (hr)
Spring 2023	13-16 Nov	10 (8/2)	80	20	26.7
Summer 2024	12-19 Feb	11 (8/3)	98	20	32.7
Autumn 2024	13-18 Apr	10 (8/2)	80	20	26.7
Winter 2024	7-12 Aug	12 (9/3)	97	20	32.3
Spring 2024	12-16 Nov	10 (8/2)	80	20	26.7
Summer 2025	3-6 Feb	10 (8/2)	77	20	25.7
Autumn 2025	24-28 Mar	12 (9/3)	95	20	31.7
Winter 2025	2-8 Jun	12 (9/3)	96	20	32.0
				Total survey effort	**234.3 hrs**

Detailed BUS data is provided in AAppendix 12.

Bat utilisation surveys (2015, 2023 – 2025)

The bat utilisation surveys were undertaken in accordance with *Survey Guidelines for Australia's threatened bats* (DEWHA 2010), and consistent with methods adopted at many wind farms in eastern Australia over the last 20 years that have satisfied the information requirements of decision-makers and regulators.

Ultrasonic bat detectors (Song Meter Mini Bat, Wildlife Acoustics®) were both deployed close to the proposed turbine sites (*N* = 13) and at reference sites (*N* = 3) along the border of the native wooded vegetation areas (Table 8; Figure 16). The study area was thus the site boundary. Detectors were installed 0.5–2 m above the ground and were programmed to commence operation approximately 30 minutes before dusk, and to cease approximately 30 minutes after dawn. Each detector used a 128GB SDHC card that recorded bat echolocation calls, along with the date and time of each call.

Calls from the detectors were downloaded and analysed by Rob Gration (EcoAerial Environmental Services, Newport VIC) for identification. His analysis involved the development of a decision tree in Anabat Insight (Ver 2 2.1.0-9g6e822da) based on specific call metrics used for identification. The decision tree was run multiple times, checking a random sample of labelled calls and call metric parameters, and where required, the call metrics were adjusted. A personal call library from various sources was used for the call metrics in the decision tree. Calls labelled to a species or complex were reviewed and re-labelled if required.

Identification is largely based on changes to frequency patterns over time, with such changes being characteristic of individual species for most genera. Only those recordings that contained at least two

definite and discrete calls were classified as bat calls. For most species, a call sequence of several seconds in duration is required before identification can confidently be made.

Presence and absence were analysed for all common species per site and survey, while the number of calls was analysed for all threatened species and species complexes containing threatened bat species.

The total number of detector nights for each survey season was: spring/summer 868 nights, summer 85 nights, summer/autumn 844 nights, winter/spring 514 nights, autumn/winter 465 nights and winter 837 nights. This survey effort is considered sufficient to obtain a baseline level of bat activity during the survey period. A total of eight bat utilisation surveys have been conducted at the wind farm site spanning two years between 2023 and 2025, including seasonal surveys each year and one early survey in summer 2015. Survey effort data is provided in Table 8, with results for threatened species for the 2023–2025 surveys.

Table 8: Survey effort and threatened species records for bat utilisation surveys.

Survey period	Survey sites (impact/reference)	Surveys (# nights)
Summer 2015	6	85
Spring/Summer 2023	14 (12/2)	367
Summer/Autumn 2024	14 (11/2)	332
Winter/Spring 2024	15 (12/3)	514
Spring/Summer 2024	15 (13/2)	501
Summer/Autumn 2025	15 (13/2)	512
Autumn/Winter 2025	15 (13/2)	465
Winter 2025	15 (13/2)	837
	Total survey effort	**3,613 nights**

Grey-headed Flying-fox surveys (2025)

Initial monitoring of the temporary Grey-headed Flying-fox colony locations has commenced, and followed the guidance in *Survey Guidelines for Australia's Threatened Bats* (DEWHA 2010). Monitoring includes both dusk and daytime surveys at known colony sites (

). Day-time surveys included inspection of potential camps within 10km of the Action Area (the study area) and nearby areas for evidence of presence, including roosting Flying-foxes and guano. Dusk surveys involved scanning the sky for flight activity, noting the number of individuals leaving camps and their direction of travel. Surveys have been undertaken on 21-22 January and 12-13 May, 2025.

White-throated Needletail surveys (2020, 2021, 2024)

Surveys for the White-throated Needletail followed guidance for migratory swifts in the *Referral guideline for 14 birds listed as migratory species under the EPBC Act* (DoE 2015a).

Experienced ornithologists undertook surveys during the peak season of their visitation to Victoria (between October and April; eBird 2021). Surveys were carried out over five survey periods (Table 9), using a variety of sites. The increase in the number of survey points in 2021 (*N*= 10), along with a balanced reduction in observation time as the surveys progressed, aimed to increase the likelihood of detecting needletails if they were present in the area. Sites 1 and 2 are now outside the project site due to layout changes. The study area for these surveys refers to the area surrounding these points where the species is observable with 10x binoculars, up to 2 km.

Survey sites were selected based on good visual coverage (>180 degrees of surrounding landscape) and within the wind farm site (Figure 17). Survey sites were chosen to represent a variety of habitats: pasture paddocks, planted cypress and eucalyptus, and small sections of state forests and plantations.

The fixed-point bird count method was used for targeted White-throated Needletail surveys. These involved an observer stationed at a fixed point for a period of time (i.e., 30–60 min) and recording all birds within range of 10x binoculars. The number of individual needletails was recorded along with distance/height when first sighted and the minimum/maximum height reached during observation. Flight paths were recorded as accurately as possible using georeferenced mapping tools (FieldMaps by ArcGIS). When a flock was observed, heights and distances were taken as flock averages. A flock was determined as a group of individuals flying in the same direction at the same time and undertaking similar behaviour.

Surveys were undertaken throughout the day to capture variations in activity and abundances at different times of the day.

Table 9: Survey effort for White-throated Needletail surveys.

Survey date	Survey sites (#)	Surveys (# reps)	Survey length (min)	Total effort (hr)
7–11 December 2020	6	24	60	24
22–26 March 2021	10	40	30	20
25–29 April 2021	10	40	40	26.7
26–29 February 2024	8	28	40	18.7
26–29 February 2024	8	68	40	45.3
			Total survey effort	**134.7 hrs**

Swift parrot and Gang-gang Cockatoo surveys (2020 – 2021, 2024)

Swift Parrot and Gang-gang Cockatoo surveys were undertaken using methods consistent with the EPBC *Survey Guidelines for Australia's Threatened Birds* (DCCEEW 2017).

Habitat assessment

An initial survey addressed the habitat available to Swift Parrots and Gang-gang Cockatoos within 5 km of proposed WTGs (the study area).

To identify habitat, treed habitat was inspected to ground-truth tree species and to identify potential habitat. The presence of flowering trees or trees carrying lerp infestation was noted. Suitable foraging trees included patches of planted Southern Blue Gums and Spotted Gums (known winter-flowering foraging resource of Swift Parrot), and larger forest areas contained Swamp Gum, Manna Gum and Saw Banksia (also suitable for foraging; DCCEEW 2024a).

No surveys were undertaken to identify potentially suitable tree hollows as neither species is known to breed within the area; Swift Parrots breed exclusively in Tasmania and Gang-Gang Cockatoos breed further north in the tall mature Eucalyptus forests of Tarra-Bulga National Park or further in the Great Dividing Range (Higgins 1999).

Targeted surveys

Eleven targeted surveys were undertaken by experienced ornithologists (Table 10). These involved roaming surveys for up to half an hour in each suitable patch of habitat (N = 17). All surveys were undertaken at times designed to capture the peak abundance of southern Victoria when Swift Parrot are returning from Tasmania to overwinter on the mainland (DCCEEW 2024a) and when Gang-gang

Cockatoos are in the area during their winter altitudinal migration (DAWE 2022a). Each of the surveys lasted two to three days, with habitat patches sampled twice (once each day) during the survey period. The overall weather conditions and timing of the surveys were suitable for maximising species detection and recording their occurrence in the study area

Table 10: Survey effort for Swift Parrot and Gang-gang Cockatoo surveys.

Survey date	Survey sites (#)	Surveys (# reps)	Survey length (min)	Total effort (hr)
28 April – 2 May 2020 (incl. habitat assessment)	17	34	30	17
12–14 April 2021	17	34	30	17
3–5, 24–26 May 2021	17	34	30	17
22–24 June 2021	17	34	30	17
21–23 July 2021	17	34	30	17
2–5, 15–17 April 2024	17	34	30	17
27–29 May 2024	17	34	30	17
11–13 June 2024	17	34	30	17
10–12 July 2024	17	34	30	17
			Total survey effort	**187 hrs**

Migratory shorebird surveys (2015, 2024 – 2025)

Migratory shorebird analysis was undertaken using a combination of surveys:

- Birdlife Australia Shorebird counts data, from 1980 to 2024 (Birdlife Australia 2025);
- Targeted migratory shorebird surveys by Nature Advisory:
  - Exploratory surveys by Nature Advisory in 2015; and
  - Targeted migratory shorebird surveys by Nature Advisory from 2024–2025.

Existing information

Birdlife Australia's Shorebird Monitoring Program is a long-running program where trained observers count migratory shorebirds annually, in both Winter and Summer, using an established survey methodology (Oldland et al 2020). An analysis of shorebird count data from 1980 to June 2024 was conducted on existing information obtained for the eastern part of Corner Inlet from the Birdlife Australia Shorebird count database (provided in September 2024). Data were collated to avoid duplication by year, season, and site. A total of 714 surveys were included: 394 in summer and 320 in winter. The 15 sites surveyed by Birdlife Australia in Corner Inlet East were mostly near or on outer islands, ranging from 7 to 15 km from the Site Boundary (Figure 2).

Targeted surveys

Initial field investigations were conducted from 25–27 February 2015 at low tide to identify potential shorebird foraging areas on intertidal sandflats and mudflats, using car, foot, and boat access. Formal shorebird surveys began in 2024 (Table 11) and were conducted by two experienced ornithologists following the *Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species* (DoE 2017). Twenty-three sites were surveyed based on suitable habitat at nearshore/inner island locations to complement Birdlife Australia shorebird counts (the 'study area',

Figure 2). The location of these sites ranged from 3 to 9 km from the site boundary. Each site was surveyed at both high and low tide to capture variation in use across spring, neap, and transitioning tides.

Table 11: Survey effort for migratory shorebird surveys.

Survey date	Season	Tides	Survey sites (#)	Surveys (# reps)	Survey length (avg. min)	Total effort (hr)
17–19 December 2024	Summer	spring	22	35	83	48.4
20–22 January 2025	Summer	transitioning	23	35	31	18.1
3–5 February 2025	Summer	neap	22	40	52	34.7
19–20 February 2025	Summer	spring	21	39	19	12.4
18–19 June 2025	Winter	spring	22	49	34	27.8
					Total survey effort	**141.3 hrs**

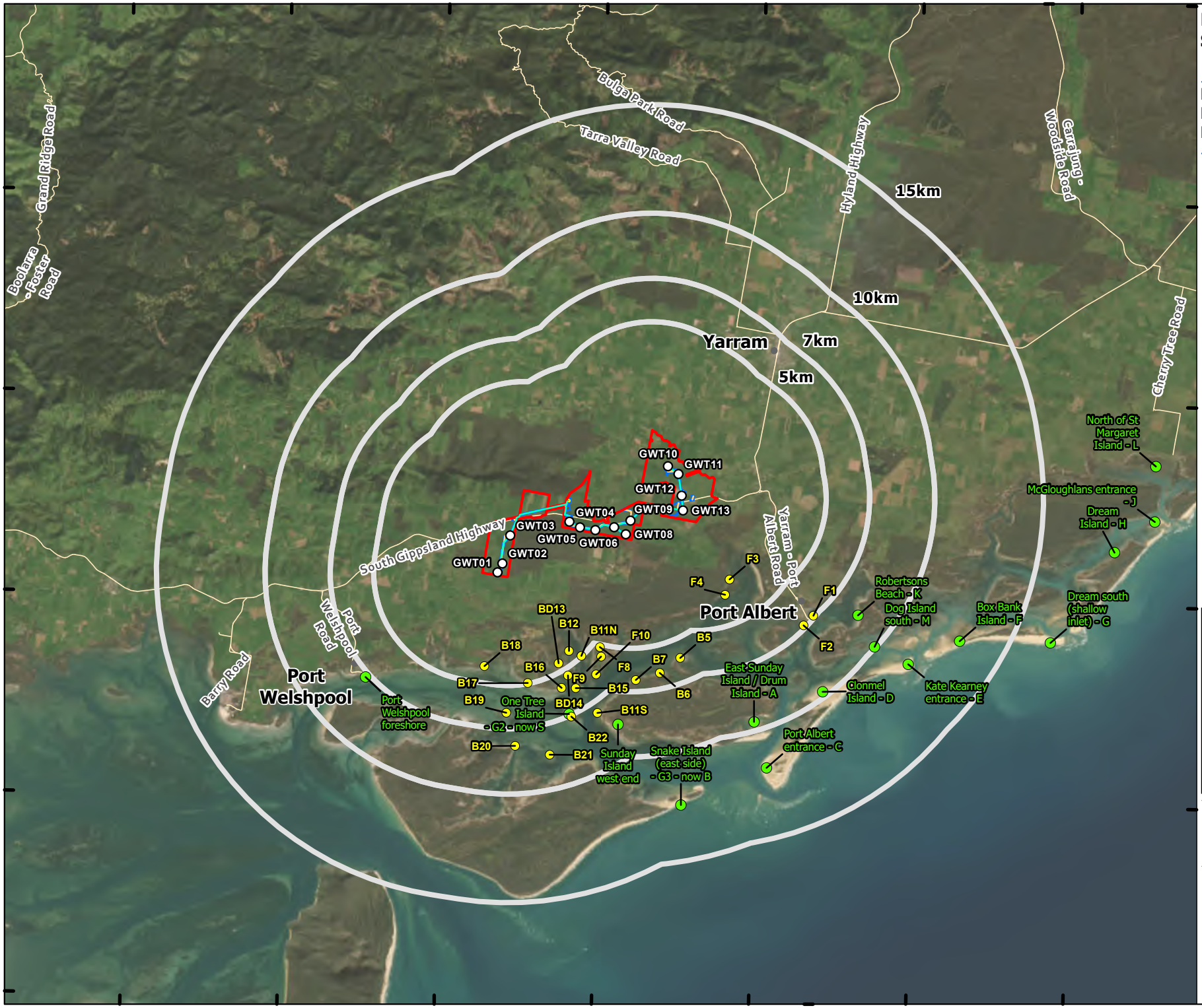

Figure 2: Migratory Shorebird survey sites

Project No: 14107.17
Project: Synergy Wind Pty Ltd
Date: 1/04/2026

- Wind farm boundary
- Application footprint
- Substation
- Electrical cable
- Access track
- Turbine
- Nature Advisory survey site
- Birdlife Australia survey site

Source: Esri, Maxar, Earthstar Geographics

N

Kilometres
0 2 4 6
GDA2020 Vicgrid

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Limitations

Overview assessment

The short duration of field assessments can fail to record all species and life forms because of the seasonal absence of some species. However, this limitation was not considered to undermine the investigations, which were designed to provide an indicative, rather than exhaustive inventory of flora and fauna species in the Action Area. Moreover, the results were subsequently supported by numerous hours of utilisation and targeted surveys.

Wherever appropriate, a precautionary approach was adopted in determining the likelihood of occurrence of fauna species listed under the EPBC Act or FFG Act. That is, where insufficient evidence was available regarding the potential occurrence of a listed species, the assumption was made that this could be in an area of suitable habitat.

Native vegetation, flora, and ecological communities

The site assessments were carried out in early autumn (overview assessment), early spring (habitat hectare assessment of cable layout) and spring (2016 targeted EPBC Act species surveys and 2021 and 2024 native vegetation assessments).

Some paddocks had been heavily grazed during the assessments, leaving little vegetation available to determine the presence, extent and/or composition of native vegetation. The timing of the survey and condition of vegetation were otherwise considered suitable to ascertain the extent and condition of native vegetation and fauna habitats.

Identification of EVCs considers vegetation types that would have naturally occupied the landscape prior to European impacts. Significant past alteration of parts of the Action Area's landform, hydrology and soil composition, as well as past vegetation clearance, has resulted in the emergence of an artificial site ecology and the reestablishment of vegetation that is likely to be notably different to what would have naturally occupied the area. Identification of EVCs in altered areas was therefore based upon consideration of:

- Modelled EVC mapping (DELWP 2021);
- Observations of adjacent landforms that had not been significantly altered;
- Observations of nearby natural vegetation remnants;
- Any observed indigenous flora species that are useful for determining EVCs; and
- Relevant published EVC benchmark descriptions.

If the above information was not sufficient to allow for a reasonable conclusion, EVC identification was based upon the structure and floristic composition of the current observed vegetation, along with knowledge of which EVC was likely to have naturally occurred in the region.

No information was available on whether planted vegetation had been planted and maintained with public or private funding. Therefore, for the purposes of the current investigation, vegetation planted on private land was assumed to have been planted and maintained with private funding, while that on public land was assumed to have been planted and maintained with public funding.

Bird Utilisation, Swift Parrot, Gang-Gang Cockatoo, White-throated Needletail and Migratory Shorebird surveys

Seasonal differences may skew data on bird abundance due to species such as starlings, cockatoos, magpies or ravens, which tend to occur in large flocks over winter. The overall weather conditions and timing of the surveys were suitable for maximising species detection and recording their occurrence in the study area.

With regard to existing shorebird data by Birdlife Australia, not all sites were surveyed each decade, leaving some gaps in temporal trends. However, as over 81% of sites were surveyed at least once each decade, the data is considered sufficient to indicate general patterns in bird use across time. Birdlife data also did not provide sufficient coverage of the nearshore and inner islands, creating a spatial gap in shorebird use of Corner Inlet East. This gap was addressed through the targeted migratory shorebird surveys conducted by Nature Advisory, which allowed for sufficient spatial coverage across recent years (2024–2025).

Bat surveys

Identification of bat species is largely based on changes to frequency patterns over time, with such changes being characteristic of individual species for most genera. Only those recordings that contained at least two definite and discrete calls were classified as bat calls. For most species, a call sequence of several seconds in duration was required before identification could be made confidently.

A limitation in the use of this technique is that it is not possible to census bat numbers. For example, ten calls of a particular species may be recorded, but it is not known if this represents ten individuals of that species or one individual flying past the bat recorder ten times. Therefore, it is not possible to determine utilisation rates, only activity levels.

The identification of echolocation calls from microbats in south-eastern Australia is facilitated by the fact that many calls are species-specific; however, not all species can be consistently or reliably identified using this technique.

Occasionally, recording devices such as those used in the survey experience technical difficulties, which are not uncommon. As a result, short periods of time may not be recorded, and total hours of recording vary between the different recorders. Weather conditions, including severe storms during the recording period, may also interfere with the recording process.

4. Assessment results and likelihood of occurrence

4.1. Existing site condition description

The study areas and surrounding land are situated in a region that has been historically cleared of native vegetation for the provision of stock grazing. Other land uses within the Flora and Fauna Search Area include a rail reserve and several road reserves, as well as Alberton West State Forest to the north and Gelliondale State Forest to the south.

Vegetation in the Action Area primarily consisted of extensive grazing paddocks, supporting an assortment of exotic pasture species. Remnant native vegetation was largely restricted to roadsides and within the extent of windbreaks. This comprised occurrences of Swamp Scrub (EVC 53) and comparatively limited Wet Heathland (EVC 8) vegetation.

The disused Gelliondale Railway, which crosses the Action Area, provided the only narrow, densely vegetated east-to-west wildlife corridor through the otherwise cleared landscape.

The key habitat areas listed below occurred within the region.

- **Alberton West State Forest** - This area comprises an extensive forest remnant on the foothills of the Strzelecki Ranges, immediately north-west and contiguous with remnant forest blocks in the central north-western part of the broader Flora and Fauna Search Area.
- **Strzelecki Ranges** - The main expanse of remaining remnant native forest covering the Strzelecki Ranges occurred less than 10 km to the north-west. This habitat was somewhat linked to the broader Flora and Fauna Search Area via a patchwork of cleared farmland and small to large patches of remnant native forest.
- **Gelliondale State Forest** - This area supported extensive heathy woodlands and other near-coastal vegetation types. It extended southwards from the southern edge of the broader Flora and Fauna Search Area.
- **Nooramunga Marine and Coastal Parks** - This area supported extensive coastal banksia woodlands, saltmarshes and other coastal vegetation types, as well as areas of intertidal sand and mud flats and shallow marine waters. It extended southwards from the southern edge of the abovementioned unnamed state forest to Corner Inlet. Nooramunga Marine Coastal Park is located approximately 3.5 km south of the broader Flora and Fauna Search Area.
- **Corner Inlet** - Ramsar and listed Important Wetland. This area extended westward from the southern end of Nooramunga Marine Coastal Park. Corner Inlet lies approximately 7 km southwest of the broader Flora and Fauna Search Area.
- **Wilsons Promontory National Park** - This area extended southward from Corner Inlet, approximately 15 km south-west of the Action Area.

Native Vegetation

Pre–European EVC mapping (DELWP 2021) indicated that the Flora and Fauna Search Area would have supported Swamp Scrub (EVC 53), Plains Grassland (EVC 132), Heathy Woodland (EVC 48), Wet Heathland (EVC 8), Damp Sands Herb-rich Woodland (EVC 3), Shrubby Foothill Forest (EVC 45), Lowland Forest (EVC 16), Coastal Saltmarsh (EVC 9), Mangrove Shrubland (EVC 140) and Estuarine Wetland (EVC 10) prior to European settlement based on modelling of factors including rainfall, aspect, soils and remaining vegetation.

Evidence on site, including floristic composition and soil characteristics, suggested that Swamp Scrub (EVC 53), Tall Marsh (EVC 821), Aquatic Herbland (EVC 653) Heathy Woodland (EVC 48), Wet Heathland (EVC 8), Lowland Forest (EVC 16), Plains Grassy Forest (EVC 151) and Creekline Herb-rich Woodland (EVC 164) were present in remnant patches throughout the Flora and Fauna Search Area.

More than 90 patches (referred to herein as habitat zones) comprising the abovementioned EVCs, were identified in the Project Area (see Figure 3). This totalled an area of 26 hectares of native vegetation in patches and included 98 large trees.

Figure 3-1 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 1/04/2026

- Project area
- Wind turbine generator
- Site boundary
- Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- DEECA mapped wetland
- Native vegetation to be removed

NOTE: The surveyed area is equivalent to the Project Area and the associated transport routes.

Source: Esri, Maxar, Earthstar Geographics

N

Metres
0 80

GDA 1994 MGA Zone 55

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Figure 3-2 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 1/04/2026

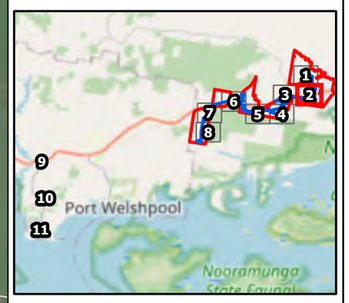
- Project area
- Wind turbine generator
- Site boundary
- Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- DEECA mapped wetland
- Native vegetation to be removed

NOTE: The surveyed area is equivalent to the Project Area and the associated transport routes.

Source: Esri, Maxar, Earthstar Geographics



N

Metres
0 80

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Figure 3-3 Native vegetation to be removed

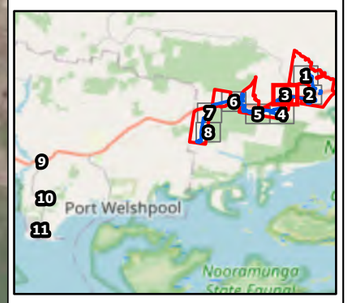
Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 1/04/2026

- Project area
- Wind turbine generator
- Site boundary
- Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- DEECA mapped wetland
- Native vegetation to be removed

Source: Esri, Maxar, Earthstar Geographics



N

Metres
0 80

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Figure 3-4 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 1/04/2026

- Project area
- Wind turbine generator
- Site boundary
- Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- DEECA mapped wetland
- Native vegetation to be removed

NOTE: The surveyed area is equivalent to the Project Area and the associated transport routes.

Source: Esri, Maxar, Earthstar Geographics

N

Metres
0 80

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146°34'10"E 146°34'20"E 146°34'30"E 146°34'40"E 146°34'50"E 146°35'E 146°35'10"E 146°35'20"E

38°38'8"S
38°38'10"S
38°38'20"S
38°38'30"S
38°38'40"S

Figure 3-5 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 1/04/2026

- Project area
- Wind turbine generator
- Site boundary
- Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- DEECA mapped wetland
- Native vegetation to be removed

NOTE: The surveyed area is equivalent to the Project Area and the associated transport routes.

Source: Esri, Maxar, Earthstar Geographics

N

Metres
0 80

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Figure 3-6 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 1/04/2026

- Project area
- Wind turbine generator
- Site boundary
- Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- DEECA mapped wetland
- Native vegetation to be removed

NOTE: The surveyed area is equivalent to the Project Area and the associated transport routes.

Source: Esri, Maxar, Earthstar Geographics

N

Metres
0 80
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Figure 3-7 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 1/04/2026

- Project area
- Wind turbine generator
- Site boundary
- Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- DEECA mapped wetland
- Native vegetation to be removed

NOTE: The surveyed area is equivalent to the Project Area and the associated transport routes.

Source: Esri, Maxar, Earthstar Geographics

N

Metres
0 80

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Figure 3-8 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 1/04/2026

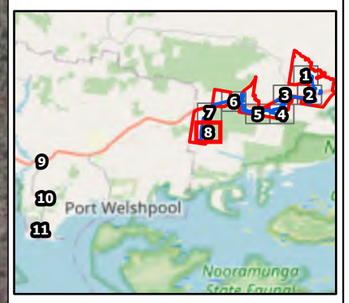
- Project area
- Wind turbine generator
- Site boundary
- Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- DEECA mapped wetland
- Native vegetation to be removed

NOTE: The surveyed area is equivalent to the Project Area and the associated transport routes.

Source: Esri, Maxar, Earthstar Geographics



N

Metres
0 80
GDA 1994 MGA Zone 55

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146°23'40"E 146°23'50"E 146°24'E

38°40'10"S

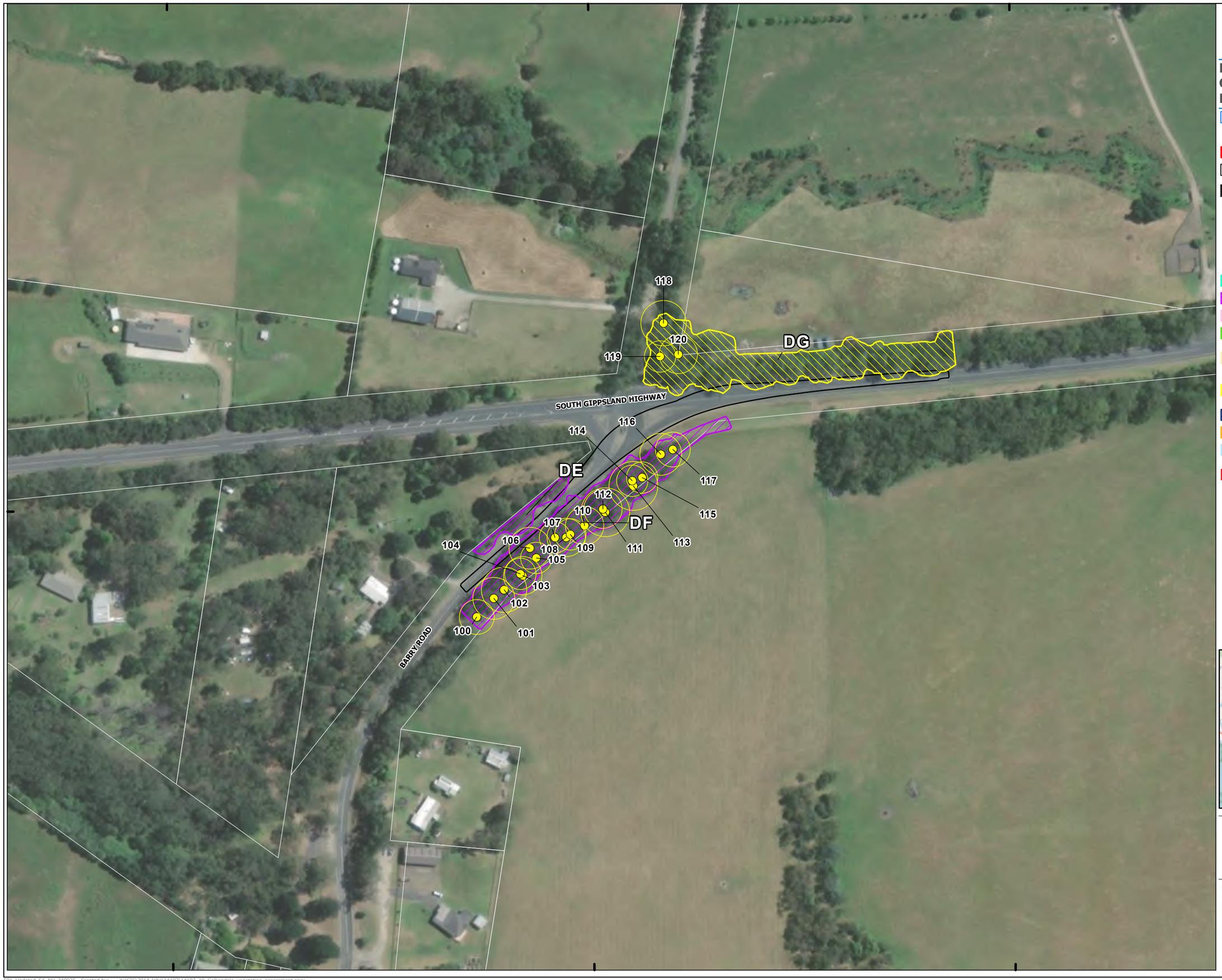

Figure 3-9 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 1/04/2026

- Project area
- Wind turbine generator
- Site boundary
- Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- DEECA mapped wetland
- Native vegetation to be removed

NOTE: The surveyed area is equivalent to the Project Area and the associated transport routes.

Source: Esri, Maxar, Earthstar Geographics

N

Metres
0 30
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146°23'50"E
146°24'E
146°24'10"E
38°41'30"S
38°41'40"S

Figure 3-10 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 1/04/2026

- Project area
- Wind turbine generator
- Site boundary
- Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- DEECA mapped wetland
- Native vegetation to be removed

NOTE: The surveyed area is equivalent to the Project Area and the associated transport routes.

Source: Esri, Maxar, Earthstar Geographics

N

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0 30
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146°23'30"E 146°23'40"E 146°23'50"E 146°24'E

38°42'50"S

38°43'S

Figure 3-11 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 1/04/2026

- Project area
- Wind turbine generator
- Site boundary
- Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- DEECA mapped wetland
- Native vegetation to be removed

NOTE: The surveyed area is equivalent to the Project Area and the associated transport routes.

Source: Esri, Maxar, Earthstar Geographics

N

Metres
0 30

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Fauna habitat

The broader Flora and Fauna Search Area supported the five fauna habitat types listed below.

- Eucalypt Forest;
- Agricultural pastures;
- Native and introduced treed-rows;
- Heathy woodland; and
- Aquatic habitats (drainage lines, wetlands, dams).

Eucalypt forest

This habitat type was present outside the project area into the north-west section of the broader Flora and Fauna Search Area (Alberton West State Forest). Species primarily comprised Yellow Stringy-bark, Mountain Grey Gum, Messmate, and Tasmanian Blue Gum, with an open understory of grasses and shrubs. Hollows that provide habitat for tree-dwelling fauna were present in some large trees. The ground layer comprised a mixture of weeds and native species. Leaf litter and fallen timber were present throughout the forest, which provided suitable habitat for reptiles. As the forest sits just outside the study areas, it has been included due to its direct proximity and its influence on the fauna of the broader Flora and Fauna Search Area.

Agricultural land

Grazing pastures were the dominant habitat type across most of the broader study areas and primarily comprised of introduced grass species. This habitat is largely devoid of native vegetation due to historic clearing for agriculture and the introduction of pasture grasses for dairy farms. Habitat components for ground-dwelling fauna, such as leaf litter, rocks and woody debris, were scarce across the Action Area. However, some artificial refuges were being utilised by some common reptile and frog species.

Native and introduced treed vegetation

Linear patches of treed vegetation (tree-rows, wind breaks, etc.) along roadsides and rail reserves in the broader Flora and Fauna Search Area supported native and introduced plant species. Various eucalyptus species and Swamp Paperbark, with the occasional she-oak species, dominated this habitat. It provided foraging opportunities for several common and generalist fauna species.

Importantly, connectivity to similar habitats within the landscape, provided by linear strips of vegetated habitat, increased the value of habitats to fauna. The broader study areas were connected to Alberton West State Forest to the north and the Gelliondale State Forest to the south. These large remnant forest blocks flanked the north-west and southern wind farm boundaries and formed a network of wider, regional value that provides dispersal, commuting routes, as well as foraging habitat for species that may move between forest blocks.

Heathy woodland

This habitat was located along the southern boundaries of the broader study areas in association with the Gelliondale State Forest, and in a degraded state, along the rail reserve. This habitat was dominated by Coast Manna Gum, Messmate and Swamp Gum. Gelliondale State Forest is an intact remnant forest with a ground layer consisting of native grasses and a shrub layer dominated by grasstree species. As the woodland sits just outside the study areas, it has been included due to its influence on the fauna of the

broader Flora and Fauna Search Area. Additionally, due to the quality of the habitat, it is likely to act as an attraction for fauna species as a place to feed and roost.

Aquatic habitats (drainage lines, creeks, rivers)

Aquatic habitats scattered across the broader Flora and Fauna Search Area consisted of drainage lines, ephemeral wetlands and farm dams. Most farm dams were accessible to stock and supported little or no vegetation. Ephemeral drainage lines were common throughout the study areas as a method of draining water from low-lying agricultural land. These were often in poor condition and dominated by native and weed species such as sedges and rushes. Although in poor condition, they provide some lower-quality habitat for several frog species and migratory species (e.g. Latham's Snipe).

Where more permanent water bodies were allowed to flow naturally and excluded from grazing pressure, low and high marshes occurred, particularly in the north-east of the site in association with the Albert River. These marshes were dominated by reeds, rushes and sedges, providing good intact and connected vegetation cover. Consequently, they provided dispersal and foraging opportunities as well as potentially important refuges for several fauna species.

4.2. Matters of National Environmental Significance (MNES)

The following section addresses the likelihood of occurrence of MNES within the Action Area.

4.2.1. Corner Inlet Ramsar Wetland

The Corner Inlet Ramsar Wetland is a large (67,071 ha), tide-driven coastal bay situated in the West Gippsland catchment and the Southeast IMCRA Transition Provincial Bioregion. The site was first listed as meeting the Ramsar criteria in 1999, with subsequent assessments determining it met 7/9 criteria (RSIS 2020), including:

- **Criterion 1 – Representative, rare, or unique wetland type:** Corner Inlet contains one of the most extensive and least-disturbed coastal wetland systems in southeastern Australia. The site includes large areas of intertidal mudflats and sandflats, seagrass meadows, mangroves, and saltmarsh. These habitats together form an intact example of a temperate embayment wetland system and support ecological processes typical of southern Australian coastal wetlands.
- **Criterion 2 – Supports threatened species or threatened ecological communities:** Corner Inlet provides important habitat for several nationally and internationally threatened species. These include migratory shorebirds such as Eastern Curlew and Curlew Sandpiper, as well as species like the Orange-bellied Parrot and Hooded Plover that use coastal saltmarsh, beaches, and adjacent habitats within the site. The wetland, therefore, contributes to the survival of threatened fauna.
- **Criterion 3 – Supports populations important for maintaining biological diversity:** The inlet supports high biodiversity across multiple groups, including waterbirds, fish, invertebrates, and marine plants. Its extensive seagrass beds and intertidal flats provide habitat for diverse benthic communities that support large food webs, making the wetland important for maintaining regional coastal biodiversity.
- **Criterion 4 – Supports species at critical stages of their life cycles or provides refuge**: Corner Inlet provides essential feeding and roosting habitat for migratory shorebirds during the non-breeding season as they travel along the East Asian–Australasian Flyway. The site also functions as a nursery area for fish and marine invertebrates within its seagrass beds and sheltered waters, supporting key life stages of many species.
- **Criterion 5 – Regularly supports 20,000 or more waterbirds:** The wetland regularly supports more than 20,000 waterbirds during peak migration and summer periods. The extensive intertidal feeding areas

and nearby high-tide roost sites allow large aggregations of shorebirds and other waterbirds to occur each year. A total of 93 waterbird species are known from the Corner Inlet Ramsar Site, representing >90 % of the waterbird diversity of Victoria (Appendix 9).

- **Criterion 6 – Supports 1 % of the population of one or more waterbird species:** Corner Inlet regularly supports internationally significant proportions (≥1 % of the flyway population) of several EPBC-listed migratory shorebird species. These include species such as Red-necked Stint, Bar-tailed Godwit, Red Knot, Curlew Sandpiper and Far Eastern Curlew. The occurrence of these numbers demonstrates the global importance of the site for migratory bird conservation. Non-listed species are also present in high abundance, including Black Swan, Grey Teal, and Chestnut Teal.

Critical components, processes, and services

The site's ecological character is maintained by several critical components, processes, and services (BMT WBM 2011):

- **Critical Components:**
  - Marine and Estuarine Wetland Habitats – supports important habitats including: seagrass beds, salt marsh, mangroves, shallow marine waters, and intertidal flats.
  - Waterbird abundance and diversity – hosts 95 bird species, including migratory shorebirds, with an average peak abundance of 36,000 birds
- **Critical Processes:**
  - Waterbird breeding – supports several beach-nesting species
- **Critical Services:**
  - Threatened species – supports habitat for several listed species, including listed migratory species
  - Fisheries resources – vital habitats (feeding, spawning, dispersal, and migratory routes) for numerous fish species important to commercial and recreational fisheries.

Threats to the wetland

The following are listed as threats to the Corner Inlet Ramsar Site (BMT WBM 2011; RSIS 2020):

- Pollutant (sediment and nutrients) inputs affecting water quality (e.g. loss of seagrass due to a drop in water quality, change in biological assemblages);
- Weeds (e.g. competition with native flora);
- Habitat loss resulting from seawalls and urban development (e.g. resulting in loss of habitat, pollutants in stormwater runoff);
- Recreational activities (e.g. impacts from recreational boat users such as anchor damage, tourism infrastructure development);
- Natural resource utilisation (e.g. impacts from grazing, changes to fish stocks from commercial fishing);
- Modified flow regimes (e.g. changes in river flows leading to altered environmental processes, such as fish spawning events);
- Future infrastructure development (e.g. removal of native vegetation, changes to water quality);
- Acid sulphate soils (e.g. leading to fish kills and associated water quality issues);

- Oil spill/marine incident (e.g. injury or fatality of marine species);
- Climate change (e.g. increased fire risk, increased incidence of storm surge and associated damage); and
- Exotic pest fauna (e.g. disturbance and predation of birds and other fauna).

Habitats available at Corner Inlet

The Corner Inlet Ramsar Wetland ecological character is described as (RSIS 2020): a submerged plain covered with sand and mudflats, widespread seagrass meadows, and sizeable sand islands. A network of deep, branching channels enables effective tidal flow across the flats and between the islands. The area includes 14 distinct wetland types (Table 12). Mangroves and saltmarshes line the tidal flats, bays, and creeks, while the sand islands support a mix of vegetation such as dune grasses, scrub, and woodland. These wetland ecosystems provide habitats for a rich array of flora and fauna. Whilst the area is experiencing long-term, incremental changes driven by climate change, surrounding land-use changes, and historical agricultural impacts, the Corner Inlet Ramsar site is still considered to be in near-natural condition (BMT WBM 2011).

Most habitats within Corner Inlet are hydrologically and ecologically separate from the Action Area. The primary potential linkage is via the Albert and Jack Rivers, which provides a downstream connection from the Action Area to estuarine and coastal habitats within the inlet. This pathway represents the main context in which changes in water quality, flow, or sediment could be transferred downstream to marine/coastal habitats. No impact pathways are expected for inland wetland types.

Table 12: Habitats available at Corner Inlet Ramsar Wetland (BMT WBM 2011; RSIS 2020)

Ramsar code	Ramsar wetland type classification	Description
Marine/coastal wetland types		
A	**Permanent shallow marine waters** typically less than six metres at low tide; includes sea bays & straits.	Shallow marine waters dominate the eastern part of Corner Inlet, forming broad, low-energy coastal waters. These areas support fish, marine fauna, and feeding habitat for seabirds and waterbirds, and are closely linked to adjacent seagrass and intertidal systems.
B	**Marine subtidal aquatic beds**; includes kelp beds, sea-grass beds, tropical marine meadows.	Seagrass beds occur widely across the inlet in shallow, sheltered waters, particularly throughout the embayment. These highly productive habitats provide essential nursery areas for fish and invertebrates, and support foraging for waterbirds and other marine fauna.
D	**Rocky marine shores**; includes rocky offshore islands, sea cliffs.	Limited rocky shore habitats occur near Tin Mine Cove, Freshwater Cove and Bennison Island. These areas support diverse algae, invertebrates and fish, and may provide foraging habitat for seabirds, though they are minor within the broader inlet.
E	**Sand, shingle or pebble shores**; includes sand bars, spits and sandy islets; includes dune systems and humic dune slacks	Sandy beaches, spits and barrier islands occur along Snake, Sunday and Shad Islands and the eastern boundary of the inlet. These habitats provide important roosting and foraging areas for large numbers of shorebirds, nesting habitat for some coastal birds, and support intertidal invertebrate communities.
F	**Estuarine waters**; permanent water of estuaries and estuarine systems of deltas.	Estuarine habitats occur where rivers and creeks (e.g. Agnes, Albert, Franklin, Tarra Rivers and Bruthen Creek) meet marine waters, particularly along the western shoreline. These areas are highly productive, supporting fish nurseries, invertebrates, and key foraging habitat for migratory shorebirds and other waterbirds.
G	**Intertidal mud, sand or salt flats**.	Extensive intertidal flats occur throughout Corner Inlet, forming one of the largest such systems in Victoria. Rich in invertebrates, these flats are key foraging habitat for migratory shorebirds and waterbirds, and also support fish and broader estuarine food webs.
H	**Intertidal marshes**; includes salt marshes, salt meadows, saltings, raised salt marshes; includes tidal brackish and freshwater marshes.	Saltmarsh occurs in the upper intertidal zone along the landward edge of mangroves, especially along the northern mainland shore and across islands such as Snake and Franklin. Dominated by samphire and salt-tolerant species, it provides critical high-tide

Ramsar code	Ramsar wetland type classification	Description
		roosting habitat for shorebirds, foraging for species like Blue-winged Parrot, and nursery/support habitat for fish and invertebrates.
I	**Intertidal forested wetlands**; includes mangrove swamps, nipah swamps and tidal freshwater swamp forests.	Mangrove communities dominated by white mangrove occur extensively along the northern mainland shore and in patches throughout the inlet. These provide critical nursery habitat for fish and invertebrates, and important roosting and shelter sites for shorebirds and other waterbirds.
K	**Coastal freshwater lagoons**; includes freshwater delta lagoons.	Coastal freshwater lagoons occur on Snake Island (e.g. Big Hole, Bullock Waterholes) and Saint Margaret Island. These permanent or semi-permanent waters provide important habitat for waterbirds, refuge for fish and amphibians, and foraging resources for species such as Grey-headed Flying-fox and other fauna.
Inland wetland types		
N	**Seasonal/intermittent/irregular rivers/streams/creeks.**	Small seasonal streams and creeks occur on Snake and Sunday Islands as minor freshwater drainage lines. These provide intermittent habitat for fish and aquatic fauna during wetter periods, and may offer drinking water and foraging opportunities for birds and other wildlife when flowing.
Tp	**Permanent freshwater marshes/pools**; ponds (below eight hectares), marshes and swamps on inorganic soils; with emergent vegetation waterlogged for at least most of the growing season	Emergent marshes with sedges, rushes and aquatic herbs occur in permanently to seasonally inundated areas, particularly across southern Snake Island where they are extensive. These wetlands provide important foraging habitat for waterbirds and shorebirds (especially during shallow water phases), nursery habitat for fish, and feeding resources for species such as Blue-winged Parrot, along with broader use by wetland-dependent fauna.
Ts	**Seasonal/intermittent freshwater marshes/pools on inorganic soils**; includes sloughs, potholes, seasonally flooded meadows, sedge marshes.	
W	**Shrub-dominated wetlands**; shrub swamps, shrub-dominated freshwater marshes, shrub carr, alder thicket on inorganic soils.	Shrub-dominated freshwater wetlands occur on infertile, waterlogged sands, forming wet heathland dominated by tea-tree and heath species. In Corner Inlet, this habitat is restricted to Snake Island. It may provide shelter and foraging for Blue-winged Parrot, refuge for small fauna, and limited roosting habitat for wetland birds, though it is less important for shorebird feeding.

Ramsar code	Ramsar wetland type classification	Description
Xf	**Freshwater, tree-dominated wetlands**; includes freshwater swamp forests, seasonally flooded forests, wooded swamps on inorganic soils.	Freshwater swamp forests and wooded wetlands occur on poorly drained, seasonally inundated soils, typically dominated by swamp paperbark with a reed- and sedge-rich understorey. In Corner Inlet, they are most extensive on Snake Island, with smaller patches along the western and northern mainland shores. These areas provide high-tide refuge for shorebirds, seasonal nursery habitat for fish, foraging for Blue-winged Parrot, and potential roosting/foraging resources for Grey-headed Flying-fox and other wetland fauna.

Context regarding the proposed Project Area

The Corner Inlet Ramsar Site is located approximately 3 km south of the Project Area at its nearest point (Figure 2). The Project Area and the Ramsar site differ markedly in habitat composition, with the Project Area largely lacking wetland environments and instead characterised by agricultural land with adjacent plantations and regrowth forest. As a result, there is limited direct ecological connectivity between habitats within the Project Area and those of the Corner Inlet Ramsar site. The primary linkage occurs via downstream hydrological connections, particularly through the Albert and Jack Rivers, which discharge into the Corner Inlet estuary (Alluvium 2025). This pathway provides the primary context through which changes originating in the Project Area could extend to estuarine habitats.

The shipping transport route crosses Corner Inlet Ramsar Site to the west along Toora Channel, terminating at the Port Anthony-Barry Beach Marine Terminal. This route traverses deep-water channels (>10 m), which are not recognised as important habitat types in the Ramsar wetland classification (BMT WBM 2011). There are no expected interactions between the shipping route and inland habitats.

For bird species that form the listing status of the Ramsar site, such as waterbirds, the connectivity between the Project Area and the Corner Inlet Ramsar site is likely to be limited, with little to no suitable habitat for the species inland near the Project Area (Figure 3). The flight path of waterbirds would, therefore, most likely link suitable habitats along the coast rather than inland to cross the Project Area. Some degree of aerial connectivity may occur for highly mobile species, including migratory species (e.g. Blue-winged Parrot and shorebirds) that traverse the broader landscape between inland and coastal habitats. Potential collision risk to migratory shorebirds associated with the Ramsar site is addressed in Section 4.2.4. For other waterbirds, interaction with the Project Area is expected to be minimal due to the absence of wetland habitat and the lack of contiguous habitat features linking the Action Area to the Corner Inlet Ramsar site.

4.2.2. Listed ecological communities

The *Protected Matters Search Tool* (DCCEEW 2025; Appendix 1) indicated that two ecological communities listed under the EPBC Act have the potential to occur in the Flora and Fauna Search Area. Both of these communities were deemed *not to occur* within the Action Area (Table 13).

Table 13: Likelihood of occurrence of EPBC Act-listed ecological communities in the Action Area

Ecological community	EPBC status	Occurrence in the search region
Natural Damp Grassland of the Victorian Coastal Plains	Critically endangered	No grassland habitat was identified within the development footprint, and targeted surveys confirmed that this community is **not present** in the Action Area.
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Areas of suitable habitat for this community occur outside the proposed development footprint in the nearby Ramsar wetland. **Not present** in the Action Area.

4.2.3. Listed flora species

The EPBC *Protected Matters Search Tool* (DCCEEW 2025; Appendix 1) and Victorian Biodiversity Atlas (DEECA 2025a) indicated that the Flora and Fauna Search Area contained records of or potentially suitable habitat for 14 flora species listed under the EPBC Act. A detailed assessment of the likelihood of occurrence of these species is provided in Appendix 2.

Species are considered 'likely to occur' if they have numerous records in the Flora and Fauna Search Area and suitable habitat in the Action Area. Species are considered to have the 'potential to occur' if suitable habitat exists, but recent records are scarce.

This analysis indicates that eight EPBC Act-listed flora species are considered 'likely to occur' or have the 'potential to occur':

- River Swamp Wallaby-grass *Amphibromus fluitans* (Vulnerable)
- Eastern Spider-orchid *Caladenia orientalis* (Endangered)
- Thick-lip Spider-orchid *Caladenia tessellata* (Vulnerable)
- Strzelecki Gum *Eucalyptus strzeleckii* (Vulnerable)
- Clover Glycine *Glycine latrobeana* (Vulnerable)
- Maroon Leek-orchid *Prasophyllum frenchii* (Endangered)
- Dense Leek-orchid *Prasophyllum spicatum* (Vulnerable)
- Metallic Sun-orchid *Thelymitra epipactoides* (Endangered)

Targeted flora surveys determined that none of these species were within the Project Footprint.

4.2.4. Listed fauna species

Existing databases indicated that the Flora and Fauna Search Area contained records of or potentially suitable habitat for 12 species listed as threatened species, 45 species listed as migratory and 23 species listed as both threatened and migratory. A detailed assessment of the likelihood of occurrence of these species is provided in Appendix 3.

Species are considered 'likely to occur' if there are numerous records in the Flora and Fauna Search Area and suitable habitat in the Action Area. Using a precautionary approach, species considered to have the 'potential to occur' are those for which suitable habitat exists, but recent records are scarce.

This analysis indicated that 34 EPBC Act-listed fauna species were likely to occur, did occur, or had the potential to occur (Figure 16).

Threatened and Migratory birds

The following bird species listed under the EPBC Act are likely to occur or have the potential to occur onsite. These species have some potential to be impacted by the proposed action.

- Blue-winged Parrot *Neophema chrysostoma* (Vulnerable)
- Gang-gang Cockatoo *Callocephalon fimbriatum* (Endangered)
- Latham's Snipe *Gallinago hardwickii* (Vulnerable, Migratory)
- Swift Parrot *Lathamus discolor* (Critically Endangered)
- White-throated Needletail *Hirundapus caudacutus* (Vulnerable, Migratory)
- Fork-tailed Swift *Apus pacificus* (Migratory)
- Migratory shorebirds (22 species, exc. Latham's Snipe)

The Latham's Snipe, White-throated Needletail, and migratory shorebird species also have various listings under several international migratory species agreements (Bonn, CAMBA, JAMBA and ROKAMBA; see

below). Historical records for these species, as sourced from the VBA database, are provided in Appendix 6, with a summary of the 22 migratory shorebirds provided in Appendix 7.

Blue-winged Parrot

The Blue-winged Parrot is listed as *Vulnerable* under the EPBC Act. The species was once common in south-eastern Australia and Tasmania but has undergone a population decline in recent decades. The estimated population of the Blue-winged Parrot is 10,000 individuals (Garnet and Baker 2021; DCCEEW 2023a). Blue-winged Parrots are a partial migrant, where a portion of the population migrates across Bass Strait each spring/summer to breed in Tasmania, while smaller portions remain to overwinter in Tasmania or remain to breed in southeastern mainland Australia (DCCEEW 2023a; Higgins 1999). The proposed project is within the modelled range, and the species has been recorded in moderately-sized flocks (up to 39 birds) during autumn surveys, and smaller flocks (up to 8 birds) in spring/summer (Figure 16).

Much modelled habitat is present in the area, though most high-quality areas are further to the south in the Corner Inlet Ramsar Wetland (Figure 4). Habitat for the species consists of a variety of habitat types used for foraging, breeding, roosting, and 'staging' areas (DCCEEW 2023a), though the DEECA modelling does not provide for the differentiation between the various uses of habitats (Figure 4). Foraging habitats typically are diverse natural habitats for foraging, including salt marsh, heathland, sedgeland, grassy woodland, sparse grassland, and chenopod shrubland (Higgins 1999). The species now appears to have adapted to more modified landscapes and is now frequently observed foraging in cleared agricultural areas dominated by exotic pasture grasses (DCCEEW 2023a). Staging habitats are those foraging areas near the coast, where birds congregate before migrating across the Bass Strait (DCCEEW 2023a). Breeding and roosting habitat typically consists of Eucalypt woodlands or heathlands with hollow-bearing trees, with nearby foraging habitats (Emison et al. 1987; Higgins 1999).

Six hundred and forty-one Blue-winged Parrots observations were made during bird utilisation surveys. Numbers were highest in autumn (521 observations, in flocks of up to 39 birds), with lower numbers and flock sizes (≤8) in spring (36 observations), summer (33 observations), and winter (51 observations). Birds were observed regularly flying at height, with 95 or 14.8 % recorded with the rotor swept area. Flight heights differed between seasons, with 8.3 % in spring (3 birds), 54.5 % in summer (18 birds), 13.1 % in autumn (68 birds), and 11.8 % in winter (6 birds). The project area contained several patches of open habitats that appeared to be utilised largely for foraging (Figure 4). It's likely the birds observed during spring/summer were breeding in the adjacent State forests and foraging in nearby open habitats. The higher numbers in autumn are likely a result of both local recruitment from breeding pairs and a staging area for birds migrating across Bass Strait to Tasmania.

Key threats to this species include the loss and degradation of habitat, with additional threats including predation by introduced species (Feral Cats, European Red Foxes, and Sugar Gliders), and disease (Psittacine Beak and Feather Disease; DCCEEW 2023a).

Surveys showed that 85.2 % of recorded flights were below rotor swept area, with only 14.8 % of flights at heights that would risk collision with WTGs. Blue-winged Parrot is broadly known to be at some risk of collision, with mortalities reported in small numbers across several Victorian and Tasmanian wind farms (Symbolix 2020; Nature Advisory *unpub. mortality data*).

A detailed Significant Impact Assessment for this species is provided in Section 5.2.5.

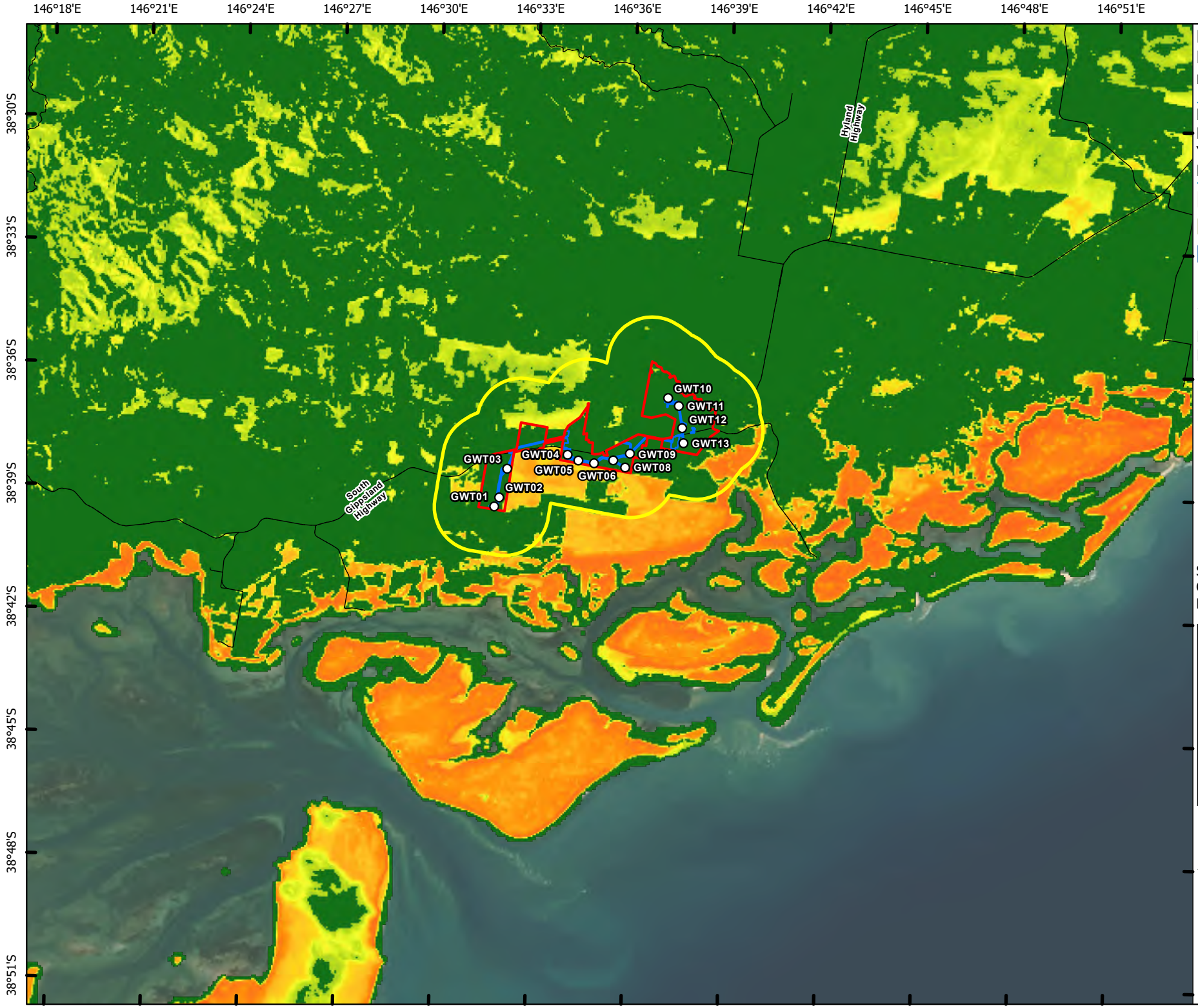

Figure 4. Blue-winged Parrot habitat distribution model (DEECA 2025b)

Project No: 14107.17
Project: Gelliondale Wind Farm, Yarram, VIC
Date: 2/04/2026

- Site boundary
- Site boundary (2km Buffer)
- Project footprint
- Turbine
- Road

Blue-winged Parrot Habitat Distribution Model (HDM)

- High suitability
- Low suitability

Source: Esri, Maxar, Earthstar Geographics, DEECA 2025b - Habitat Distribution Models

N

Kilometres
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Gang-gang Cockatoo

The Gang-gang Cockatoo is listed as *Endangered* under both the EPBC Act and FFG Act. Gang-gangs are endemic to coastal regions of south-eastern Australia, the national population of the species is estimated at 17,600-35,200 individuals (DAWE 2022a). The species is a partial altitudinal migrant, during the breeding season (generally October to January), it occupies forests and woodlands in alpine areas and birds disperse widely to lower elevations during winter (DAWE 2022a, NSW Scientific Committee 2024).

Much modelled habitat exists in the study area and beyond (Figure 5), including in the surrounding forest reserves and roadside corridors (though none in the Project Area or transport route). The current DEECA modelling does not allow for differentiation between foraging and breeding habitat. The regional significance of this habitat is likely limited to largely non-breeding use when birds migrate to drier lowland areas to forage (Higgins 1999). During winter months, Gang-gang Cockatoos rely on drier, more open eucalypt forests and woodland assemblages at lower altitudes. Open eucalypt assemblages such as box-ironbark make up their habitat during this period. The species also relies on assemblages of river red gum (*Eucalyptus camaldulensis*), dense coastal thickets of *Leptospermum* or *Casuarina*, or heathland and occurs in parks, gardens, and trees beside roads (Higgins 1999). All habitats, including winter foraging areas, are listed as critical habitat for the species (DAWE 2022a). There are patches of foraging habitat in the nearby forest reserves, with two potential foraging trees, moderately-sized (67-68 cm DBH) Manna Gum, proposed to be removed (Habitat zone, HZ: DD and DC; Figure 3).

Existing data from the local region are consistent with the documented seasonal habitat use, with less frequent observations over the breeding periods. Records from the Port Albert area indicate that the species is observed in higher numbers during the non-breeding period, with most records during the breeding period located further north in Tarra-Bulga National Park, reflecting its seasonal movement from upland breeding habitats to lower-elevation coastal and lowland environments for winter foraging (eBird 2026). The increased frequency of records at Port Albert during the non-breeding season suggests that the area functions as seasonal foraging habitat rather than breeding habitat for the species.

During the 234+ hours of BUS surveys, Gang-gang Cockatoos were recorded in the study area twice during autumn 2025 BUS (flock of up to 18 birds) and once during summer 2024 BUS (one flock of 4 birds; Figure 16). Notably, the single summer observation was made in February, outside of the typical breeding season (Oct-Jan; DAWE 2022a, NSW Scientific Committee 2024). No observations were made during the 187 hours of targeted searches, and no other observations were made during the 134 hours of WTNT surveys. Collectively, this indicates that the species has a limited presence in the area, and it appears that, when present, it is largely restricted to the non-breeding season.

Gang-gang Cockatoos typically undertake local flights within or just above the forest canopy when moving between feeding, roosting and nesting sites. During seasonal or longer-distance movements, individuals are capable of flying above the canopy and across open landscapes; however, no published studies have quantified preferred flight heights or flight altitude distributions for the species (Higgins 1999; NSW Scientific Committee 2024). The species is more likely to move through landscapes containing mature trees and vegetated corridors that provide foraging opportunities and habitat connectivity (Higgins 1999; NSW Scientific Committee 2024).

The two observations of Gang-gangs during the BUS surveys were of birds below RSA height (AAppendix 12), but is an insufficient number to support a robust collision risk model. Collisions with wind turbines are possible, with the Gang-gang having previously been documented as colliding with operating turbines (Nature Advisory *unpub. mortality data*). However, the species is generally considered to present a relatively low collision risk due to its predominantly canopy-associated foraging behaviour, short local flights within wooded habitats, and infrequent use of open agricultural environments. Nevertheless,

individuals undertaking seasonal movements or traversing the landscape between foraging areas may occasionally fly within the rotor-swept area, and collision risk cannot be discounted.

Key threats listed in the species *Conservation Advice* (DAWE 2022a) include: habitat loss, wildfire, climate change and competition for suitable nesting hollows.

A detailed Significant Impact Assessment for this species is provided in Section 5.2.5.

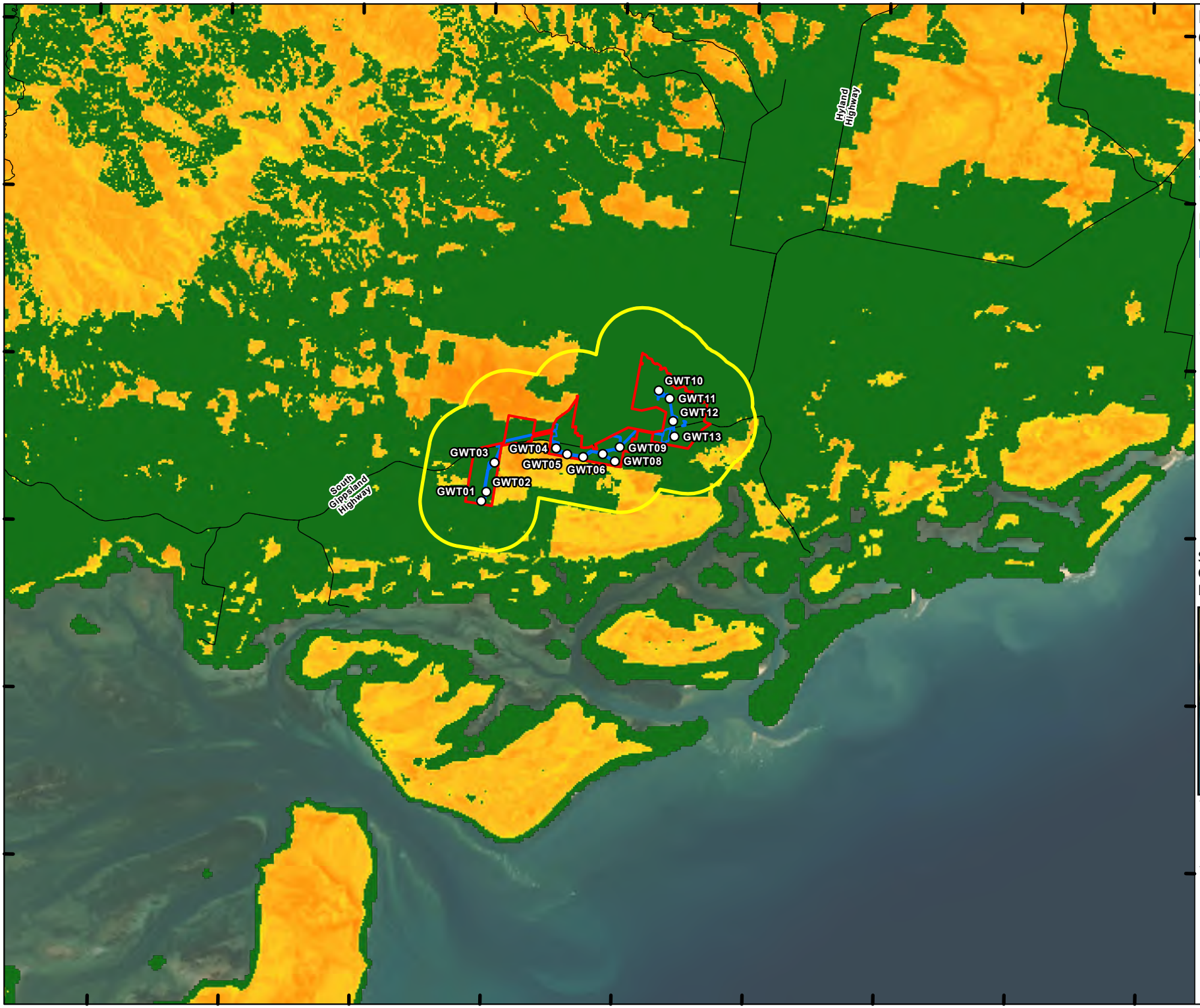

Figure 5. Gang-gang Cockatoo habitat distribution model (DEECA 2025b)

Project No: 14107.17
Project: Gelliondale Wind Farm, Yarram, VIC
Date: 2/04/2026

- Site boundary
- Site boundary (2km Buffer)
- Project footprint
- Turbine
- Road

Gang-gang Cockatoo Habitat Distribution Model (HDM)

- High suitability
- Low suitability

Source: Esri, Maxar, Earthstar Geographics, DEECA 2025b - Habitat Distribution Models

N

Kilometres
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Latham's Snipe

The Latham's Snipe is listed as *Vulnerable* and *Migratory* under the EPBC Act, with additional protections under International migratory agreements between the co-signatories of the Bonn Convention, Japan-Australia (JAMBA), and Korea-Australia (ROKAMBA). The species was listed as vulnerable in 2024 after consistent declines picked up in breeding flocks in Japan. The estimated population of the Latham's Snipe is 30,000 individuals, with a nationally important population representing being 18 birds (Hansen et al. 2016). Latham's Snipe migrates between breeding grounds in Japan and Russia to foraging grounds on the east coast of Australia. The species is present in Australia from approximately September to February. The proposed project is within the species' modelled range, and four single Latham's Snipe were recorded incidentally during the 2023/24 BUS, all perched on the ground and when incidentally flushed, flying well below RSA (Figure 16). The species regularly flights between roost sites and foraging sites, with flights are typically below 40 m (B. Hansen *personal communications*), however, as there is little data on flight heights and the species typically travels at night, flights at RSA cannot be ruled out.

There are small pockets of modelled habitat mostly to the south of the project footprint, though most high-quality areas are further to the south in the Corner Inlet Ramsar Wetland (Figure 6). While the current DEECA modelling does not allow for differentiation between foraging and breeding habitat, foraging habitat for the species consists of soft mudflats or shallow water wetlands, whilst they are known to roost in small wetlands, urban water bodies, saltmarshes, creek edges and even pastures, particularly when inundated (DCCEEW 2024c). Very little wetland habitat is present on the project site, though pastures may provide some low to moderate-quality habitat, especially in wetter times. The species, therefore, is expected to largely be restricted to the use of the Ramsar site and associated habitats.

Population decline in Latham's Snipe is thought to be the result of prolonged drought and large wildfires in eastern Australia throughout the 2010s, as well as the broad-scale draining of wetlands since European colonisation. Latham's Snipe have not been recorded in Nature Advisory's extensive turbine mortality database.

A detailed Significant Impact Assessment for this species is provided in Section 5.2.5.

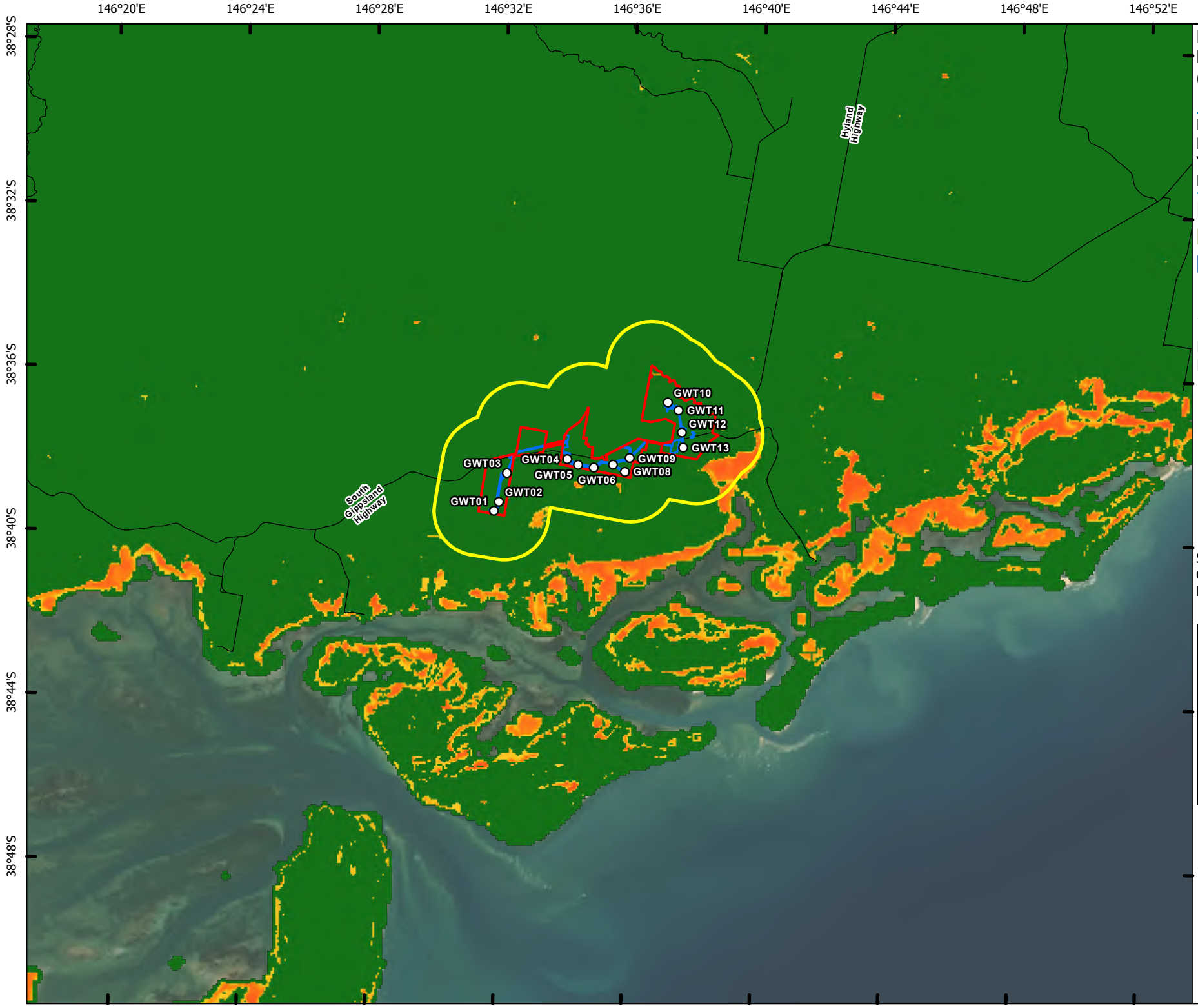

Figure 6. Latham's Snipe habitat distribution model (DEECA 2025b)

Project No: 14107.17
Project: Gelliondale Wind Farm, Yarram, VIC
Date: 2/04/2026

- Site boundary
- Site boundary (2km Buffer)
- Project footprint
- Turbine
- Road

Latham's Snipe Habitat Distribution Model (HDM)

- High suitability
- Low suitability

Source: Esri, Maxar, Earthstar Geographics, DEECA 2025b - Habitat Distribution Models

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Kilometres
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Swift Parrot

The Swift Parrot is listed as *Critically Endangered* under the EPBC Act. The species had undergone a sharp decline, with the most recent estimate using genetic data showing an effective population of 60 to 338 individuals (Olah et al. 2020). This species undertakes an annual migration across Bass Strait to breed in Tasmania, with the breeding season varying between years depending on food availability (DCCEEW 2024a). The species overwinters on the Australian mainland, from South Australia, Victoria, New South Wales and into southeastern Queensland (DCCEEW 2024a). The proposed project is within the modelled range, and where they are known to occur.

DEECA's Strategic Management Prospect Habitat Distribution Models (DEECA 2025b) do not show the area or the surrounding landscape to provide important habitat for the Swift Parrot. Field surveys, however, have identified some habitat in the area consisting of patches of foraging habitat in variable quality (Figure 16). These patches consisted of a mix of known foraging species such as the Southern Blue Gum, Spotted Gum, Swamp Gum, Manna Gum, Stringy Bark, and Saw Banksia. Of the identified habitat, one patch partially intercepts the proposed layout, which represents 0.1 % of that identified in the area (0.42 ha of 375.66 ha). There are two potential foraging trees, moderately-sized (67-68 cm DBH) Manna Gum, proposed to be removed (Habitat zone, HZ: DD and DC; Figure 3). In addition, the proposal also removes 0.134 ha of heathy woodland (HZ: DA, DC, and DD) and 0.03 ha of plains grassy forest (HZ: DI), which contain a low density of suitable foraging habitat in the form of sparse canopies of Manna Gum and/or Swamp Gum.

The Swift Parrot has been recorded a few times within a couple of kilometres of Gelliondale Wind Farm (Figure 16). A single bird was observed during targeted surveys on May 28, 2024, in a patch of Swamp Gum/Stringy Bark approximately 2 km west of the proposed site. The bird was observed to fly up to 25 m height, below RSA. Existing records (Bird Life Australia 2025; DEECA 2025a) show a single bird observed on Sunday Island in 2024 (>6 km south), three birds at Port Albert in 1991 (>6 km southeast), and a flock of 20 at Biddies Cove, Wilsons Promontory in 1992 (15 km to southwest). It is expected that individuals or small flocks may occasionally pass the Gelliondale wind farm when traversing between the preferred forest areas. Birds may, on occasion, use trees within or in close proximity to the wind farm site when food resources are available, but it would be expected that, at those times, similar resources would also be available in the larger, higher-quality patches further afield (e.g. Wilson's Promontory). Commuting flights may take birds through the wind farm itself.

Key threats to this species include loss of habitat, predation by Sugar Gliders, competition for resources, and mortality from collision with artificial structures such as fences, buildings, and vehicles (DCCEEW 2024a). The species typically flies at or below tree canopy height, but has been observed in Tasmania to occasionally fly in excess of 100 m (Nature Advisory *unpub. observations*). Modelling suggests the species may be at some risk of collision at wind farms, but that the risks are relatively low (Smales 2005). This species has not been recorded as a mortality at any operational wind farms in over 17 years of monitoring by Nature Advisory across southeastern Australia (Nature Advisory *unpub. mortality data*).

A detailed Significant Impact Assessment for this species is provided in Section 5.2.5.

White-throated Needletail

The White-throated Needletail is listed as *Vulnerable* and *Migratory* under the EPBC Act, with additional protections under International migratory agreements between the co-signatories of the Bonn Convention, China-Australia (CAMBA), Japan-Australia (JAMBA), and Korea-Australia (ROKAMBA). The species has undergone an apparent decline over recent years, with current population estimates of 41,000 (Garnett and Baker 2021). The species is a long-distance migrant – breeding in Siberia and Japan

over the austral winter and migrating through South-East Asia to reach Australia in late spring (Chantler & Kirwan 2020). They typically migrated north by mid-Autumn. The Gelliondale Wind Farm is located within their non-breeding range, where they were recorded during summer and autumn BUS and targeted surveys (Figure 17).

The White-throated Needletail were recorded in the study area during autumn and summer BUS 2024 (AAppendix 12) with targeted surveys conducted by Nature Advisory in 2020, 2021, and 2024. The species was recorded on 47 occasions, with flocks ranging from a single bird up to 160 (Table 14). The species abundances observed at Gelliondale wind farm matched patterns in the existing records from the broader Gippsland region; birds arrived in late spring, peaked in abundance over high summer and dropped sharply mid-autumn.

Being largely aerial, the species has no known critical habitat within Australia (DoE 2017; TSSC 2019). They are most frequently observed above wooded areas (Higgins 1999), and while known to fly above farmland, they appear to prefer partially cleared pasture or patches of trees at the edge of the paddocks (Tarburton 1993; TSSC 2019). In coastal areas, they fly over sandy beaches, mudflats (Cooper 1971; TSSC 2019), and at times offshore (Nature Advisory *unpub. observations*). The conservation advice for this species states that although the species appears to primarily roost aerially, it has been recorded in trees in forests and woodlands (TSSC 2019). If WTNTs were roosting in nearby woodland, they would likely have been observed more often as they commuted to and from their roost site. DEECA's Habitat Distribution Model (DEECA 2025b) shows that habitat suitable for the species is centred around treed areas, with a particular hotspot in Alberton State Park to the north (Figure 7). This is likely because those areas represent suitable areas for both foraging and, although unlikely, potential roosting (the DEECA model does not provide information to differentiate between these uses). Targeted survey results confirm these patterns, with most birds observed above or near wooded areas such as the State forests to the north and south (Figure 17). It is likely, however, that the entire area may be used on occasion as birds traverse between preferred habitats.

The species is known to be at some risk of colliding with WTGs at several southeast Australian wind farms (Symbolix 2020; Nature Advisory *unpub. mortality data*). Recent evidence from automated cameras installed at an operational wind farm suggests that, while there is some collision mortality, the species shows a much higher avoidance rate than previously assumed (Identiflight *pers. comm*. June 4, 2025).

A collision risk model was applied to the field data collected on this species (Appendix 4). Observations show that the typical flyways for this species within and immediately surrounding the Project Area are largely contained within forested areas, in particular the ridgeline of Alberton State Park (Figure 17 and Appendix 4). The CRM model suggests an annual mortality rate of 1.404 birds, which represents 42 birds over the life of the wind farm without mitigation measures. We note this model is an estimate and may not represent the number actually hit by the wind farm.

A detailed Significant Impact Assessment for this species is provided in Section 5.2.5.

Table 14: Summary of flight heights for WTNT at Gelliondale Wind Farm.

Flight height	Flock size (min/max)	Total observations at height class (% of total)
Below RSA (<40 m)	2/10	8 (17.02 %)
At RSA (40-210 m)	1/160	38 (80.85 %)
Above RSA (>210 m)	80/80	1 (2.13 %)

TOTAL	1 to 160 birds	47 observations

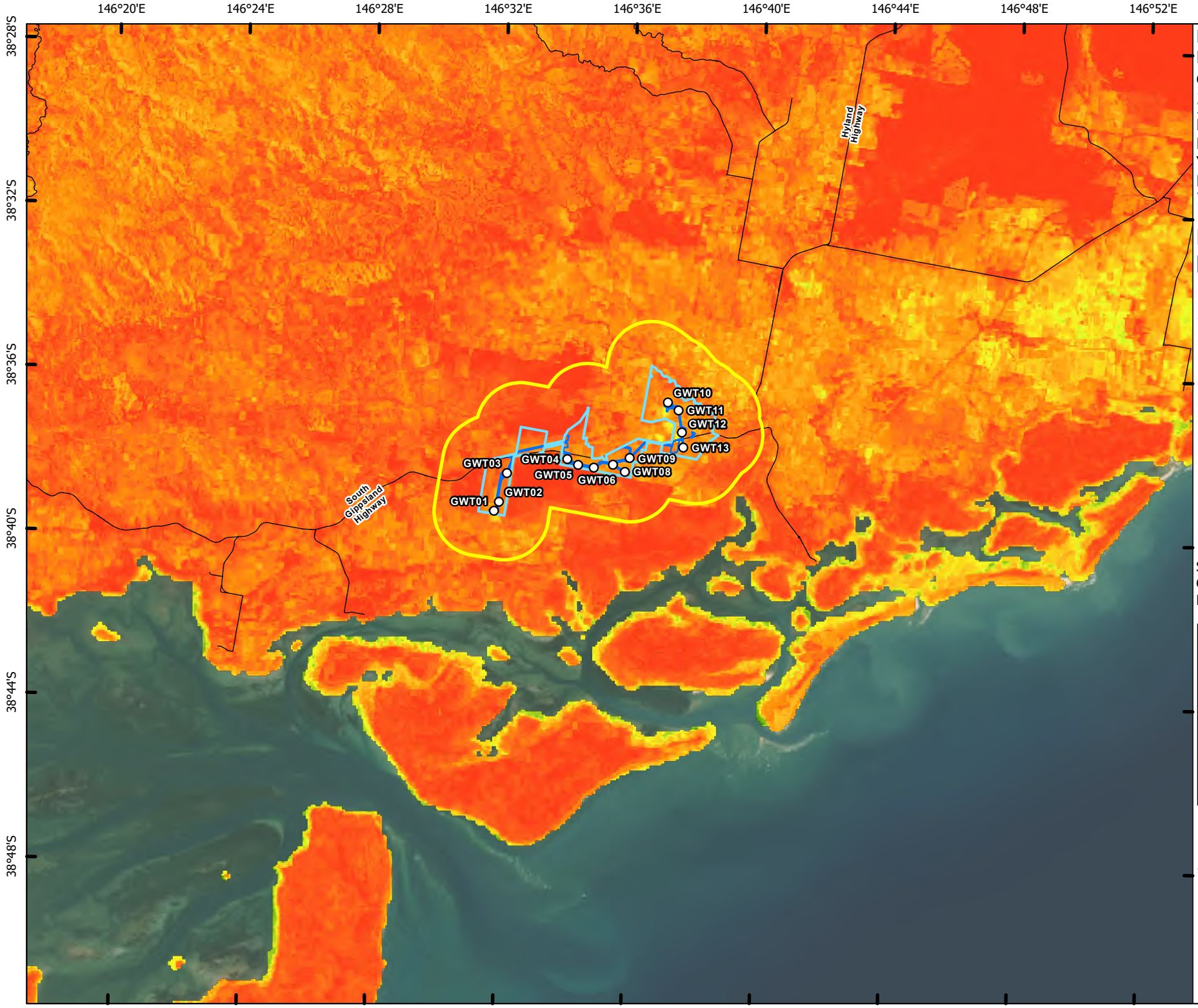

Figure 7. White-throated Needletail habitat distribution model (DEECA 2025b)

Project No: 14107.17
Project: Gelliondale Wind Farm, Yarram, VIC
Date: 2/04/2026

Site boundary
Site boundary (2km Buffer)
Project footprint
Turbine
Road

White throated Needletail Habitat Distribution Model (HDM)

High suitability
Low suitability

Source: Esri, Maxar, Earthstar Geographics, DEECA 2025b - Habitat Distribution Models

N

Kilometres
0 2 4 6
GDA2020 Vicgrid

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Fork-tailed Swift

The Fork-tailed Swift is listed as *migratory* under the EPBC Act, with additional protections from international migratory agreements between China-Australia (CAMBA), Japan-Australia (JAMBA), and Korea-Australia (ROKAMBA). The species' population size is unknown and is suspected to be stable (Birdlife International 2024). Despite no population estimate, the DoE (2015a) recommends that an ecologically significant proportion of this species is 1,000 individuals, and further investigations are required if 100 individuals are affected by a proposed action within one year.

The species is a long-distance migrant, breeding across Siberia, Japan, Korea, and eastern China, and in the northernmost Philippines (Chantler et al. 2020). The species migrates south to overwinter in Malaysia, Indonesia, the Philippines, Melanesia, Australia, and possibly northeast India. The Fork-tailed Swift typically arrives in Australia in spring and returns north in late autumn (eBird 2021). In southern Australia and Victoria, the species is generally widespread but sparsely distributed (Higgins 1999). No habitat distribution modelling is available for this species (DEECA 2025a).

The species is almost exclusively aerial in Australia, even sleeping on the wing, with no critical habitat identified (DoE 2015a; Higgins 1999). A single incidental observation was made during the summer BUS 2015 at the associated Alberton Wind Farm (Figure 16), which was observed flying at RSA height. There is some potential that the general area may be used, but this would be considered to be a very infrequent occurrence as it had not been observed during any subsequent bird surveys (600+ hours).

The species typically flies at high-risk heights and is known to have collided with WTGs, although it appears to be a very uncommon occurrence (Moloney et al. 2019). Indeed, the species has been recorded as a collision mortality only once in over 17 years of carcass monitoring by Nature Advisory at wind farms across southeastern Australia (Nature Advisory *unpub. mortality data*). It is listed as a low-risk species for collision risk at Gippsland wind farms, largely due to the low portion (<2 %) of the Australian population likely to occur in the area (Smales & Venosta 2005).

A detailed Significant Impact Assessment for this species is provided in Section 5.2.6.

Migratory shorebirds (22 species, exc. Latham's Snipe)

Species abundance and diversity

Twenty-three listed migratory species were recorded within Corner Inlet East (combined field surveys and Birdlife data; Table 15), which represent 72 % of all migratory shorebirds known to visit Australia (DoE 2017). Overall, 1,229,413 individual migratory shorebirds were recorded in the combined Birdlife and Nature Advisory datasets between 1980 and 2025.

Summer captured a higher diversity (23 species) and abundance (1,097,465 birds) of migratory shorebirds compared to winter (17 species, and 131,948 birds). The only exception was the Double-banded Plover, which is a winter migrant from New Zealand (Wiersma et al. 2023). Some species considered to be visitors during the Austral summer were present throughout the winter as well (e.g. Bar-tailed Godwit, Common Greenshank, Far Eastern Curlew).

Several listed non-migratory species were observed during field surveys, most of which are associated almost exclusively with coastal waterbodies (e.g. terns and Hooded Plovers), though others range more widely (e.g. Blue-winged Parrots; Table 15). While the Latham's Snipe was also recorded (Table 15), it is addressed separately (see above) due to differences in its habitat preferences, some of which has been found inside the Action Area.

Table 15: Listed species recorded during Nature Advisory (NA) field surveys and BirdLife Australia (BLA) shorebird surveys.

Notes: 'ns' denotes species not surveyed.

Species	Status		Bilateral migratory species agreements	Summer			Winter	
	EPBC	Internat. agreements		NA (2015)	NA (2024/25)	BLA (1980-2024)	BLA (1980-2024)	NA (2025)
Migratory shorebirds								
Bar-tailed Godwit (*baueri* subsp.)	En/Mig.	1-4	1-4	1,259	929	394,481	49,631	5
Black-tailed Godwit	En/Mig.	1-4	1-4	0	0	510	0	0
Common Greenshank	En/Mig.	2-4	2-4	23	13	3,731	29	1
Common Redshank	Mig.	2-4	2-4	0	0	70	0	0
Common Sandpiper	Mig.	2-4	2-4	0	2	0	0	0
Curlew Sandpiper	Cr/Mig.	1-4	1-4	0	28	42,958	558	0
Double-banded Plover	Mig.	1	1	0	0	291	17,741	17
Far Eastern Curlew	Cr/Mig.	1-4	1-4	35	320	30,078	1,272	6
Great Knot	Vu/Mig.	1-4	1-4	2	0	7,008	610	0
Greater Sand Plover	Vu/Mig.	1-4	2-4	0	0	419	41	0
Grey Plover	Vu/Mig.	2-4	2-4	0	0	17,257	879	0
Grey-tailed Tattler	Mig.	1-4	1-4	0	0	321	105	0
Latham's Snipe	Vu/Mig.	1, 3-4	1, 3-4	0	4	0	0	0
Lesser Sand Plover	En/Mig.	2-4	2-4	0	0	1,370	58	0
Marsh Sandpiper	Mig.	2-4	2-4	0	0	7	0	0
Pacific Golden Plover	Mig.	2-4	2-4	0	48	273	1	7
Red Knot	Vu/Mig.	2-4	2-4	18	0	83,779	24,108	0
Red-necked Stint	Mig.	1-4	1-4	324	3,590	491,554	35,569	152

Species	Status		Bilateral migratory species agreements	Summer			Winter	
	EPBC	Internat. agreements		NA (2015)	NA (2024/25)	BLA (1980-2024)	BLA (1980-2024)	NA (2025)
Ruddy Turnstone	Vu/Mig.	2-4	2-4	0	0	2,348	650	0
Sanderling	Mig.	2-4	2-4	0	0	10,214	361	0
Sharp-tailed Sandpiper	Vu/Mig.	1-4	1-4	0	177	3,049	0	0
Terek Sandpiper	Vu/Mig.	2-4	2-4	0	0	41	7	0
Whimbrel	Mig.	2-4	2-4	58	34	842	140	0
					Summer total	1,097,465	Winter total	131,948

Notes:

EPBC Act: *Environment Protection and Biodiversity Conservation Act 1999* (Cth.), Cr = Critically endangered, En = Endangered, Vu = Vulnerable, Mig. = Migratory

International Agreements: 1 = Bonn Convention (Bonn), 2 = Australia-China (CAMBA), 3 = Australia-Japan (JAMBA), 4 = Australia-Republic of Korea (ROKAMBA).

Spatial use of Corner Inlet Ramsar Site

Corner Inlet functions primarily as a non-breeding habitat for migratory shorebirds, where they remain throughout the austral spring and summer (approximately September to March), before commencing their northward migration from late summer to autumn (approximately March–April; Minton et al. 2012; Choi et al. 2016).

The spatial use of the Corner Inlet Ramsar site by the nine most common shorebirds showed a consistent trend of higher abundance on the outer islands (10 to 15 km from GWF). These locations contained, on average, 10,497 birds, accounting for >90 % of records for the most common migratory shorebirds observed over the summers of 2024 and 2025 (Table 16). Notably, there were only two sites within 10 to 15 km distance, Port Albert and Kate Kearney entrances (see Section 9.2.1). Both appear to be supporting important habitat and numbers of migratory shorebirds.

Only two species, the Whimbrel and Far Eastern Curlew, did not follow this pattern. The area with the most Whimbrel was Dream Island, 18 km from the proposed wind farm. Far Eastern Curlew were fairly evenly spread across the sites, though those >10 km away did have the majority of birds.

Migratory shorebirds, in general, forage primarily on intertidal benthic invertebrate prey in the intertidal mudflats and shallow coastal areas during low tides before moving to adjacent high-tide roost sites including beaches, islands and saltmarsh (Minton et al. 2012; Rogers et al. 2010). These daily movements are strongly influenced by tidal cycles and may involve flights of several kilometres between feeding and roosting areas. There is limited incentive for migratory shorebirds using Corner Inlet to undertake regular movements into inland terrestrial environments, as these environments do not provide equivalent foraging or roosting resources.

Likewise, the locations that were closest to the proposed wind farm, on average, only accounted for 0.5% of the top nine species observed over the summer 2024 and 2025 surveys. No major wetland capable of supporting a nationally or internationally important population of migratory shorebirds was located on the wind farm site and its immediate surroundings. The cause of these patterns is unknown but is thought to be related to disturbance and predation, with nearshore locations likely experiencing more human and animal (e.g. fox) impacts. Note, however, that fox prints were observed on Snake Island during field assessments, but are more than likely fewer in number than on the mainland sites.

Table 16: Spatial use of Corner Inlet for the nine most abundant migratory shorebird species.

Notes: data using average count (abundance by number of surveys) per summer survey (collated NA and Birdlife data for 2024/25). Bold denotes more than 50% of a species' total.

Distance to GWF	No. Surveys	No. Locations	Average count (% of total for species)									TOTAL
			Bar-tailed Godwit subsp. *baueri*	Curlew Sandpiper	Far Eastern Curlew	Grey Plover	Pac. Golden Plover	Red Knot	Red-necked Stint	Sanderling	Whimbrel	
<5 km	54	7	22 (0.5%)	-	10 (12.5%)	-	1 (6.8%)	-	23 (0.5%)	-	-	55 (0.5%)
5-7 km	121	13	41 (0.9%)	2 (1.2 %)	19 (24.2%)	-	4 (36.4%)	-	272 (5.6%)	-	-	338 (3.2%)
7-10 km	26	6	149 (3.3%)	-	5 (6.2%)	1 (0.9%)	-	3 (1%)	8 (0.2%)	-	6 (27.9%)	172 (1.6%)
10-15 km	2	2	**3,970 (87.7%)**	**185 (98.8%)**	28 (35.3%)	**96 (90.9%)**	**6 (56.8%)**	**311 (93%)**	**4,177 (86.3%)**	**390 (100%)**	-	**9,163 (87.3%)**
>15 km	3	3	347 (7.7%)	-	17 (21.8%)	9 (8.2%)	-	20 (6%)	362 (7.5%)	-	**15 (72.1%)**	769 (7.3%)

Temporal trends: Summer

Table 17 shows the average summer count of all migratory shorebirds in Corner Inlet east between 1980 and 2024, sorted by distance of the survey site to the wind farm site and grouped by decade. Figure 8 shows the data trend.

The Corner Inlet east area consistently held over 20,000 individual birds. The general trend in summer abundance was relatively consistent, though data showed somewhat lower abundance from the 1990s to 2010s, the abundance in the 1980s was similar to that recorded over the last four years. However, some outer island sites showed a marked increase over the last two decades (Kate Kearny entrance, Box Bank Island, and Port Albert entrance), and other nearshore and inner island sites showed a decrease in abundance (Dog Island south and One Tree Island). Port Welshpool foreshore appeared to regularly hold fewer shorebirds over summer compared to other sites, with summer numbers ranging from only 15-61 birds.

Table 17: Sum of average counts for all migratory shorebird species over Summer 1980-2024.

Notes: High counts over 2000 are highlighted in grey. Sites not surveyed are denoted with 'ns'.

Survey Site	1980-89	1990-99	2000-09	2010-19	2020-24	Distance from GWF
One Tree Island - G2 - now S	4,266	3,569	3,443	2,161	ns	7 km
Port Welshpool foreshore	ns	61	15	40	ns	7.5 km
Robertsons Beach - K	ns	0	0	509	ns	7.5 km
Sunday Island west end	377	ns	ns	ns	ns	7.5 km
Clonmel Island - D	2,413	2,276	2,329	2,173	874	9 km
Dog Island south - M	ns	1750	102	102	35	9 km
East Sunday Island / Drum Island - A	102	145	18	287	172	9 km
Port Albert entrance - C	946	621	1,049	2,546	7,650	11 km
Box Bank Island - F	8,663	5,509	3,110	2,883	10,015	12 km
Kate Kearney entrance - E	2,081	1,335	12,920	10,569	10,331	12 km
Snake Island (east side) - G3 - now B	2,523	3,783	3,191	30	860	12.5 km
Dream south (shallow inlet) - G	3,086	8,277	516	2,692	1,785	16 km
Dream Island - H	5,095	439	99	262	112	18 km
McGloughlans entrance - J	921	1,119	1,104	1,033	398	19 km
North of St Margaret Island - L	1,951	21	25	144	ns	20 km
Total # birds for all sites	**32,425**	**28,904**	**27,922**	**25,430**	**32,230**	

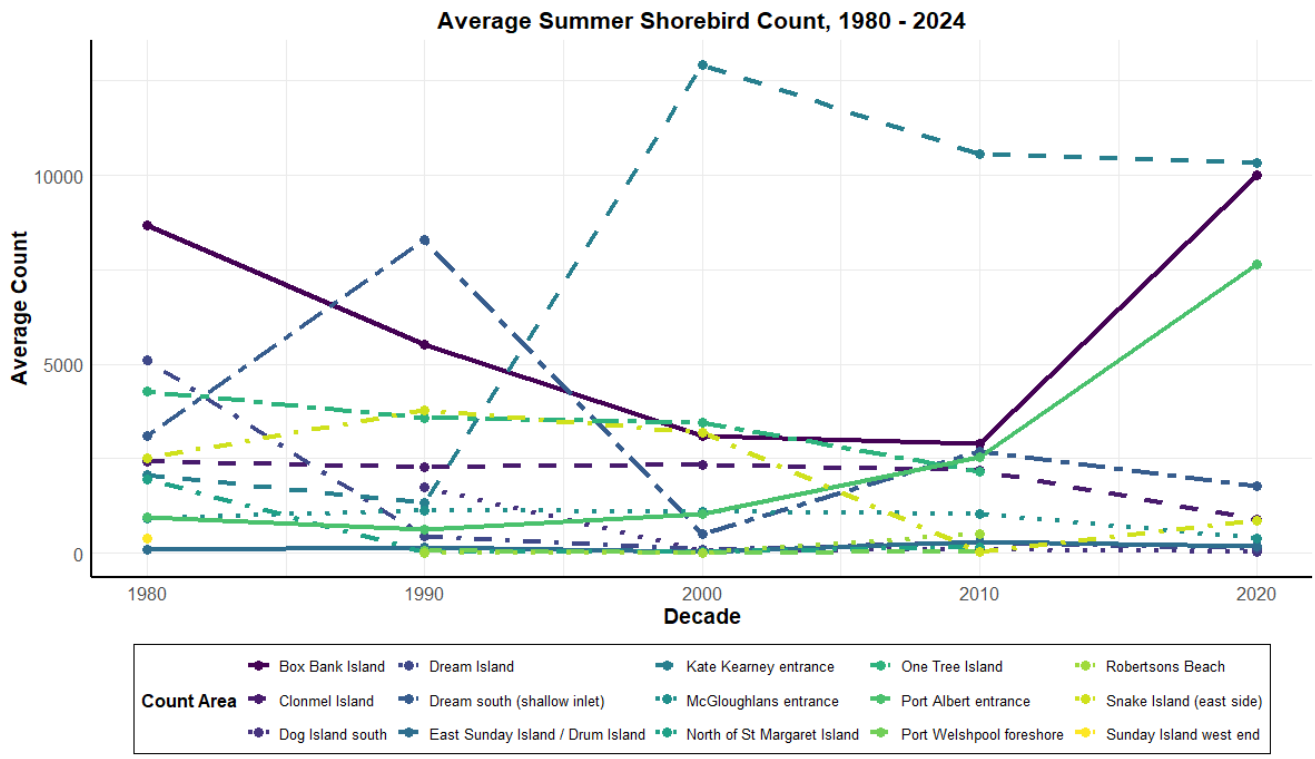

Figure 8: Trends in average summer count for all migratory shorebird species at each site between 1980 and 2024.

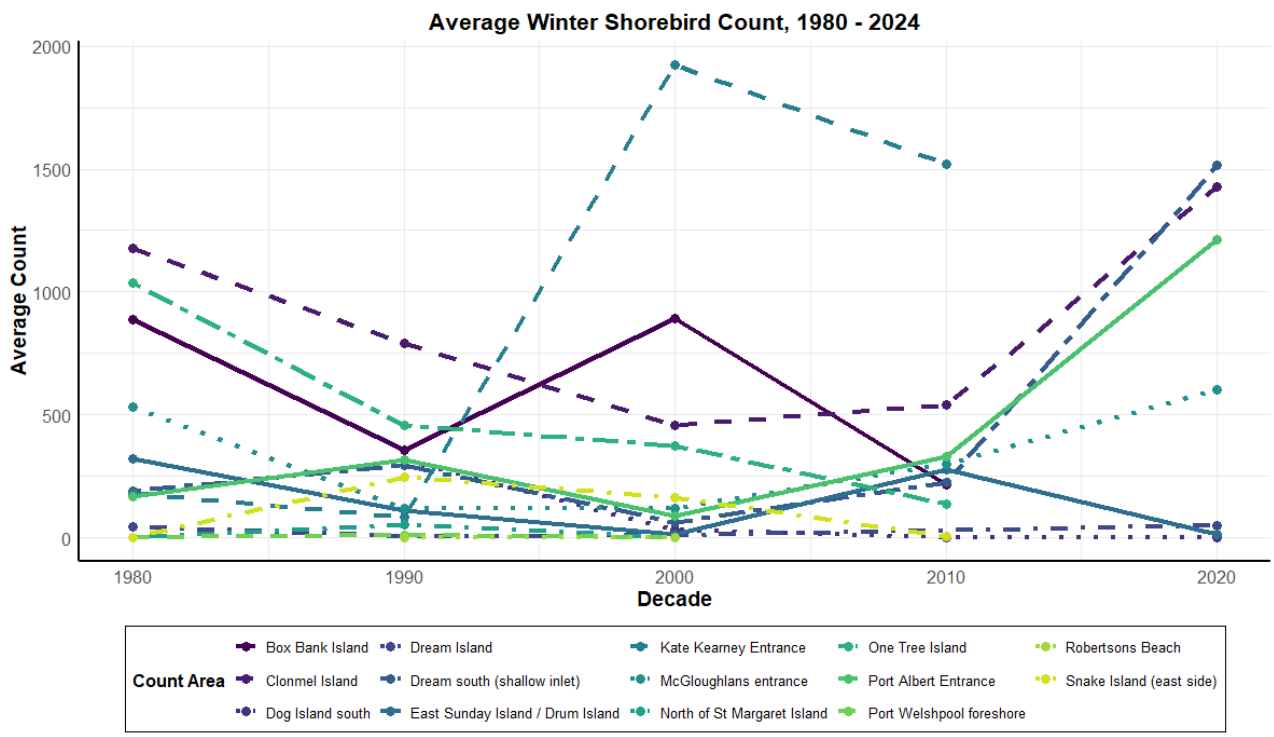

Figure 9: Trends in average winter count for all migratory shorebird species at each site between 1980 and 2024.

Temporal trends: Winter

Table 18 shows the average winter count of all migratory shorebirds in Corner Inlet east between 1980 and 2024, sorted by distance of the survey site to the wind farm site and grouped by decade. Figure 9 shows the data trend.

Corner Inlet East consistently held 3,000 to 4,000 individual birds over winter. The general trend in winter abundance was consistent. Though, some fluctuations over the decades, the abundance in the 1980s was fairly similar to that recorded over the last four years.

Some sites showed a decrease over time (Dog Island south and East Sunday Island/Drum Island). Others showed a sharp increase in wintering shorebird numbers (Kate Kearney entrance, Clonmel Island, Port Albert entrance, and Dream south - shallow inlet).

Three sites appeared to regularly hold fewer shorebirds over winter compared to other sites (all nearshore locations); Port Welshpool foreshore (0-9 birds), Robertsons Beach (0 birds), and North of St Margaret Island (1-51 birds).

Table 18: Sum of average counts for all migratory shorebird species over Winter 1980-2024.

Notes: High counts over 2000 are highlighted in grey. Sites not surveyed are denoted with 'ns'.

Survey Site	1980-89	1990-99	2000-09	2010-19	2020-24	Distance from GWF
One Tree Island - G2 - now S	1,037	458	376	138	ns	7 km
Port Welshpool foreshore	0	9	0	ns	ns	7.5 km
Robertsons Beach - K	ns	0	0	ns	ns	7.5 km
Sunday Island west end	2	245	165	5	ns	7.5 km
Clonmel Island - D	1,178	790	458	540	1,429	9 km
Dog Island south - M	ns	315	33	2	2	9 km
East Sunday Island / Drum Island - A	320	111	13	275	13	9 km
Port Albert entrance - C	166	316	87	328	1,213	11 km
Box Bank Island - F	887	356	892	215	ns	12 km
Kate Kearney entrance - E	180	85	1,924	1,519	ns	12 km
Snake Island (east side) - G3 - now B	ns	0	ns	ns	ns	12.5 km
Dream south (shallow inlet) - G	188	297	62	225	1,517	16 km
Dream Island - H	45	6	ns	10	50	18 km
McGloughlans entrance - J	533	117	121	299	604	19 km
North of St Margaret Island - L	1	51	1	ns	ns	20 km
Total # birds for all sites	**4,536**	**3,155**	**4,129**	**3,556**	**4,827**	

Flight behaviour

A single Latham's Snipe was incidentally recorded once during a BUS (see Latham's Snipe under Section 4.2.4), but no other migratory shorebirds were observed during any formal BUS or targeted surveys or incidentally around the proposed wind farm site. No wetland habitat considered to have the potential to support a nationally important number of migratory shorebirds was observed onsite. So, the likelihood of shorebirds visiting the site is considered low. However, there is a chance that shorebirds may fly across the proposed wind farm site when migrating to and from the important habitat at Corner Inlet east.

Migratory flights have been described in detail by several authors (Lane & Jessop 1985; Piersma *et al.* 1990; Piersma 1997; Swennen 1992; Tulp *et al.* 1994). These studies have detailed shorebird migratory flight as remarkably consistent, with characteristics such as:

- Shorebirds depart in flocks of between five and 250 birds, with occasional observations of larger flocks (averages: 52, Lane & Jessop 1985; 10 – 151, depending on species, Piersma *et al.* 1990; 127, Swennen 1992; 13 – 94, depending on species, Tulp *et al.* 1994);
- They fly in an elongated, shallow "V" formation, termed an 'echelon' (Piersma *et al.* 1990; 1997);
- Shorebirds are very vocal when they depart on migration, calling unceasingly to one another rather loudly compared with their normal calling during flight;
- They ascend rapidly and steeply and are usually still ascending when lost from sight by the observer. Estimates of climb rate vary from 0.55 to 0.69 m per second, with larger, heavier species of shorebirds climbing at the slower rates (Piersma *et al.* 1990; 1997). Rates of ascent for smaller shorebirds in West Africa were between 0.7 and 0.92 m per second. Optimal climb rates of approximately twice this have been predicted for shorebirds by Hedenstrom and Alerstam (1994);
- Observations of flight altitude using weather radar show that during migration, shorebirds fly at between 0.5 and 6 km (Piersma *et al.* 1990; Tulp *et al.* 1994). Altitudes of migration given in the last two studies are of birds still ascending when they disappeared from sight, often at altitudes of greater than one kilometre, and are therefore likely to be at the lower range of altitude estimates for level migratory flight. The first two studies used radar on oceanic islands to study shorebirds on long-distance, level, migratory flights. Altitudes in these circumstances ranged from 2.5 to 6 km.
- Ground speeds for migrating shorebirds range between 20 km/h and 91 km/h (Lane & Jessop 1985; Tulp *et al.* 1994; Williams & Ying 1990), with these studies addressing a variety of wind strengths and directions.

Given these various climb rates and flight speeds, several scenarios may exist (Table 19). Under all of these scenarios it is very unlikely migratory shorebirds will be at RSA height of 210 m when passing over the wind farm. The worst scenario (slowest climb and fastest speed) birds are expected to pass above RSA after 9.6 km.

Notably, the sites that account for the majority of the most abundant migratory shorebirds (94.6 %; Table 16) are over 10 km away from GWF. So it's expected that it is unlikely that these migratory shorebirds will be at RSA height if/when passing through the GWF.

Table 19: Scenarios under which birds will reach above RSA height (210 m), under the various flight speeds and climb rates.

Scenario	Horizontal speed	Climb rate (m/sec)	Distance needed to reach above RSA
1	5.56 m/s (20 km/h)	0.90	1,296 m
2		0.70	1,668 m
3		0.69	1,694 m
4		0.55	2,122 m
5	25.28 m/s (91 km/h)	0.90	5,899 m
6		0.70	7,580 m
7		0.69	7,686 m
8		0.55	9,645 m

Notes: Reported speed and climb rates from Piersma et al. (1990; 1997), Land & Jessop (1985), Williams & Zing (1990), and Tulp et al. (1994).

Threatened mammals

- Grey-headed Flying Fox *Pteropus poliocephalus* (Vulnerable)
- Long-nosed Potoroo *Potorous tridactylus trisulcatus* (Vulnerable)
- Southern Brown Bandicoot *Isoodon obesulus obesulus* (Endangered)
- Swamp Antechinus *Antechinus minimus maritimus* (Vulnerable)

Ultrasonic bat detector survyes did not identify any EPBC Act-listed bat species (Appendix 14).

Grey-headed Flying-fox

The Grey-headed Flying Fox is listed as *Vulnerable* under the EPBC Act. Grey-headed Flying Foxes are endemic to the south-eastern forested areas of Australia, principally east of the Great Dividing Range, and have an estimated population of just over half a million individuals (Westcott et al. 2015). The proposed project is within the range for the species, with several potential and confirmed camps within 100 km (Figure 10).

A desktop assessment has occurred to assess the presence of seasonal and long-term camps for the Grey-headed Flying Fox) within 50km (at least) of the wind farm site. Habitat modelling shows there are some smaller patches of low-quality potential habitat within the immediate surrounds (Figure 10), with more high-quality habitat on Wilsons Promontory (Figure 10). Flying-fox leaving these camps would be expected to fly in the direction of foraging habitat, most likely to the large patches to the north near Maffra/Sale and southwest on Wilsons Promontory (Figure 10). Flights to Wilson's Promontory may lead the Flying-fox to cross the wind farm site.

There is currently no available dataset that enables a reliable distinction between foraging and breeding habitat for the Grey-headed Flying Fox. DEECA's state-wide habitat mapping identifies areas of relative importance and distribution (as per Figure 10), but does not distinguish between habitat types. Other referenced sources (e.g. CSIRO and UWS datasets) identify known camp

locations (used already to find camps), which may be considered 'breeding habitat', but these do not map the broader extent of potential breeding habitat.

Accurately delineating breeding habitat for all areas within 100 km would require substantial, targeted field investigations. Even with such effort, a high degree of uncertainty would likely remain as the species is known to utilise a large range of roosting environments, including highly modified settings such as botanical gardens and urban parks (one on the Yarra River in Abbotsford), as well as more natural habitats in mangroves in northern Queensland. This is also noted in the National Recovery Plan, where they state that they exhibit flexible roosting behaviour, and further research is required to better understand their habitat use patterns.

On-ground investigations of possible camps occurred in January and May 2025, and ongoing liaison with the University of Western Sydney (UWS) will continue to access data from their Flying-fox tracking program. Information from the UWS Animal Ecology Lab indicated that two new roost locations have been identified relatively close to Gelliondale:

- A forested site north of Port Welshpool (-38.682712, 146.454993) was used for around a month by one tracked female in January 2024. As this location was occupied for a longer period, UWS assume that it is likely that it is a new colony (i.e. more than one animal is likely to have roosted there), but this has not been confirmed.
- A small forest north of Agnes (-38.649472, 146.379182) was used by one animal roosting here for 2 nights in December 2023.

Both sites are well within the foraging distance to Gelliondale (site 1 is c. 7.5 km away and site 2 c. 13km; Eby 1991, DAWE 2021b). Tracking data also suggests a potential new colony on Snake Island (-38.767848, 146.538662), and older data suggests two other locations (-38.7610, 146.5870 and -38.7692, 146.5261).

The closest confirmed colony per the National Flying-fox Monitoring program (NFFMP) is Woodside, Bruthen Cresent, approximately 23 km east of the wind farm site (McKeown et al. 2024). These are shown in Figure 10.

Additionally, DEECA have provided a broad indication of possible Flying-fox activity at Snake Island and Woodside, which corresponds with the UWS tracking data, and a location near Mcloughlins Beach, which warrants further investigation.

Preliminary investigations at the aforementioned sites noted that only the Port Welshpool camp (Telegraph Rd) was active in January 2025. On 22/01/2025, the Flying-fox departure from this camp occurred between 20:56-21:22 hrs, with all (~2000 individuals) departing to the SSE to access foraging resources on Snake Island. A re-assessment of these camps in May 2025 noted all sites were inactive, suggesting a seasonal departure of Flying-foxes from the area.

Current knowledge of these camps, therefore, fails to meet the criteria as nationally important: camps that have contained >10,000 Flying-foxes in more than one year in the last 10 years, or have been occupied by more than 2,500 Flying-foxes permanently or seasonally every year for the last 10 years (DoE 2015d). Long-term seasonal monitoring, described in the BAMP, will likely help inform a broader understanding of the importance of these camps and how Flying-foxes are using the landscape. A phenological review of flora within the wind farm's vicinity may also assist this understanding. This information can then be used to inform the adaptive management approach detailed in the BAMP.

The effects of climate change on the species are expected to have serious impacts, particularly through increasing frequency, intensity, and duration of extreme heat events (Welbergen et al. 2007). Heat events disproportionately affect adult females and dependent young, leading to high mortality, reduced recruitment, and potential declines in effective breeding populations (Welbergen et al. 2007). With extreme heat events already increasing in Australia, such climate-driven stressors pose a significant conservation concern for the species. Changing climate conditions will also alter the availability and location of food resources, likely pushing the species to different foraging and camp locations in cooler areas. Predictions on these are largely unknown due to a broad lack of understanding of the complexity of possible responses (DEW 2021).

The species regularly flies at RSA height and is known to occasionally collide with turbines at operational wind farms in south-eastern Australia (Symbolix 2020). However, data is not available to inform a site-specific CRM for the species.

A detailed Significant Impact Assessment for this species is provided in Section 5.2.5.

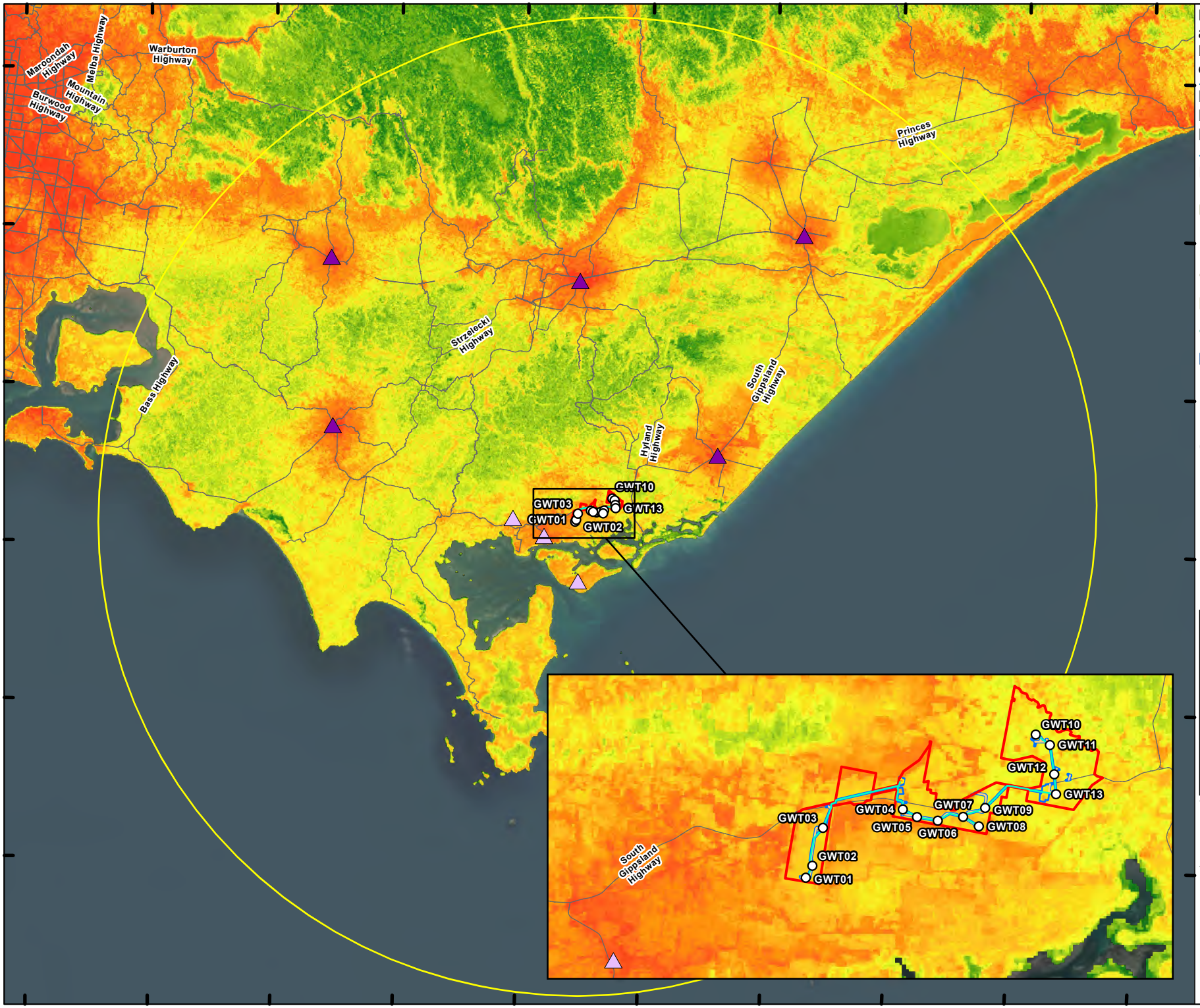

Figure 10: Location of known and potential Grey-headed Flying-fox colonies in the vicinity of Gelliondale Wind Farm

Project No: 14107.22
Project: Synergy Wind Pty Ltd
Date: 2/04/2026

- Wind farm boundary
- Wind farm boundary (100km Buffer)
- Turbine
- Access track
- Substation
- Electrical cable
- Application footprint
- Confirmed bat colony
- Potential bat colony

Grey headed flying fox Habitat Distribution Model (HDM)

- High suitability
- Low suitability

Source: Esri, Maxar, Earthstar Geographics

N

Kilometres
0 10 20 30
GDA2020 Vicgrid

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Long-nosed Potoroo

The Long-nosed Potoroo is listed as *Vulnerable* under the EPBC Act. The species was listed as threatened in 2022 when a population decline was predicted as a result of broadscale wildfires in the Summer of 2019/20 compounding predation by introduced predators such as foxes and cats. The estimated population of the Long-nosed Potoroo is 20,000 individuals, though there is low confidence in this estimate (Woinarski 2014, DAWE 2022d). The proposed project is within the species' modelled range, and the species was assessed as having potential to occur, although no historical records occur within 10km of the wind farm site.

There are substantial pockets of modelled habitat to the north and south of the project footprint where bushland reserves provide high-quality habitat (Figure 11). Although the current DEECA modelling does not provide information to determine the specific use of these areas, such as breeding or foraging areas, due to the home range size and nature of the species, habitats would likely be used for all purposes. Potoroo habitat consists of scrub, heathy woodland to forests, with structure consisting of a dense understorey with some cleared areas for foraging (DAWE 2022d). The major threat to Long-nosed potoroos is habitat clearing and fragmentation, but no habitat suitable for potoroos is being impacted by the proposed wind farm, which is being constructed almost entirely in pastures.

A detailed Significant Impact Assessment for this species is provided in Section 5.2.5.

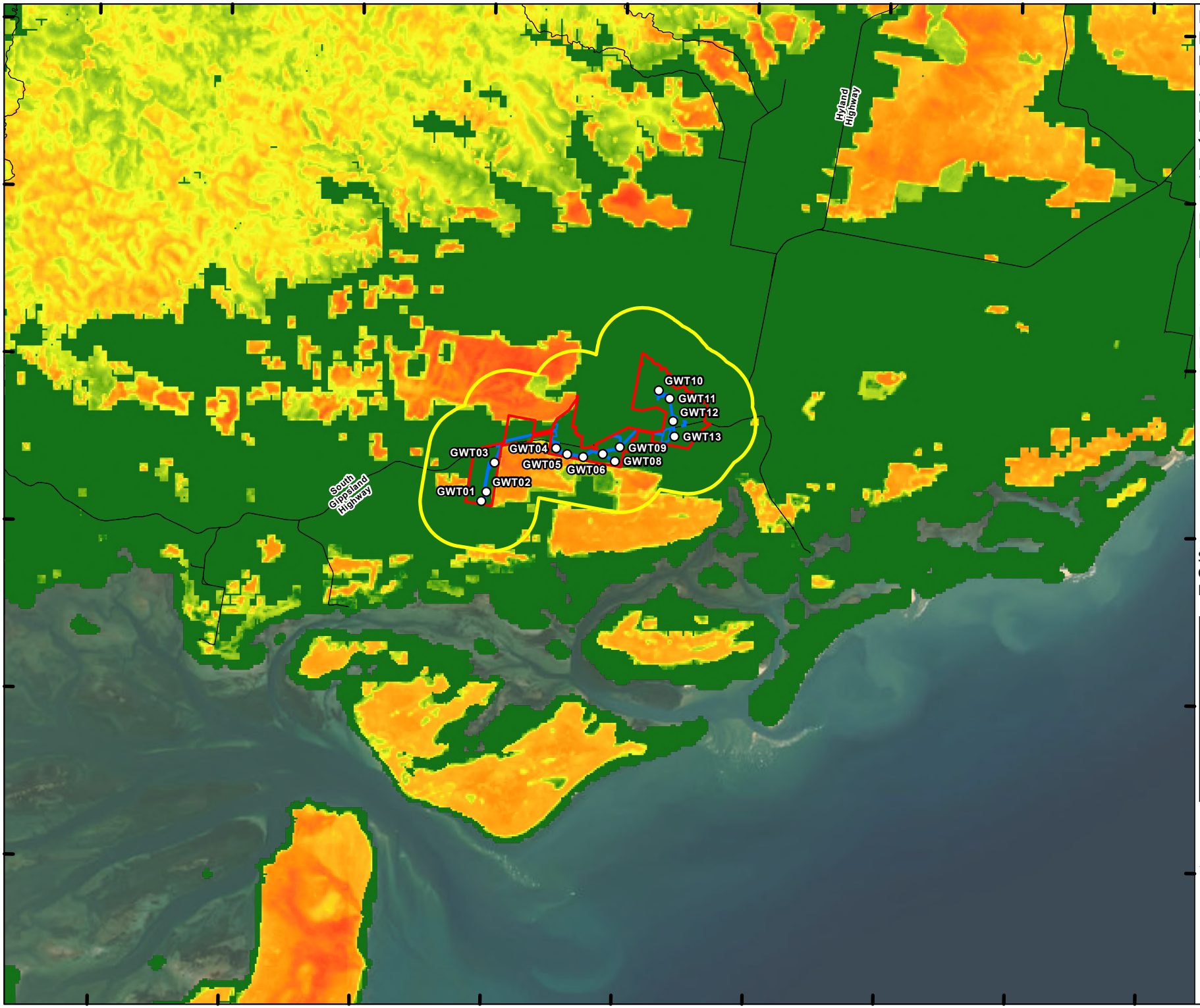

Figure 11. Long-nosed Potoroo habitat distribution model (DEECA 2025b)

Project No: 14107.17
Project: Gelliondale Wind Farm, Yarram, VIC
Date: 2/04/2026

Site boundary
Site boundary (2km Buffer)
Project footprint
Turbine
Road

Long-nosed Potoroo Habitat Distribution Model (HDM)

High suitability
Low suitability

Source: Esri, Maxar, Earthstar Geographics, DEECA 2025b - Habitat Distribution Models

N

Kilometres
0 2 4 6
GDA2020 Vicgrid

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Southern Brown Bandicoot

The Southern Brown Bandicoot is listed as *Endangered* under the EPBC Act as a result of predation by introduced predators such as foxes and cats, habitat loss and altered fire regimes since European colonisation. There are no reliable estimates of the Southern Brown Bandicoot population, but they are thought to have declined drastically through the last century and into this one (DOE 2016a). The proposed project is within the species' modelled range, and the species was assessed as having the potential to occur, with only one historical record within 10km of the wind farm site from 1962.

There are substantial pockets of modelled habitat to the north and south of the project footprint where bushland reserves provide adequate ground cover and potential for high-quality habitat (Figure 12). Although the current DEECA modelling does not provide information to determine the specific use of these areas, such as breeding or foraging areas, due to the home range size and nature of the species, habitats would likely be used for all purposes. Bandicoots inhabit areas of dense vegetation, including wetland fringes and heathland (Paull 2008). The major threat to Southern Brown Bandicoots relevant to this project is habitat clearing and fragmentation, but no habitat suitable for Bandicoots is being impacted by the proposed wind farm, which is being constructed almost entirely in pastures.

A detailed Significant Impact Assessment for this species is provided in Section 5.2.5.

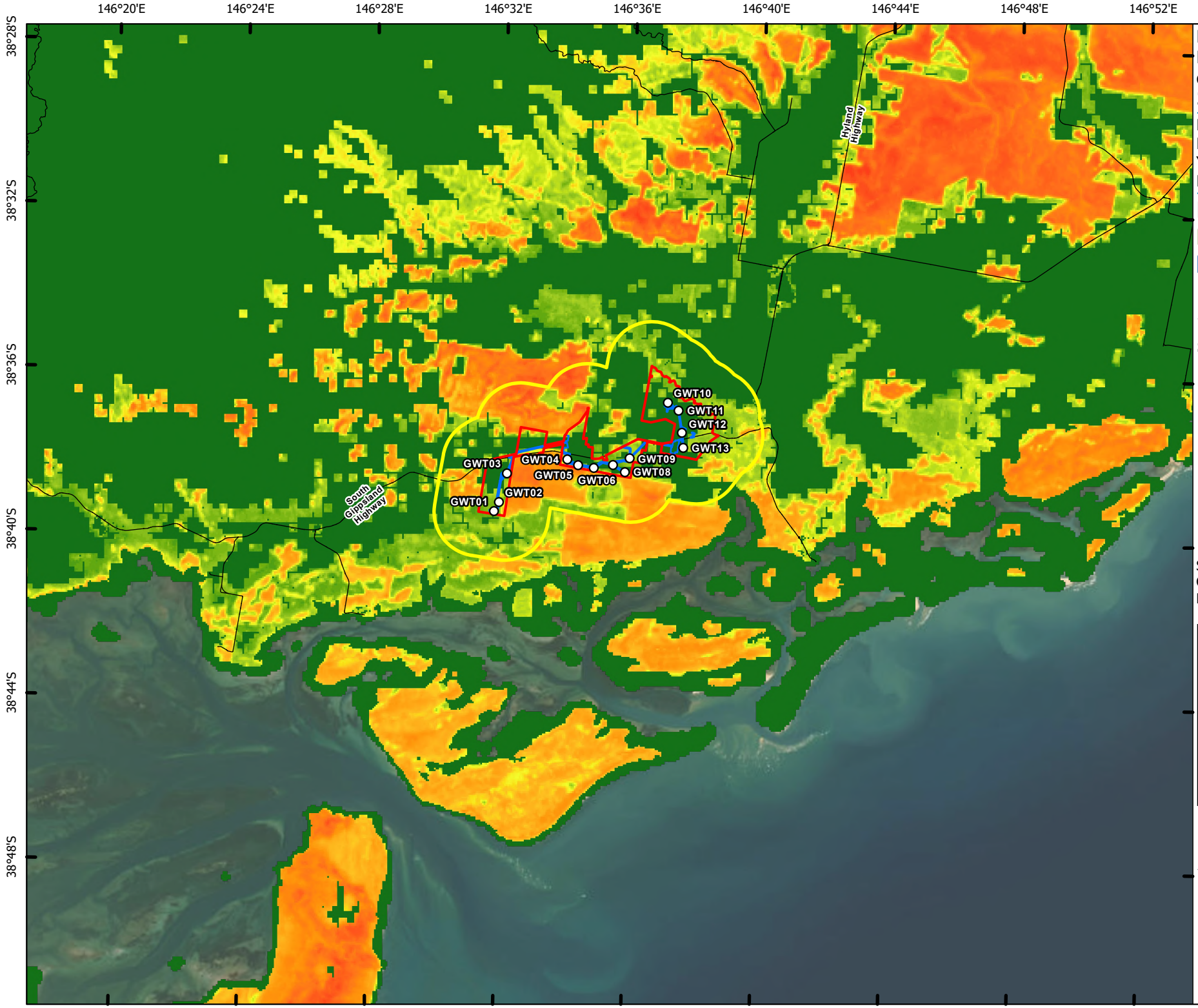

Figure 12. Southern Brown Bandicoot habitat distribution model (DEECA 2025b)

Project No: 14107.17
Project: Gelliondale Wind Farm, Yarram, VIC
Date: 2/04/2026

Site boundary
Site boundary (2km Buffer)
Project footprint
Turbine
Road

Southern Brown Bandicoot Habitat Distribution Model (HDM)

High suitability
Low suitability

Source: Esri, Maxar, Earthstar Geographics, DEECA 2025b - Habitat Distribution Models

N

Kilometres
0 2 4 6
GDA2020 Vicgrid

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Swamp Antechinus

The Swamp Antechinus is listed as *Vulnerable* under the EPBC Act as a result of altered fire regimes since European colonisation, habitat loss and predation by introduced predators such as foxes and cats. Woinarski (2014) estimated the population at 100,000 individuals, but there is low confidence in this figure. The proposed project is within the species' modelled range, and the species was assessed as having potential to occur.

There are substantial pockets of modelled habitat to the south of the project footprint where bushland reserves and the Corner Inlet Ramsar Site provide adequate ground cover for the species (Figure 13). Although the current DEECA modelling does not provide information to determine the specific use of these areas, such as breeding or foraging areas, due to the home range size and nature of the species, habitats would likely be used for all purposes. Antechinus inhabit Dense wet heath, tussock grassland, sedgeland heathy woodland and coastal heath and scrub (Menkhorst 1996), requiring mature, dense vegetation with thick ground cover (DOE 2016b). The major threat to Swamp Antechinus relevant to this project is habitat clearing and fragmentation, but no habitat suitable for Antechinus is being impacted by the proposed wind farm, which is being constructed almost entirely in pastures.

A detailed Significant Impact Assessment for this species is provided in Section 5.2.5.

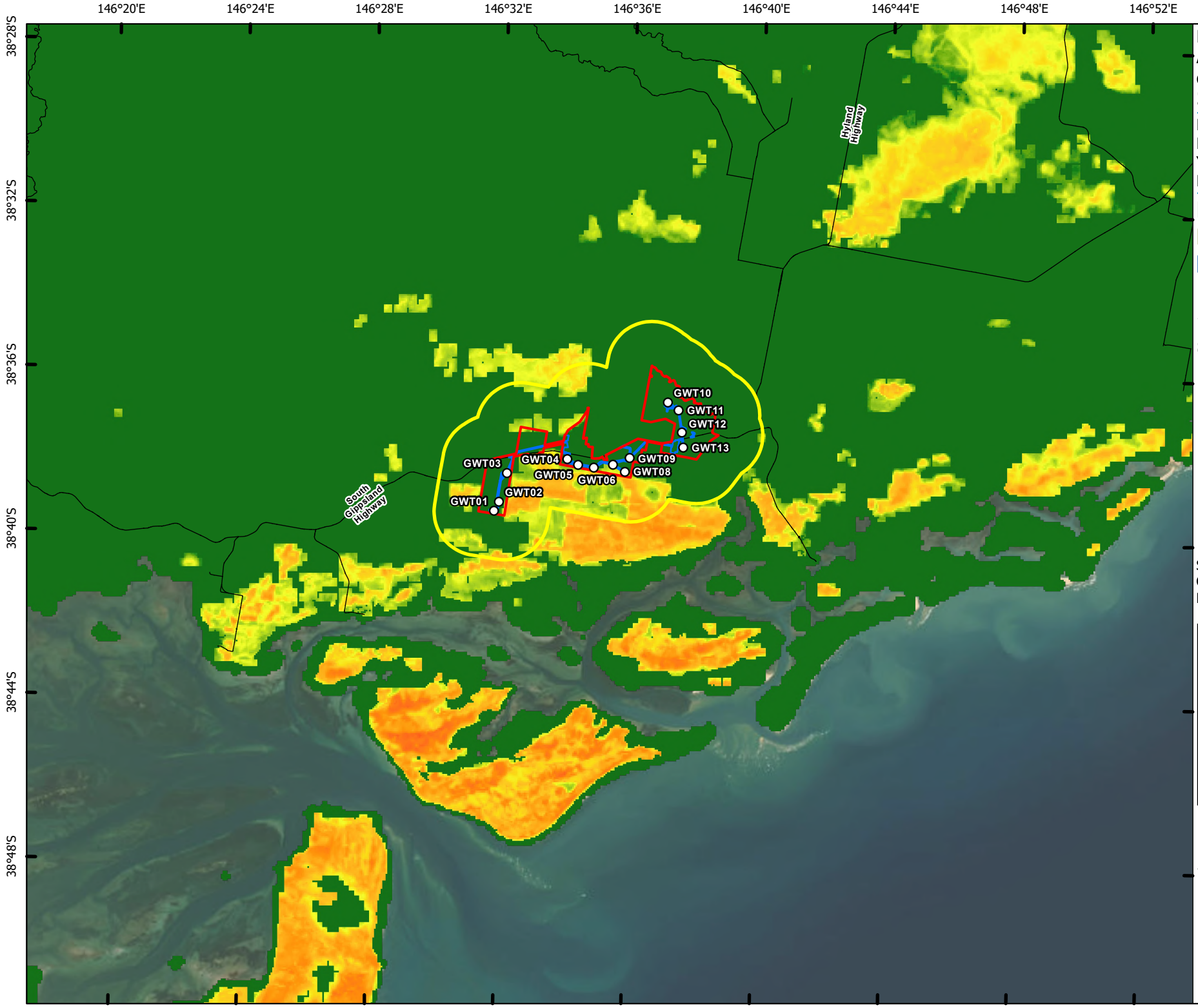

Figure 13. Swamp Antechinus habitat distribution model (DEECA 2025b)

Project No: 14107.17
Project: Gelliondale Wind Farm, Yarram, VIC
Date: 2/04/2026

Site boundary
Site boundary (2km Buffer)
Project footprint
Turbine
Road

Swamp Antechinus Habitat Distribution Model (HDM)

High suitability
Low suitability

Source: Esri, Maxar, Earthstar Geographics, DEECA 2025b - Habitat Distribution Models

N
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Threatened fish

- Australian Grayling *Prototroctes maraena* (Vulnerable)
- Dwarf Galaxias *Galaxiella pusilla* (Endangered)

Australian Grayling

The Australian Grayling is listed as *Vulnerable* under the EPBC Act due to a range of threats including barriers to fish passage, altered hydrological regimes, habitat degradation, introduced predators and competitors, and climate-induced changes such as extreme droughts and bushfires (DAWE 2021a). The population of Grayling appears to be declining or fluctuating across its range in Victoria, Tasmania, and New South Wales.

A number of waterbodies within the modelled range of this fish are within the 2 km buffer of the project (Figure 14), including the Tarwin, Barwon, Albert, and Thomson Rivers. These habitats offer the freshwater and estuarine environments necessary for the species' complex life cycle, which involves both marine and freshwater phases (Backhouse et al. 2008; Amtstaetter et al. 2016). The mapping by DEECA only represents the freshwater and estuarine habitats (Figure 14). Impacts on this species would be expected if there were any introduction of barriers for fish passage, removal of riparian vegetation and associated increase in siltation, introduction of invasive species and/or disease, or increase in recreational fishing (DAWE 2021a).

These impacts are not expected and any crossings of minor waterways if required will be managed by an Environmental Management Plan (Accent 2025) to avoid any impacts on fish species.

A detailed Significant Impact Assessment for this species is provided in Section 5.2.5.

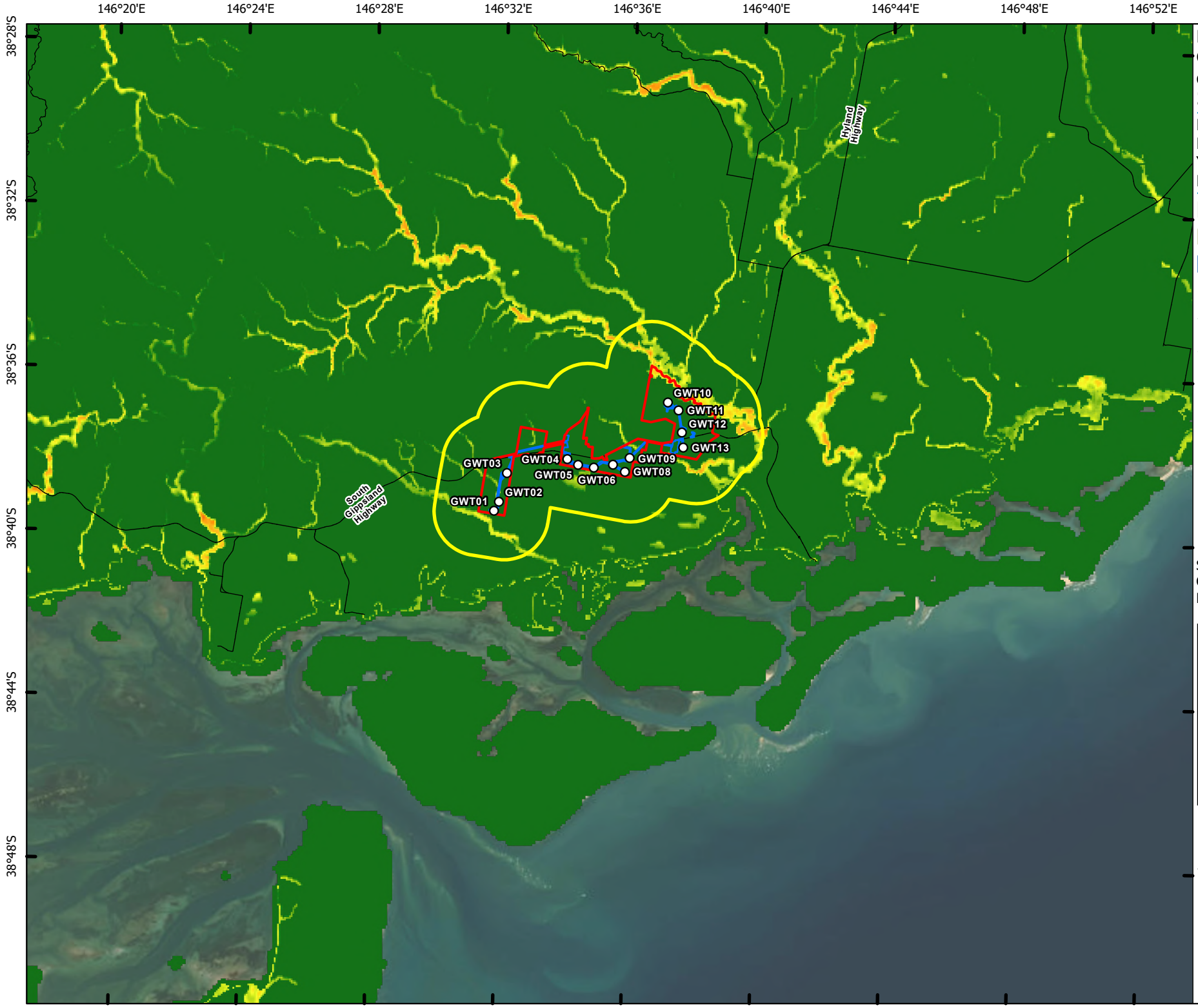

Figure 14. Australian Grayling habitat distribution model (DEECA 2025b)

Project No: 14107.17
Project: Gelliondale Wind Farm, Yarram, VIC
Date: 2/04/2026

Site boundary
Site boundary (2km Buffer)
Project footprint
Turbine
Road

Australian Grayling Habitat Distribution Model (HDM)

High suitability
Low suitability

Source: Esri, Maxar, Earthstar Geographics, DEECA 2025b - Habitat Distribution Models

N

Kilometres
0 2 4 6
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Dwarf Galaxias

The Dwarf Galaxias is listed as *Endangered* under the EPBC Act due to its restricted distribution, fragmented populations, and ongoing habitat degradation driven by altered hydrology, climate change, and invasive species (DCCEEW 2023f). The species inhabits shallow, slow-flowing freshwater systems such as swamps, creeks, and marshes, often with dense aquatic vegetation.

The proposed project occurs within the modelled range of the Dwarf Galaxias (Figure 15), and the species was assessed as having potential to occur. A number of waterbodies within the modelled range of this fish are within the 2 km buffer of the project, including the Tarwin, Albert, Barwon and Thomson Rivers. Impacts on this species would be expected if there were any introduction of barriers for fish passage, removal of riparian vegetation and associated increase in siltation, altered hydrological regimes (e.g. surface and ground water extraction, drainage), introduction of invasive species and/or disease, or increase in recreational fishing (DCCEEW 2023f).

These impacts are not expected and any crossings of minor waterways if required will be managed by an Environmental Management Plan (Accent 2025) to avoid any impacts on fish species.

A detailed Significant Impact Assessment for this species is provided in Section 5.2.5.

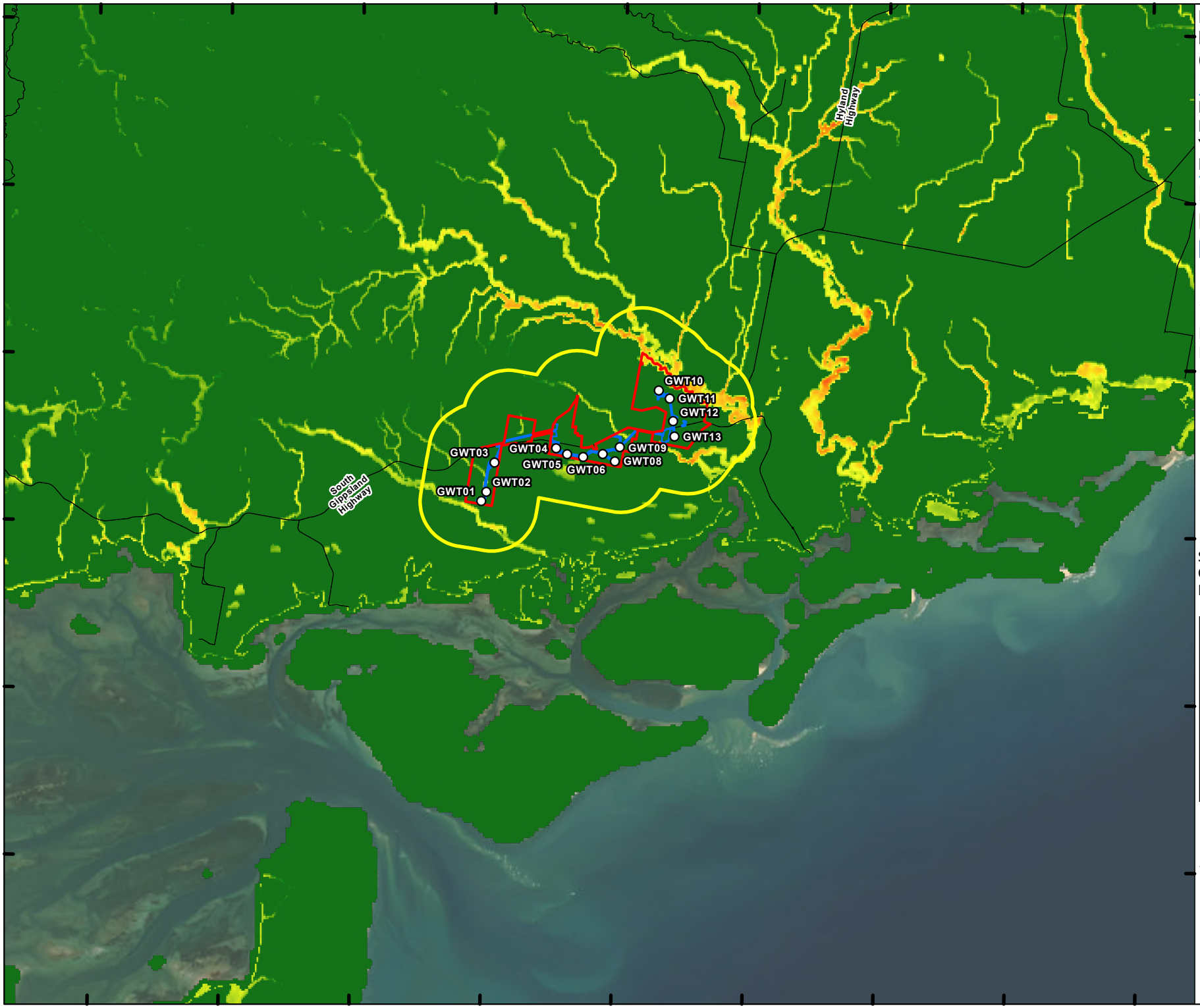

Figure 15. Dwarf Galaxias habitat distribution model (DEECA 2025b)

Project No: 14107.17
Project: Gelliondale Wind Farm, Yarram, VIC
Date: 2/04/2026

Site boundary
Site boundary (2km Buffer)
Project footprint
Turbine
Road

Dwarf Galaxias Habitat Distribution Model (HDM)

High suitability
Low suitability

Source: Esri, Maxar, Earthstar Geographics, DEECA 2025b - Habitat Distribution Models

N
Kilometres
0 2 4 6
GDA2020 Vicgrid

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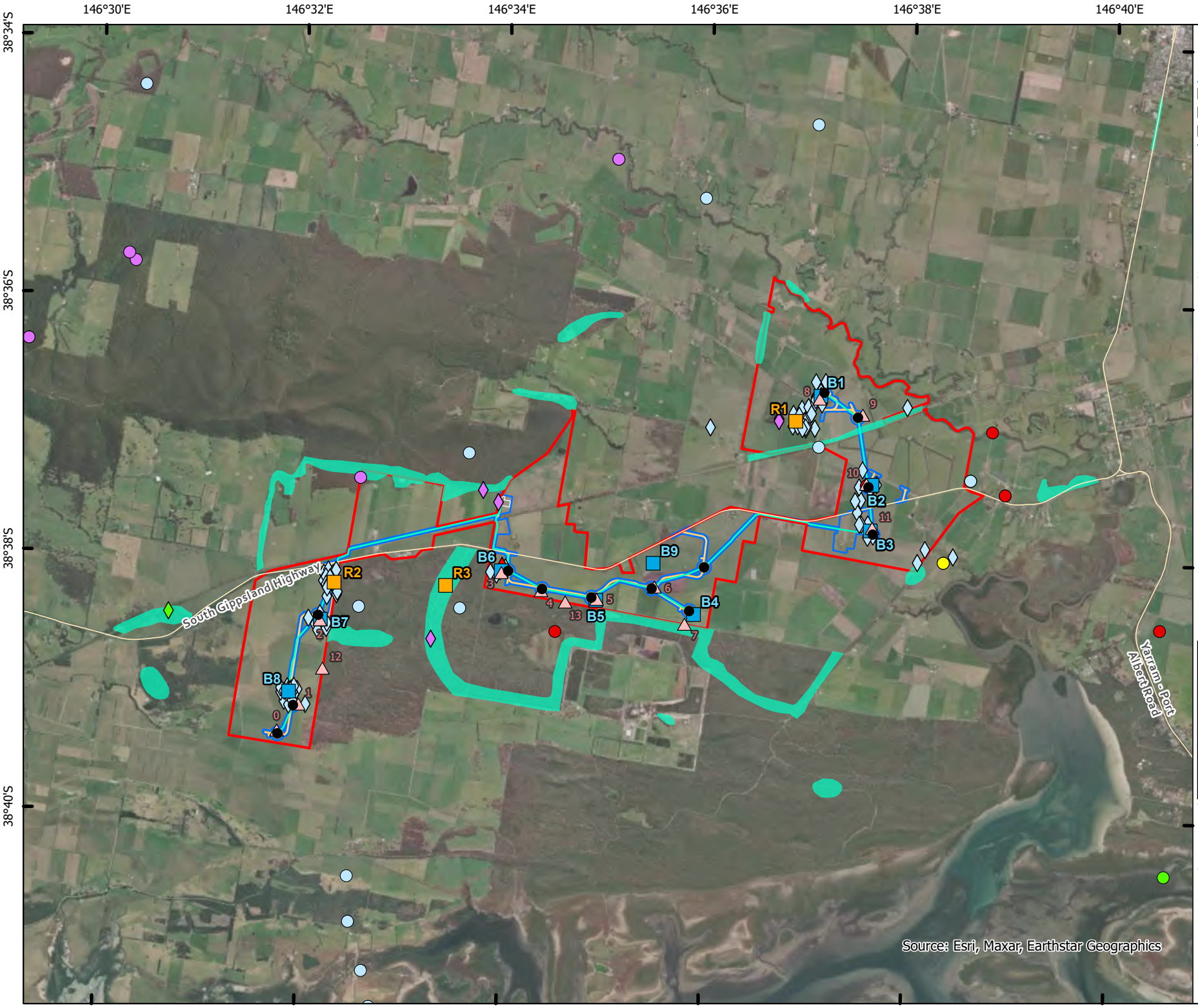

Figure 16: MNES at Gelliondale Wind Farm

Project No: 14107.22
Project: Synergy Wind Pty Ltd
Date: 1/04/2026

- Wind farm boundary
- Application footprint
- Access track
- Substation
- Electrical cable
- Turbine

Survey point

- BUS impact
- BUS reference
- Bat detector

Nature Advisory survey species observation

- Blue-winged Parrot
- Gang-gang Cockatoo
- Latham's Snipe
- Swift Parrot

VBA survey species observation

- Blue-winged Parrot
- Gang-gang Cockatoo
- Latham's Snipe
- Swift Parrot
- Fork-tailed Swift
- Swift Parrot and Gang-Gang Cockatoo suitable habitat search areas

N

Kilometres
0 2

GDA2020 Vicgrid

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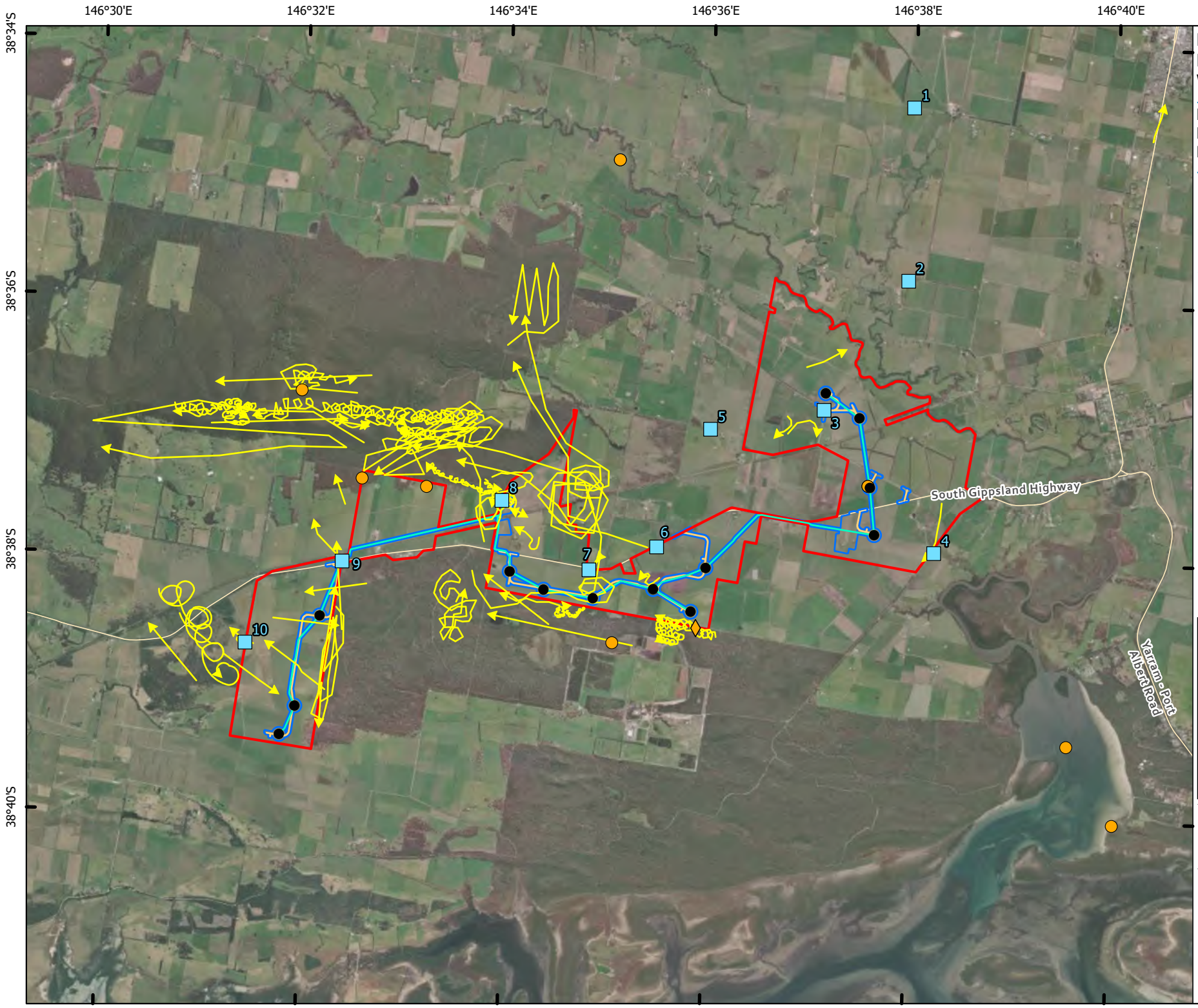

Figure 17: White-throated Needletail at Gelliondale Wind Farm

Project No: 14107.22
Project: Synergy Wind Pty Ltd
Date: 1/04/2026

- Wind farm boundary
- Application footprint
- Access track
- Substation
- Electrical cable
- Turbine
- White-throated Needletail survey point
- Nature Advisory White-throated Needletail observation
- VBA White-throated Needletail observation
- White-throated Needletail flight path

Source: Esri, Maxar, Earthstar Geographics

N

Kilometres
0 2

GDA2020 Vicgrid

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5. Impacts to Matters of National Environmental Significance

5.1. Potential impact pathways

Corner Inlet Ramsar Wetland

Several factors are listed as potential threats to the ecological character of the Corner Inlet Ramsar Site (RSIS 2020), including:

- *Pollutants affecting water quality* - Rising levels of sediment and nutrient runoff from the surrounding catchment area, mainly due to agricultural and forestry activities, are negatively impacting water quality (WGCMA, 2013). These pollutants threaten the health and distribution of seagrass and reduce the productivity of mudflats, which can disrupt the ecosystems that depend on these habitats;
- *Marine invasive species* – Three major invasive marine species pose a risk to the Ramsar site: the Northern Pacific Seastar, the European Shore Crab, and the Mediterranean Fanworm. Others may also pose a level of risk, including terrestrial invasive species (e.g. weed incursions);
- *Climate change* – Sea level rise of 17 to 50 cm is projected for Gippsland's southern coastline by 2070 (McInnes & Zhang 2024). This could cause coastal erosion, especially affecting island areas. Changing water levels may alter the size and distribution of key habitats, with particular concern for salt marsh and mangrove communities. These ecosystems face long-term risks due to barriers such as levees, seawalls, and other infrastructure that prevent their inland migration. More frequent storm surges could also further damage coastal environments; and
- *Hydrological changes* – Shifts in the amount, timing, frequency, and duration of freshwater flows influence water conditions in Corner Inlet's estuaries and bays. These hydrological changes can affect the ecological functions and biodiversity that rely on stable water regimes.

Native Vegetation, ecological communities, and flora

The identified impact pathways for native vegetation and flora species are:

- Direct vegetation and habitat loss from clearance, earthworks and physical disturbance; and
- Habitat and vegetation degradation from direct and indirect pathways including introduction or spread of invasive species or pathogens, edge effects, barrier effects, surface hydrological changes, deposition of eroded sediments or from contamination caused by accidental spills of hazardous materials.

The key activity with the potential to impact native vegetation and listed flora values is physical disturbance and earthworks during construction. Physical disturbance includes vegetation clearance, excavation, trenching and earthworks such as stockpiling or cut-and-fill material movements required to construct the project infrastructure. The shape, size and duration of physical disturbance (i.e., temporary or permanent) influences the degree to which vegetation and listed flora may be impacted. Physical disturbance will primarily occur during construction, although a small amount of physical disturbance is expected during decommissioning of the Project. Physical disturbance during the operational phase for maintenance, replacement or repair of infrastructure is expected to be rare and limited to areas already cleared during construction (e.g. hardstand areas and formed tracks) where native vegetation is unlikely to be present.

Physical disturbance for the construction of the project infrastructure may result in the clearance of some native vegetation. Clearing of native vegetation can result in habitat fragmentation, whereby previously contiguous areas of habitat are separated into smaller patches.

Weeds and pathogens may be lodged and transported in construction plant and equipment and then driven through the area. Plant and equipment used within the area can also spread weeds and pathogens to other areas, causing potential infestations further afield. Six declared noxious weed species (listed under the CALP Act) were recorded in the Project Area, including African Box-thorn (*Lycium ferocissimum*), Blackberry (*Rubus fruticosus spp. agg.*), Hawthorn (Crataegus monogyna), Sweet Briar (*Rosa rubiginosa*), Soursob (*Oxalis pes-caprae*), and Spear Thistle (Cirsium vulgare).

Earthworks and vehicle movements can result in dust deposition on adjacent vegetation, which can result in smothering. Unauthorised access to areas of native vegetation can result in damage to vegetation and/or soil, as well as the ingress of weeds and pathogens. Unauthorised access can occur where roads/tracks are not followed by vehicles, where areas of native vegetation are used for parking vehicles or where these areas are used for stockpiling or laydown of materials.

Fauna and their habitats

The impact pathways affecting fauna species are categorised into two groups: construction and operational impacts.

Construction impacts

- Direct habitat loss from clearance, earthworks and physical disturbance. This includes construction and maintenance works during operation that involve earthworks, noise, and dust;
- Direct loss of individuals by increased traffic and associated rates of roadkill (e.g. Southern Brown Bandicoots); and
- Habitat degradation from direct and indirect pathways, including introduction or spread of invasive species or pathogens, edge effects, barrier effects, surface hydrological changes, deposition of eroded sediments or contamination caused by accidental spills of hazardous materials. The project is not considered to change impacts to fauna or their habitats in the event of a flood, including from increased sediment run-off or erosion.
- Increased light and noise pollution during construction

Operational impacts

- Collision of birds and bats with WTGs and/or transmission lines

In addition to these pathways, the following threatening processes have the potential to be exacerbated by the Project:

- Barotrauma risk for bats,
- Habitat fragmentation,
- Increase in sediment input into rivers, streams, and wetlands,
- Infection of amphibians with Chytrid Fungus, resulting in chytridiomycosis,
- Invasion of native vegetation by 'environmental weeds',
- Loss of coarse woody debris from native forests and woodlands,
- Loss of hollow-bearing trees from native forests,

- Increased light and noise pollution during operation, and
- Increased risk of fire incursion, including increased fire incursion into Gelliondale and Alberton State Forest Areas or along riparian vegetation corridors.

5.2. Impact Assessments

5.2.1. Comparison between alternate designs

The GWF is preceded by the larger Alberton Wind Farm (AWF). A comparison of the two wind farm layouts indicates that the revised design substantially reduces potential environmental impacts.

The original layout (AWF,c 2016), comprising 34 turbines, was estimated to result in the removal of approximately 1.317 ha of native vegetation, including 16 trees. In contrast, the revised layout (GWF) proposes 13 turbines, reducing the extent of native vegetation removal to approximately 1.244 ha and only two trees. The 62 % reduction in turbine numbers is expected to reduce collision risk by decreasing the number of turbines that birds may encounter within the landscape. Fewer turbines correspond to a lower density of potential collision hazards, thereby reducing the overall likelihood of bird-turbine interactions. This risk reduction would apply to all species, including all the assessed listed and migratory birds and bats.

In addition to the reduced physical footprint, the spatial arrangement of turbines has also improved. The original design included turbines located in close proximity to, and between, the Alberton and Gelliondale State Forests, as well as within 1 km of the Corner Inlet Ramsar site. This configuration presented a higher potential risk to biodiversity values, including species utilising the Ramsar wetland and those moving between the State Parks (such as the White-throated Needletail).

The revised GWF layout, as proposed here, increases separation distances from both the Ramsar site and the State Parks, thereby reducing the likelihood of disturbance to key habitats and movement corridors. Furthermore, the reduced number of turbines lowers the overall risk of bird and bat collision and results in a smaller overall impact on native vegetation.

Overall, the GWF layout represents a clear improvement in terms of minimising ecological risk and impact when compared to the original AWF design.

5.2.2. Impacts to Corner Inlet Ramsar Wetland

The significant impact assessment found that the proposed action is unlikely to cause significant impacts to the Corner Inlet Ramsar Wetland or modify its ecological character. The proposed action will not directly impact any part of the Ramsar Site, with potential impacts confined to downstream effects as a result of sediment run-off from construction flowing into waterbodies that discharge into the Corner Inlet estuary and impacts to birds protected by the Ramsar listing that may be at risk of turbine collision if they fly over the proposed wind farm.

An action is likely to have a significant impact on the ecological character of a declared Ramsar wetland if there is a real chance or possibility that it will result in any of the significant impact criteria listed in Table 20 (DoE 2013a, p. 13).

Table 20: Significant Impact Assessment – Corner Inlet Ramsar Wetland

Significant Impact criterion	Assessment	Significant Impact likelihood
Areas of the wetland being destroyed or substantially modified	The impact footprint of the proposed action does not intersect with the Corner Inlet Ramsar Site. The shipping transport route to Port Anthony-Barry Beach Marine Terminal traverses deeper water (≥10 m) that does not coincide with identified wetland habitat types. As such, no direct impacts to the wetland are anticipated. The only potential pathways to impacts are through indirect impact. The most likely pathways for impacts from the proposed action on the wetland are: ▪ Increased sediment deposition within waterways causing loss of stream habitats (mangroves, saltmarsh and seagrass beds), ▪ Sediment-driven increases in turbidity impacting seagrass meadows and benthic microalgae (and indirectly through them, waterbirds), ▪ Mobilisation of acid sulphate soils, ▪ Contamination from oil, fuel or chemical spills (inc. from weed/pest control), and ▪ Disturbance of contaminated soil. All other indirect impacts were assessed as "unlikely" in the hydrological (Alluvium 2025) and contamination reports (Accent 2025b). None of the 14 types of wetland habitats are expected to be significantly impacted. Assessments found that increases in annual runoff are possible, but they would increase by a minor amount when compared to the size of the catchment (Alluvium 2025). Sediment-laden and contaminated runoff may spread from points where proposed access tracks intersect with waterways within the impact footprint, unless appropriate mitigation measures are taken to prevent this. An Environmental Management Plan (EMP; Accent 2025a) can address these mitigation measures to further reduce potential impacts. Impacts on seagrass meadows and benthic microalgae would be likely low in extent, and highly localised around waterways that had received sediment from the proposed action, such as Albert and Jack River mouths (Alluvium 2025). There is some limited potential for acid sulphate soils to be disturbed, mobilised, and flow into waterways and the wetland as a result of the proposed action (Alluvium 2025). However, impacts from these can be controlled with appropriate, standard mitigation measures that can be outlined in an EMP (Accent 2025a).	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	An Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) for the proposed action will address these mitigation measures and include items such as appropriate sediment control measures to prevent this impact from occurring. The above analysis indicates that the proposed action is unlikely to result in areas of the wetland being destroyed or substantially modified.	
A substantial and measurable change in the hydrological regime of the wetland, for example, a substantial change to the volume, timing, duration and frequency of ground and surface water flows to and within the wetland	Increases in the total annual volume of runoff entering the Corner Inlet Ramsar wetland are considered possible (Alluvium 2025). However, this increase in volume is negligible when compared to the volume of runoff from the whole catchment (which also flows into the wetland). The increase in volume is also highly likely to be within the range of regular natural variation. The hydrological assessment considered all other changes in the hydrological regime to be unlikely to occur because of the proposed action (Alluvium 2025). Both this assessment and the hydrological assessment (Alluvium 2025) therefore consider that the proposed action is unlikely to result in a substantial and measurable change in the hydrological regime of the wetland.	**Unlikely**
The habitat or lifecycle of native species, including invertebrate fauna and fish species, dependant upon the wetland being seriously affected	Sedimentation (both sediment deposition and sediment-driven increases in turbidity) was considered to be the strongest possible impact from the proposed action (Alluvium 2025). Large increases in sediment deposition may smother mangroves (burying their pneumatophores in sediment so they no longer function), saltmarsh and seagrass (blocking sunlight so photosynthesis is inhibited; Alluvium 2025). Increases in turbidity could also reduce sunlight levels available for seagrass and benthic microalgae, adversely impacting both (Alluvium 2025). The latter forms the base of the food chain, so impacts to them may cause waterbirds (Alluvium 2025) and fish to be indirectly impacted as well. In extreme cases, increases in turbidity may cause sediment to clog the gills of fish and interfere with their gas exchange processes, resulting in direct mortality. However, the above impacts were considered unlikely. Any increase in turbidity is likely to be small, and the "moderate" rating of severity is simply a reflection of the degraded and highly threatened status of seagrass beds and their low ability to withstand increasing pressures against their survival (Alluvium 2025). Any sediment runoff and deposition resulting from the proposed action is also likely to be highly localised around point sources where	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	proposed tracks intersect waterways; widespread impacts are not anticipated (Alluvium 2025). Finally, both of the above impacts can largely be prevented and managed by the adoption of appropriate sediment control measures in the EMP for the proposed action (Alluvium 2025a). The above analysis indicates that the proposed action is unlikely to result in the habitat or life cycle of native species dependent on the wetland being seriously affected.	
A substantial and measurable change in the water quality of the wetland – for example, a substantial change in the level of salinity, pollutants, or nutrients in the wetland, or water temperature which may adversely impact on biodiversity, ecological integrity, social amenity or human health	Increases in the total annual volume of runoff entering the Corner Inlet Ramsar wetland are considered possible, which would also result in a decrease in salinity in the wetland (Alluvium 2025). However, this increase in volume is negligible when compared to the volume of runoff from the whole catchment (which also flows into the wetland; Alluvium 2025). The increase in volume is also highly likely to be within the range of regular natural variation (Alluvium 2025). By extension, the decrease in salinity in the wetland caused by the proposed action is also likely to be negligible and within the range of regular natural variation (Alluvium 2025). Hydrological assessments identified that it is possible that chemicals used during the construction process may wash into the wetland if spilled, disposed of incorrectly or inappropriately used in sensitive locations (Alluvium 2025). These may include substances toxic to aquatic life, and/or nutrients that could prompt undesirable biotic processes like eutrophication. However, the EMP will include appropriate mitigation measures to prevent this impact from occurring, and to quickly clean and contain any chemical spills that do occur (Alluvium 2025a). Additionally, given the very large size of the Corner Inlet Ramsar Site relative to the localised scale of any spill that could conceivably occur, it is unlikely that a substantial change in water quality across the Ramsar Site would occur. Sedimentation has been previously discussed – see the Assessment for the previous criterion. Appropriate mitigation measures are likely to prevent sediments from causing a significant impact (Alluvium 2025). No other aquatic pollutants were identified in the hydrological assessment as plausibly entering the wetland due to the proposed action (Alluvium 2025). The hydrological assessment did not identify any substantial changes in water temperature of the wetland could plausibly be caused by the proposed action (Alluvium 2025).	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	Collectively, the above information indicates that it is unlikely the proposed action would result in a substantial and measurable change in the water quality of the wetland.	
An invasive species that is harmful to the ecological character of the wetland being established (or an existing invasive species being spread) in the wetland.	The following invasive species are listed as potentially or actually harmful to the ecological character of the wetland (RSIS 2020): Cord Grass, Sea Spurge, Pacific Seastar, European Shore-crab, rabbits, black rats, foxes, and European fan-worm. The proposed action could plausibly cause the invasive plants and invertebrates to establish and/or spread by introducing or spreading these species in contaminated soil, sediments or runoff. However, the risk of the project causing an increase in marine invasive species is considered low (Fathom Pacific 2025). And the risk of weeds and terrestrial pests can be managed through the construction mitigation measures to be employed to prevent the spread of these organisms, including the disinfection of footwear, vehicles, tools and equipment prior to entry to sensitive areas (particularly areas where the impact footprint intersects with waterways). These are standard measures used to prevent impacts from construction on environmentally sensitive areas and are widely considered to work. The construction mitigation measures will be fully documented and detailed in the EMP (Accent 2025a). Collectively, the above information indicates that it is unlikely the proposed action would result in an invasive species harmful to the ecological character of the wetland, establishing or spreading through the area.	**Unlikely**
Overall assessment		**Unlikely**

As a result, the proposed action is considered unlikely to either directly or indirectly result in:

- changes to availability of foraging resources
- disturbances to listed threatened and listed migratory species roosting/foraging habitat
- increase in litter
- increased predation

5.2.3. Impacts on listed ecological communities

The proposed development footprint and transport routes will not result in the loss of any threatened ecological communities, as targeted surveys and comparison to published descriptions

of communities with modelled potential to occur within the study area confirmed that none are present within the study area.

5.2.4. Impacts on listed flora species

The following flora species have the *potential* to be impacted by the proposed action, as determined by the assessment results and likelihood of occurrences (see Section 4.2.3 and Appendix 2).

River Swamp Wallaby-grass / Strzelecki Gum

Analysis showed that these species were likely to occur within the Flora and Fauna Study Area (Appendix 2). However, no individual plants were identified in targeted flora surveys throughout the wider initial layout, and no suitable treed or wetland habitat will be removed by the currently proposed layout or transport route. Surveys took place at a suitable time 2nd to 4th of November 2016) to identify Strzelecki Gum. This species can only be differentiated from similar Swamp Gum during late spring, when it displays distinctly glaucous (waxy) new growth. As such, no significant impacts to these species are expected from the project.

Eastern Spider-orchid / Thick-lip Spider-orchid / Clover Glycine / Maroon Leek-orchid / Dense Leek-orchid / Metallic Sun-orchid

These species were likely to occur only in the adjacent State forests (Appendix 2), which have been excluded following design changes to mitigate impacts. None of these species were found during targeted surveys throughout the wider initial layout. These were conducted in early November, which is an appropriate time of year to survey for them. Given that none of these species were found during targeted surveys, and that the layout avoid areas of suitable habitat, it is unlikely that any of these species occur in the impact area. No significant impacts to these species are expected from the project.

5.2.5. Impacts on threatened fauna species

The following fauna species have the *potential* to be impacted by the proposed action, as determined by the assessment results and likelihood of occurrences (see Section 4.2.4 and Appendix 3).

Threatened Birds

Blue-winged Parrot

The significant impact assessment found that the proposed action is possible to cause significant impacts to the Blue-winged Parrot, unless mitigation measures are implemented. Implementation of mitigation measures will reduce the likelihood of a Significant Impact (see Section 6)

An action is likely to have a significant impact on this vulnerable species if there is a real chance or possibility that it will meet any of the significant impact criteria listed in Table 21 (DoE 2013a, p.10).

Table 21: Significant Impact Assessment – Blue-winged Parrot

Significant Impact criterion	Assessment	Significant Impact likelihood
Lead to a long-term decrease in the size of an important population of a species.	The Blue-winged Parrot population is roughly estimated at 10,000 mature individuals (Holdsworth et al. 2021). They are highly mobile, with their population spreading across a vast range in mainland Australia that extends up to north-eastern South Australia, south-western Queensland, and western New South Wales (Birdlife International 2022). The species was frequently observed at most BUS Points, albeit in higher numbers at those near wooded areas. In spring/summer, flocks consisted of up to 8 birds, with larger flocks in autumn (up to 39 individuals). The species was semi-regularly seen at height, with 87 or 14.8 % of flights recorded at RSA height. Flight heights differed between seasons, with 8.3 % in spring (3 birds), 54.5 % in summer (18 birds), 13.1 % in autumn (68 birds), and 11.8 % in winter (6 birds). The species is known elsewhere to fly at 40 m (approximately 60 % of all observed flights from Nature Advisory at other wind farms in Victoria and Tasmania; Nature Advisory *unpub. data*). Collision mortalities are known from other wind farms (Nature Advisory *unpub. mortality data*). If collision mortalities do occur, they are anticipated to be more frequent during summer and autumn. These may represent a sufficiently large portion of the population to cause a long-term decline. Collision should be proactively managed through BAM Plan, which will detail adaptive strategies for mitigating risk and collision events to Blue-winged Parrots. It is expected that the implementation of these will reduce the likelihood of a Significant Impact to the species.	**Possible** (if no mitigation measures implemented) OR **Unlikely** (if mitigation measures implemented)
Reduce the area of occupancy of an important population.	The study area and transport route comprises mostly highly modified farmland. The small amount of native vegetation planned to be removed (less than 2 ha), including the removal of a few trees, is unlikely to have any impact on the Blue-winged Parrot occupancy. This level of clearance is not expected to directly or indirectly impact on-site habitat, which consists mainly of cleared land and grazing paddocks. The nearby woodland, likely used for breeding, will not be impacted by the proposal. The GWF will not reduce the area of occupancy of the Blue-winged Parrot population.	**Unlikely**
Fragment an existing important population into two or more populations.	Although farmland activities such as livestock grazing can degrade grassland habitat and reduce food resource availability (DCCEEW 2023a), the project activities during construction, operations and decommissioning are not	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	expected to worsen these impacts or contribute further to habitat fragmentation. In Victoria, it is typically seen in small flocks using a range of open habitats with broad post-breeding dispersal across the state and no evidence of defined migratory routes through the Project Area (Higgings 1999). There is little evidence that wind farms pose a barrier for this species. It is not expected that the local or migratory population in the area would be impacted through fragmentation.	
Adversely affect habitat critical to the survival of a species.	According to the Conservation Advice for this species (DCCEEW 2023a), habitat critical to the survival of this species includes foraging, roosting, breeding, and staging habitats, including grasslands, grassy woodland and semi-arid chenopod shrubland, and nearby hollow-bearing trees and stumps. Much of such habitat is modelled (Figure 4) and known from the local area. Breeding habitat in the Project Area and transport routes is confined to nearby State parks, with none present within the project's footprint. Further, no mature trees with hollows are proposed for removal. Foraging habitat in the Project Area and along the transport route mainly comprises grazing paddocks and cleared farmland, which is abundant throughout the project site and wider region, including in higher quality patches than present in the impacted zones. It is not anticipated that the impacts to foraging/staging habitats within the project footprint represent an adverse impact on habitats critical to the survival of this species. There is no indication that the proposed GWF site will affect habitat critical to the Blue-winged Parrot.	**Unlikely**
Disrupt the breeding cycle of a population.	There is a potential small breeding population (8 birds) that forages within the project area and nests in the nearby wooded State Parks. It is unlikely that the breeding habitat will be disturbed through the proposed actions. Impacts to the breeding cycle may occur through collision mortality of nesting birds. However, due to the low number of nesting birds (up to 8), the loss of these breeding pairs would not be considered a nationally significant size.	**Unlikely**
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Blue-winged Parrot habitat in the Project Area and transport route is largely associated with foraging areas and potential staging areas, consisting of lower-quality grazed paddocks and cleared farmland. These areas will not be further altered in a way that would significantly impact the availability or quality of the species' food plants	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	(common exotic and native species; DCCEEW 2023a) or the availability of the habitat in general. There is no indication that the proposed project will affect Blue-winged Parrot habitat availability or quality.	
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. It is unlikely that the GWF will introduce or cause the proliferation of an invasive species that could cause the species to decline.	**Unlikely**
Introduce disease that may cause the species to decline.	The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. It is unlikely that the GWF will introduce or cause the proliferation of a disease that may cause the species to decline.	**Unlikely**
Interfere substantially with the recovery of the species.	A recovery plan for this species has not been prepared, though is noted as required by DCCEEW. So, to assess against this point we utilised the listed threats to the species identified in the Conservation Advice (DCCEEW 2023a). The proposed project is unlikely to substantially increase any of the identified threats.	**Unlikely**
Overall assessment		**Possible**

Gang–gang Cockatoo

The significant impact assessment found that the proposed action is unlikely to cause significant impacts to the Gang-gang Cockatoo. The development of adaptive mitigation measures included within a Bat and Avifauna Management Plan (BAM Plan) will reduce impacts further.

An action is likely to have a significant impact on this endangered species if there is a real chance or possibility that it will meet any of the significant impact criteria listed in Table 21 (DoE 2013a, p.10).

Table 22: Significant Impact Assessment – Gang-gang Cockatoo

Significant Impact criterion	Assessment	Significant Impact likelihood
Lead to a long-term decrease in the size of a population.	Three observations of Gang-gang Cockatoo flocks during field surveys coupled with numerous records from the region suggest the species is an infrequent but regular visitor to the site. Lower numbers would be expected in the warmer months when the species migrate into the highlands to the north (DAWE 2022a). The species may occasionally fly through the site during the colder months when traversing between foraging habitats or from its summer highland range. The majority of historical records and modelled habitat are constrained to the heavily treed areas, such as Alberton and Gelliondale State parks, where suitable food resources exist (e.g. flowers, seed pods, etc.). The species was too scarce at GWF to have sufficient data to run a collision risk model. Collision with WTGs is known, though Nature Advisory's collision mortality database contains very few records of Gang-gang Cockatoo from over 17 years of monitoring (Nature Advisory *unpub. mortality data*). So, while there is potential for the species to interact with the turbines at GWF, the frequency and likelihood of impacts are considered low. Collision should be proactively managed through the BAM Plan, which will detail adaptive strategies for mitigating risk and collision events to Gang-gang Cockatoos.	**Unlikely**
Reduce the area of occupancy of the species.	Gang-gang Cockatoo occupancy is closely tied to the availability of their preferred foraging habitat, which is tall eucalypt woodland (DAWE 2022a). The highest quality patches are within the adjacent State parks (Figure 5), with very little low-quality habitat present across the rest of the Project Area and transport route. The project proposes the removal of approximately 0.13 ha of heathy woodland that may provide some level of suitable foraging habitat and two manna gums in HZ DD and DC (Figure 3). This comprises three patches near Port Anthony along the transport route, several kilometres away from the known high-quality habitat at Alberton and Gelliondale State parks. A removal of this extent, particularly considering the	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	infrequent occurrence of the species and abundance of nearby high-quality habitat, is unlikely to impact the area of occupancy for the species.	
Fragment an existing population into two or more populations.	The Gang-gang Cockatoo is a broad-ranging species that is present across much of Victoria (Higgins 1999). No key habitat corridors exist at the project scale that would be impacted or cause fragmentation. The Project Area and transport route likely represent non-breeding habitat for species that breed in summer in mature, wet sclerophyll forests (DAWE 2022a). So, it is unlikely that the proposed project will cause a fragmentation of the species' movement or breeding habitat.	**Unlikely**
Adversely affect habitat critical to the survival of a species.	Habitat critical for Gang-gang cockatoos includes both breeding and foraging habitat (DAWE 2022a), both of which are largely comprised of tall eucalypt forest. The Project Area and transport route represent lower quality non-breeding habitat for the species, which breeds in mature, wet sclerophyll forests largely in the alpine areas far to the north (DAWE 2022a). No breeding habitat is present within the Project Area and transport route, and due to the preference for mature wet forests in alpine areas, it is considered unlikely that any breeding habitat will exist in the surrounding landscape. The project proposes the removal of approximately 0.13 ha of heathy woodland that may provide some level of suitable foraging habitat. A removal of this extent, particularly considering the infrequent occurrence of the species and abundance of nearby high-quality habitat, is unlikely to impact habitat critical to the survival of the species.	**Unlikely**
Disrupt the breeding cycle of a population.	Gang-gang Cockatoo breeds in tall, mature, wet sclerophyll forests (DAWE 2022a), which are not present in the study area. The project is unlikely to disrupt the breeding cycle of the Gang-gang Cockatoo.	**Unlikely**
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The project proposes the removal of approximately 0.13 ha of heathy woodland that may provide some level of suitable foraging habitat, but of a poor quality relative to that present in the surrounding landscape (i.e. State parks). The project's impacts upon native vegetation are unlikely to result in the decline of the Gang-gang Cockatoo.	**Unlikely**
Result in invasive species that are harmful to an endangered or critically endangered species becoming established in the	The proposal is unlikely to result in the introduction or proliferation of an invasive species that may be harmful to these species. A number of invasive species are already established, including cats, European honeybees and a range of birds such as Common Myna and European Starlings. These species may have some impact on the	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
endangered or critically endangered species' habitat.	Gang-gang Cockatoo, but their impacts will not be promoted by the actions of the proposed development. The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. Therefore, it is unlikely that the GWF will introduce or cause the proliferation of an invasive species that could cause the species to decline.	
Introduce disease that may cause the species to decline.	The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. It is unlikely that the GWF will introduce or cause the proliferation of a disease that may cause the species to decline.	**Unlikely**
Interfere with the recovery of the species.	The proposal may reduce the availability of foraging habitat. However, this is very small (0.13 ha) in the context of the area. No impacts are expected on the breeding or movement of the species. So, it is unlikely the project will interfere with the recovery of the species.	**Unlikely**
Overall assessment		**Unlikely**

Latham's Snipe

The significant impact assessment found that the proposed action is unlikely to cause significant impacts to the Latham's Snipe. The development of adaptive mitigation measures included within a Bat and Avifauna Management Plan (BAM Plan) will reduce impacts further.

An action is likely to have a significant impact on this vulnerable species if there is a real chance or possibility that it will meet any of the significant impact criteria listed in Table 23 (DoE 2013a, p.10).

Table 23: Significant Impact Assessment – Latham's snipe

Significant Impact criterion	Assessment	Significant Impact likelihood
Lead to a long-term decrease in the size of an important population.	An important population of Latham's Snipe is defined as an area supporting 18 or more birds (DoE 2017). No such habitat has been identified onsite, with the species observed four times in a maximum flock size of 1. There is no identified important population onsite, with the nearest likely being within the Corner Inlet Ramsar wetland, which is unlikely to be impacted (Alluvium 2025). Consequently, no impacts are expected on habitat that could lead to a long-term decrease in the size of an important population. Latham's Snipe are a typically low-flying species with flights between roosts and foraging habitat typically below 40 m (B. Hansen *pers. comm.*). Migratory and other long-distance flights are often well over 1,000 m in height. No Latham's Snipe have been recorded in large, publicly available bird mortality datasets associated with wind farms in Victoria (cite), or in Nature Advisory's own extensive dataset of bird mortalities at wind farms over the last 17 years (Nature Advisory *unpub. mortality data*). As such, collisions are considered unlikely to lead to a long-term decrease in the size of an important population of Latham's Snipe. Collision should be proactively managed through the BAM Plan, which will detail adaptive strategies for mitigating risk and collision events to Latham's Snipe.	**Unlikely**
Reduce the area of occupancy of an important population.	No important population or important habitat has been identified within the project site. The only area of wetland habitat that occurs in the impacted areas of the Project Area and transport route is HZ C (Figure 3). This is an area of Aquatic Herbland (EVC 653) that is described as one of several semi-permanent wetlands occurring in low-lying areas of paddocks and drainage lines (Nature Advisory 2025). Vegetation in these wetlands consists of rushes, aquatic herbs, and exotic tussock-forming grasses, all of which provide structurally suitable daytime roosting	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	habitat for the species (DCCEEW 2024c, Hansen et al. 2024). When inundated, low-lying paddocks may be opportunistically used by the species. However, under these conditions, it is expected that there will be a wide range of other habitats available, particularly those with more native vegetation cover and prey availability. For this reason, it is not expected that paddocks within the Project Area, even when inundated, will provide important habitat for the species. HZ C appears to be an area that could plausibly be used by Latham's Snipe, though this was not where the species was observed (Figure 16). The area that will be removed by the proposed action is approx. 0.05 ha of this potentially suitable habitat. As such, it is considered unlikely that the project will reduce the area of occupancy of an important population of the species.	
Fragment an existing important population into two or more populations.	The Australian population of Latham's Snipe is considered the one population, East Asian-Australasian Flyway population, which spreads across the mainland and Tasmania during their non-breeding season in the austral summer (DoE 2017). While wind farms are generally considered a barrier to migratory species (DoE 2017), it is unlikely that the size and location of this farm will fragment the flyway population. Further, the habitat of the species will not be impacted through the proposed project. Therefore, the proposed action is unlikely to fragment an existing important population into two or more populations.	**Unlikely**
Adversely affect habitat critical to the survival of a species.	Areas of nationally or internationally important habitat are considered habitat critical to the survival of the species DCCEEW 2024c). This is defined as areas supporting more than 18 birds at once (DoE 2017). The maximum number of birds observed at once was one, all being around a dam, which does not qualify as high-quality habitat. Impacts to potential habitat in the Project Area and transport route include the 0.05 ha of HZ C (Figure 3), with represents a low-quality foraging habitat of farm land. The extent of these impacts is unlikely to affect the survival of the species and is unlikely to affect habitats defined as critical.	**Unlikely**
Disrupt the breeding cycle of an important population.	This species does not breed in Australia (Higgins 1999). As such, the proposed action is unlikely to disrupt the breeding cycle of an important population of the species.	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The proposal includes the removal of 0.05 ha of potential habitat from HZ C. When inundated, low-lying paddocks may be opportunistically used by the species. However, under these conditions, it is expected that there will be a wide range of other habitats available, particularly those with more native vegetation cover and prey availability. For this reason, it is not expected that paddocks within the Project Area, even when inundated, will provide important habitat for the species. No important areas of habitat will be modified, destroyed, isolated, or experience a decrease in quality or availability. Given the very small area of potentially important Latham's Snipe habitat to be removed and its lower quality, particularly in the wider context of abundant higher-quality habitat available at Corner Inlet Ramsar Wetland, it is considered unlikely that the proposed action will cause the species to be likely to decline.	**Unlikely**
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The invasive species identified as threats to Latham's Snipe in the *Conservation Advice* for the species (DCCEEW 2024c) are cats and foxes. Both predators already exist in the area and there is no apparent mechanism or clear reason why the proposed action would result in their proliferation. The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. Therefore, it is unlikely that the GWF will introduce or cause the proliferation of an invasive species that could cause the species to decline.	**Unlikely**
Introduce disease that may cause the species to decline.	No diseases have been identified as threats to Latham's Snipe in the *Conservation Advice* for the species (DCCEEW 2024c). Further, the project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. It is unlikely that the GWF will introduce or cause the proliferation of a disease that may cause the species to decline.	**Unlikely**
Interfere substantially with the recovery of the species.	Modelling (DEECA 2025b) and data suggest that the proposed action is not situated in an area where important habitat is known to occur. A very small amount of	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	potentially habitat (0.05 ha) is proposed for removal. The extent of impacts is not considered sufficient to interfere substantially with the recovery of the species, as it is unlikely to result in any observable or measurable changes to the population.	
Overall assessment		**Unlikely**

Swift Parrot

The significant impact assessment found that the proposed action is unlikely to cause significant impacts to the Swift Parrot. The development of adaptive mitigation measures included within a Bat and Avifauna Management Plan (BAM Plan) will reduce impacts further.

An action is likely to have a significant impact on this critically endangered species if there is a real chance or possibility that it will meet any of the significant impact criteria listed in Table 24 (DoE 2013a, p. 10).

Table 24: Significant Impact Assessment – Swift Parrot (EPBC Act: Critically Endangered)

Significant Impact criterion	Assessment	Significant Impact likelihood
Lead to a long-term decrease in the size of a population.	Few records for this species exist in the area. A single observation of a Swift Parrot during field surveys and a single historical record suggest the Swift Parrot is an infrequent visitor to the site. However, we would expect their prevalence to be higher during migration periods or when local food plants are in flower. We note surveys were undertaken during both these times of expected higher utilisation, but only a single bird was observed. Moreover, no other Swift Parrots were observed during any other bird surveys which totalled to over 697 hours of surveys. Owing to the extremely low population of the species, the removal of any individuals could have an impact on the population size. However, the apparent low site utilisation, coupled with a low modelled collision risk (Smales 2005) and the lack of mortalities at any operating wind farms monitored by Nature Advisory throughout southeast Australia (Nature Advisory *unpub. mortality data*), suggests the likelihood of collision is very low. Collision should be proactively managed through the BAM Plan, which will detail adaptive strategies for mitigating risk and collision events to the Swift Parrot.	**Unlikely**
Reduce the area of occupancy of the species.	The proposed Gelliondale wind farm is not within a key biodiversity area with Swift Parrot triggers (DCCEEW 2024a). However, they are known to use the area to some degree. The proposal includes the removal of two moderately-sized potential foraging trees (both Manna Gums) and approximately 0.164 ha of vegetation that contains a low density of suitable foraging habitat in the form of sparse canopies of Manna Gum and/or Swamp Gum. Of the habitat identified as Swift Parrot habitat during field surveys, 0.1 % (0.42 ha of 375.66 ha) is to be removed under the proposed layout. Considering the dispersive nature of the species in the area, it's apparent low use of the local area, and the small	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	percentage of foraging habitat being removed – the proposed action is unlikely to reduce the area of occupancy of the Swift Parrot.	
Fragment an existing population into two or more populations.	The Swift Parrot represents a single broad-ranging migratory population, which breeds exclusively in Tasmania (DCCEEW 2024a; Higgins 1999). Their non-breeding range includes much of Victoria and parts of South Australia, New South Wales, and Queensland (DCCEEW 2024a). This species may visit the general Gelliondale area during their non-breeding season, from approximately March to October (Higgins 1999). Little is known about the species avoidance of wind farms. The habitat found onsite represents a foraging habitat that would only be used during the non-breeding season and only when suitable food plants are in flower. The project will remove minimal foraging habitat (0.164 ha and two moderate-sized trees; Figure 3), and will not create any barriers for such a wide-ranging species. Therefore, it is considered very unlikely the proposed action would result in the fragmentation of the Swift Parrot population.	**Unlikely**
Adversely affect habitat critical to the survival of a species.	The National Recovery Plan for the Swift Parrot states that habitat critical for the species on mainland Australia includes "all preferred foraging species within known and likely foraging habitat on the mainland including Yellow Gum (E. leucoxylon); Red Ironbark (E. tricarpa); Mugga Ironbark (E. sideroxylon); Grey Box (E. macrocarpa); White Box (E. albens); Yellow Box (E. melliodora); Swamp Mahogany (E. robusta); Forest Red Gum (E. tereticornis); Blackbutt (E. pilularis); and Spotted Gum (Corymbia maculata)" (p. 15, DCCEEW 2024a). Of these, only Spotted Gum was recorded onsite (Nature Advisory 2025), with none of these trees to be removed. Several other species known as potential foraging trees but not listed as critical mainland habitat are known onsite, such as planted Blue Gum, Swamp Gum, and Manna Gum (Webb et al. 2014). In the Project Area and transport route, only two moderately-sized Manna Gums are to be removed, along with 0.164 ha of habitat that may contain smaller trees. This is minimal considering the surrounding context, where the majority of identified habitat was avoided during the design phase of the project. The project is therefore considered unlikely to adversely affect habitat critical for the survival of the Swift Parrot.	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
Disrupt the breeding cycle of a population.	Swift Parrots breed exclusively in Tasmania, particularly in the southeast of the state (Higgins 1999). So, the project is very unlikely to disrupt the species' breeding cycle.	**Unlikely**
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The proposal includes the removal of two potentially suitable trees and 0.164 ha of potentially suitable foraging habitat. The removal of such a small area habitat, particularly in an area that is not identified as a key area for the species (DCCEEW 2024a) and appears to be infrequently utilised, is unlikely to contribute to the species' declines.	**Unlikely**
Result in invasive species that are harmful to an endangered or critically endangered species becoming established in the endangered or critically endangered species' habitat.	The proposal is unlikely to result in the introduction or proliferation of an invasive species that could be harmful to the Swift Parrot. The Swift Parrot is susceptible to predation by Sugar Gliders in Tasmania when using nesting hollows during breeding season (Stojanovic et al. 2014). However, they don't appear to be susceptible when outside of the breeding season when not using nesting hollows (DCCEEW 2024a). The project site already has a number of invasive species that are already established including cats, European honeybees, and a range of birds such as Common Mynas and European Starlings. None of these species are identified as key threats to the Swift Parrot (DCCEEW 2024a). So, it is unlikely the proposed project will result in a harm invasive species. Further, the project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease.	**Unlikely**
Introduce disease that may cause the species to decline.	The species appears to be susceptible to psittacine beak and feather disease (DCCEEW 2021). However, the proposal will not engage in any activities known or likely to introduce or spread this or any other disease harmful to this species. Further, the project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease.	**Unlikely**
Interfere with the recovery of the species.	The proposal has a small degree of habitat loss in an area rarely frequented by these species. This is unlikely to interfere with the recovery plan objects (DCCEEW 2024a).	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
Overall assessment		Unlikely

White-throated Needletail

The significant impact assessment found that the proposed action is unlikely to cause significant impacts to the White-throated Needletail. The development of adaptive mitigation measures included within a Bat and Avifauna Management Plan (BAM Plan) will reduce impacts further.

An action is likely to have a significant impact on this vulnerable species if there is a real chance or possibility that it will meet any of the significant impact criteria listed in Table 25 (DoE 2013a, p.10).

Table 25: Significant Impact Assessment – White-throated Needletail (EPBC: Vulnerable)

Significant Impact criterion	Assessment	Significant Impact likelihood
Lead to a long-term decrease in the size of an important population of a species.	Historical records and observations during field surveys suggest White-throated Needletails (WTNT) are regular visitors to the area during the warmer months. WTNT are known to regularly fly at height and experience turbine collisions (Nature Advisory *unpub. mortality data*), though the extent to which collision mortality impacts their total population is not known (TSSC 2019). The White-throated Needletail population is estimated 41,000 (Garnett and Baker 2021), with a nationally significant number at 41 birds. Collision risk modelling (Appendix 2) suggests an average mortality of 1.4 birds. This is well below the mortality rates predicted to have a serious disruption of the species (DoE 2015a). Collision should be proactively managed through the BAM Plan, which details strategies for mitigating risk and collision events to White-throated Needletails.	**Unlikely**
Reduce the area of occupancy of an important population.	This species' critical habitat includes its breeding ground in the northern hemisphere and any potential roosting sites in Australia (TSSC 2019, Tarburton 2014). As yet, no critical habitat has been identified within Australia (DoE 2017, TSSC 2019). There is no clear mechanism as to how the proposed project will reduce the area of occupancy. The project will, therefore, not reduce the extent of the species' range in any meaningful way.	**Unlikely**
Fragment an existing important population into two or more populations.	There is only one population that visits Australia (TSSC 2019), with their distribution completely encompassing the proposed site and surrounding areas. White-throated Needletails are known to move between, under and around the turbine blades. There is no clear mechanisms to which the proposed wind farm will fragment the Australian population of White-throated Needletails.	**Unlikely**
Adversely affect habitat critical to the survival of a species.	No critical habitat has been identified within Australia (DoE 2017, TSSC 2019). While some habitat has been modelled	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	in the area (Figure 7), it does not constitute critical habitat for the species.	
Disrupt the breeding cycle of a population.	White-throated Needletails breed in the Northern Hemisphere (Higgins 1999). The project is therefore not able to disrupt the breeding cycle of the species.	**Unlikely**
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The White-throated Needletail is mainly aerial, though there is evidence that it prefers airspace over wooded habitats (Higgins 1999, Appendix 4). This habitat exists largely in the adjacent State parks and other wooded areas, which are unaltered by the current proposal. Further, reduction of any small aspects of preferred habitat (such as the few trees proposed for removal) is unlikely to result in the species decline due to the abundance nearby and the species dispersive nature across most of southeastern Australia.	**Unlikely**
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. Therefore, it is unlikely that the GWF will introduce or cause the proliferation of an invasive species that could cause the species to decline.	**Unlikely**
Introduce disease that may cause the species to decline.	The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. It is unlikely that the GWF will introduce or cause the proliferation of a disease that may cause the species to decline.	**Unlikely**
Interfere substantially with the recovery of the species.	The recovery of this species likely relies upon protection and revegetation of their breeding grounds in Asia (Tarburton 2014). Further, impacts to preferred habitat are minimal and no critical habitat is to be impacted by the project. However, there is the possibility for a significant impact on a nationally important number of birds over the coarse of the wind farm's 30-year lifespan.	**Unlikely**
Overall assessment		**Unlikely**

Critically Endangered/Endangered migratory shorebirds (6 species)

This significant impact assessment addresses those migratory shorebirds that also have a threatened listing status under the EPBC Act, and which share the same listing status, impact pathways and similar use and likelihood of migrating through GWF. This includes:

- Bar-tailed Godwit subsp. *baueri* – Endangered
- Black-tailed Godwit – Endangered
- Common Greenshank – Endangered
- Curlew Sandpiper – Critically Endangered
- Far Eastern Curlew – Critically Endangered
- Lesser Sand Plover – Endangered

The proposed action is unlikely to cause significant impacts to these threatened migratory shorebirds. The development of adaptive mitigation measures included within a Bat and Avifauna Management Plan (BAM Plan) will reduce impacts further.

An action is likely to have a significant impact on threatened species if there is a real chance or possibility that it will meet any of the significant impact criteria listed in Table 25 (DoE 2013a, p.10).

Table 26: Significant Impact Assessment – critically endangered/endangered migratory shorebirds (6 species)

Significant Impact criterion	Assessment	Significant Impact likelihood
Lead to a long-term decrease in the size of a population of a species.	These six species may be impacted if a nationally important size of the population is impacted, which is defined as (DoE 2017, Wetlands International 2020): ▪ 130 Bar-tailed Godwit subsp. *baueri* ▪ 160 Black-tailed Godwit ▪ 110 Common Greenshank ▪ 90 Curlew Sandpiper ▪ 35 Far Eastern Curlew ▪ 26 Lesser Sand Plover The Action area does not contain habitat or any records of these six species, with their present confined to the nearby Corner Inlet Ramsar Site. However, they may fly over the GWF whilst migrating to/from the Ramsar wetland, where they may be at risk of collision with turbines. The likelihood of this was assessed by way of investigations into the spatial location, temporal consistency, and flight behaviour of the species (see full details in Section 4.2.4). Analysis showed these species generally reside in areas of Corner Inlet that are more than 10 kilometres away from	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	the GWF. This spatial use of the site appears to have been stable over the last 45 years. Given the known climb rates and flight speeds, several scenarios of flight behaviour are expected (Table 19). All scenarios demonstrate that shorebirds migrating from over 10 km away will be above the 210 m RSA height when reaching the wind farm. The worst-case scenario (fastest speed and slowest climb), puts birds above RSA height after 9.6 km from their place of take-off. Notably, these species were either rarely observed in numbers approaching nationally significant or not within 10-11 km of the GWF. So, flight scenarios coupled with the presence of nationally significant numbers, their spatial use of Corner Inlet, and their temporal consistency of use, suggest that it is unlikely that birds will interact with turbines at GWF. If their migration path does intersect with the turbines, they are likely to be above RSA height by the time they reach the Action Area. It is therefore unlikely that the GWF will lead to a long-term decrease in the size of the population of these species. Detected shorebird collisions should be proactively managed through the BAM Plan, which will detail adaptive strategies for mitigating risk and collision events.	
Reduce the area of occupancy of the species.	The area of occupancy for these six species does not occur on the GWF project footprint, being confined to the nearby Corner Inlet Ramsar Site and coastal areas. Hydrological (Alluvium 2025) and contamination assessments (Accent 2025b) found that while there may be some contaminants, sedimentation and mobilisation of acid sulphate soils, it is unlikely to greatly impact the area, particularly if appropriate mitigation measures are taken to prevent this, such as would be outlined in an Environmental Management Plan (EMP; Accent 2025a). When inundated, low-lying paddocks may be opportunistically used by some species. However, under these conditions, it is expected that there will be a wide range of other habitats available, particularly those with more native vegetation cover and prey availability. For this reason, it is not expected that paddocks within the Project Area, even when inundated, will provide important habitat for these species. An Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) for the proposed action will address these mitigation measures and include items such as appropriate sediment control measures to prevent this impact from occurring. It	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	is therefore unlikely that the proposed action will reduce the area of occupancy for these species.	
Fragment an existing population into two or more populations.	Each of these six species of critically endangered or endangered migratory shorebirds is represented in Australia by a single population, the East-Asian Australasian Flyway (EAAF) population, each with large distributions across the country (DoE 2017, Wetlands International 2020). They are highly mobile, and utilise a broadly distributed range of habitats, with site choice likely influenced by environmental conditions like rainfall, tide and weather (Higgins 1999). There is no clear mechanism by which the proposed wind farm will fragment the EAAF population of any of these six species.	**Unlikely**
Adversely affect habitat critical to the survival of a species.	The development of the GWF will not directly impact upon the six species' habitat. However, there is some limited potential for contaminants, sediments and acid sulphate soils to be disturbed, mobilised, and flow into waterways that drain into the Corner Inlet Ramsar Wetland as a result of the proposed action (Accent 2025b, Alluvium 2025). However, impacts from these can be controlled with appropriate, standard mitigation measures as outlined in an EMP (Accent 2025a). The Environmental Management Plan (EMP) addresses both construction and operational phases (Accent 2025a) for the proposed action will address these mitigation measures and include items such as appropriate sediment control measures to prevent this impact from occurring. It is therefore unlikely that the GWF will adversely affect habitat critical to the survival of any of the migratory shorebird species.	**Unlikely**
Disrupt the breeding cycle of a population.	None of the species of critically endangered or endangered migratory shorebirds breed in Australia. There is therefore no clear mechanism by which the GWF will disrupt the breeding cycle of these species.	**Unlikely**
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The development of the GWF will not directly impact the six species of critically endangered or endangered migratory shorebird habitat, aside from potential impacts from sediment runoff, which are addressed above. When inundated, low-lying paddocks may be opportunistically used by some species. However, under these conditions, it is expected that there will be a wide range of other habitats available, particularly those with	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	more native vegetation cover and prey availability. For this reason, it is not expected that paddocks within the Project Area, even when inundated, will provide important habitat for these species. It is therefore unlikely that the GWF will modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that any of the migratory shorebird species are likely to decline.	
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the vulnerable species' habitat.	The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. Therefore, it is unlikely that the GWF will introduce or cause the proliferation of an invasive species that could cause any of the species of migratory shorebird to decline.	**Unlikely**
Introduce disease that may cause the species to decline.	The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. It is unlikely that the GWF will introduce or cause the proliferation of a disease that may cause the species to decline.	**Unlikely**
Interfere substantially with the recovery of the species.	The recovery of migratory shorebirds in Australia is identified as the need to avoid habitat loss, habitat degradation, disturbance, and direct mortality (DoE 2017). As detailed above, the GWF is unlikely to impact upon migratory shorebird habitat and direct mortality, particularly with the implementation of a BAMP and EMP. As the Action area is several kilometres away from the areas used by these species, it is unlikely that the project will result in disturbance of these species. We conclude it is therefore unlikely that the project will substantially interfere with these species' recovery.	**Unlikely**
Overall assessment		**Unlikely**

Vulnerable migratory shorebirds (7 species, exc. Latham's Snipe)

This significant impact assessment addresses those migratory shorebirds that also have a threatened listing status under the EPBC Act, and which share the same listing status, impact pathways and similar likelihood of migrating through GWF. This includes:

- Great Knot – Vulnerable

- Greater Sand Plover – Vulnerable
- Grey Plover – Vulnerable
- Red Knot – Vulnerable
- Ruddy Turnstone – Vulnerable
- Sharp-tailed Sandpiper – Vulnerable
- Terek Sandpiper – Vulnerable

The proposed action is unlikely to cause significant impacts to these threatened migratory shorebirds. It should be noted that for migratory shorebird species, an important population is defined as either internationally important (1 % of the East Asian-Australasian Flyway estimate) or Nationally important (0.1 % of the East Asian-Australasian Flyway population estimate). None of the above seven species have been observed in nationally or internationally important numbers at the nearby Corner Inlet Ramsar Site.

An action is likely to have a significant impact on threatened species if there is a real chance or possibility that it will meet any of the significant impact criteria listed in Table 27 (DoE 2013a, p.10).

Table 27: Significant Impact Assessment – vulnerable migratory shorebirds (7 species, exc. Latham's Snipe)

Significant Impact criterion	Assessment	Significant Impact likelihood
Lead to a long-term decrease in the size of an important population of a species.	These seven vulnerable species may be impacted if a nationally important size of the population is impacted, which is defined as (DoE 2017, Wetlands International 2020): ▪ 430 Great Knot ▪ 240 Greater Sand Plover ▪ 80 Grey Plover ▪ 56 Red Knot ▪ 30 Ruddy Turnstone ▪ 85 Sharp-tailed Sandpiper ▪ 85 Terek Sandpiper The Action area does not contain habitat or any records of these seven species, with their present confined to the nearby Corner Inlet Ramsar Site. However, they may fly over the GWF whilst migrating to/from the Ramsar wetland, where they may be at risk of collision with turbines. The likelihood of this was assessed by way of investigations into the spatial location, temporal consistency, and flight behaviour of the species (see full details in Section 4.2.4).	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	Analysis showed these species generally reside in areas of Corner Inlet that are more than 10 kilometres away from the GWF. This spatial use of the site appears to have been stable over the last 45 years. Given the known climb rates and flight speeds, several scenarios of flight behaviour are expected (Table 19). All scenarios demonstrate that shorebirds migrating from over 10 km away will be above the 210 m RSA height when reaching the wind farm. The worst-case scenario (fastest speed and slowest climb), puts birds above RSA height after 9.6 km from their place of take-off. Notably, these species were either rarely observed in numbers approaching nationally significant or not within 10-11 km of the GWF. So, flight scenarios coupled with the presence of nationally significant numbers, their spatial use of Corner Inlet, and their temporal consistency of use, suggest that it is unlikely that birds will interact with turbines at GWF. If their migration path does intersect with the turbines, they are likely to be above RSA height by the time they reach the Action Area. It is therefore unlikely that the GWF will lead to a long-term decrease in the size of the population of these species. Detected shorebird collisions should be proactively managed through the BAM Plan, which will detail adaptive strategies for mitigating risk and collision events.	
Reduce the area of occupancy of an important population.	The area of occupancy for these seven species does not occur on the GWF project footprint, being confined to the nearby Corner Inlet Ramsar Site and coastal areas. Hydrological (Alluvium 2025) and contamination assessments (Accent 2025b) found that while there may be some contaminants, sedimentation and mobilisation of acid sulphate soils, it is unlikely to greatly impact the area, particularly if appropriate mitigation measures are taken to prevent this, such as would be outlined in an Environmental Management Plan (EMP; Accent 2025a). When inundated, low-lying paddocks may be opportunistically used by some species. However, under these conditions, it is expected that there will be a wide range of other habitats available, particularly those with more native vegetation cover and prey availability. For this reason, it is not expected that paddocks within the Project Area, even when inundated, will provide important habitat for these species. An Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) for the proposed action will address these mitigation	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	measures and include items such as appropriate sediment control measures to prevent this impact from occurring. It is therefore unlikely that the proposed action will reduce the area of occupancy for these species.	
Fragment an existing important population into two or more populations.	Each of these seven species of critically endangered or endangered migratory shorebirds is represented in Australia by a single population, the East-Asian Australasian Flyway (EAAF) population, each with large distributions across the country (DoE 2017, Wetlands International 2020). They are highly mobile, and utilise a broadly distributed range of habitats, with site choice likely influenced by environmental conditions like rainfall, tide and weather (Higgins 1999). There is no clear mechanism by which the proposed wind farm will fragment the EAAF population of any of these six species.	**Unlikely**
Adversely affect habitat critical to the survival of a species.	The development of the GWF will not directly impact the seven species' habitat. However, there is some limited potential for contaminants, sediments and acid sulphate soils to be disturbed, mobilised, and flow into waterways that drain into the Corner Inlet Ramsar Wetland as a result of the proposed action (Accent 2025b, Alluvium 2025). However, impacts from these can be controlled with appropriate, standard mitigation measures as outlined in an EMP (Accent 2025a). The Environmental Management Plan (EMP) addresses both construction and operational phases (Accent 2025a) for the proposed action will address these mitigation measures and include items such as appropriate sediment control measures to prevent this impact from occurring. It is therefore unlikely that the GWF will adversely affect habitat critical to the survival of any of the migratory shorebird species.	**Unlikely**
Disrupt the breeding cycle of an important population.	None of these species of migratory shorebirds breed in Australia. There is therefore no clear mechanism by which the GWF will disrupt the breeding cycle of these species.	**Unlikely**
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The development of the GWF will not directly impact the seven species of Vulnerable migratory shorebird habitat, aside from potential impacts from sediment runoff, which are addressed above. When inundated, low-lying paddocks may be opportunistically used by some species. However, under these conditions, it is expected that there will be a wide range of other habitats available, particularly those with	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	more native vegetation cover and prey availability. For this reason, it is not expected that paddocks within the Project Area, even when inundated, will provide important habitat for these species. It is therefore unlikely that the GWF will modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that any of the migratory shorebird species are likely to decline.	
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. Therefore, it is unlikely that the GWF will introduce or cause the proliferation of an invasive species that could cause any of the species of migratory shorebird to decline.	**Unlikely**
Introduce disease that may cause the species to decline.	The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. It is unlikely that the GWF will introduce or cause the proliferation of a disease that may cause the species to decline.	**Unlikely**
Interfere substantially with the recovery of the species.	The recovery of migratory shorebirds in Australia is identified as the need to avoid habitat loss, habitat degradation, disturbance, and direct mortality (DoE 2017). As detailed above, the GWF is unlikely to impact upon migratory shorebird habitat and direct mortality, particularly with the implementation of a BAMP and EMP. As the Action area is several kilometres away from the areas used by these species, it is unlikely that the project will result in disturbance of these species. We conclude it is therefore unlikely that the project will substantially interfere with these species' recovery.	**Unlikely**
Overall assessment		**Unlikely**

Threatened Mammals

Based on the likelihood of occurrence assessment detailed in Section 0, the following mammal species listed under the EPBC Act are likely to occur or have the potential to occur onsite. So, have some potential to be impacted by the proposed action.

- Grey-headed Flying-fox

- Long-nosed Potoroo
- Southern Brown Bandicoot
- Swamp Antechinus

Grey-headed Flying-fox

The significant impact assessment found that the proposed action is unlikely to cause significant impacts to the Grey-headed Flying-fox. The development of adaptive mitigation measures included within a Bat and Avifauna Management Plan (BAM Plan) will reduce impacts further.

An action is likely to have a significant impact on this vulnerable species if there is a real chance or possibility that it will meet any of the significant impact criteria listed in Table 28 (DoE 2013a, p.10).

Table 28: Significant Impact Assessment – Grey-headed Flying-fox

Significant Impact criterion	Assessment	Significant Impact likelihood
Lead to a long-term decrease in the size of an important population of a species.	The Grey-headed Flying-fox is considered to be a single mobile population extending across Queensland, New South Wales, Victoria, South Australia, Tasmania and the ACT (DAWE 2021b). Estimates put the population at 680,000 individuals (DAWE 2021b), with criteria of a nationally important camp being those that contain >10,000 Flying-foxes in more than one year over the last 10 years or those that are occupied by more than 2,500 permanently or seasonally every year for the last 10 years (DoE 2015d). The closest colony per the National Flying-fox Monitoring program is at Woodside, approximately 23 km east of the project area (Figure 10). There are also several camps to the west and southwest (7.5 to 13 km), which surveys suggest are seasonally used. Surveys in January 2025 estimated that 2,000 individuals use these camps. These seasonal camps do not currently meet the criteria of a nationally important camp (DAWE 2021b). The project is within the daily foraging range from these camps (<100 km; DAWE 2021b, Vanderduys et al. 2024). However, modelling suggests any habitat within the area is unlikely to be high-quality (DEECA 2025b; Figure 10). The project does not present any meaningful mechanism to disturb known camps or remove any high-quality foraging habitat. As camps are within the daily foraging distance to the project, there is potential for collision with the operating WTG. The species is known to experience mortalities from other wind farms (Nature Advisory *unpub. mortality data*). Consequently, there is some level of risk on impacting a camp approaching a nationally important number of	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	individuals. A systematic monitoring program and mitigation measures should be employed, and their effectiveness assessed, during the operational phase through implementation of a BAM Plan.	
Reduce the area of occupancy of an important population.	The proposed wind farm is situated in an area modelled as no habitat, with some low-quality areas present in the adjacent State parks and Ramsar wetlands. The proposal avoids the removal of suitable habitat in the area. Therefore, it is unlikely that the proposed action will reduce the area of occupancy of an important population.	**Unlikely**
Fragment an existing important population into two or more populations.	The species is considered a single highly mobile population extending from Queensland to South Australia, largely near the coast (DAWE 2021b). Grey-headed Flying-fox are known to move upwards of 1,000 km seasonally and make daily movements of over 140 km (DAWE 2021b, Vanderduys et al. 2024). It is unlikely that the proposed development will lead to a fragmentation of the population.	**Unlikely**
Adversely affect habitat critical to the survival of a species.	The recovery plan for the species lists important habitats as roosts (camps) and important winter/spring foraging areas (DAWE 2021b). A roost site does not occur within the Project Area or transport route. Foraging habitat is defined as the presence of suitable plant species, of which some may occur, but none are dominant in the Project Area or transport route. Habitat critical to the survival of the species may also include vegetation communities not supporting important winter and spring tree species, but which (DAWE 2021b): ▪ Contain native species that are known to be productive as foraging habitat during the final weeks of gestation, and during the weeks of birth, lactation and conception (August to May) ▪ Contain native species used for foraging and occur within 20 km of a nationally important camp as identified on the Department's interactive flying-fox web viewer, or ▪ Contain native and or exotic species used for roosting at the site of a nationally important GHFF camp as identified on the Department's interactive flying-fox web viewer. The Project Area and transport route do not contain high-quality foraging or roosting habitat, and very little native vegetation is being affected by the proposal. Thus, the development is unlikely to affect habitat critical to the survival of the species.	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
Disrupt the breeding cycle of a population.	Roosts constitute the only breeding sites for the species (Mo et al. 2024). Though the wind farm is located in the vicinity of several camps and poses a level of collision impact to individuals using these camps, it is unlikely to critically disrupt the breeding cycle.	**Unlikely**
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The GWF does not contain high-quality foraging or roosting habitat. Although the project plans to remove some native vegetation, none constitutes an important foraging resource for the species. So, the proposed development will unlikely modify, destroy, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	**Unlikely**
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. Therefore, it is unlikely that the GWF will introduce or cause the proliferation of an invasive species that could cause the species to decline.	**Unlikely**
Introduce disease that may cause the species to decline.	The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. It is unlikely that the GWF will introduce or cause the proliferation of a disease that may cause the species to decline.	**Unlikely**
Interfere substantially with the recovery of the species.	The site is not considered an important habitat for the recovery of this species. It will likely continue to be used for intensive grazing by landholders. Though there may be some level of impact from collision, it is unlikely to have a substantial impact on the recovery of the species.	**Unlikely**
Overall assessment		**Unlikely**

Long-nosed Potoroo

The significant impact assessment found that the proposed action is unlikely to cause significant impacts to the Long-nosed Potoroo.

An action is likely to have a significant impact on this vulnerable species if there is a real chance or possibility that it will meet any of the significant impact criteria listed in Table 29 (DoE 2013a, p.10).

Table 29: Significant Impact Assessment – Long-nosed Potoroo

Significant Impact criterion	Assessment	Significant Impact likelihood
Lead to a long-term decrease in the size of an important population.	The nearest important population of the species identified in the *Conservation Advice* (DAWE 2022d) is located in Wilson's Promontory. No connectivity exists between the study area and this important population, or any other identified important population. Any population of the species in the study area is unlikely to be a key source population for breeding or dispersal, as this species is not highly mobile (DAWE 2022d). Due to the above, any individuals using the study area could not reasonably be considered part of any important population. As such, the proposed action is unlikely to lead to a long-term decrease in the size of an important population.	**Unlikely**
Reduce the area of occupancy of an important population of the species.	Modelling suggests the potential for high-quality habitat (DEECA 2025b; Figure 11), but no important population of the species is likely to occur in the study area. As such, the proposed action is unlikely to lead to a long-term decrease in the area of occupancy of an important population of the species.	**Unlikely**
Fragment an existing important population into two or more populations.	No important population of the species is likely to occur in the study area. As such, the proposed action is unlikely to fragment an existing important population into two or more populations. However, there is potential to reduce connectivity between Alberton and Gelliondale State Parks through the removal of roadside vegetation. Such removal is unlikely to cause a significant impact.	**Unlikely**
Adversely affect habitat critical to the survival of a species.	Habitat critical to the survival of the species is defined in the *Conservation Advice* for the species as (DAWE 2022d): ▪ Occupied forested habitats >10 ha ▪ Unoccupied forested habitats >10 ha if adjacent or proximal to extant subpopulations ▪ Areas of habitat that supported the species in the past, but where they are now absent. All potentially suitable habitat patches in the study area are <10 ha. The species is also not known to have occurred in	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	the study area previously, or from the adjacent modelled high-quality habitats in the State parks and Ramsar sites. As such, habitat critical to the survival of the species is not considered to occur in the study area. The proposed action is therefore considered unlikely to adversely affect habitat critical to the survival of the species.	
Disrupt the breeding cycle of an important population.	No important population of the species is likely to occur in the study area. As such, the proposed action is unlikely to disrupt the breeding cycle of an important population.	**Unlikely**
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The habitat patches in the Project Area and transport route that have some level of connectivity to larger areas of potentially high-quality habitat include HZs AF, AG, AH, AI, DA, DC, and DD. The area of habitat to be removed from these habitat patches is around 0.3 ha. The minimum home range size for the species identified in the *Conservation Advice* is 19 ha (DAWE 2022d). As the area of habitat to be removed comprises only a small fraction of the area required to support a single individual, it is considered unlikely that the proposed action would modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline.	**Unlikely**
Result in invasive species that are harmful to an endangered or critically endangered species becoming established in the endangered or critically endangered species' habitat.	The invasive species identified as threats to Long-nosed Potoroo in the *Conservation Advice* for the species (DAWE 2022d) are cats, foxes, wild dogs, feral pigs, livestock and invasive weeds. However, there is no apparent mechanism or clear reason why the proposed action would result in the proliferation of these species. Cats, foxes, and livestock are already present in the study area and are widespread across South Gippsland. Further, the project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. Therefore, it is considered unlikely that the proposed action would result in invasive species harmful to the Long-nosed Potoroo becoming established in its habitat.	**Unlikely**
Introduce disease that may cause the species to decline.	Toxoplasmosis is identified as a disease threatening Long-nosed Potoroo in its *Conservation Advice* (DAWE 2022d). This disease is spread by feral cats. However, there is no apparent mechanism for the proposed action to result in an increased presence of feral cats in the study area.	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	Phytophthora cinnamomi is a fungus that causes dieback in plants, and this disease can damage the habitat of the Long-nosed Potoroo. However, the project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. Therefore, it is considered unlikely that the proposed action would introduce disease that may cause the species to decline.	
Interfere with the recovery of the species.	There is no apparent or clear mechanism for the proposed action to interfere with the recovery of the species.	**Unlikely**
Overall assessment		**Unlikely**

Southern Brown Bandicoot

The significant impact assessment found that the proposed action is unlikely to cause significant impacts to the Southern Brown Bandicoot.

An action is likely to have a significant impact on this endangered species if there is a real chance or possibility that it will meet any of the significant impact criteria listed in Table 30 (DoE 2013a, p.10).

Table 30: Significant Impact Assessment – Southern Brown Bandicoot

Significant Impact criterion	Assessment	Significant Impact likelihood
Lead to a long-term decrease in the size of a population.	Within the Project Area and transport route, the following impacted habitat patches (or Habitat Zones, (HZ)) are connected to sufficiently large areas of habitat that they could plausibly support the species: AF, AG, AI, AH, DH, D, CI, CH, CF, F, DI, DD, DC and DA. Within these impacted habitat patches, the total area to be removed is approx. 0.64 ha. The low end of home range size for the species is 0.5 ha. It is therefore theoretically possible that the carrying capacity of the study area will be reduced by 1 individual. However, the Draft Referral Guidelines for the species (DSEWPaC 2011) state that the threshold for considering the species to be significantly impacted by the amount of habitat removed is: ▪ Greater than 1% in patches less than 100 ha; or ▪ Greater than 5% in patches greater than 100 ha. The areas of connected habitat include Alberton State Forest, which is >100 ha. As, 5% of 100 ha is 5 ha, and the amount of habitat removed falls below this threshold, it is considered unlikely the proposed action will significantly impact the species under this criterion.	**Unlikely**
Reduce the area of occupancy of the species.	Within the Project Area and transport route, the following impacted habitat patches (or Habitat Zones, HZ) are connected to sufficiently large areas of habitat that they could plausibly support the species: D, AF, AG, AI, AH, CI, CH, CF, DH, F, DI, DD, and DA. Within these impacted habitat patches, the total area to be removed is approx. 0.64 ha. If the above HZs are occupied, removing 0.64 ha of habitat from within those habitat zones would, by definition, reduce the area of occupancy of the species. However, the Draft Referral Guidelines for the species (DSEWPaC 2011) state that the threshold for considering the species to be	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	significantly impacted by the amount of habitat removed is: ▪ Greater than 1% in patches less than 100 ha; or ▪ Greater than 5% in patches greater than 100 ha. The areas of connected habitat include Alberton State Forest, which is >100 ha. As 5% of 100 ha is 5 ha, and the amount of habitat removed falls below this threshold, it is considered unlikely that the proposed action will significantly impact the species under this criterion.	
Fragment an existing population into two or more populations.	The Draft Referral Guidelines for the Southern Brown Bandicoot (DSEWPaC 2011) state the following as the threshold criteria for fragmentation causing a significant impact to the species: ▪ Reduced connectivity or fragmentation of suitable habitat known or likely to support southern brown bandicoots, that results in: ▫ A distance greater than 50 m over natural surfaces; or ▫ A distance greater than 10 m over artificial surfaces. ▪ Reduction in suitable vegetation corridor core width to less than 50 m; or ▪ Any reduction in the width of suitable vegetation corridors, which are less than 50 m in width and likely to be utilised by southern brown bandicoots; or ▪ Degradation of suitable habitat within a 30 m buffer of the edge of known or likely habitat, surveyed in accordance with this document, which may lead to the long-term modification of suitable habitat or reduce its suitability for southern brown bandicoots. The proposed action will not result in a reduction in the width of any vegetation corridors for the Southern Brown Bandicoot, as the impact footprint does not intersect with areas of plausible habitat in the manner required to do so. The proposed action does technically result in fragmentation of suitable habitat in accordance with the first criterion above, as follows: The removal of part of HZs CH and CI causes a very small amount of habitat in their southern areas to be isolated from other connected patches to the north, by >50 m	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	across a natural surface. However, the very small size of the isolated areas makes this a negligible consideration. The removal of part of HZ AF, and all of AG, AH and AI along Coal Mine Rd causes a link between the Great Southern Rail Trail and Alberton State Forest to be broken by a gap of >50 m across a natural surface. However, some connectivity also exists between these two areas along Lanes Rd (albeit lower in quality). No connectivity is considered to exist between Alberton and Gelliondale State Forests according to the criteria set out in the Draft Referral Guidelines, as the corridor between the two is broken by the South Gippsland Highway. The gap in vegetation caused by the highway exceeds 10 m across an artificial surface, making the species unlikely to cross regularly. However, occasional crossing might still occur, and the species may have a net benefit from the proposed action with the vegetation corridor from Alberton State Forest along Coal Mine Rd. In view of the above, it is considered unlikely that the proposed action will fragment an existing population into two or more populations. The species may even benefit from targeted revegetation works that may be included as a condition of the proposed action.	
Adversely affect habitat critical to the survival of a species.	Habitat critical to the survival of the species has not been formally defined by the Commonwealth, but is likely to be considered habitat with an understorey vegetation structure of 50-80 % density in the 0.2-1 m height range, which is characteristic of the vegetation the species uses (DSEWPaC 2011). These conditions are assumed to be present in areas of impacted habitat the species could plausibly occupy: D, AF, AG, AI, AH, CI, CH, CF, DH, F, DI, DD, and DA. Within these impacted habitat patches, the total area to be removed is approx. 0.64 ha. The Draft Referral Guidelines for the species (DSEWPaC 2011) state that the threshold for considering the species to be significantly impacted by the amount of habitat removed is: ▪ Greater than 1% in patches less than 100 ha; or ▪ Greater than 5% in patches greater than 100 ha. The areas of connected habitat include Alberton State Forest, which is >100 ha. As 5 % of 100 ha is 5 ha, and the amount of habitat removed falls well below this threshold	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	(0.64 ha), it is considered unlikely that the proposed action will significantly impact the species under this criterion.	
Disrupt the breeding cycle of a population.	There is no clear or apparent mechanism for how the proposed action might disrupt the breeding cycle of a population of Southern Brown Bandicoot. Habitat use in this species is not segregated between sexes or life stages, and a specific breeding habitat is not required. Olfactory cues are likely the main form of breeding-related communication in this species, and there is no apparent reason the proposed action would interfere with their function. Therefore, it is considered that the proposed action is unlikely to disrupt the breeding cycle of any local Southern Brown Bandicoot population.	**Unlikely**
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	See Assessment for the criterion "Lead to a long-term decrease in the size of a population". For the same reasons, it is considered unlikely that the proposed action will modify, destroy, remove or isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline.	**Unlikely**
Result in invasive species that are harmful to an endangered or critically endangered species becoming established in the endangered or critically endangered species' habitat.	The invasive species identified in the Conservation Advice for Southern Brown Bandicoot as being potentially harmful to the species are foxes, feral cats, and feral rabbits (TSSC 2016a). All three of these species are likely already present in the study area, being widespread across South Gippsland. There is no clear or apparent mechanism for the proposed action to cause an increased presence of foxes or feral cats. The soil disturbance resulting from construction could result in higher densities of rabbits, as they find it easier to burrow in the loose, disturbed soil. An Environmental Management Plan (EMP; Accent 2025a) is drafted that addresses this impact. Therefore, it is considered unlikely that the proposed action would result in invasive species harmful to the Southern Brown Bandicoot becoming established in its habitat.	**Unlikely**
Introduce disease that may cause the species to decline.	Toxoplasmosis is identified as a disease threatening the Southern Brown Bandicoot in its Conservation Advice (TSSC 2016a). This disease is spread by feral cats. However, there is no apparent mechanism for the	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	proposed action to result in an increased presence of feral cats in the study area. *Phythophthora cinnamomi* is a fungus that causes dieback in plants, and this disease can damage the habitat of the South Brown Bandicoot. Further, the project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. Therefore, it is considered unlikely that the proposed action would introduce a disease that may cause the species to decline.	
Interfere with the recovery of the species.	There is no apparent mechanism for the proposed action to interfere with the recovery of the species.	**Unlikely**
Overall assessment		**Unlikely**

Swamp Antechinus

The significant impact assessment found that the proposed action is unlikely to cause significant impacts to the Swamp Antechinus.

An action is likely to have a significant impact on this vulnerable species if there is a real chance or possibility that it will meet any of the significant impact criteria listed in Table 30 (DoE 2013a, p.10).

Table 31: Significant Impact Assessment – Swamp Antechinus

Significant Impact criterion	Assessment	Significant Impact likelihood
Lead to a long-term decrease in the size of an important population.	No important populations for Swamp Antechinus have formally been defined by the Commonwealth. Apart from a population being specifically identified as important, the Commonwealth has previously given the following as other reasons to consider a population important (DoE 2013a): ▪ Key source populations either for breeding or dispersal, ▪ Populations that are necessary for maintaining genetic diversity, and/or ▪ Populations that are near the limit of the species' range. The easternmost records of the species are from Snake and Sunday Islands within Corner Inlet. It has not previously been recorded from the study area, Alberton or Gelliondale State Forests, or the Albert River riparian corridor. However, if a local population were present, it would form the easternmost limit of the species' known distribution and would therefore be considered important. Within the Project Area and transport route, the following impacted habitat patches (or Habitat Zones, HZ) are connected to sufficiently large areas of habitat that they could plausibly support the species: AF, AG, AI, AH, DH , D, CI, CH, CF, F , DD, DC and DA . Within these impacted habitat patches, the total area to be removed is approx. 0.64 ha. The low end of home range size for the species on the mainland is 1.1-1.3 ha (Sale and Arnould 2009). The 0.64 ha comprises a substantial fraction of such a home range. It is therefore theoretically possible that the carrying capacity of the study area will be reduced by up to 1 individual. There are estimated to be 100,000 mature individuals of the species remaining, although confidence in this estimate is low (TSSC 2016b). The reduction in carrying capacity of the study area by <1 individual is a negligible impact.	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	For the above reasons, it is considered unlikely that the species will be significantly impacted under this criterion.	
Reduce the area of occupancy of an important population of the species.	As any population present in the study area would constitute the eastern limit of the species range, it would be considered an important population. Within the Project Area and transport route, the following impacted habitat patches (or Habitat Zones, HZ) are connected to sufficiently large areas of habitat that they could plausibly support the species: AF, AG, AI, AH, DH , D, CI, CH, F , DD, DC and DA . Within these impacted habitat patches, the total area to be removed is approx. 0.64 ha. By definition, this would constitute a reduction in the area of occupancy of the local Swamp Antechinus population, which is considered important. However, this impact would not be considered significant to the species considering the surrounding abundance of habitat. For the above reasons, it is considered unlikely that the species will be significantly impacted under this criterion.	**Unlikely**
Fragment an existing important population into two or more populations.	As any population present in the study area would constitute the eastern limit of the species range, it would be considered an important population. Within the Project Area and transport route, the following impacted habitat patches (or Habitat Zones, HZ) are connected to sufficiently large areas of habitat that they could plausibly support the species: ▪ Connected to Alberton State Forest and the Great Southern Rail Trail: AF, AG, AH, AI, DH ▪ Connected to the Albert River riparian corridor: D, CI, CH, CF, F ▪ Part of larger woodland blocks near Port Welshpool: DD, DC and DA Impacts to DH narrow the existing corridor, but enough of it remains for connectivity to continue. Impacts to HZs AF-AI break connectivity between Alberton State Forest and the Great Southern Rail Trail along Coal Mine Rd. Additionally, an alternative connecting corridor exists along Lanes Rd. It is likely to currently be too broken for Swamp Antechinus to use. Impacts to HZ F are extremely narrow and unlikely to present a barrier to Swamp Antechinus movement, avoiding fragmentation. In contrast, impacts to HZs D, CF,	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	CI and CH will create sufficiently large gaps in roadside vegetation strips that Swamp Antechinus movement is likely to be inhibited, causing fragmentation. However, the size of the isolated fragments in CI and CH are small enough to be considered negligible (approx. 0.1 ha in total). A larger fragment will be isolated by impacts to HZ D and CF. However, it is anticipated that all these impacts will be temporary. Impacts to HZs DD, DC and DA do not cut connectivity between any habitat patches, and as such, do not cause fragmentation to occur. For the above reasons, it is considered unlikely that Swamp Antechinus will be significantly impacted under this criterion.	
Adversely affect habitat critical to the survival of a species.	Habitat critical to the survival of the species has not been formally defined by the Commonwealth, but is likely to be damp areas of dense vegetation 1-2 m high that are at a relatively late stage of vegetative succession (>15 years post-disturbance), as these are the known key requirements of the species (TSSC 2016b). The species could plausibly occupy several habitat zones in the Project Area and transport route. HZs AF-AI, CI, CH, D, DH and F appear to have been disturbed too recently to be critical to the survival of the species – these are areas of Swamp Scrub where the Swamp Paperbark canopy was generally sparse or absent, and most woody species were recruiting. So these areas are likely to represent lower quality habitat. Additionally, the grassy or sedgy understory in these areas is likely too short. HZs DD, DC and DA appear to be less disturbed, with more late-succession vegetation that is likely to be of higher quality and suitable for the species. Shrubbery, likely in the 1-2 m height range, also appears to be denser and more prominent. However, as these areas are Heathy Woodland (EVC 48), and rushes and sedges are only patchily distributed, they may not be damp enough to be considered habitat critical to the survival of the species – this is especially the case for HZ DD, where sedges and rushes appear rare. For the above reasons, it is considered unlikely that Swamp Antechinus will be significantly impacted under this criterion.	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
Disrupt the breeding cycle of an important population.	As any population present in the study area would constitute the eastern limit of the species range, it would be considered an important population. Olfactory cues are likely the main form of breeding-related communication in this species, and there is no apparent reason the proposed action would interfere with their function. For the above reasons, it is considered unlikely that Swamp Antechinus will be significantly impacted under this criterion.	**Unlikely**
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	See Assessment for the criterion "Lead to a long-term decrease in the size of a population". For the same reasons, it is considered unlikely the proposed action will modify, destroy, remove or isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline.	**Unlikely**
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The invasive species identified as threats to the Swamp Antechinus in its Conservation Advice (TSSC 2016b) are foxes, feral cats, livestock and feral herbivores (presumably ungulates). All of these species are known to be widespread across South Gippsland and likely already occur in the study area. There is no clear or apparent mechanism for the proposed action to result in an increased presence of these species. The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. Therefore, it is unlikely that the GWF will introduce or cause the proliferation of an invasive species that could cause the species to decline.	**Unlikely**
Introduce disease that may cause the species to decline.	*Phythophthora cinnamomi* is a fungus that causes dieback in plants, and this disease can damage the habitat of Swamp Antechinus (TSSC 2016b). The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. Therefore, it is considered unlikely that the proposed action would introduce a disease that may cause the species to decline.	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
Interfere with the recovery of the species.	There is no apparent mechanism for the proposed action to interfere with the recovery of the species.	**Unlikely**
Overall assessment		**Unlikely**

Threatened Fish

Based on the likelihood of occurrence assessment detailed in Section 0, the following fish species listed under the EPBC Act are likely to occur or have the potential to occur onsite or nearby downstream. So, have some potential to be impacted by the proposed action.

- Australian Grayling
- Dwarf Galaxias

Australian Grayling

The significant impact assessment found that the proposed action is unlikely to cause significant impacts to the Australian Grayling.

An action is likely to have a significant impact on this vulnerable species if there is a real chance or possibility that it will meet any of the significant impact criteria listed in Table 32 (DoE 2013a, p. 10).

Table 32: Significant Impact Assessment – Australian Grayling

Significant Impact criterion	Assessment	Significant Impact likelihood
Lead to a long-term decrease in the size of an important population.	The Albert River catchment is not listed as one of the Victorian populations known as historical strongholds of the species in (TSSC 2021). The Albert River population is also not near the limits of the species' range. Australian Grayling populations across Victoria appear connected because their larvae are highly dispersive during the marine phase of their life cycle, allowing them to move into different river systems (TSSC 2021). Indeed, Victorian populations have been identified as a single genetic population (TSSC 2021). As such, it does not appear that the area's local Australian Grayling population is a key source population for breeding and dispersal. The above information indicates the area's local Australian Grayling population is not an important population. It is therefore unlikely that the proposed action will lead to a	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	long-term decrease in the size of an important population of the species.	
Reduce the area of occupancy of an important population.	The local Australian Grayling population does not appear to be an important population. Moreover, the proposed project is unlikely to reduce the area available downstream in the Ramsar wetland. Hydrological downstream impacts to the Corner Inlet Ramsar Site have been assessed by qualified hydrologists, with minimal impacts expected (including from runoff patterns and flow regimes; Alluvium 2025). There is a risk of contamination of waterways, but it is suggested to be minimal provided appropriate measures are taken (Accent 2025b), such as those outlined in the contamination report and EMP (Accent 2025a, 2025b). Therefore, it is unlikely the proposed action will reduce the area of occupancy of an important population of the species.	**Unlikely**
Fragment an existing important population into two or more populations.	The local Australian Grayling population does not appear to be an important population. Therefore, it is unlikely the proposed action will fragment an existing important population of the species into two or more populations.	**Unlikely**
Adversely affect habitat critical to the survival of a species.	No habitat critical to the survival of the species has formally been defined by the Commonwealth, and no habitat for the species occurs directly within the impact footprint of the proposed action. However, the Corner Inlet Ramsar Site downstream of the study area may meet criteria for critical, as it forms an extensive estuarine system. This could plausibly form a crucial refuge for larvae to grow and for juveniles to slowly transition from marine to freshwater habitats (TSSC 2021). Hydrological and contamination downstream impacts to the Corner Inlet Ramsar Site have been assessed by qualified consultants, with minimal impacts expected (including from runoff patterns and flow regimes; Alluvium 2025, Accent 2025b). Ecological impacts on critical habitats (e.g. seagrass beds, mangroves and saltmarsh) are anticipated to be minor (Alluvium 2025, Accent 2025b). Localised sedimentation is anticipated as a potential impact (Alluvium 2025). The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control such sedimentation risks.	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	When the above information is considered, the proposed action is considered unlikely to adversely affect habitat critical to the survival of the species.	
Disrupt the breeding cycle of an important population.	The local Australian Grayling population does not appear to be an important population. Moreover, the proposed project is unlikely to impact potentially important areas downstream in the Ramsar wetland. Hydrological and contamination downstream impacts to the Corner Inlet Ramsar Site have been assessed by qualified consultants, with minimal impacts expected (including from runoff patterns and flow regimes; Alluvium 2025, Accent 2025b). Therefore, it is unlikely the proposed action will disrupt the breeding cycle of an important population of the species.	**Unlikely**
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Modelling (DEECA 2025b) suggests some intersection with potential habitat and the footprint. However, no waterway is visible from satellite imagery, and no signs of regular inundation (i.e. no riparian vegetation). So, it is likely that this area will not qualify as habitat for the species. No direct impacts on the species' habitat will occur because of the proposed action. Some limited indirect impacts are possible (e.g. localised sedimentation), but can be controlled using appropriate mitigation measures (see Assessment for "Adversely affect habitat critical to the survival of the species" above). Therefore, it is unlikely the proposed action will modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	**Unlikely**
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	Invasive species that have been identified as harmful to the Australian Grayling in its Conservation Advice are Trout, Redfin, Carp, and Mosquitofish (TSSC 2021). There is no clear or apparent mechanism for how the proposed action could result in the establishment of these species in areas of habitat for the Australian Grayling. Further the project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. Therefore, it is considered unlikely that the proposed action would result in invasive species harmful to the Australian Grayling becoming established in its habitat.	**Unlikely**
Introduce disease that may cause the species to decline.	Diseases that are identified as threats to Australian Grayling in its Conservation Advice (TSSC 2021), and that are unlikely to already occur in the study area and	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	surrounding region, are Anchor Worm, Cotton Mould, Asian Fish Tapeworm, the ENHV virus, and Goldfish Ulcer Disease. The project will implement an Environmental Management Plan (EMP) that addresses both construction and operational phases (Accent 2025a) to control the spread and proliferation of invasive species and disease. Therefore, it is considered unlikely that the proposed action would introduce a disease that may cause the species to decline.	
Interfere with the recovery of the species.	There is no apparent mechanism for the proposed action to interfere with the recovery of the species.	**Unlikely**
Overall assessment		**Unlikely**

Dwarf Galaxias

The significant impact assessment found that the proposed action is unlikely to cause significant impacts to the Dwarf Galaxias.

An action is likely to have a significant impact on this endangered species if there is a real chance or possibility that it will meet any of the significant impact criteria listed in Table 33 (DoE 2013a, p. 10).

Table 33: Significant Impact Assessment – Dwarf Galaxias

Significant Impact criterion	Assessment	Significant Impact likelihood
Lead to a long-term decrease in the size of a population.	The proposed action will not directly impact an important population or habitat of this species. Hydrological downstream impacts to the main waterways in the surrounding region (Albert River, Jack River, Muddy Creek and Nine Mile Creek – the primary downstream habitats for the species) have been assessed by qualified hydrologists, with minimal impacts expected (including from runoff patterns and flow regimes) (Alluvium 2025). There is a risk of contamination of waterways, but it is suggested to be minimal provided appropriate measures are taken (Accent 2025b), such as those outlined in the contamination report and EMP (Accent 2025a, 2025b). Localised sedimentation is anticipated as a potential impact (Alluvium 2025). Construction mitigation measures	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	will be employed to prevent impacts to downstream habitats, including appropriate controls for the prevention of sedimentation and chemical pollution. These are standard measures used to prevent impacts from construction on environmentally sensitive areas and are widely considered to work. The construction mitigation measures will be fully documented and detailed in an Environmental Management Plan (EMP; Accent 2025a). Other than impacts to habitat, there is no clear or apparent mechanism for the proposed action to result in long-term declines of any local populations of the species. When the above information is considered, the proposed action is considered unlikely to lead to the long-term decline of any local Dwarf Galaxias population	
Reduce the area of occupancy of the species.	Other than impacts to habitat, there is no clear or apparent mechanism for the proposed action to reduce the area of occupancy of the species. See above, Assessment for "Lead to a long-term decrease in the size of a population" for information on why significant impacts to habitat are not anticipated. When the above information is considered, the proposed action is considered unlikely to reduce the area of occupancy of the species.	**Unlikely**
Fragment an existing population into two or more populations.	Other than impacts to habitat, there is no clear or apparent mechanism for the proposed action to fragment an existing population of the species. When the above information is considered, the proposed action is considered unlikely to fragment an existing population of Dwarf Galaxias into two or more populations.	**Unlikely**
Adversely affect habitat critical to the survival of a species.	No significant direct or indirect impacts to habitat for the species are anticipated. Given that habitat for the species is not anticipated to be significantly impacted (Alluvium 2025, Accent 20225b), the proposed action is considered unlikely to adversely affect habitat critical to the survival of the species.	**Unlikely**
Disrupt the breeding cycle of a population.	This is likely an annual species (DCCEEW 2023f). Their short lifespan renders them particularly sensitive to disruptions to breeding, as a single failed breeding season can result in a substantial population decrease. The species is non-migratory – it does not undertake breeding-related movements, and the habitat required for breeding does not differ from that which is normally used in other stages of the life cycle.	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	In view of the above, the main mechanism by which the breeding cycle of Dwarf Galaxias could be disrupted is by the disruption of likely chemical and/or visual cues used by individuals to communicate breeding activity to each other (DCCEEW 2023f). These could be disrupted by chemical pollution or by changes in visibility due to sedimentation. Construction mitigation measures will be employed to prevent impacts to downstream habitats, including appropriate controls for the prevention of sedimentation and chemical pollution. These are standard measures used to prevent impacts from construction to environmentally sensitive areas and are widely considered to work. The construction mitigation measures will be fully documented and detailed in an Environmental Management Plan (EMP; Accent 2025a). The analysis presented here indicates that, provided an appropriate EMP is drafted and implemented, the proposed action is unlikely to disrupt the breeding cycle of any local Dwarf Galaxias populations.	
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	See above in Assessment for the criterion "Lead to a long-term decrease in the size of a population". For the same reasons, it is considered unlikely the proposed action will modify, destroy, remove or isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline.	**Unlikely**
Result in invasive species that are harmful to an endangered or critically endangered species becoming established in the endangered or critically endangered species' habitat.	The invasive species identified as threats to the Dwarf Galaxias in the Conservation Advice for the species are domestic stock and a variety of invasive fish species (Redfin, Trout, Mosquitofish, Goldfish, and Oriental Weatherloach; DCCEEW 2023f). There is also no apparent mechanism for how the proposed action could result in the establishment of invasive fish species in the Dwarf Galaxias habitat. In view of the above, it is considered unlikely that the proposed action will result in invasive species harmful to Dwarf Galaxias establishing in its habitat.	**Unlikely**
Introduce disease that may cause the species to decline.	No diseases are identified as threats to the Dwarf Galaxias in its Conservation Advice (DCCEEW 2023f). It is therefore considered unlikely that the proposed action will introduce a disease that may cause the species to decline.	**Unlikely**
Interfere with the recovery of the species.	There is no apparent mechanism for the proposed action to interfere with the recovery of the species.	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
Overall assessment		Unlikely

5.2.6. Impacts on listed migratory species

Based on the likelihood of occurrence assessment detailed in Section 4, the following migratory species listed under the EPBC Act and/or International migratory species agreements (Bonn, CAMBA, JAMBA, ROKAMBA) are likely to occur or have the potential to occur onsite. So, have some potential to be impacted by the proposed action.

- Fork-tailed Swift
- Latham's Snipe
- Migratory shorebirds (22 species)
- White-throated Needletail

The White-throated Needletail and Latham's Snipe are also listed as threatened. Impacts on these species are considered in accordance with their status as threatened species (see above).

Obligations under International agreements (Bonn, CAMBA, JAMBA, ROKAMBA) address the protection of these species in terms of their removal, impacts to habitat, and obstacles to migration. These obligations are included under the EPBC Act and associated significant impact assessments.

Fork-tailed Swift

The significant impact assessment found that the proposed action is unlikely to cause significant impacts to the Fork-tailed Swift. The development of adaptive mitigation measures included within a Bat and Avifauna Management Plan (BAM Plan) will reduce impacts further.

An action is likely to have a significant impact on this migratory species if there is a real chance or possibility that it will meet any of the significant impact criteria listed in Table 34 (DoE 2013a, p. 15).

Table 34: Significant Impact Assessment – Fork-tailed Swift (EPBC Act: Migratory)

Significant Impact criterion	Assessment	Significant Impact likelihood
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	The species is almost exclusively aerial in Australia, even sleeping on the wing, and does not breed in Australia (Higgins 1999). They tend to be widespread and dispersive across a range of habitats, with no particular type being identified as important to the species in Australia (DoE 2015a; Higgins 1999). The proposed works will not impact important habitat for these species.	Unlikely

Significant Impact criterion	Assessment	Significant Impact likelihood
	Collision should be proactively managed through BAM Plan, which details strategies for mitigating risk and collision events to White-throated Needletails.	
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.	The species does not have any habitat identified as important in Australia (DoE 2015a; Higgins 1999). No invasive species can therefore be harmful in areas of important habitat. Moreover, the species is widespread and sparse throughout its Victorian range (eBird 2021; Higgins 1999). So, it is unlikely that any invasive species infestations will occur in a concentrated area such that it has a significant impact on the species. Further, the adoption of best-practice construction environmental management measures will ensure monitoring and adaptive control of any infestation of invasive plant or animal species.	**Unlikely**
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	Fork-tailed Swifts do not breed in Australia (Higgins 1999), so it cannot be disrupted. Direct mortality by collisions with WTGs may disrupt the local population's feeding and migration. There is little knowledge of their avoidance behaviour of rotating blades or wind farms. However, their high manoeuvrability may suggest that wind farms are unlikely to be a barrier for the species. Moreover, very few Fork-tailed Swifts are hit at wind farms (Moloney et al. 2019; Nature Advisory unpub. mortality data). If collisions do occur, it would be expected very infrequently, with less than 2 % of the Australian population found in the Gippsland area (Smales & Venosta 2005). This is supported by field surveys where only a single bird was observed from over 697 cumulative hours of bird surveys (BUS and targeted WTNT, Swift Parrot, and migratory shorebirds). This suggests they are not often present in the area. This species may also be susceptible to confusion or disorientation as a result of artificial light created by the wind farm during construction and operation. Construction will not occur at night, so artificial lighting during this phase will be minimal. Once operational, the wind farm will have some artificial lighting at night that will be in line with the existing, sparse artificial lighting environment that is already present in the region of the proposed wind farm. Artificial lighting is therefore considered unlikely to disrupt the migration of this species Coupling their lack of important habitat, lack of breeding in Australia, their low abundance in the area, their use of a	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	wide diversity of landscapes, and the smaller size of the proposed wind farm (13 WTGs) – we can conclude the proposed works will not disrupt the lifecycle of the Fork-tailed Swift.	
Overall assessment		Unlikely

Migratory shorebirds (9 species)

This significant impact assessment addresses those migratory shorebirds that are not also listed with a threatened species status under the EPBC Act, and which share the same impact pathways and similar likelihood of migrating through GWF. This includes:

- Common Redshank
- Common Sandpiper
- Double-banded Plover
- Grey-tailed Tattler
- Marsh Sandpiper
- Pacific Golden Plover
- Red-necked Stint
- Sanderling
- Whimbrel

The significant impact assessment found that the proposed action is unlikely to cause significant impacts to the migratory shorebirds. The development of adaptive mitigation measures included within a Bat and Avifauna Management Plan (BAM Plan) will reduce impacts further.

An action is likely to have a significant impact on these migratory species if there is a real chance or possibility that it will meet any of the significant impact criteria listed in Table 35 (DoE 2013a, p. 15).

Table 35: Significant Impact Assessment – non-threatened migratory shorebirds (9 species)

Significant Impact criterion	Assessment	Significant Impact likelihood
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of	The migratory shorebirds' important habitat is wholly contained in the Corner Inlet Ramsar Wetland. Hydrological and contamination downstream impacts to the main waterways in the surrounding region (Albert River, Jack River, Muddy Creek and Nine Mile Creek – the primary downstream habitats for the species) have been assessed by qualified consultants, with minimal impacts expected	Unlikely

Significant Impact criterion	Assessment	Significant Impact likelihood
important habitat for a migratory species	(including from runoff patterns and flow regimes) (Alluvium 2025, Accent 2025b). Localised sedimentation is anticipated as a potential impact (Alluvium 2025). Construction mitigation measures will be employed to prevent impacts to downstream habitats, including appropriate controls for the prevention of sedimentation and chemical pollution. These are standard measures used to prevent impacts from construction on environmentally sensitive areas and are widely considered to work. The construction mitigation measures will be fully documented and detailed in an Environmental Management Plan (EMP; Accent 2025a). There is no clear or apparent mechanism for the proposed action to substantially modify, destroy or isolate an area of important habitat for any of the 9 migratory shorebird species.	
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.	The habitats important for these migratory species are restricted to the Corner Inlet Ramsar wetlands. So invasive species that impact the wetlands may also impact the habitats for these species. The following invasive species are listed as potentially or actually harmful to the ecological character of the Corner Inlet Ramsar wetland (RSIS 2020); Cord Grass, Sea Spurge, Pacific Seastar, European Shore-crab, rabbits, black rats, foxes, and European fan-worm. The risk of the project increasing marine invasive species is considered low (Fathom Pacific 2025). There is no clear or apparent mechanism for the proposed action to cause any invasive vertebrate species listed above to establish in the wetland to such an extent that it would cause harm to the habitat of migratory shorebirds. Moreover, all of them are already considered present.	**Unlikely**
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	The migratory shorebirds known to use the nearby Corner Inlet Ramsar Wetland have an ecologically significant portion of their population listed between 18 and 430 birds. Those with a lower threshold include Double-banded Plover (23) and Sanderling (30) (Wetlands International 2021; DoE 2017). These species were not found in these numbers within 10 km of the wind farm. The migratory shorebirds using the nearby Corner Inlet Ramsar Wetland are present only in a non-breeding capacity. Though some remain during the breeding season (austral winter), they do not breed there (Higgins 1999; RSIS 2020).	**Unlikely**

Significant Impact criterion	Assessment	Significant Impact likelihood
	Migratory shorebirds use this habitat for feeding, resting behaviour, and as staging areas for migration (RSIS 2020). The proposed project has no clear or apparent mechanisms to disrupt the use of the habitat (see above). Migration may be interrupted if the wind farm poses a barrier or risk to a significant portion of the population (DoE 2017). Such a barrier would only be feasible if a wind farm were to result in a collision with migrating species. Given known climb rates and flight speeds, several scenarios of flight behaviour are expected (Table 19). Under all of these scenarios there it is very unlikely migratory shorebirds will be at RSA height if/when passing over the wind farm. The worst scenario (slowest climb and fastest speed) birds will be passing above RSA after 9.6 km. Notably, the sites that account for the majority of the most abundant migratory shorebirds (94.6 % of all records of migratory shorebirds in the Corner Inlet Ramsar Wetland; Table 16) are 10-11 km away from the proposed wind farm. This spatial use appears to be fairly consistent over the last 40 years of surveys. Flight scenarios coupled with the spatial use of the site suggest that it is unlikely that birds will experience the wind farm as a barrier that seriously disrupts their migration. Collision should be proactively managed through the BAM Plan, which details strategies for mitigating risk and collision events to White-throated Needletails. These species may also be susceptible to confusion or disorientation as a result of artificial light created by the wind farm during construction and operation. Construction will not occur at night, so artificial lighting during this phase will be minimal. Once operational, the wind farm will have some artificial lighting at night that will be in line with the existing, sparse artificial lighting environment that is already present in the region of the proposed wind farm. Artificial lighting is therefore considered unlikely to disrupt the migration of these species.	
Overall assessment		**Unlikely**

5.2.7. Cumulative Impacts

All Australian wind energy developments are subject to comprehensive ecological assessments to identify and evaluate potential risks to biodiversity. These assessments are undertaken in accordance with established regulatory frameworks and apply a hierarchical mitigation approach of avoidance, minimisation, and mitigation. Through iterative design and embedded mitigation

measures, residual impacts are reduced to the lowest practicable level. The GWF project has been assessed and designed in accordance with these same standards.

Cumulative impacts arise from the aggregation of residual and, to a lesser extent, unforeseen effects across multiple developments. These risks are further managed through project-specific adaptive management frameworks (e.g. Bat and Avifauna Management Plans), which include monitoring, trigger-based responses, and mechanisms for ongoing impact reduction where required.

A fully quantitative assessment of cumulative impacts is typically not feasible due to the limited availability of consistent, publicly accessible data on the design, operation, and ecological outcomes of other wind energy developments. In addition, there are inherent ecological complexities that constrain cumulative assessment. Species differ markedly in their movement ecology and patterns of habitat use, which influences their likelihood of interacting with multiple developments. This is particularly relevant for migratory species, whose exposure to wind farms may occur across broad geographic scales, including international flyways, rather than being confined to a discrete local area. While cumulative effects for more sedentary species can be more readily conceptualised within a defined geographic area, highly mobile and migratory species may encounter numerous developments across their range (e.g. between Australia and northern hemisphere breeding grounds), making attribution and quantification of cumulative risk inherently complex.

Cumulative impacts were considered for the following operational wind farms within 50 km of the Project Area:

- Delburn Wind Farm: 40 km from the project site, 33 turbines (operational);
- Toora Wind Farm: 16 km from the project site, 12 turbines (operational); and
- Bald Hills Wind Farm: 43 km from the project site, 52 turbines (operational).

In the absence of comprehensive data, a qualitative, expert-led assessment has been undertaken, applying a precautionary worst-case framework to characterise the potential for cumulative impacts from nearby developments. This approach focuses on relevant impact pathways and sensitive receptors to provide a realistic and defensible evaluation of cumulative risk.

Cumulative impacts to listed species are therefore considered below with respect to both indirect effects (e.g. habitat loss, fragmentation, barrier effects, and biodiversity resiliance) and direct effects (e.g. collision mortality).

Habitat loss, fragmentation and barrier effects

The proposed GWF is not expected to result in a meaningful rise in cumulative habitat loss or fragmentation. Turbines and associated infrastructure are predominantly located within already modified landscapes (e.g. open paddocks), and do not remove or isolate substantial areas of native vegetation. As such, the project does not materially alter habitat connectivity at a landscape scale.

In a cumulative context, the proposed GWF and other wind energy developments in the region are separated by distances of at least 15 km. For many terrestrial resident species (e.g. potoroo, bandicoot, antechinus), particularly those with relatively small home ranges and limited dispersal capacity, this separation distance exceeds typical home range and movement distances. This separation distance maintains extensive areas of intervening habitat where movement and dispersal pathways are not influenced by wind farm infrastructure.

Similarly, for more mobile species (e.g. parrots, cockatoos, swifts, bats, and migratory shorebirds), the spatial separation between developments ensures that large areas of the landscape remain free of turbine infrastructure. These species typically utilise broad movement corridors, including forested habitats and coastal environments. As the proposed GWF and existing developments do not encircle, constrain, or create continuous barriers across these key movement pathways, the potential for barrier effects is low.

Accordingly, the likelihood of the GWF Project contributing to cumulative habitat fragmentation or creating functional barriers to movement, either independently or in combination with other developments, is considered to be low.

Ecosystem resilience

In the context of the proposed GWF, resilience is considered with respect to the existing landscape, which is already characterised by a high degree of modification associated with agricultural land use. The Project is predominantly located within cleared and actively managed land (e.g. grazing paddocks), where baseline ecological conditions and connectivity are already influenced by historical land use. As such, the Project represents an incremental change within an already altered system, rather than a transformation of intact or highly sensitive ecological communities.

Key features that support ecosystem resilience, remnant vegetation, wetlands, riparian corridors, have been avoided or buffered through the Project's design. These areas continue to provide core ecological functions, including the provision of breeding/foraging habitats, movement pathways, and refuge. The retention of these features ensures that the underlying ecological resilience of the landscape remains intact.

From a cumulative perspective, the Project does not substantially reduce the availability, quality, or connectivity of habitat required to sustain local or regional populations. Nor does it introduce barriers or disturbances at a scale likely to disrupt key ecological processes. The capacity of the surrounding environment, therefore, is expected to continue effectively functioning and to preserve the ability to recover from natural or anthropogenic disturbances.

Where residual impacts are unavoidable, these are localised and managed through mitigation and adaptive management measures. In combination with the broader pattern of land use in the region, the Project is not expected to materially diminish ecosystem resilience or compromise the long-term ecological integrity of the landscape.

Collision mortality

Cumulative collision risk is inherently difficult to quantify in the absence of detailed utilisation data across all nearby wind farms and the broader landscape, as well as robust population estimates for key species. This limitation is compounded by the fact that collision risk model (CRM) predictions are infrequently validated through long-term carcass monitoring, meaning that key parameters such as avoidance rates remain uncertain. As a result, quantitative cumulative assessments are typically constrained and subject to a degree of uncertainty.

Notwithstanding these limitations, an available study by Smales (2006) provides a useful context for understanding potential cumulative risk. For example, their early quantitative assessment of cumulative collision risk to the Swift Parrot considered 39 wind farms across Tasmania and south-eastern Australia (representing a collective 1,226 turbines). While this assessment relied on surrogate data from similar parrot species (due to a lack of species-specific flight data), it predicted a total annual mortality of approximately 0.08 to 0.13 individuals across all 39 developments. This

would not be considered a significant annual mortality rate, with the addition of the proposed 13 turbines of GWF unlikely to result in a stepwise increase in mortality rate.

An early assessment of cumulative collision risk at five wind farms in Gippsland (Smales and Venosta 2005) found that, for several MNES relevant to this assessment (e.g. Grey-headed Flying-fox, White-throated Needletail, and migratory shorebirds), the risk of collision was low to negligible. Not all wind farms proposed at that time were subsequently approved or constructed, indicating that the realised level of regional wind farm development—and therefore associated collision risk—has likely remained within or below that assessed scenario.

While the conservation status of some species has changed, with some uplisted since that assessment, the findings nonetheless provide useful context, indicating that wind farm development in the region has historically been associated with low cumulative collision risk for these species. Accordingly, the proposed Project is not expected to represent a step-change increase in cumulative collision risk at a regional scale.

It is also relevant that many of the wind farms included in Smales' (2006) assessment utilised older-generation turbines with lower RSA, generally extending to approximately 30 m above ground level. In contrast, the proposed project incorporates modern turbine designs with a higher minimum blade clearance of 40 m, which increases the separation between RSA and typical flight heights for many species. This is expected to lead to a reduced collision risk relative to earlier wind farm developments.

Many of the bird and bat species recorded within the project area are highly mobile, undertaking long-distance movements for foraging (e.g. flying-foxes) or migration (e.g. parrots, swifts, and shorebirds). These species may interact with multiple wind farms across broad spatial scales and therefore have the potential to be exposed to cumulative collision risk. However, wind energy developments across the region, and more broadly across Australia, are subject to consistent regulatory requirements, including detailed ecological surveys, CRM, and the implementation of mitigation measures and adaptive management measures (e.g. operational carcass and bird monitoring, and trigger-based responses).

Within this regulatory and management context, cumulative collision risk is expected to comprise the aggregation of small, managed contributions from individual projects. Given the low level of predicted mortality associated with the proposed GWF Project, and the application of standard mitigation and adaptive management measures, the incremental contribution of the project to regional cumulative collision risk is not expected to be significant.

6. Recommendations

This section provides a list of the avoidance and mitigation measures proposed to address the potential impacts on Matters of National Environmental Significance. These measures are discussed in the impact assessments for relevant species (Section 5).

These measures are specific to ecological impacts but note that other measures and management plans are also applicable and may reduce some impacts to flora and fauna species, such as those discussed in the contamination report (Accent 2025b), marine invasive species report (Fathom Pacific 2025), and hydrological report (Alluvium 2025). These are not specifically addressed here as they are detailed in the relevant reports and also largely captured under the draft Environmental Management Plan (EMP; Accent 2025a), which is discussed below.

Table 36: Avoidance and Mitigation measures at Gelliondale Wind Farm.

Mitigation ID	Description	Impact aspect	Project phase
MM01 Bat and Avifauna Management Plan	Development of a Bat and Avifauna Management Plan (BAM Plan), that would aim to: ▪ Minimise the impacts from the GWF on threatened fauna listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and/or the Victorian Flora and Fauna Guarantee Act 1988 (FFG Act); ▪ An informed understanding of the turbine collision risk to listed threatened fauna that occurs on-site; ▪ An informed understanding of how threatened fauna use of the site changes in response to wind farm construction and operation; ▪ Monitoring for the timely identification of turbine collisions and the timely collection and analysis of data; ▪ Responsive updates to, and regular validation of, the impact assessment framework for listed fauna regularly recorded on site, using monitoring data to support a robust adaptive management approach to reducing impacts, where possible; ▪ Where applicable, the development and implementation of tangible, on-ground management actions to promote a long-term collision risk reduction on listed threatened and migratory bird and bat species. The BAMP should specifically address the following key species of concern identified during baseline assessments: ▪ Blue-winged Parrot ▪ Gang-gang Cockatoo ▪ Grey-headed Flying-Fox ▪ Latham's Snipe ▪ Migratory shorebird species	Direct impact on turbine collisions and indirect impact on fauna use of the site	Operation

Mitigation ID	Description	Impact aspect	Project phase
	▪ Swift Parrot ▪ White-throated Needletail		
MM02 Environmental Management Plan (EMP)	Development of an Environmental Management Plan (EMP), that would aim to: ▪ Set out the framework for management, mitigation and monitoring of relevant impacts of the action, including any provisions for independent environmental auditing; ▪ Address all project phases (construction, operation, decommission), including stating the environmental objectives, performance criteria, monitoring, reporting, corrective action, responsibility and timing for each environmental issue; and ▪ describe contingencies for events such as failure of sewerage systems, heavy or prolonged rainfall, or saltwater intrusion into groundwater. The EMP should specifically address the potential risks and impact pathways on MNES, including: ▪ Pollutants affecting water and habitat quality, such as hydrological alteration, sedimentation, mobilisation of acid sulphate soils and contaminated materials; and ▪ Management of hygiene and control measures to mitigate the spread and introduction of invasive species and diseases.	Indirect and direct impacts on species, habitats and Ramsar wetlands	Construction and operation

7. Conclusion

Assessment of the project's impacts in relation to the EPBC Act Significant Impact Guidelines found the following implications:

- The project is unlikely to cause significant impacts to the **Corner Inlet Ramsar Wetland** or modify its ecological character, as no areas of the wetland are being destroyed or substantially modified. Further, the hydrological assessment showed that increases in the total annual volume of runoff entering the Corner Inlet Ramsar wetland are negligible (Alluvium 2025) and considered all other changes in the hydrological regime to be unlikely to occur because of the proposed action (Alluvium 2025). The risk for potential contamination was low (Accent 2025b) as was the risk for introduction/proliferation of marine invasive species (Fathom Pacific 2025). Further, these risks are addressed in mitigation actions detailed in the Environmental Management Plan (Accent 2025a).
- The project is unlikely to have a significant impact on **listed flora species** and listed **ecological communities,** as these were found not to occur within the impact zone of the Project Footprint.
- The project could potentially lead to a long-term decrease in the population of the vulnerable **Blue-winged Parrot,** as 14.8% of these birds were observed at RSA, and a small portion of these could be prone to collision with WTGs, given a usual avoidance rate of 90%. Statistical advice suggests these species are not suited for assessment in collision risk models. These impacts would not be expected to be classified as significant, provided that the mitigation measures to be detailed in a Bat and Avifauna Management Plan (BAM Plan) are followed. However, collisions should be proactively managed through the BAM Plan, which should detail strategies for mitigating risk and collision events to Blue-winged Parrots to avoid a significant impact on the species.
- No significant impacts on other threatened bird species, such as **Swift Parrot, Gang-Gang Cockatoo** and **Latham's Snipe,** are considered likely. This is due to their low numbers of occurrence, minimal impact on habitats, and the infrequency of risky behaviour, i.e. unlikely to regularly fly at RSA height. However, collisions should be proactively managed through the BBAMP, which should detail strategies for mitigating risk and collision events to avoid a significant impact on these species.
- Historical records and observations during field surveys suggest **White-throated Needletail** are regulator visitors to the area during the warmer months. White-throated needletails are known for risk behaviour, regularly flying at height and experiencing turbine collisions (Nature Advisory *unpub.* mortality data), though the extent to which collision mortality impacts their total population is not known (TSSC 2019).
- The collision risk modelling **White-throated Needletail** suggests an average mortality of 1.4 birds. The population is estimated at 41,000 (Garnett and Baker 2021), with a nationally significant number being 41 birds (0.01% of the population), showing the annual mortality of 1.4 birds is unlikely to seriously disrupt the species' recovery (DoE 2015a). However, collisions should be proactively managed through the BBAMP, which should detail strategies for mitigating risk and collision events to White-throated Needletails to avoid a significant impact on the species.
- No significant impacts are expected on **Fork-tailed Swift**. This species is almost exclusively aerial in Australia and does not breed in Australia. They tend to be widespread and dispersive across

a range of habitats, with no particular type of habitat being identified as important to the species in Australia. The proposed works will not impact important habitat for these species. If collisions do occur, it would be expected very infrequently, with less than 2 % of the Australian population found in the Gippsland area. However, collisions should be proactively managed through the BBAMP, which should detail strategies for mitigating risk and collision events to avoid a significant impact on the species.

- The impact assessment found that the proposed action is unlikely to cause significant impacts to **migratory shorebirds**. The migratory shorebirds' important habitat is wholly contained in the Corner Inlet Ramsar Wetland. Hydrological and contamination downstream impacts to the main waterways in the surrounding region (Albert River, Jack River, Muddy Creek and Nine Mile Creek – the primary downstream habitats for the species) have been assessed by qualified consultants, with minimal impacts expected (Alluvium 2025, Accent 2025b). Additionally, an EMP will be developed to reduce impacts further.
- Flight scenarios, coupled with the abundance and spatial use of the site, suggest that it is unlikely that **migratory shorebirds** will experience the wind farm as a barrier that seriously disrupts their migration. However, collisions should be proactively managed through the BBAMP, which should detail strategies for mitigating risk and collision events to avoid a significant impact on these species.
- The impact assessment found that the proposed action is unlikely to cause significant impacts to the **Grey-headed Flying-fox**. However, several camps are within the daily foraging distance to the project, and there is potential for collision with the operating WTG. Consequently, there is some level of risk of impacting the species. A systematic monitoring program and mitigation measures need to be employed, and their effectiveness assessed, during the operational phase through implementation of a BBAMP.
- No significant impacts are expected on the **Long-nosed Potoroo**, **Southern Brown Bandicoot** and **Swamp Antechinus**. This is largely because there are very few records of these species within the area, and only small areas of potential habitat are proposed to be removed. Additionally, measures detailed in an EMP with further reduce potential impact pathways.
- No significant impacts are expected on fish species, such as **Australian Grayling** and **Dwarf Galaxias,** as impacts on water quality are considered low (Alluvium 2025; Accent 2025b). Additionally, an EMP will be employed to prevent impacts to downstream habitats, including appropriate controls for the prevention of sedimentation and pollution.

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Appendix 1: Output of the protected matters search tool (PMST)

Australian Government

Department of Climate Change, Energy, the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 25-Mar-2026

- Summary
- Details
  - Matters of NES
  - Other Matters Protected by the EPBC Act
  - Extra Information
- Caveat
- Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	89
Listed Migratory Species:	62

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	76
Whales and Other Cetaceans:	11
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	14
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	9
Key Ecological Features (Marine):	None
Biologically Important Areas:	7
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Corner inlet	Within Ramsar site	In feature area

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community likely to occur within area	In feature area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area	In buffer area only
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area	In feature area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In buffer area only
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Sternula albifrons Little Tern [82849]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche salvini			
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Thinornis cucullatus cucullatus			
Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Xenus cinereus			
Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area	In feature area
FISH			
Galaxiella pusilla			
Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat known to occur within area	In feature area
Prototroctes maraena			
Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area	In feature area
Seriolella brama			
Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In feature area
FROG			
Litoria aurea			
Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Ranoidea raniformis listed as Litoria raniformis			
Southern Bell Frog, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [94668]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Uperoleia martini Martin's Toadlet [1873]	Endangered	Species or species habitat may occur within area	In buffer area only
MAMMAL			
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In buffer area only
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat likely to occur within area	In feature area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat may occur within area	In feature area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area	In feature area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat may occur within area	In feature area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
PLANT			
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat known to occur within area	In feature area
Caladenia orientalis Eastern Spider Orchid [83410]	Endangered	Species or species habitat may occur within area	In feature area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat known to occur within area	In feature area
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat may occur within area	In feature area
Eucalyptus strzeleckii Strzelecki Gum [55400]	Vulnerable	Species or species habitat known to occur within area	In feature area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area	In feature area
Prasophyllum frenchii Maroon Leek-orchid, Slaty Leek-orchid, Stout Leek-orchid, French's Leek-orchid, Swamp Leek-orchid [9704]	Endangered	Species or species habitat known to occur within area	In buffer area only
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thelymitra matthewsii Spiral Sun-orchid [4168]	Endangered	Species or species habitat may occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area	In feature area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat known to occur within area	In feature area
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area	In feature area
Pseudemoia rawlinsoni Glossy Grass Skink, Swampland Cool-skink, Rawlinson's Window-eyed Skink [59160]	Vulnerable	Species or species habitat known to occur within area	In feature area
SHARK			
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area	In buffer area only

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Sternula albifrons Little Tern [82849]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche bulleri			
Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri			
Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta			
Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche chrysostoma			
Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida			
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche melanophris			
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini			
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Migratory Marine Species			
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Caperea marginata			
Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Carcharias taurus Grey Nurse Shark [64469]		Species or species habitat may occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In feature area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area	In buffer area only
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris alba Sanderling [875]		Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area	In feature area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In feature area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In feature area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area	In feature area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Australian Postal Corporation		
Lot 2 PS420065D [AGPR7222]	VIC	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris alba Sanderling [875]		Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In feature area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area	In feature area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Sternula albifrons as Sterna albifrons Little Tern [82849]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche bulleri platei as Thalassarche sp. nov.			
Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri			
Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta			
Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche chrysostoma			
Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida			
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche melanophris			
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini			
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Thinornis cucullatus as Thinornis rubricollis			
Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis			
Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa brevipes as Heteroscelus brevipes			
Grey-tailed Tattler [851]		Roosting known to occur within area	In feature area
Tringa glareola			
Wood Sandpiper [829]		Roosting known to occur within area overfly marine area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis			
Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area	In feature area
Xenus cinereus			
Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area	In feature area
Mammal			
Arctocephalus forsteri			
Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In buffer area only
Arctocephalus pusillus			
Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area	In buffer area only
Reptile			
Caretta caretta			
Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area

Whales and Other Cetaceans

[Resource Information]

Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			

Current Scientific Name	Status	Type of Presence	Buffer Status
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In feature area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In buffer area only
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
ALBERTON EAST FLORA & FAUNA RESERVE	Nature Conservation Reserve	VIC	In buffer area only
Binginwarri H15 B.R	Natural Features Reserve	VIC	In buffer area only
Binginwarri H18 B.R	Natural Features Reserve	VIC	In buffer area only
Binginwarri H19 B.R	Natural Features Reserve	VIC	In buffer area only
Binginwarri H43 B.R	Natural Features Reserve	VIC	In buffer area only
Devon B.R.	Natural Features Reserve	VIC	In buffer area only
Jack River SS.R.	Natural Features Reserve	VIC	In buffer area only
Nooramunga Marine & Coastal Park	National Parks Act Schedule 4 park or reserve	VIC	In feature area
NOORAMUNGA STATE FAUNAL RESERVE	Nature Conservation Reserve	VIC	In buffer area only
Tarra River SS.R.	Natural Features Reserve	VIC	In buffer area only
Unnamed P0155	Private Nature Reserve	VIC	In buffer area only
Welshpool H16 B.R	Natural Features Reserve	VIC	In buffer area only
Welshpool H17 B.R	Natural Features Reserve	VIC	In buffer area only
Woranga B.R	Natural Features Reserve	VIC	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State	Buffer Status
Gippsland	Victoria	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Gelliondale Wind Farm Project	2023/09577		Assessment	In feature area
Controlled action				
Alberton Wind Farm, Sth Gippsland, Vic	2017/7854	Controlled Action	Post-Approval	In feature area
Windfarm	2003/1109	Controlled Action	Completed	In buffer area only
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Port Welshpool Harbour Dredging	2007/3521	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Construction of wharf	2003/1050	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Referral decision				
All actions taken in response to the current severe bushfires in Victoria.	2009/4787	Referral Decision	Completed	In feature area

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Ardenna tenuirostris			
Short-tailed Shearwater [82652]	Foraging	Known to occur	In feature area

Scientific Name	Behaviour	Presence	Buffer Status
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur	In feature area
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur	In feature area
Sharks			
Carcharodon carcharias White Shark [64470]	Breeding (nursery area)	Known to occur	In buffer area only
Whales			
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present	In buffer area only
Eubalaena australis Southern Right Whale [40]	Migration		In buffer area only
Eubalaena australis Southern Right Whale [40]	Reproduction		In buffer area only

Bioregional Assessments			[Resource Information]
SubRegion	BioRegion	Website	Buffer Status
Gippsland	Gippsland Basin	BA website	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Appendix 2: Likelihood of occurrence of listed flora species

Notes: grey highlights indicate species known to occur, likely to occur, or potential to occur within the Action Area.

EPBC (**Vu** = vulnerable, **En** = endangered, **Cr** = Critically endangered).

Common Name	Scientific name	EPBC	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Austral Toad-flax	*Thesium australe*	VU	Grows in damp habitat of grasslands, woodlands and herb fields. Thought to be extinct across much of its former distribution, with all recent collections being from the highlands near Wulgulmerang. Flowers from spring to summer (RBGV 2023).	PMST	No VBA records	N/A	Thought to be extinct across much of its former range, potentially restricted to the Wulgulmerang highlands. **Unlikely to occur.**
Clover Glycine	*Glycine latrobeana*	VU	Primarily favours grassland and grassy woodland, though also known from dry forest and rarely heathland. This species mostly grows on clays and sometimes more loamy soils. Distribution is widespread but sporadic across the state. Flowers during spring at lower elevations, and during summer at higher elevations (Carter & Sutter 2010).	PMST & VBA	1	2019	Habitat present within more open areas of heathy woodland and swamp scrub with intact grassy ground layer within Gelliondale State Forest. **Potential to occur.**
Dense Leek-orchid	*Prasophyllum spicatum*	VU	Distributed across southern Victoria primarily along the coast from the South Australian border to Wonthaggi. Primarily occurs in low, windswept coastal and near-coastal heathland, sandhills and heathy woodland where soils are generally sand and clay loams which are usually damp but well-drained, although some sites can experience seasonal waterlogging. Also found in grasslands. Flowers from October to December (DEECA 2023; RBGV 2023; Duncan 2010).	PMST	No VBA records	N/A	The Action Area supports near-coastal heathland and heathy woodland within Gelliondale State Forest, with sandy soils prone to waterlogging. **Potential to occur.**
Eastern Spider-orchid	*Caladenia orientalis*	EN	Grows on well-drained sandy soils, in coastal heathland and heathy woodland habitat. This species is primarily distributed around Grantville and Yarram. Flowers from September to October (Jeanes & Blackhouse 2006; RBGV 2023).	PMST & VBA	2	1939	Heathland and heathy woodland patches within Gelliondale State Forest supported less degraded ground layers that may be suitable for the species. However, nearby records are pre-2000. **Potential to occur.**
Green-striped Greenhood	*Pterostylis chlorogramma*	VU	Found growing on sandy-loam soils in Box-Stringybark Forest, often supporting a canopy of *Eucalyptus obliqua, Eucalyptus radiata, Eucalyptus cephalocarpa* and/or *Eucalyptus cypellocarpa*. The understory typically comprises a dominant Pteridium esculentum component, and may also include *Hakea ulicina, Dillwynia glaberrima, Pultenaea scabra, Banksia spinulosa, Epacris impressa, Acacia mucronata, Leptospermum laevigatum, Monotoca scoparia*, and *Bursaria spinosa*. The species has a scattered distribution from Yarram to Edenhope. Flowers from July to September (Duncan, Pritchard & Coates 2009).	PMST	No VBA records	N/A	No Box-stringybark forest occurs in the Action Area. **Unlikely to occur.**

Common Name	Scientific name	EPBC	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Maroon Leek-orchid	*Prasophyllum frenchii*	EN	Distributed sporadically throughout the whole of southern Victoria where it grows mostly in the lowlands with rare occurrences in the foothills. Occurs in grassland, grassy woodland, heathland and open forest on well-drained but usually damp sandy to black clay loams, although some sites are seasonally waterlogged. This includes sites that occur in seasonally damp transition zones on the margins of shallow freshwater swamps and marshlands. Flowers from October to November (DEECA 2025b; RBGV 2023; Duncan 2010).	PMST & VBA	4	2003	Habitat present within more open areas of heathy woodland and swamp scrub with intact grassy ground layer within Gelliondale State Forest. **Potential to occur.**
Matted Flax-lily	*Dianella amoena*	EN	Mostly found in drier lowland grassland and grassy woodlands on well-drained to seasonally waterlogged fertile sandy loams to heavy cracking soils derived from sedimentary or volcanic geology. Commonly associated native species include *Themeda triandra, Microlaena stipoides* var. *stipoides, Anthosachne scaber, Poa labillardierei* and *Rytidosperma racemosum* var. *racemosum*. Most sites contain a high cover of introduced plant species, and the surrounding landscape is often highly altered. Widely distributed from eastern to south-western Victoria. Flowers from December to February (Carter 2010; RBGV 2023).	PMST	No VBA records	N/A	Soils largely non-clay within Action Area. No grassland habitat occurs, and woodlands typically dominated by heath. **Unlikely to occur.**
Metallic Sun-orchid	*Thelymitra epipactoides*	EN	Primarily found in coastal areas, growing on dry sand loams or loamy sands in heathland, grassland and woodland habitat. The species is also found further inland in comparable habitat (Backhouse & Jeanes 1995). Distribution ranges as far west as the South Australian border, north to the Nhill-Dimboola area and as far east as the Bairnsdale area. Flowers from September to November, during sunny periods (RBGV 2023).	VBA	1	1978	Habitat is present within areas with a relatively intact and diverse grassy or heathy understory within Gelliondale State Forest. However, nearby records are limited and pre-2000. **Potential to occur.**
River Swamp Wallaby-grass	*Amphibromus fluitans*	VU	River Swamp Wallaby-grass grows mostly in permanent swamps and lagoons, billabongs, dams and roadside ditches. The species requires moderately fertile soils with some bare ground; conditions that are caused by seasonally fluctuating water levels (DCCEEW 2025b).	PMST & VBA	2	2007	Habitat present within drainage channels, vegetated dams and waterways, though recent records within the Action Areaare limited. **Potential to occur.**
Spiral Sun-orchid	*Thelymitra matthewsii*	VU	A rare species known from coastal to slightly elevated areas (to 400m), where it occurs on well-drained soils of sandy flats and open forest. The species often colonises disturbed sites but may be outcompeted as the site regenerates. Distributed around the Grampians, Anglesea, near Woodside and the Mallacoota area. Flowers from August to October, during sunny periods (RBGV 2023).	PMST	No VBA records	N/A	The Action Area comprises lowland areas and largely poorly draining soils. No nearby records. **Unlikely to occur.**
Strzelecki Gum	*Eucalyptus strzeleckii*	VU	The species grows on deep, fertile loams in damp hilly country and along the banks of watercourses. It is distributed along the western Strzelecki Ranges, as far north as Neerim South and potentially as far south as Wilsons Promontory. Survey in spring to best identify glossy new growth (Carter 2006).	PMST & VBA	4	2012	The Action Area is dominated by lowland plains with heavy soils grading into coastal sands. Some habitat occurs, but treed vegetation largely cleared from the Action Area. **Potential to occur.**

Common Name	Scientific name	EPBC	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Swamp Everlasting	*Xerochrysum palustre*	VU	Often growing on heavy black clay soils in wetlands including sedge swamps, shallow freshwater marshes and seasonally wet areas within native grasslands and heaths. Commonly associated genera include *Amphibromus, Baumea, Carex, Chorizandra, Craspedia, Eleocharis, Isolepis, Lachnagrostis, Lepidosperma, Myriophyllum, Phragmites australis, Themea triandra* and *Villarsia*. May occur in the threatened ecological communities SHWTLP, NTGVVP and Gippsland Red Gum Grassy Woodland and Associated Native Grassland (DAWE 2021). Distributed in lowland swamps in Victoria from near the South Australian border to near Bairnsdale. Also, an isolated occurrence near Cobberas. Flowers from November to March (RBGV 2023).	PMST & VBA	9	2023	Lack of wetland habitat dominated by associated genera on heavy clay soils. **Unlikely to occur.**
Swamp Fireweed	*Senecio psilocarpus*	VU	Herb-rich winter-wet swamps on volcanic clays or peaty soils (Walsh & Entwisle 1999). Known from approximately 10 sites between Wallan, about 45 km north of Melbourne, and Honans Scrub in south-eastern South Australia (TSSC 2008).	PMST	No VBA records	N/A	Wetland and swamp habitats are degraded in the Action Areaand not derived from volcanic clay. No nearby records. **Unlikely to occur.**
Thick-lip Spider-orchid	*Caladenia tessellata*	VU	Coastal open woodlands, lowland forest, heathy woodland (Entwisle 1994).	PMST & VBA	2	1992	Heathland and heathy woodland patches within Gelliondale State Forest supported less degraded ground layers that may be suitable for the species. However, nearby records are pre-2000. **Potential to occur.**

Appendix 3: Likelihood of occurrence of listed fauna species

Notes: grey highlights indicate species known to occur, likely to occur, or potential to occur within the Action Area.

EPBC: **Vu** = vulnerable, **En** = endangered, **Cr** = Critically endangered, **Mig.** = migratory.

International agreements: 1 = Bonn Convention, **2** = China-Australia Migratory Bird Agreement, CAMBA, **3** = Japan-Australia Migratory Bird Agreement, JAMBA, **4** = Republic of Korea-Australia Migratory Bird Agreement, ROKAMBA, **5** = Agreement on the Conservation of Albatrosses and Petrels, ACAP.

Common Name	Scientific name	Conservation Status		Habitat	Number of VBA records	Date of last existing record	Likelihood of occurrence
		EPBC	Internat. Agreements				
Birds							
Australasian Bittern	*Botaurus poiciloptilus*	En	-	The Australian population is estimated at 1,300 individuals, with a further 700 in New Zealand (TERN Australia 2024). This species is a wetland specialist, likely to use the Ramsar site and nearby dams, rivers, and creeks where waterbodies are fringed by dense vegetation (DCCEEW 2022b). While the species is generally considered sedentary, birds are known to readily move long distances (100–500 km) depending on wet/dry seasons and foraging conditions (Garnett and Baker 2021; DOC 2024). During these movements, they use a variety of wetland habitats as stopovers, including those of poor quality, such as drainage ditches (Williams 2021). Terrestrial wetlands, including a range of wetland types but prefer permanent water bodies with tall dense vegetation, particularly those dominated by sedges, rushes, reeds or cutting-grass (Marchant & Higgins 1990).	No VBA records	N/A	Potential wetlands exist in the broader Flora and Fauna Search Area, including the shoreline and nearshore islands within the Corner Inlet Ramsar wetland. However, there are no recent records of the species from this wider area. All identified suitable habitat is located to the south of the project area (DEECA 2025b) and are well-connected east-to-west. Since there is no suitable habitat to the north, and the Action Area does not extend into any likely movement corridors, it is unlikely that the species would need to cross the Action Area. **Unlikely to occur**.
Australian Gull-billed Tern	Gelochelidon macrotarsa	Mig.	2	Shallow freshwater and saline wetlands; intertidal mudflats, also in sheltered inshore marine waters where they roost on sandbars and beaches (Higgins & Davies 1996).	9	1988	This species was recorded infrequently during migratory shorebird surveys in the Corner Inlet Ramsar Site, where high-quality habitat is abundant. The species was not observed in the study areas during over 697 hours spread over 4 years of bird surveys, and has few areas of modelled low-quality habitat to the north of the Ramsar site (DEECA 2025b). These habitats are largely farm dams or drained wetlands. The species may fly over the area, but this would be expected to be very rare. **Unlikely to occur.**
Australian Fairy Tern	*Sternula nereis nereris*	Vu	-	Generally restricted to sheltered coasts both on the mainland, and inshore and offshore islands. Occurs in embayment, such as harbours, inlets, bays, estuaries, lagoons, and ocean beaches. Also found on lakes and salt ponds (Higgins & Davies 1996).The species is not known to collide with wind turbines, but regularly flies at height. The southern Australian population is estimated as 1200 to 1980 birds (Wetlands International 2015).	10	2020	This species was recorded infrequently during migratory shorebird surveys in the Corner Inlet Ramsar Site, where high-quality habitat is abundant. The species was not observed in the study areas during over 697 hours spread over 4 years of bird surveys, and has few areas of modelled low-quality habitat to the north of the Ramsar site (DEECA 2025b). These habitats are largely farm dams, drained wetlands, or small ephemeral wet areas that are unlikely to provide quality habitat for the species. The species may fly over the area, but this would be expected to be very rare. **Unlikely to occur.**
Australian Painted-snipe	*Rostratula australis*	En	-	Generally, inhabits shallow terrestrial freshwater wetlands, including temporary and permanent lakes, swamps and claypans (Marchant & Higgins 1990). They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of *Lignum muehlenbeckia* or cane grass or sometimes tea-tree (Melaleuca). Sometimes utilises areas that are lined with trees, or that have some scattered fallen or washed-up timber (DAWE 2020).	No VBA records	N/A	Although some potentially suitable wetland habitat is present in the broader Flora and Fauna Search Area, it is all within the Corner Inlet Ramsar site and is modelled as low-quality (DEECA 2025b). The nearest recent records are in wetlands around Melbourne and at Sale, and there are no records either in the VBA or in the Atlas data. **Unlikely to occur.**

Common Name	Scientific name	Conservation Status		Habitat	Number of VBA records	Date of last existing record	Likelihood of occurrence
		EPBC	Internat. Agreements				
Bar-tailed Godwit	*Limosa lapponica*	En/Mig.	1-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). Their non-breeding habitat is mainly intertidal mudflats and sand flats, but they are also known to use shallow salt pans and salt marsh (McCaffery and Gill 2020). The East Asian-Australasian flyway population is estimated at 126,000 (Wetlands International 2020), with a nationally important number of 130 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017). Mainly coastal species, usually in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats. In Vic. Found mainly around Port Phillip Bay (Higgins & Davies 1996).	25	2020	This species is regularly recorded with the Corner Inlet Ramsar site, and has been observed in nationally important numbers during migratory shorebird surveys by Nature Advisory and Birdlife Australia. The modelled habitat is confined to the Ramsar site (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart northwards on their annual migration. **Potential to occur.**
Black-tailed Godwit	*Limosa limosa*	En/Mig.	1-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). Their non-breeding habitat is mainly intertidal mudflats and sand flats, but they are also known to use shallow salt pans and salt marsh (van Gils et al. 2020a). The East Asian-Australasian flyway population is estimated at 160,000 (Wetlands International 2021), with a nationally important number of 160 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017). Mainly coastal species, usually in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats. In Vic. Found mainly around Port Phillip Bay (Higgins & Davies 1996).	1	1987	This species is regularly recorded with the Corner Inlet Ramsar site, and has been observed in nationally important numbers during migratory shorebird surveys by Birdlife Australia. The modelled habitat is confined to the Ramsar site (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart northwards on their annual migration. **Potential to occur.**
Blue-winged Parrot	*Neophema chrysostoma*	Vu	-	This species is partially migratory, with most birds flying to Tasmania to breed over the warmer months, though some breeding is known from southeast Australia (DCCEEW 2023a). When in Victoria, they inhabit areas of mosaic open woodland, shrubland, salt marsh, wetlands, and pasture (Collar and Boesman 2020a). The species tend to congregate in flocks around migration but in small family groups in the breeding season (Collar and Boesman 2020a). The species uses suitable habitats in the wider area for foraging, roosting, breeding, and staging before crossing the Bass Strait. Habitat for the species is likely to exist throughout the project area, with some potential breeding habitat present. Occupies coastal, subcoastal and inland habitats ranging into semi-arid zones. Throughout much of their range, they inhabit grasslands and grassy woodlands and forests (Higgins 1999).	27	2021	**Recorded** in the Action Area. Frequently observed at most BUS Points, in flocks of up to 8 in spring-summer. In autumn, flocks are significantly larger (up to 39 individuals). Occasionally seen at RSA height.
Brown Treecreeper (southeastern)	*Climacteris picumnus*	Vu	-	Woodlands dominated by eucalypts, especially Stringybarks or other rough-barked eucalypts, usually with open grassy understorey (Higgins et al. 2001). Commonly found in arid and ssemi-arid zones, and less commonly found on coastal plains and ranges (DCCEEW 2023b).	No VBA records	N/A	Typically confined to dry woodland areas inland of the Great Dividing Range, no suitable habitat has been identified or modelled in the area (DEECA 2025b). **Unlikely to occur**
Caspian Tern	*Hydroprogne caspi*	Mig.	3	This species frequents coastlines and lareger inland waterbodies (Cuthbert and Wires 2020). The species tends to forage at low heights above waterbodies (<20 m), but is known to fly higher when displaying during the breeding season or moving between habitats (Cuthbert and Wires 2020).	40	2020	This species was recorded infrequently during migratory shorebird surveys in the Corner Inlet Ramsar Site, where high-quality habitat is abundant. The Ramsar site represents one of three significant breeding colonies in Victoria (Minton and Deleyev 2001). The species was not observed in the study areas during over 697 hours spread over 4 years of bird surveys, and has few areas of modelled low-quality habitat to the north of the Ramsar site (DEECA 2025b). These habitats are largely farm dams, drained wetlands, or small ephemeral wet areas that are unlikely to provide quality habitat for the species. The species may fly over the area, but this would be expected to be very rare. **Unlikely to occur.**
Common Greenshank	*Tringa nebularia*	En/Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). Their non-breeding habitat is mainly intertidal mudflats and sand flats, but they are also known to use shallow salt pans, salt marsh, and artificial waterbodies such as dams (van Gils et al. 2020b). The East Asian-Australasian flyway population is estimated at 110,000 (Wetlands International 2021), with a nationally	26	2018	This species is regularly recorded with the Corner Inlet Ramsar site, and has been occasionally observed in nationally important numbers during migratory shorebird surveys by Birdlife Australia. The modelled habitat is confined to the Ramsar site (DEECA 2025b), with good

Common Name	Scientific name	Conservation Status		Habitat	Number of VBA records	Date of last existing record	Likelihood of occurrence
		EPBC	Internat. Agreements				
				important number of 110 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).			connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart northwards on their annual migration. **Potential to occur.**
Common Sandpiper	*Actitis hypoleucos*	Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). Their non-breeding habitat is mainly the margins of rivers, shorelines, and wetlands, with some use of grassland and dams (van Gils et al. 2020c). The East Asian-Australasian flyway population is estimated at 190,000 (Wetlands International 2021), with a nationally important number of 190 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	6	2005	This species is regularly recorded with the Corner Inlet Ramsar site by Nature Advisory and Birdlife Australia migratory shorebird surveys. The modelled habitat is confined to the Ramsar site and coastal ephemeral wet areas (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart northwards on their annual migration. **Potential to occur.**
Common Redshank	*Tringa totanus*	Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). Their non-breeding habitat is mainly rocky, muddy and sandy shorelines, saltmarshes and open mudflats, salt lakes, freshwater lagoons, saltworks and sewage farms; sometimes at inland waters or flooded grasslands (van Gils et al. 2020a). The East Asian-Australasian flyway population is estimated at 10,000 to 100,00 (Wetlands International 2021), with a nationally important number of 100 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	No VBA records	N/A	Despite no VBA records, this species has been recorded within the Corner Inlet Ramsar site by Birdlife Australia migratory shorebird surveys, in numbers approaching national significance. Suitable habitat is largely confined to the Ramsar site and coastal ephemeral wet areas, with good connections east-to-west. There is the possibility of some lower-quality habitat onsite in the form of dams and ephemeral wet areas. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart northwards on their annual migration. **Potenital to occur.**
Curlew Sandpiper	*Calidris ferruginea*	Cr/Mig.	1-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). Their non-breeding habitat is mainly intertidal mudflats, saltpans, ephemeral wetlands, and dams with relatively flat edges of bare ground (Mlodinow and Medrano 2023). The East Asian-Australasian flyway population is estimated at 90,000 (Wetlands International 2021), with a nationally important number of 90 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	16	2004	This species is regularly recorded within the Corner Inlet Ramsar site, and has been observed in nationally important numbers during migratory shorebird surveys by Birdlife Australia. The modelled habitat is confined to the Ramsar site (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart northwards on their annual migration. **Potential to occur.**
Diamond Firetail	*Stagonopleura guttata*	Vu	-	The species uses open woodland and mallee habitats, preferring areas with a grassy undergrowth (Payne 2020b). The species is generally sedentary with only short-distance flights between habitat patches (Payne 2020b). Forages on a wide range of seeds, from which in some cases a large portion can be derived from weed species (Read 1994).	No VBA records	N/A	Typically confined to dry woodland areas inland of the Great Dividing Range**. Unlikely to occur**
Double-banded Plover	*Charadrius bicinctus*	Mig.	1	This is a unique migratory shorebird, where migration is east-west rather than the north-south of other migratory shorebirds. The species breeds in New Zealand, only visiting Australia over the austral winter (DoE 2017). Their non-breeding habitat is mainly coastal beaches, pasture and wetlands, never too far from the coast (Wiersma et al. 2023). The East Asian-Australasian flyway population is estimated at 19,000 to 27,000 (Wetlands International 2021), with a nationally important number of 23 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	No VBA records	N/A	Despite no VBA records, this species is regularly recorded within the Corner Inlet Ramsar site, and has been observed in nationally important numbers during migratory shorebird surveys by Birdlife Australia. The modelled habitat is confined to the Ramsar site (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart on their annual migration, likely in a north-east direction toward their New Zealand wintering grounds. **Potential to occur.**
Far Eastern Curlew	*Numenius madagascariensis*	Cr/Mig.	1-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). Their non-breeding habitat is mainly coastal estuaries, swamps, salt marshes, and mudflats (van Gils et al. 2020d). However, the species often roosts further inland at night on salt marshes and pans (van Gils et al. 2020d). The East Asian-Australasian flyway population is estimated at 35,000 (Wetlands International 2021), with a nationally important number of 35 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	61	2020	This species is regularly recorded within the Corner Inlet Ramsar site, and has been observed in nationally important numbers during migratory shorebird surveys by Nature Advisory and Birdlife Australia. The modelled habitat is confined to the Ramsar site (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart north on their annual migration. **Potential to occur.**

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Fork-tailed Swift	*Apus pacificus*	Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2015a). In Australia, the species is an aerial specialist, using the airspace above almost all habitats from coastal to inland, grassland to woodland (Chantler et al. 2020). The Australian population is estimated at 10,000 (BirdLife International 2024), with a nationally important number of 100 birds (DoE 2015a). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	No VBA records	N/A	Recorded in the Action Area (one observation in summer BUS 2015). Will likely use the area on occasion, but would be considered rare. **Known to occur.**
Gang-gang Cockatoo	*Callocephalon fimbriatum*	En	-	In summer, generally in tall mountain forests and woodlands, particularly in heavily timbered, mature wet sclerophyll forests and woodlands. Prefer Eucalyptus-dominated assemblages. Also occurs in subalpine snow gum woodlands and occasionally in temperate rainforests and regenerating forests. In winter occurs at lower altitudes in drier, more open Eucalyptus woodland (Higgins 1999).	64	2021	Common cockatoo in eucalypt forests surrounding the Action Area, with much modelled habitat nearby, including Alberton State Forest (DEECA 20025b). Has been recorded during BUS and in existing records using such forests. **Known to occur.**
Glossy Ibis	*Plegadis falcinellus*	Mig.	1	This species inhabits mainly freshwater marshes, although it is commonly observed in saline ponds and mudflats (Davis and Kricher 2020). Movement pathways are likely to be north-south along the Ramsar site, with some inland movement where suitable habitat exists. The project site has some small ephemeral saline wetlands, which may provide some habitat when filled. While little is known about their behaviour at wind farms, the species tends to fly in flocks, with the occasional flight at height (Hancock et al. 1992).	1	2001	A single, older record in the search area, not recorded in over 697 hours of surveys spread over 4 years. At the edge of the species' range, with no high-quality habitat available on site. **Unlikely to occur.**
Great Crested Tern	*Thalasseus bergii*	Mig.	2	Forages in shallow waters of lagoons and barrier reefs, in estuaries, along beaches, and also well out to sea (Gochfeld et al 2020). Generally considered more common in tropical and subtropical coasts and oceanic islands (Gochfeld et al 2020).	No VBA records	N/A	This species was recorded infrequently during migratory shorebird surveys in the Corner Inlet Ramsar Site, where high-quality habitat is abundant. The species was not observed in the study areas during over 697 hours spread over 4 years of bird surveys, and has few areas of modelled low-quality habitat to the north of the Ramsar site (DEECA 2025b). These habitats are largely farm dams, drained wetlands, or small ephemeral wet areas that are unlikely to provide quality habitat for the species. The species may fly over the area, but this would be expected to be very rare. **Unlikely to occur.**
Great Knot	*Calidris tenuirostris*	Vu/Mig.	1-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). Their non-breeding habitat is mainly sheltered coastal habitats, with large intertidal mudflats or sandflats (van Gils et al. 2020b). This includes inlets, bays, harbours, estuaries and lagoons. They are occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in saltworks, at swamps near the coast, salt lakes and non-tidal lagoons. The Great Knot rarely occurs on inland lakes and swamps (DoE 2017). The East Asian-Australasian flyway population is estimated at 425,000 (Wetlands International 2021), with a nationally important number of 430 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	4	1988	This species is regularly recorded with the Corner Inlet Ramsar site, and has been observed in large numbers during migratory shorebird surveys by Birdlife Australia. The modelled habitat is confined to the Ramsar site (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart north on their annual migration. **Potential to occur.**
Greater Sand Plover	*Charadrius leschenaultii*	Vu/Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). Their non-breeding habitat is entirely coastal, mainly on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks (Marchant & Higgins 1993). The East Asian-Australasian flyway population is estimated at 200,000 – 300,000 (Wetlands International 2021), with a nationally important number of 240 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	5	1988	This species is semi-regularly recorded with the Corner Inlet Ramsar site, and has been observed in large numbers during migratory shorebird surveys by Birdlife Australia. The modelled habitat is confined to the Ramsar site (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart north on their annual migration. **Potential to occur.**
Grey Falcon	*Falco hypoleucos*	Vu	-	Inhabits arid and semi-arid zones; mainly on sandy and stony plains of inland drainage systems, lightly timbered with acacia. Hunt far into open areas, over spinifex, tussock grasslands and low shrublands. In Victoria, few records mostly in north and north-western regions (Marchant & Higgins 1993).	No VBA records	N/A	No suitable habitat onsite (DEECA 2025b) and well outside nkown range. **Unlikely to occur**

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Grey Plover	*Pluvialis squatarola*	Vu/Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). This species uses coastal beaches and estuaries, though they tend to prefer nearby flooded pasture during high tide and heavy rain (Poole et al. 2020). The species commonly roosts in pasture and salt marshes during high tides (Poole et al. 2020). The East Asian-Australasian flyway population is estimated at 80,000 (Wetlands International 2021), with a nationally important number of 80 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	12	2004	This species is regularly recorded with the Corner Inlet Ramsar site, and has been observed in large numbers during migratory shorebird surveys by Birdlife Australia. The modelled habitat is confined to the Ramsar site (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart north on their annual migration. **Potential to occur.**
Grey-tailed Tattler	*Tringa brevipes*	Mig.	1-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). Often found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. It can also be found at intertidal rocky, coral or stony reefs as well as platforms and islets that are exposed at low tide (van Gils et al. 2020c). It has been found around shores of rock, shingle, gravel or shells and on intertidal mudflats, estuaries and coastal lagoons, especially fringed with mangroves (van Gils et al. 2020c). The species is rarely recorded in Victoria, however sightings have been reported in Gippsland, and east of McLaughlans Beach. The largest populations in Victoria are located at Corner Inlet, west to Westernport and Port Phillip Bays (DoE 2017). The East Asian-Australasian flyway population is estimated at 70,000 – 700,000 (Wetlands International 2021), with a nationally important number of 70 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	6	1987	This species is semi-regularly recorded with the Corner Inlet Ramsar site, and has been observed in large numbers during migratory shorebird surveys by Birdlife Australia. The modelled habitat is confined to the Ramsar site with some potential at a now-drained wetland further inland (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart north on their annual migration. **Potential to occur.**
Hooded Plover (eastern)	*Thinornis cucullatus cucullatus*	Vu	-	Inhabits sandy ocean beaches, especially those that are broad and flat, with a wide wave-wash zone for feeding. Widespread and scattered across coastal Victoria. Numbers reduced due to disturbance by recreational activities on beaches (Marchant & Higgins 1993).	3	2004	This species has been observed during Nature Advisory migratory shorebird counts. Their habitat is confined to the Corner Inlet (DEECA 2025b), approximately. 2.3 km southeast at the closest point, with no suitable habitat in the Action Area**. Unlikely to occur**
Hooded Robin (southeastern)	*Melanodryas cucullata cucullata*	En	-	This species utilises dry eucalypt and acacia woodland and shrubland, where the structural diversity is high and the understory relatively open (DCCEEW 2023c). Breeding habitats require at least 10 ha of suitable habitat (Watson et al. 2000). The species shows little dispersal across open areas more than 100 m (DCCEEW 2023c). This species typically occurs north of the great divide in shrubland or woodland dominated by acacias (Higgins & Peter 2002; Tzaros 2005).	No VBA records	N/A	Typically confined to dry woodland areas inland of the Great Dividing Range, with no identified or modelled habitat onsite (DEECA 2025b), and is well outside the typical range for the species. **Unlikely to occur**
Latham's Snipe	*Gallinago hardwickii*	Vu/Mig.	1,3-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). Their non-breeding foraging habitat consists of ephemeral and permanent wetlands with dense vegetation, where they mainly feed at night (van Gils et al. 2020e). Roosting habitat is generally within 4 km of the foraging habitat, where birds rest during daylight hours (van Gils et al. 2020e). The East Asian-Australasian flyway population is estimated at 35,000 (Wetlands International 2021), with a nationally important number of 18 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	13	2018	There is an abundance of high-quality habitat in the Corner Inlet Ramsar site and little modelled habitat onsite (DEECA 2025b), but the species is a generalist and tends to use ephemerally wet areas, including low-quality drainage lines. Has been recorded during bird surveys onsite and in the Ramsar site**. Known to occur.**
Lesser Sand Plover	*Charadrius mongolus*	En/Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). Their non-breeding foraging habitat consists of beaches of sheltered bays, harbours, and estuaries with large intertidal sandflats or mudflats (Marchant & Higgins 1993). The East Asian-Australasian flyway population is estimated at 25,500 (Wetlands International 2021), with a nationally important number of 26 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	3	1988	This species is semi-regularly recorded with the Corner Inlet Ramsar site, and has been observed in numbers during migratory shorebird surveys by Birdlife Australia. The modelled habitat is confined to the Ramsar site with some now-drained wetlands further inland (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart north on their annual migration. **Potential to occur.**
Little Curlew	*Numenius minutus*	Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). Their non-breeding foraging habitat consists of coastal swamps and sheltered coasts on mudflats or sandflats (Higgins & Davies 1996). The East Asian-Australasian flyway population is estimated at 110,000 (Wetlands International 2021), with a nationally important number of 110 birds (DoE 2017). Wind farms that are in	No VBA records	N/A	This species has not been recorded during any migratory shorebird surveys at Corner Inlet Ramsar site by Nature Advisory or Birdlife Australia. The species has also not been recorded onsite by over 697 hours of surveys spread over 4 years. While some habitat exists in the Ramsar site, it is largely confined to coastal areas. No records in the nearby

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				migration or movement pathways are listed as a potential threat for this species (DoE 2017).			area exist despite an intensive shorebird monitoring program in the region. **Unlikely to occur**
Little Tern	*Sternula albifrons*	Vu/Mig.	1-4	This species inhabits mostly coastal habitats, though it may also visit nearby salt marshes and saltpans (Gochfield et al. 2020c). The East Asian-Australasian flyway population is estimated at 10,000 to 100,000 (Wetlands International 2021), with a nationally important number of 100 birds (DoE 2017).	8	2018	This species was recorded infrequently during migratory shorebird surveys in the Corner Inlet Ramsar Site, where high-quality habitat is abundant. The species was not observed in the study areas during over 697 hours spread over 4 years of bird surveys, and has few areas of modelled low-quality habitat to the north of the Ramsar site (DEECA 2025b). These habitats are largely farm dams or drained wetlands. The species may fly over the area, but this would be expected to be very rare. **Unlikely to occur.**
Marsh Sandpiper	*Tringa stagnatilis*	Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). Their non-breeding habitat is mainly the margins of inland fresh to brackish wetlands, including saltpans and salt marshes (van Gils et al. 2020f). The East Asian-Australasian flyway population is estimated at 130,000 (Wetlands International 2021), with a nationally important number of 130 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	1	1992	This species has been very infrequently recorded by Birdlife Australia in the Corner Inlet Ramsar site. There is much habitat in the general area, with high-quality areas within the Ramsar site and lower-quality areas extending further inland (DEECA 2025b). However, there are very few records despite the presence of an intensive shorebird monitoring program in the region since the 1980s, in addition to over 697 hours of bird surveys by Nature Advisory over the past few years. The species may, on occasion, when in the area, fly over the wind farm site. **Potential to occur**.
Nunivak Bar-tailed Godwit	*Limosa lapponica baueri*	En	-	This is a subspecies of the Bar-tailed Godwit, a species that breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). Their non-breeding habitat is mainly intertidal mudflats and sand flats, but they are also known to use shallow salt pans and salt marsh (van Gils et al. 2020a). The East Asian-Australasian flyway population is estimated at 126,000 (Wetlands International 2021), with a nationally important number of 130 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	No VBA records	N/A	This species is generally recorded as the broader species, Bar-tailed Godwit, which is regularly observed within the Corner Inlet Ramsar site, and has been observed in nationally important numbers during migratory shorebird surveys by Nature Advisory and Birdlife Australia. The modelled habitat is confined to the Ramsar site (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart northwards on their annual migration. **Potential to occur.**
Orange-bellied Parrot	*Neophema chrysogaster*	Cr	-	This species utilises areas near the coast, in particular where *Arthrocnemum arbusculum, Salicornia quinqueflora,* and *Suaeda australis* dominate (Collar et al. 2020c). However, it is also known to move inland to scrubland and pasture (Collar et al. 2020c). In Victoria, they mostly occur in sheltered coastal habitats, such as bays, lagoons and estuaries, or, rarely, saltworks (DELWP 2016). The species will only be present during the winter months, as it migrates back to southwest Tasmania to breed. While flight heights are not well studied, it is generally considered similar to the related Blue-winged Parrot. In this case, they are likely to fly under 60 m with the occasional higher flight when travelling longer distances (usually at night).	1	2004	The suitable saltmarsh habitat for this species is largely confined to the Corner Inlet Ramsar site (DEECA 2025b), with some potential in a now-drained wetland further inland but still south of the project area. Numbers of this species are fairly small, but the species is recovering into its former ranges as numbers increase from successful conservation efforts. So while there is some potential for the species may on rare occasions pass through the region, but it is expected it would keep to high-quality habitats along the coast. **Unlikely to occur**
Pacific Golden Plover	*Pluvialis fulva*	Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). This species uses a wide variety of habitats, from pasture, salt marsh, mudflats, beaches, and modified areas (Johnson et al. 2024). The East Asian-Australasian flyway population is estimated at 120,000 (Wetlands International 2021), with a nationally important number of 120 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	2	1978	This species is regularly recorded with the Corner Inlet Ramsar site by Nature Advisory and Birdlife Australia migratory shorebird surveys. The modelled habitat is confined to the Ramsar site and coastal ephemeral wet areas (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart northwards on their annual migration. **Potential to occur.**
Painted Honeyeater	*Grantiella picta*	Vu		Inhabits box-ironbark forests and woodlands and mainly feeds on the fruits of mistletoe. Strongly associated with mistletoe around the margins of open forests and woodlands (DoE 2015b). Can also be found in farmland containing remnant treed vegetation. Occurs at a few localities. Uncommon breeding migrant from further north, arriving in October and leaving in February (Higgins et al. 2001; Tzaros 2005).	No VBA records	N/A	Typically inhabit drier woodland areas inland of the Great Dividing Range, no suitable habitat has been identified or modelled in the area (DEECA 2025b). **Unlikely to occur**

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Pectoral Sandpiper	*Calidris melanotos*	Mig.	3-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). This species typically uses a variety of freshwater and brackish wetlands, both coastal and inland (Johnson et al. 2024). The East Asian-Australasian flyway population is estimated at 1,220,000 to 1,930,000 (Hansen et al. 2016), with a nationally important number of 1,200 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	No VBA records	N/A	This species has not been recorded during any migratory shorebird surveys at Corner Inlet Ramsar site by Nature Advisory or Birdlife Australia. The species has also not been recorded onsite by over 697 hours of surveys spread over 4 years. While some habitat exists in the Ramsar site, it is largely confined to coastal areas. No records in the nearby area exist despite an intensive shorebird monitoring program in the region. **Unlikely to occur**
Pilotbird	*Pycnoptilus floccosus*	Vu	-	Common in wet sclerophyll forests and coastal heath, often in gullies; usually hoping across the forest floor; generally, keeps to cover (DAWE 2022b). Generally, habitat exists in higher elevation areas (DEECA 2025b). This is generally a low-flying, sedentary species (DAWE 2022b).	1	1973	Some small patches of modelled habitat occur in Alberton State Forest (DEECA 2025b), with little other habitat in the area. This is generally a sedentary species (DAWE 2022b) unlikely to leave the forest and enter the wind farm area. **Unlikely to occur**
Pin-tailed Snipe	*Capella stenura*	Mig.	2-4	Outside the breeding season, this species is typically found in or at the edge of shallow freshwater swamps, ponds, and lakes with varying levels of grass and vegetation cover (van Gils 2020d). They can be spotted in drier wetlands like claypans, especially in arid regions within their range. Additionally, this species is often observed near sewage ponds but is rarely seen in saline or inter-tidal wetlands (DEECA 2023). The East Asian-Australasian flyway population is estimated at 250,00 – 1,000,000 (Wetlands International 2021), with a nationally important number of 1,000 birds (DoE 2017).	No VBA records	N/A	This species has not been recorded during any migratory shorebird surveys at Corner Inlet Ramsar site by Nature Advisory or Birdlife Australia. The species has also not been recorded onsite by over 697 hours of surveys spread over 4 years. While some habitat exists in the Ramsar site, it is largely confined to coastal areas. No records in the nearby area exist despite an intensive shorebird monitoring program in the region. **Unlikely to occur**
Red Knot	*Calidris canutus*	Vu/Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). This species tends to use salt marshes and brackish wetlands (Baker et al. 2020). The East Asian-Australasian flyway population is estimated at 50,500 to 62,000 (Wetlands International 2021), with a nationally important number of 56 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	10	2004	This species is regularly recorded with the Corner Inlet Ramsar site, and has been observed in large numbers during migratory shorebird surveys by Birdlife Australia. The modelled habitat is confined to the Ramsar site (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart north on their annual migration. **Potential to occur.**
Red-necked Stint	*Calidris ruficollis*	Mig.	1-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). This species uses a wide variety of freshwater, brackish, and saltwater wetlands (Mlodinow & Pyle 2025). The East Asian-Australasian flyway population is estimated at 475,000 (Wetlands International 2021), with a nationally important number of 480 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	No VBA records	N/A	Despite no VBA records, this species is regularly recorded with the Corner Inlet Ramsar site, and has been observed in large numbers during migratory shorebird surveys by Nature Advisory and Birdlife Australia. The modelled habitat is confined to the Ramsar site (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart north on their annual migration. **Potential to occur.**
Regent Honeyeater	*Anthochaera phrygia*	Cr	-	Inhabits dry box-ironbark eucalypt forests near rivers and creeks on inland slopes of the Great Dividing Range (DoE 2015c). Can also occur in small remnant patches or mature trees in farmland or partly cleared agricultural land (Higgins et al. 2001).	No VBA records	N/A	Typically inhabit drier woodland areas inland of the Great Dividing Range, no suitable habitat has been identified or modelled in the area (DEECA 2025b). **Unlikely to occur**
Ruddy Turnstone	*Arenaria interpres*	Vu/Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). The species inhabits shallow fresh to saline wetlands, usually coastal to near coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins & Davies 1996). The East Asian-Australasian flyway population is estimated at 30,000 (Wetlands International 2021), with a nationally important number of 30 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	3	1988	This species is semi-regularly recorded with the Corner Inlet Ramsar site by Birdlife Australia migratory shorebird surveys. The modelled habitat is confined to the Ramsar site and coastal ephemeral wet areas (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart northwards on their annual migration. **Potential to occur.**
Ruff	*Calidris pugnax*	Mig.	1-4	This species breeds in the northern hemisphere and is a very rare visitor to Australia over the austral summer (DoE 2017). This species prefers muddy margins of lakes, marshes and ephemerally flooded areas, including freshwater, brackish, and saline water (van Gils et al. 2020g). The East Asian-Australasian flyway population is estimated at 500 to 1,000 (Wetlands International 2021), with a nationally important number of 1 (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	No VBA records	N/A	This species has not been recorded during any migratory shorebird surveys at the Corner Inlet Ramsar site by Nature Advisory or Birdlife Australia. The species has also not been recorded onsite by over 697 hours of surveys spread over 4 years. While some habitat exists in the Ramsar site, it is largely confined to coastal areas. No records in the nearby

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							area exist despite an intensive shorebird monitoring program in the region. **Unlikely to occur**
Sanderling	*Calidris alba*	Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). This species prefers high-energy coastal areas, though it is known to infrequently visit mudflats and the shores of lakes and rivers (Macwhirter et al. 2020). The East Asian-Australasian flyway population is estimated at 30,000 (Wetlands International 2021), with a nationally important number of 30 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	No VBA records	N/A	Despite no VBA records, this species is regularly recorded with the Corner Inlet Ramsar site, and has been observed in large numbers during migratory shorebird surveys by Nature Advisory and Birdlife Australia. The modelled habitat is confined to the Ramsar site (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart north on their annual migration. **Potential to occur.**
Sharp-tailed Sandpiper	*Calidris acuminata*	Vu/Mig.	1-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). This species uses shallow wetlands and inundated areas (fresh, brackish, and saline), typically with some emergent vegetation (Mlodinow et al. 2024a). The East Asian-Australasian flyway population is estimated at 85,000 (Wetlands International 2021), with a nationally important number of 85 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	6	2020	This species is regularly recorded with the Corner Inlet Ramsar site, and has been observed in large numbers during migratory shorebird surveys by Nature Advisory and Birdlife Australia. The modelled habitat is confined to the Ramsar site (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart north on their annual migration. **Potential to occur.**
Swift Parrot	*Lathamus discolor*	Cr		Prefers a select range of eucalypts in Victoria, including Yellow Gum, Grey Box, White Box, Red Ironbark and Yellow Box, as well as River Red-gum when this species supports abundant 'lerp' (DCCEEW 2024a). The species is also known to forage within planted stands of Spotted Gum and Sugar Gum (Nature Advisory; unpublished data). Breeds in Tasmania. Migrates to mainland Australia for the autumn, winter and early spring months. It lives mostly north of the Great Dividing Range, passing through two areas of Victoria on migration: the Port Phillip district and Gippsland (Emison et al. 1987; Higgins 1999; Kennedy & Tzaros 2005. It is not uncommonly sighted in urban areas (Nature Advisory; unpublished data). Species occurrence on the mainland can substantially change from year to year depending on food availability, giving potential for this species to occur almost anywhere throughout its range (Emison et al. 1987).	1	1991	The area is outside of modelled habitat (DEECA 2025b), but several patches of suitable foraging habitat has been identified throughout and surrounding the study areas. A single individual was recorded, with more within a few kilometres of the area in the existing databases. **Known to occur.**
Swinhoe's Snipe	*Gallinago megala*	Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). In Australia, they prefer habitats characterised by dense grass and rushes along the edges of both fresh and brackish wetlands, including swamps, billabongs, river pools, small streams, and sewage ponds (van Gils et al. 2020e). Additionally, they can be found in drying claypans and inundated plains with crab holes (DEECA 2023). The East Asian-Australasian flyway population is estimated at 40,000 (Hansen et al. 2016), with a nationally important number of 40 birds (DoE 2017).	No VBA records	N/A	This species has not been recorded during any migratory shorebird surveys at Corner Inlet Ramsar site by Nature Advisory or Birdlife Australia. The species has also not been recorded onsite by over 697 hours of surveys spread over 4 years. While some habitat exists in the Ramsar site, it is largely confined to coastal areas. No records in the nearby area exist despite an intensive shorebird monitoring program in the region. **Unlikely to occur.**
Terek Sandpiper	*Xenus cinereus*	Vu/Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). This species uses shallow wetlands and inundated areas (fresh, brackish, and saline), typically with some emergent vegetation (Mlodinow et al. 2024b). The East Asian-Australasian flyway population is estimated at 85,000 (Wetlands International 2021), with a nationally important number of 85 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	1	1987	This species has been recorded with the Corner Inlet Ramsar site by Birdlife Australia migratory shorebird surveys, in numbers approaching national significance. Suitable habitat is largely confined to the Ramsar site and coastal ephemeral wet areas, with good connections east-to-west. There is the possibility of some lower-quality habitat onsite in the form of dams and ephemeral wet areas. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart northwards on their annual migration. **Potential to occur.**
Whimbrel	*Numenius phaeopus*	Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). Inhabit intertidal mudflats of sheltered coasts, harbours, lagoons, estuaries and river deltas. Prefer mudflats with mangrove, but also occur on open, unvegetated mudflats. In Victoria, small numbers occur at Gippsland lakes; most from Corner Inlet, Westernport and Port Phillip Bays (Higgins & Davies 1996). The East Asian-Australasian flyway population is estimated at 65,000 (Wetlands International 2021), with a nationally important number of 65 birds (DoE 2017). Wind farms that are	14	2020	This species is regularly recorded with the Corner Inlet Ramsar site, and has been observed in large numbers during migratory shorebird surveys by Nature Advisory and Birdlife Australia. The modelled habitat is confined to the Ramsar site (DEECA 2025b), with good connections east-to-west. It is unlikely the species will regularly fly over the wind farm, but may traverse the area as they depart north on their annual migration. **Potential to occur.**

Common Name	Scientific name	Conservation Status		Habitat	Number of VBA records	Date of last existing record	Likelihood of occurrence
		EPBC	Internat. Agreements				
				in migration or movement pathways are listed as a potential threat for this species (DoE 2017).			
White-throated Needletail	*Hirundapus caudacutus*	Vu/Mig.	2-4	Being largely aerial, the species has no known critical habitat within Australia (DoE 2017; TSSC 2019). They are most frequently observed above wooded areas (Higgins 1999), and while known to fly above farmland, they appear to prefer partially cleared pasture or patches of trees at the edge of the paddocks (Tarburton 1993; TSSC 2019). In coastal areas, they fly over sandy beaches, mudflats (Cooper 1971; TSSC 2019). The species has undergone an apparent decline over recent years, with current population estimates of 41,000 (Garnett and Baker 2021), with a nationally important number of 41 birds.	53	2019	Several nearby records and observed frequently during targeted surveys and BUS. **Known to occur.**
Wood Sandpiper	*Tringa glareola*	Mig.	2-4	This species breeds in the northern hemisphere, only visiting Australia over the austral summer (DoE 2017). The species inhabits well-vegetated, shallow, freshwater wetlands, such as swamps, lakes, pools, and waterholes; typically with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reed. In Victoria, they are mostly from Port Phillip Bay and in mid-Murray Valley (Higgins & Davies 1996). The East Asian-Australasian flyway population is estimated at 130,000 (Wetlands International 2021), with a nationally important number of 130 birds (DoE 2017). Wind farms that are in migration or movement pathways are listed as a potential threat for this species (DoE 2017).	No VBA records	N/A	This species has not been recorded during any migratory shorebird surveys at Corner Inlet Ramsar site by Nature Advisory or Birdlife Australia. The species has also not been recorded onsite by over 697 hours of surveys spread over 4 years. While some habitat exists in the Ramsar site, it is largely confined to coastal areas. No records in the nearby area exist despite an intensive shorebird monitoring program in the region**. Unlikely to occur.**
Yellow Wagtail	*Motacilla flava*	Mig.	2-4	A regular migrant from Asia to northwest Australia, infrequently to the southeast (DoE 2015a). Inhabits moist, grassy or muddy areas, sewage treatment plants, sports fields, tracks or bare ground, occasionally on beaches (Menkhorst et al. 2017).	No VBA records	N/A	Very rare vagrant to Victoria, with no records nearby. **Unlikely to occur**
Marine species: Campbell Albatross Antipodean Albatross Fairy Prion (southern) Gibson's Albatross Indian Yellow-nosed Albatross Northern Royal Albatross Shy Albatross Sooty Albatross Southern Royal Albatross Wandering Albatross White-capped Albatross	 *Thalassarche impavida* *Diomedea antipodensis* *Pachyptila turtur subantarctica* *Diomedea antipodensis gibsoni* *Thalassarche carteri* *Diomedea sanfordi* *Thalassarche cauta* *Phoebetria fusca* *Diomedea epomophora* *Diomedea exulans* *Thalassarche steadi*	 Vu/Mig. Vu/Mig. Vu Vu Vu/Mig. En/Mig. En/Mig. Vu/Mig. Vu/Mig. Vu/Mig. Vu/Mig.	 1, 5 1, 5 - - 1, 5 1, 5 1, 5 1, 5 1, 5 1, 5 1, 5	These species strictly use marine environments outside of the breeding season (DCCEEW 2022a; TSSC 2015). Their use of land systems is largely confined to the breeding season, with birds showing remarkable fidelity to breeding sites (DCCEEW 2022a; TSSC 2015). Several terrestrial activities are listed as threats to these species, but are only relevant at breeding sites (DCCEEW 2022a; TSSC 2015).	No VBA records	N/A	The proposed wind farm is fully land-based, with the species only using land around breeding sites. Breeding sites for these albatrosses are relatively well-known and consist of island habitats, with none within any proximity to the area (ACAP 2021). Only two areas are known for breeding of the Fairy Prion (southern), both being near Macquarie Island. **All of these species are unlikely to occur.**
Mammals							
Broad-toothed Rat (mainland)	*Mastacomys fuscus mordicus*	En	-	Specialist herbivore which occurs in high rainfall areas in the eastern highlands, south Gippsland highland, Wilsons Promontory, and Otway ranges (DEECA 2025b). Habitats include alpine herb field, heath, woodland, sedgeland and coastal tussock grassland (Menkhorst 1996). This species has also been known to inhabit dense, heathy	No VBA records	N/A	Some low-quality modelled habitat is within Alberton State Park to the north (DEECA 2025b), but the nearest high-quality habitat is in Wilsons Promontory or north in the highlands. No records in or around the wind farm area, and no habitat within the Action Area. **Unlikely to occur.**

Common Name	Scientific name	Conservation Status		Habitat	Number of VBA records	Date of last existing record	Likelihood of occurrence
		EPBC	Internat. Agreements				
				vegetation within disturbed areas such as powerline easements and alpine ski slopes (Clarke & White 2008; Whisson et al. 2015).			
Grey-headed Flying Fox	*Pteropus poliocephalus*	Vu	-	This is a highly mobile species with movement patterns primarily determined by seasonal flowering and fruiting events (DAWE 2021). The nearest known camp for the species is south towards the Corner Inlet Ramsar site. The global population is estimated at 495,000-680,000 (DAWE 2021). The species is known to fly at RSA height, with documented collisions at wind farms throughout southeast Australia (Symbolix 2020; NA unpublished data). The species also travels widely in search of food (>100 km nightly). Roost sites are typically located near water, such as lakes, rivers or the coast (DAWE 2021). Roost vegetation includes rainforest patches, stands of Melaleuca, mangroves and riparian vegetation, but colonies also use highly modified vegetation in urban and suburban areas (DAWE 2021).	15	2002	Some nearby camps, approximately 25 km from the proposed wind farm site. Approximately 2000 individuals inhabit a newly established site at Port Welshpool. **Likely to occur**.
Long-nosed Potoroo (southern mainland)	*Potorous tridactylus trisulcatus*	Vu	-	In Victoria, the species occupies a wide variety of wet forest and wet scrub, usually occurring on sandy loam soils where rainfall exceeds 750mm annually (Menkhorst 1996). Dense understorey vegetation is an essential component for the species' persistence, which can consist of grass trees, sedges, ferns, heath, tea-tree or melaleucas (Menkhorst 1996).	No VBA records	N/A	While there are no nearby records, there is large tracts of modelled high-quality habitat in both Gelliondale and Alberton State Parks (DEECA 2025b). Modelled habitat does not include the open areas of the Action Area. **Potential to occur**
New Holland Mouse	*Pseudomys novaehollandiae*	Vu	-	Suitable habitat includes coastal heath and scrub, heathy woodland, open forest and vegetated sand-dunes, with dry heath regenerating post-fire appearing to be optimal for the species (Menkhorst 1996). Victorian records are largely restricted to the localities of Anglesea, Westernport and Gippsland lakes. The species is largely sedentary, occupying territories of 0.44 to 1.4 ha (DCCEEW 2024b).	No VBA records	N/A	Some modelled habitat of moderate to high-quality present in Gelliondale State Park (DEECA 2025b). No habitat is modelled to the north, and the species has a smaller dispersal range (DCCEEW 2024b), so they are unlikely to cross the wind farm area. No records exist in or around the wind farm area. **Unlikely to occur.**
Southern Brown Bandicoot (eastern)	*Isoodon obesulus obesulus*	En	-	Suitable habitat for Southern Brown Bandicoots (eastern) is defined to be any patches of native or exotic vegetation, within their distribution, which contains understorey vegetation structure with 50–80% average foliage density in the 0.2–1 m height range (TSSC 2016a). In areas where native habitats have been degraded or diminished, exotic vegetation, such as Blackberry (Rubus spp.), can and often does, provide important habitat (DAWE 2020).	1	1962	Few records, much modelled habitat nearby (DEECA 2025b), including patches of high-quality in the nearby State parks and lower quality into the remnant patches of dense vegetation. **Potential to occur**
Greater Glider (southern and central)	*Petauroides volans*	En	-	In Victoria, this species inhabits forest habitats dominated by peppermint, stringybark, ash and gum eucalypts (Menkhorst 1996). Restricted to the central highlands and eastern Victoria, and common in areas of high rainfall. Rare in dry stringybark-box and Snow Gum Forest and does not occur in the box-ironbark or River Red-gum dominated Riverina regions (Menkhorst 1996).	43	2020	Some moderate-quality habitat modelled in Alberton State Park, but little to the south (DEECA 2025b). Unlikely the species will cross the windfarm into unsuitable habitat. **Unlikely to occur**
Spot-tailed Quoll	*Dasyurus maculatus maculatus*	EN	-	Rainforest, wet and dry forest, coastal heath and scrub and River Red-gum woodlands along inland rivers (Menkhorst 1996).	No VBA records	N/A	Rare with no modelled habitat nearby (DEECA 2025b). Outside of modelled range. **Unlikely to occur**.
Swamp Antechinus (mainland)	*Antechinus minimus maritimus*	Vu	-	The species inhabits damp areas with dense vegetation at 1-2 m above the ground, but with a relatively open understory (Menkhorst 1995). They tend to prefer settings with little sun exposure, such as damp gullies, wet heathland, sedgelands, swamps, and shrubby woodland (Menkhorst 1995; Wilson et al. 2001). Shelters in short burrows or underneath dense leaf litter. Rarely occurs more than 200m above sea level. Though this species has also previously been detected at sites that had experienced some structural disturbance in the South Gippsland region (Nature Advisory; unpublished data).	10	1991	Moderate to high-quality habitat modelled in Gelliondale State Park to the south, with some lower-quality habitat in Alberton State Park (DEECA 2025b). **Potential to occur.**
Yellow-bellied Glider (southeastern)	*Petaurus australis australis*	Vu	-	The yellow-bellied glider (south-eastern) is found at altitudes ranging from sea level to 1400 m above sea level and has a widespread but patchy distribution from south-eastern Queensland (Qld) to far south-eastern SA, near the SA-Vic border (DAWE 2022c). In Vic, 75 % of all yellow-bellied glider (south-eastern) records are in the eastern portion of the state, extending from the east coast to Melbourne and Port Philip bay (DAWE 2022c).	No VBA records	N/A	No suitable habitat in the area (DEECA 2025b) and well outside of the typical range for the species (DAWE 2022c). **Unlikely to occur**
Reptiles							

Common Name	Scientific name	Conservation Status		Habitat	Number of VBA records	Date of last existing record	Likelihood of occurrence
		EPBC	Internat. Agreements				
Swamp Skink	*Lissolepis coventryi*	En	-	The swamp skink occurs primarily in coastal areas with some inland subpopulations, inhabiting freshwater and saltwater wetlands (DCCEEW 2023d). The swamp skink occupies densely vegetated freshwater and saltwater wetlands in southeastern Australia which have natural hydrological regimes and contain shelter sites. Wetlands including swamp margins, lakes, rivers, creeks and even tidal salt marshes, are often associated with tea-tree thickets (Wilson & Swan 2003). Swamp skinks are generally found in areas of poorly-drained peaty soils, with the exception of coastal saltmarsh sites which often have sandy substrates (DCCEEW 2023d).	1	2004	Low-quality habitat mapped across the region, but few moderate or high-quality areas (DEECA 2025b). The project is outside likely habitat areas, which occur mostly within adjacent state forests. No densely vegetated wetlands have been recorded within the wind farm site. Few nearby records. **Unlikely to occur.**
Frogs							
Growling Grass Frog	*Litoria raniformis*	Vu	-	Permanent, still or slow-flowing water with fringing and emergent vegetation in streams, swamps, lagoons and artificial wetlands such as farm dams and abandoned quarries (Clemann & Gillespie 2004).	1	1977	The broad area is mapped as suitable habitat (DEECA 2025b), but little habitat exists onsite. Most farm dams on site were accessible to stock with no or little vegetation. Ephemeral drainage lines were in poor condition. Few records in the area. **Unlikely to occur**
Martin's Toadlet	*Uperoleia martini*	En	-	Martin's toadlet is mostly restricted to the Gippsland coast in Victoria, with the species' distribution extending 320 km from near Yarram, Victoria, to just across the Victorian/NSW border to Nadgee, NSW (DCCEEW 2023e). Typically inhabits dry forest and coastal heath, breeds in flooded grassy depressions (Cogger 2000).	No VBA records	N/A	Habitat modelling shows some low-quality habitat in Gelliondatel State Park, but little elsewhere (DEECA 2025b). The project is on the edge of the typical range for the species (DCCEEW 2023d) with no recorded observations nearby. **Unlikely to occur**
Fish							
Australian Grayling	*Prototroctes maraena*	Vu	-	Large and small coastal streams and rivers with cool, clear waters, with a gravel substrate and alternating pools and riffles (Cadwallader & Backhouse 1983).	20	1990	Suitable habitat exists in the broader study areas (DEECA 2025b), largely to the east in the Albert River. Several historical records are in the Albert River**. Likely to occur**
Dwarf Galaxias	*Galaxiella pusilla*	En	-	Ranges from the far west of the state through to the Mitchell River basin in central Gippsland. Vegetated margins of still water, ditches, swamps and backwaters of creeks, both ephemeral and permanent (Allen et al. 2002). Some wetlands where it occurs may partially or completely dry up during summer, with such wetlands reliant on seasonal flooding plus linkages to other sites where the species occurs, for habitat and population replenishment (Saddlier, Jackson & Hammer 2010). Dwarf Galaxias is also often found in association with burrowing freshwater crayfish (*Engaeus* spp.), with the crayfish burrows reportedly providing refuge from predators and dry conditions for the species (Saddlier, Jackson & Hammer 2010).	No VBA records	N/A	Suitable habitat exists in the broader study areas within tributaries associated with the Albert and Jack Rivers in the north-east of the site, but no historical records**. Potential to occur**
Macquarie Perch	*Macquaria australasica*	En	-	Cool, clear water of rivers and lakes. Favours slower-moving water (Allen et al. 2002).	2	1981	There is little modelled habitat, though some low-quality in the Albert River (DEECA 2025b). There are no records from the catchment of the study areas. If present, this is a large species that would likely have been detected more recently by anglers**. Unlikely to occur**
Murray Cod	*Maccullochella peelii*	Vu	-	Slow-flowing turbid water of rivers and streams of low elevation; also fast-flowing clear upland streams (Allen et al. 2002).	1	1970	There are no records from the catchment and no modelled habitat (DEECA 2025b). If present, this is a large species that would likely have been detected more recently by anglers**. Unlikely to occur**

Appendix 4: Gelliondale Wind Farm White-throated Needletail Collision Risk Model (Symbolix report: 3 June 2025)

Gelliondale Wind Farm White-throated Needletail Collision Risk Model

Ver. 0.9

Submitted to Synergy Pty Ltd

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1 Executive summary

This document summarises the activity rate and collision risk forecasts for the White-throated Needletails (WTNT) at the proposed Gelliondale Wind Farm site, South East Victoria. This analysis was undertaken for Synergy using data collected by Nature Advisory.

Nature Advisory collected flight data from February 2021 to November 2024 across 22 sites (12 general Bird Utilistation Survey (BUS) sites and 10 WTNT targeted sites) at Gelliondale. Observations of WTNT were recorded during these surveys, including location, distance from the observer, flight height (starting, minimum and maximum) and flock size. A total of 613 surveys have been completed, with 435 general bird utilisation surveys (20 minutes each) and 178 targeted WTNT surveys (30 minutes each in 2021 and 40 minutes each in 2024). This equated to 16 to 41 bird utilisation surveys per site and 8 to 22 targeted surveys per site.

We report here an overview of the data used for analysis and an assessment of flight activity and collision risk with wind turbines at the proposed site. This analysis aims to provide quantitative data that can be considered as a part of an ecological risk analysis.

This includes:

- A summary of the survey effort, and the recorded WTNT observations (Section 3).
- A distance-corrected flight activity rate, in flights per hectare per hour. We use distance correction models (Buckland et al. 1993) to obtain an overall estimate of WTNT flight density, accounting for the fact that it's harder to spot flights that are further from the observer (Section 2.3). This measure does not take into account spatial variation in activity, but provides a measure of average activity over the whole study area.
- A spatial map of WTNT utilisation over the Gelliondale site (Section 5). This complements the previous measure by providing information on the spatial variation, but not on the likelihood of a flight in the first place.
- Results of predicted collisions of WTNT with turbines, using the Nature Advisory BAND collision risk model. This model combines the distance-corrected activity rate, the spatial map, a geometric model incorporating physical turbine and bird parameters, and proposed turbine locations.

1.1 Summary of results

A total of 250 survey hours were completed over 56 days of observations across the proposed site. This includes 435 (145 survey hours) BUS and 178 (105 survey hours) targeted WTNT surveys. These surveys captured the following:

- A total of 1103 individual flights in 49 total observations.
- A maximum recorded observation distance at first observation of 2500 meters.
- An effective detection radius of 1664 metres[1] (this radius was calculated using the

[1]The effective detection radius is the radius of a circle, such that if 100% of flights were observed within this circle, then the expected number of flights detected is the same as for the actual survey (which has decaying detectability with

distances calculated from the GIS files provided by Nature Advisory[2]).

- A distance-corrected activity rate for WTNT of 0.0077 flights per hectare per hour with a 95% confidence interval of [0.0073, 0.0082].
- An expected annual collision rate for WTNT of 1.4, 0.9 or 0.4, for a 92%, 95% or 98% avoidance rate, respectively[3].

distance).

[2]WTNT_Flightpaths_250210.zip and sites_14107.12.zip

[3]The avoidance rate is the probability that the individual will fly around the turbine infrastructure through alterations in flight path through the subject site or to fly through the risk zone of the turbine (i.e. the envelope of the tower and blade sweep) and avoid the turbine infrastructure.

2 Methodology

2.1 Collision risk model overview

Collision risk modelling (CRM) can be modelled by a step-wise risk model (Reason 1997), where the total risk is the probabilistic combination of the risk of each step in the process. The process can be summarised by the equation:

$$N_{\text{collision}} = F \times P(I|F) \times P(C|I) \times (1 - \text{AR})$$

where:

- $N_{\text{collision}}$ is the estimated number of flights ending in collision
- F is the estimated activity rate of flights in the region (flights / area / time)
- $P(I|F)$ is the probability of a flight interacting with a turbine or power line (given a flight in the region)
- $P(C|I)$ is the probability of collision, given an interaction occurs
- AR is the avoidance rate

The probability of collision given interaction (the final dot point above) is generated using the exact model published by Band Madders and Whitfield (2007), and Band (2012).

The probability of interaction component in Band Madders and Whitfield (2007) and Band (2012) (the third dot point above) includes an unreasonable assumption that every flight interacts with every turbine. The Nature-Advisory Band model (NA-BAND) uses distance sampling to get a background activity rate and uses this to estimate the expected number of interactions at each turbine over a given period of time, removing the reliance on the Band Madders and Whitfield (2007) and Band (2012) assumption. This modification of Band (2012) has subject to review as part of the approvals process for sites such as St Patrick Plains Wind Farm (Symbolix 2021), and Golden Plains Wind Farm (Symbolix 2017).

2.2 Activity rate

The ability of an observer to sight and record flights is influenced by multiple factors including the object's size, colouring, volume, and weather conditions on the day. We also assume that an observer's ability to detect an object will decrease the further the object is from the observer.

Simply taking the number of objects observed and dividing it by the time spent surveying gives a naive "encounter rate", which is flights on the site per unit time. However, this doesn't account for unsurveyed area and the relationship between distance and detectability. Naive encounter rate is thus poor estimate of true flight activity.

Instead, distance sampling can be applied to the encounter rate to correctly scale it to an activity rate. The key concept of this is the "detection function", which provides a model describing the probability of detecting an object (flight) given that is a certain distance from the observer

(Buckland et al. 1993). The "detection function" was modelled using the combined dataset. We calculated an activity rate for the WTNT across the site.

2.3 Distance modelling

To correct for imperfect visibility as distance from the field observer increases, we apply distance sampling (Buckland et al. 1993) methods to convert the raw encounter rate into an estimate of total flights per square km per year.

From the distance models, we obtain the effective detection radius (EDR), which provides a measure of the detectability in the study area. Larger EDRs suggest that detection is good at large distances, and the encounter rate requires a smaller correction for undetected flights. In this case the recorded distances were binned significantly, with bin widths of 50m or more. Because of this a smooth detection curve could not be fit to the recorded distances so distances were calculated from the observation site to the first point on the flight path for each observation.

Detection efficiency decreases as the distance between the observer and bird increases. Buckland et al. (1993) provides a method to estimate an "effective detection area" (EDA), which is a circular area with radius = EDR. The EDA is obtained by integrating the detection efficiency function. It represents a theoretical observed area with an expected number of flights observed within (based on the survey data) in which flights are observed with 100% probability. In essence, if in a survey, n flights were observed in t time, then the flight rate within that survey could be calculated as to be $\frac{n}{t \cdot \text{EDA}}$ flights per unit time per unit area.

It should be noted that although distance sampling can be applied to smaller sample sizes (i.e. observations), at least 50-70 positive observations of the target species is recommended by Buckland et al. (1993) for a robust detection function. Poor resolution of the detection function and the EDA will translate directly to a poor estimate of the activity rate.

We modelled the detection function using both half-normal and hazard-rate distributions (with and without cosine adjustments) as well as a uniform distribution with cosine adjustments. Models were run with and without desktop truncation, which can improve the fit of the detection function as it is not forced to fit the long tail rather than the main body of the distribution (Buckland et al. 1993, pg. 151). As the distances were taken from the flight paths, they were not binned so no cutpoints were applied. Models were compared and selected using the Akaike Information Criterion (AIC) (Burnham and Anderson 2002) and visual inspection.

To obtain a measure of uncertainty on the activity rate, we use the bootstrap (Buckland et al. 1993). The bootstrap is a stochastic technique involving resampling of the dataset in order to obtain "replicate" sets. The variation in replicate sets can be used to estimate the variance of the parameter estimate (activity rate).

2.4 Spatial flight density

Analysing spatial flight utilisation requires

1) relatively even observer visibility of the whole study area and
2) geolocated flight path data for each flight observed.

With 48 flight paths recorded the data is just sufficient to conduct a spatial CRM. However a custom area (defined by a buffer of the 90th percentile of the observation distances around each observation site) will be needed to account for the unusual shape of the wind farm (Section 5.1).

2.5 Probability of collision given turbine interaction

Turbine collision risk was estimated using an avian collision risk model, based directly on Band Madders and Whitfield (2007) and Band (2012). The NA-BAND application updates the model to accept spatial data inputs where available. This modification also extends Band (2012) to more correctly calculate the probably that a flight will interact with a turbine (if a flight occurs onsite) for general sites. The probability of collision after interaction is a geometric calculation using Band (2012). The NA-BAND model has previously been applied to assess collision risk for Moorabool Wind Farm, Dundonnell Wind Farm, and Golden Plains Wind Farm (Victoria).

There are a number of important assumptions of these models that must be met to ensure reliability of the model results. Firstly, the model assumes that the surveys are conducted at times throughout the year and locations across the site that are representative of the site as whole. For example, if the species activity rates substantially varies across the year (e.g. due to breeding or migratory behaviours), then the surveys must capture this variability and on average, represent of the species yearly utilisation of the site. Similarly, if there is spatial variability in species utilisation, the survey sites must capture the site average utilisation. This means that if utilisation is much higher in one region of the site, survey sites are not clustered in this region, but are evenly spread across areas of high to low utilisation.

Another important note is that the NA-BAND model has no assumption about the upper limit of the number of birds present in the area and available to collide with a given turbine. The model estimates the number of flights that are at risk of collision under the assumption that any individual bird is immediately replaced. This estimate of flight collisions may be higher than the number of individuals present in the area at risk of collision.

3 Dataset summary

Survey and observation data were provided to us from Nature Advisory through White & Case LLP.

3.1 Survey summary

- 613 surveys (435 BUS surveys and 178 targeted WTNT surveys) were performed at Gelliondale between 2021-02-22 and 2024-11-16, across 7 seasons (targeted surveys were conducted in Summer and Autumn in 2021 and 2024).
- Surveys were conducted at 22 sites (12 BUS sites and 10 targeted sites).
- The number of survey hours per site for BUS sites was 13.3, except sites B9 and R3 which had 5.3 survey hours (due to only being added in 2024).
- The number of survey hours per site for targeted sites was 12, except sites WTNT1 and WTNT2 which had 4 survey hours (due to only being used in 2021) and site WTNT8 which had 13 survey hours (two extra surveys in 2021).
- Totalling to 250 survey hours across all sites. This equates to an average of 36 hours per season.

The location of the 22 sites are shown in Figure 1. The survey effort is summarised in Table 1.

Table 1: Summary of survey effort at Gelliondale WF.

Year	Season	Start date	End date	Number of surveys	Total survey hours
2021	Summer	2021-02-22	2021-02-26	42	21.00
2021	Autumn	2021-03-22	2021-03-26	40	20.00
2023	Spring	2023-11-13	2023-11-16	80	26.67
2024	Summer	2024-02-12	2024-03-01	127	52.00
2024	Autumn	2024-03-01	2024-04-18	147	71.33
2024	Winter	2024-08-05	2024-08-12	97	32.33
2024	Spring	2024-11-12	2024-11-16	80	26.67

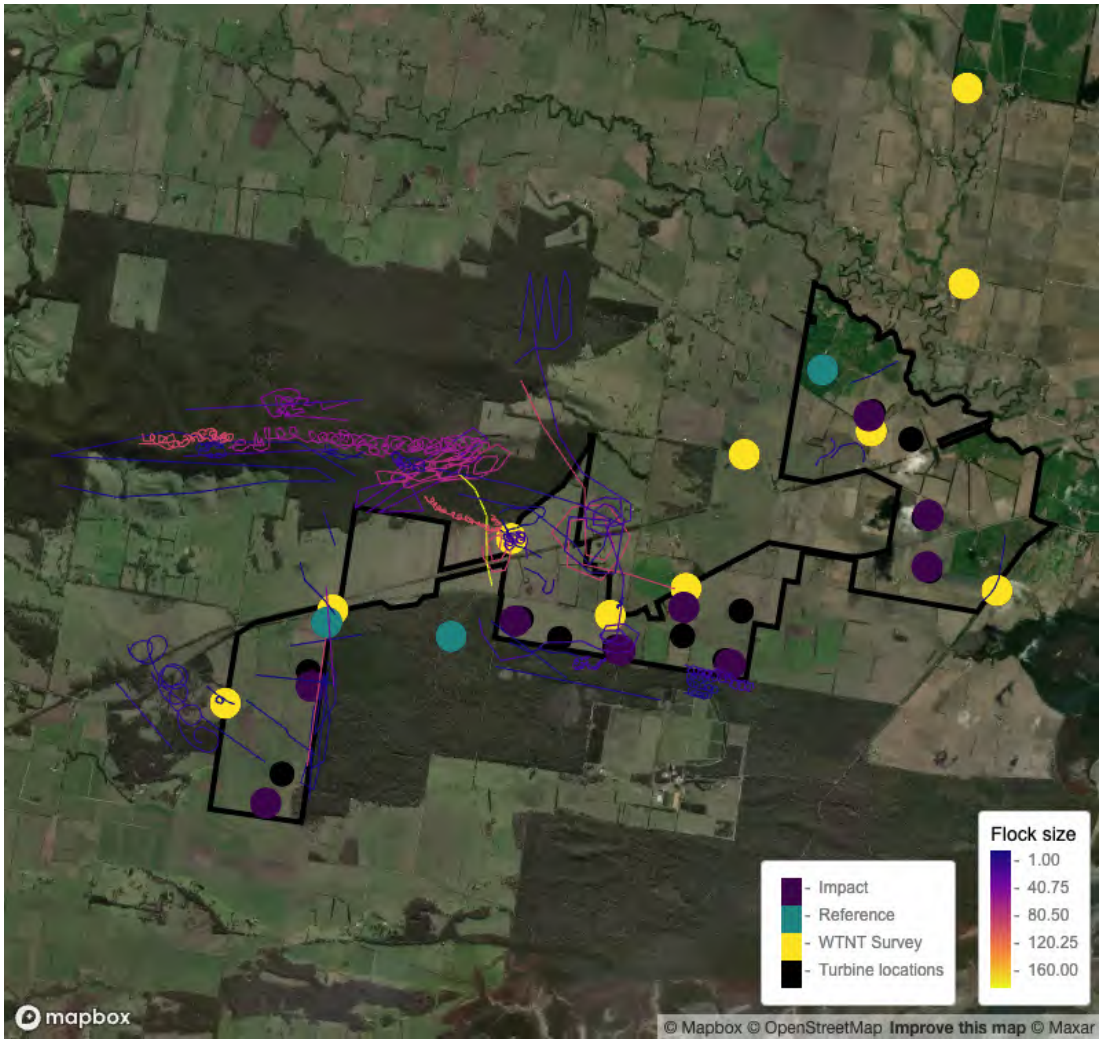

Figure 1: Survey and turbine locations.

3.1.1 Temporal Coverage

Ideally, CRM data collection surveys would have equal survey effort across the entire period a species is expected to be onsite. Our goal is to estimate the expected rate of flights on the site when the species is present which requires the surveys be representative of the site's spatial extent and the time period. This is particularly important when a species activity varies throughout the survey period.

In Figure 2 it is clear that the surveys only covered about 50% of the time that WTNT are onsite, however it appears that the peak and right tail of WTNT activity have been covered. As a result we have chosen to treat the activity rate captured in the surveys conducted in February, March and April as representative of the average activity across the whole period.

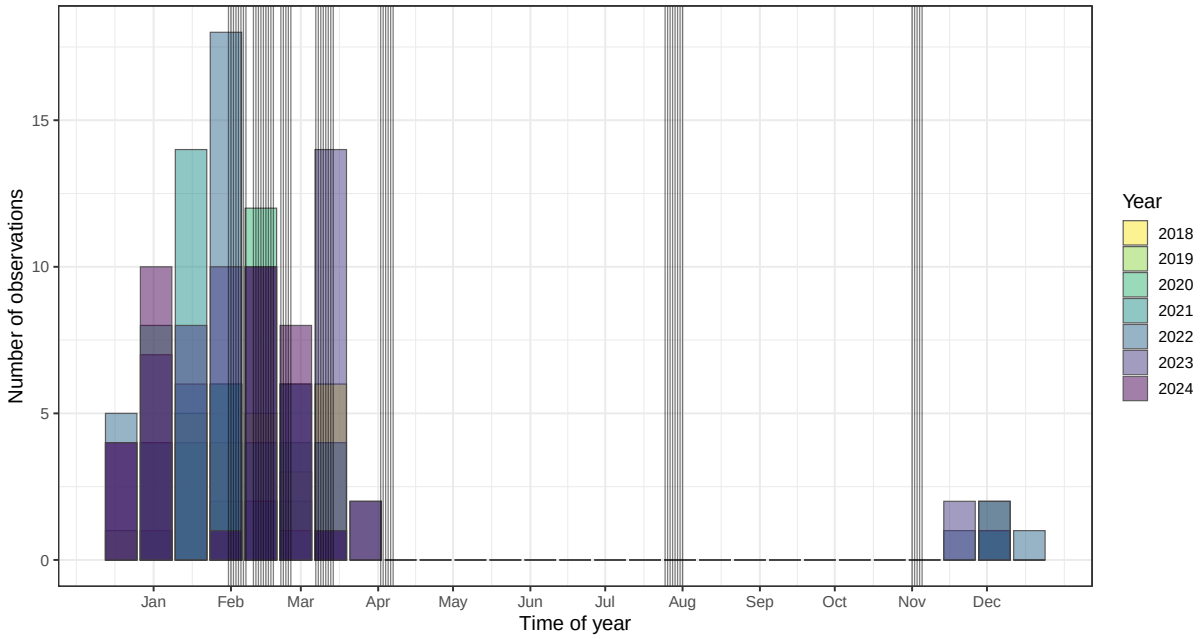

Figure 2: WTNT sightings from ebird data (provided by Nature Advisory) in Wellington and South Gippsland counties with the survey times on top in grey.

3.2 Observation summary

Analysis was based off:

- 49 observations at Gelliondale, with a total of 1103 flights sighted.
- Observations at heights between 10 and 800 metres above ground and between 0 and 2500 metres from the observer (between 54 and 3585 metres when calculated from the flight paths).
- All observations were recorded with height above ground and distance from the observer recorded, and therefore could be used for calculations of activity rates.

The WTNT observations are summarised in Table 2.

Table 2: Summary of observations and survey effort at Gelliondale.

Year	Season	Observations	Individuals	Median Flight Duration (mins)	Surveys	Survey hours	Encounter rate
2021	Summer	11	469	NA	42	21.00	22.33
2021	Autumn	6	75	31	40	20.00	3.75
2023	Spring	0	0	0	80	26.67	0
2024	Summer	21	488	1.92	127	52.00	9.38
2024	Autumn	11	71	1.76	147	71.33	1
2024	Winter	0	0	0	97	32.33	0
2024	Spring	0	0	0	80	26.67	0

4 Distance detection models

The most parsimonious model was a half-normal distribution without cosine adjustments. Since the distances were taken from the GIS data the data was not binned so no cutpoints were needed, and the models did not benefit from desktop truncation. As such a half-normal distribution with no cosine adjustment terms, truncation or cutpoints was chosen. The distribution of distances from GIS is displayed in Figure 3 with the selected fitted model (curve) against the empirical distances (histogram). The recorded distances are also shown in Figure 4 for comparison.

The effective detection radius (EDR) provides a measure of detectability and is used to distance-correct the raw activity rate. Here, the EDR was found to be 1664 meters.

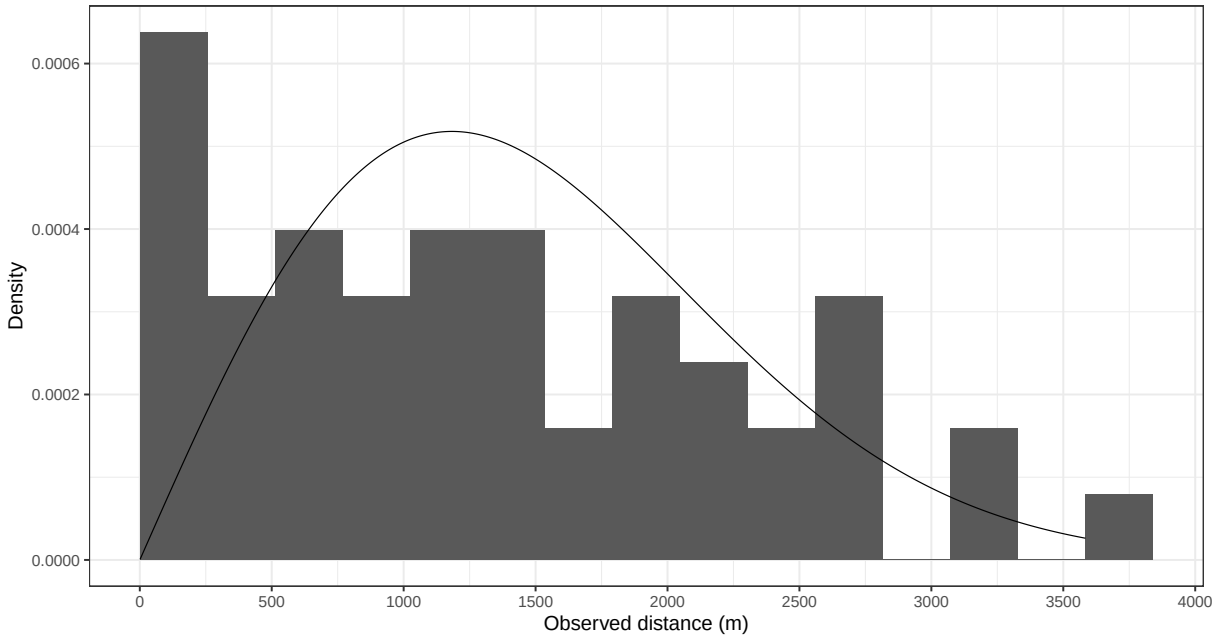

Figure 3: Empirical (grey bars) and fitted (black line) observed-distance distributions for White-throated Needletails at Gelliondale. Distances were taken from GIS data.

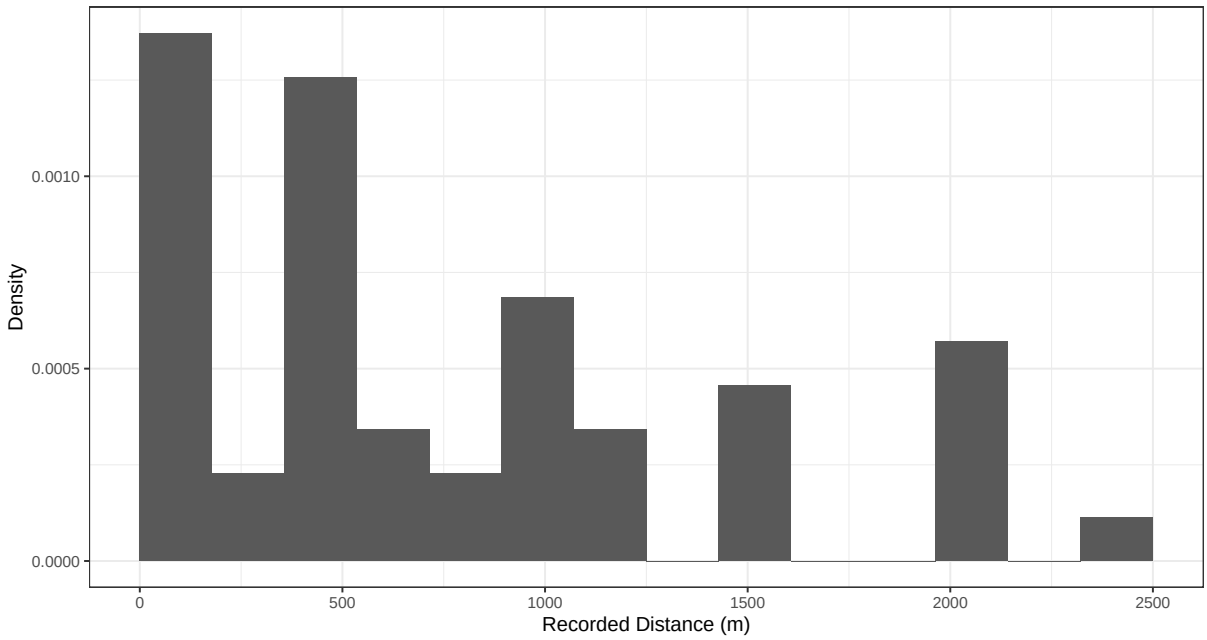

Figure 4: Recorded observed distance distribution.

4.0.1 CRM inputs

Additionally to an activity rate, the NA-BAND model requires a number of turbine-related and bird-related inputs, which are summarised in Tables 3 and 4 respectively. Species parameters were provided by NA based on published literature. The activity rate is calculated as **flights / ha / hour**.

Table 3: Turbine inputs for the NA-BAND model (provided by Synergy).

Parameter	Value
Model	V162
Hub height (m)	129
Blade length (m)	81
Max chord (m)	4.32
Pitch (deg)	25
Rotation period (s)	7.5
Proposed number of turbines	13

Table 4: White-throated Needletail inputs for the NA-BAND model (provided by Nature Advisory).

	White-throated Needletail
Bird length (m)	0.2
Bird wingspan (m)	0.46
Flight speed (m/s)	10
Percentage of year on site	40*
Percentage of daytime active	100
Percentage of nighttime active	20

* Updated during analysis from 50% to 40% based on Figure 2

4.1 Corrected flight activity rates

We applied the distance sampling to the number of observations of WTNT to obtain the final estimate of distance-corrected activity rates.

The distance-corrected activity rate of WTNT at Gelliondale was **0.0077 flights per hectare per hour** with a 95% confidence interval of **[0.0073, 0.0082]**.

5 Spatial mapping

Flight tracks were recorded by Nature Advisory and provided as GIS set. The tracks were then "smoothed" over the surrounding area using kernel functions, which then provides a two-dimensional probability map over the study area.

5.1 Methods - kernel smoothing

To understand the relative spatial patterns in flight density we need to transform the individual flight tracks into a smoothed probability map for the whole area. The flight points are "smoothed" using a kernel function (Figure 5 illustrates the concept with a simpler 1-dimensional method, whereas our method operates in 2 dimensions)[4]. For an introduction to kernel methods in ecology see Worton (1989) or Fulk and Quinn (1996) for more detailed mathematics.

The resulting maps are a visualisation of the conditional likelihood that a flight will be seen at a particular location, relative to the other locations. That is, it answers the question: "if a flight exists in the study area, where is it likely to be?"

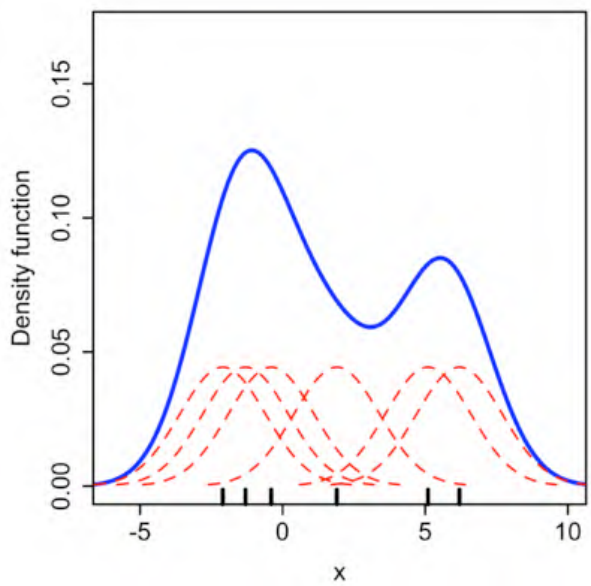

Figure 5: Schematic of kernel methods. The contributions of individuals points (small vertical lines along the x axis) are smoothed using a kernel (red dashes curves). The overall density is the combination of all the kernels (blue curve).

We used a W4 kernel function with smoothing parameter $h = 750$ metres. This kernel function has a Gaussian-like shape, but compact support - a single point on a flight path is smoothed to no more than $2 \times h$ metres away from the original point. While the smoothing, to some degree, provides a safety buffer to account for the difficulty of recording exact flight tracks, mostly we

[4] "Comparison of 1D histogram and KDE". Created by Drleft and edited by A. Jackson (Symbolix). Available under the Creative Commons Attribution-Share Alike 3.0 Unported license.

smooth to account for natural flight variability, to answer: "even though an eagle flew here today, if it flew again, where is it likely to be?"

Prior to smoothing, we re-spaced the points on the flight path to a consistent distance (10 metres). The raw flight paths had point spacing from anywhere between 8.03 and 1126 metres, which meant that if we smoothed on the raw data, some flight paths would erroneously contribute more weight to the spatial map than others. Once re-spaced, the contribution of each flight to the spatial map was proportional to its length.

Due to the unique shape of the site we needed to define "study area" over which to calculate the relative flight utilisation. The study area was defined as using a buffer of the 90th percentile of the recorded observation distances (2000 metres) around the observation sites, this is the area where we can reasonably assume complete visibility. Outside of this area, where the likelihood of detecting a WTNT is approaching zero, there is ambiguity between what is a true "zero" and what is just "N/A" (i.e. we don't know if there were no flights or just no flights *detected* due to poor visibility). Assuming no detections means no flights at distances greater than 2000 metres would bias the estimate down.

5.2 Results

Figure 6 plots the contours of utilisation for WTNT. The green and yellow contours have the higher levels of utilisation, and the utilisation level decreases as the colour tends towards blue and purple.

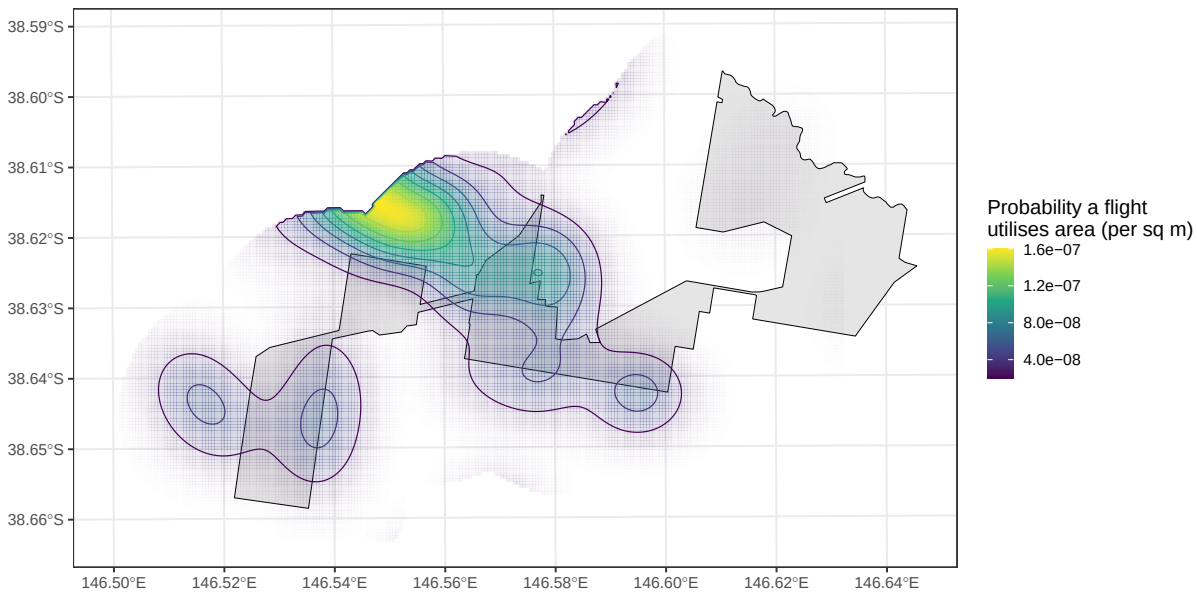

Figure 6: Contour map of WTNT utilisation, overlaid on the study area (boundary line). This combines the spatial mapping / kernel smoothing with the observed metres of WTNT flights over the whole farm. The kernel was calculated over the area within 2000 metres (90th percentile of the recorded observation distances) from the observation sites (i.e. the area of assumed complete visibility).

In Figure 6, we can see that WTNT density is concentrated in the centre-North over the forest, with some activity in the South-West and almost none in the North-East section of the site.

6 Annual collision rates

Annual collision rates (based on the turbine and bird parameters in Tables 3 and 4, the turbine locations in Figure 1 and the activity rates in Section 4.1) are summarised in Table 5.

Table 5: Predicted long-term average collision rate by avoidance rate.

Avoidance rate	0.92	0.95	0.98
Annual collisions	1.404	0.878	0.351

The plausible range of cumulative mortalities (over a 30 year period assuming 92% avoidance) is shown in Figure 7. These counts represent the potential yearly manifestation of the long-term rate. Over time, the long-term rate should regress to the values in this Figure.

Mortalities

Years	[0,4)	[4,8)	[8,12)	[12,16)	[16,20)	[20,24)	[24,28)	[28,32)	[32,36)	[36,40)	[40,44)
1	98.8%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2	89.8%	10.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3	72.9%	26.5%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4	53.4%	43.9%	2.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
5	36.1%	56.1%	7.6%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
6	23.0%	60.8%	15.5%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
7	13.9%	58.5%	25.3%	2.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
8	8.1%	51.5%	35.0%	5.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
9	4.5%	42.2%	42.8%	9.7%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10	2.5%	32.6%	47.3%	15.8%	1.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
11	1.3%	24.0%	48.2%	22.7%	3.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
12	0.7%	16.9%	45.9%	29.5%	6.4%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%
13	0.4%	11.5%	41.2%	35.3%	10.3%	1.3%	0.1%	0.0%	0.0%	0.0%	0.0%
14	0.2%	7.6%	35.1%	39.4%	15.1%	2.4%	0.2%	0.0%	0.0%	0.0%	0.0%
15	0.1%	4.9%	28.7%	41.2%	20.4%	4.3%	0.4%	0.0%	0.0%	0.0%	0.0%
16	0.0%	3.0%	22.6%	40.9%	25.7%	6.9%	0.9%	0.1%	0.0%	0.0%	0.0%
17	0.0%	1.9%	17.1%	38.6%	30.3%	10.2%	1.7%	0.2%	0.0%	0.0%	0.0%
18	0.0%	1.1%	12.6%	35.0%	33.9%	14.1%	2.9%	0.3%	0.0%	0.0%	0.0%
19	0.0%	0.7%	9.0%	30.4%	36.1%	18.4%	4.7%	0.6%	0.1%	0.0%	0.0%
20	0.0%	0.4%	6.3%	25.6%	36.7%	22.7%	7.0%	1.2%	0.1%	0.0%	0.0%
21	0.0%	0.2%	4.3%	20.9%	35.8%	26.7%	9.9%	2.0%	0.2%	0.0%	0.0%
22	0.0%	0.1%	2.9%	16.5%	33.7%	29.9%	13.2%	3.2%	0.5%	0.0%	0.0%
23	0.0%	0.1%	1.9%	12.8%	30.7%	32.1%	16.8%	4.8%	0.8%	0.1%	0.0%
24	0.0%	0.0%	1.2%	9.6%	27.0%	33.2%	20.4%	6.9%	1.4%	0.2%	0.0%
25	0.0%	0.0%	0.8%	7.1%	23.2%	33.2%	23.8%	9.4%	2.2%	0.3%	0.0%
26	0.0%	0.0%	0.5%	5.1%	19.3%	32.1%	26.7%	12.3%	3.4%	0.6%	0.0%
27	0.0%	0.0%	0.3%	3.6%	15.7%	30.1%	28.9%	15.4%	4.9%	1.0%	0.1%
28	0.0%	0.0%	0.2%	2.5%	12.5%	27.5%	30.3%	18.5%	6.7%	1.5%	0.1%
29	0.0%	0.0%	0.1%	1.7%	9.8%	24.4%	30.8%	21.5%	8.9%	2.4%	0.2%
30	0.0%	0.0%	0.1%	1.2%	7.4%	21.2%	30.4%	24.1%	11.5%	3.4%	0.3%

Quantile range: 95% (2.5% – 97.5%) | 99% (0.5% – 99.5%) | Outside 99%

Figure 7: Plausible range of collisions for the WTNT at a 92% avoidance rate.

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Appendix 5: PER guidelines for Gelliondale Wind Farm, 2023/09577 (DCCEEW, 23 January 2024)

GUIDELINES FOR THE CONTENT OF A DRAFT PUBLIC ENVIRONMENT REPORT

Gelliondale Wind Farm Project, Gelliondale, Victoria

(Reference: 2023/09577)

Environment Protection and Biodiversity Conservation Act 1999

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GUIDELINES FOR A DRAFT PUBLIC ENVIRONMENT REPORT/ENVIRONMENT IMPACT STATEMENT FOR

Gelliondale Wind Farm Project, Gelliondale, Victoria – Alberton Renewable Energy Pty Ltd

PREAMBLE

Alberton Renewable Energy Pty Ltd proposes to construct and operate a wind energy facility located along a section of the South Gippsland Highway between the Welshpool and Gelliondale township of Victoria. The proposed action will involve the installation of up to 13 wind turbine generators, two operations and maintenance facilities, a battery energy and storage system and associated infrastructure which includes medium voltage underground powerlines, 14km of access tracks and up to two meteorological masts.

The proposal was referred under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) to the Minister for the Environment on 12 June 2023. The Delegate of the Minister determined on 17 October 2023 that approval is required as the action has the potential to have a significant impact on the following matters of national environmental significance (MNES) that are protected under Part 3 of the EPBC Act:

- The ecological character of a declared Ramsar wetland (section 16 & section 17B)
- Listed threatened species and communities (section 18 & section 18A)
- Listed migratory species (section 20 & section 20A)

On the same date, it was determined that the proposed action be assessed by a Public Environment Report (PER).

Information about the action and its relevant impacts, as outlined below, is to be provided in the PER. This information should be sufficient to allow the Minister to make an informed decision on whether or not to approve, under Part 9 of the EPBC Act, the taking of the action for the purposes of each controlling provision.

GENERAL ADVICE ON GUIDELINES

1 GENERAL CONTENT

The PER should be a stand-alone document that primarily focuses on the MNES listed above. It should contain sufficient information to avoid the need to search out previous or supplementary reports. The PER should take into consideration the EPBC Act Significant Impact Guidelines that can be downloaded from the following web site: http://www.environment.gov.au/epbc/guidelines-policies.html.

The PER should enable interested stakeholders and the Minister to understand the environmental consequences of the proposed development. Information provided in the PER should be objective, clear, and succinct and, where appropriate, be supported by maps, plans, diagrams or other descriptive detail. The body of the PER is to be written in a clear and concise style that is easily understood by the general reader. Technical jargon should be avoided wherever possible. Cross-referencing should be used to avoid unnecessary duplication of text.

Detailed technical information, studies or investigations necessary to support the main text should be included as appendices to the PER. It is recommended that any additional supporting documentation and studies, reports or literature not normally available to the public from which information has been extracted be made available at appropriate locations during the period of public display of the PER.

After receiving the Ministers approval to publish the report, the proponent is required to make the draft PER available for a period of public comment. Specific instructions regarding publication requirements will be provided as part of the Minister's direction to publish.

If it is necessary to make use of material that is of a confidential nature, the proponent should consult with the Department on the preferred presentation of that material, before submitting it to the Minister for approval for publication.

The level of analysis and detail in the PER should reflect the level of significance of the expected impacts on the environment. All unknown variables or assumptions made in the assessment must be clearly stated and discussed. The extent to which the limitations, if any, of available information may influence the conclusions of the environmental assessment should be discussed.

The proponent should ensure that the PER assesses compliance of the action with principles of Ecological Sustainable Development as set out in the EPBC Act, and the objects of the Act at Appendix A. A copy of Schedule 4 of the EPBC Regulations, - *Matters to be addressed by draft public environment report and environmental impact statement* is at Appendix B.

2 FORMAT AND STYLE

The PER should comprise three elements, namely:

- the executive summary;
- the main text of the document, and
- appendices containing detailed technical information and other information that can be made publicly available.

The guidelines have been set out in a manner that may be adopted as the format for the PER. This format need not be followed where the required information can be more effectively presented in an alternative way. However, each of the elements must be addressed to meet the requirements of the EPBC Act and Regulations.

The PER should be written so that any conclusions reached can be independently assessed. To this end all sources must be appropriately referenced using the Harvard standard. The reference list should include the address of any Internet “web” pages used as data sources.

The main text of the PER should include a list of abbreviations, a glossary of terms and appendices containing:

- a copy of these guidelines;
- a list of persons and agencies consulted during the PER;
- contact details for the proponent; and
- the names of the persons involved in preparing the PER and work done by each of these persons.

Maps, diagrams and other illustrative material should be included in the PER, including clear legends, scale and delineation of key environmental features relative to the action area. The PER should be produced on A4 size paper capable of being photocopied, with maps and diagrams on A4 or A3 size and in colour where possible.

The proponent should consider the format and style of the document appropriate for publication on the Internet. The capacity of the website to store data and display the material may have some bearing on how the document is constructed.

SPECIFIC CONTENT

3 GENERAL INFORMATION

This should provide the background and context of the action including:

(a) the title of the action;

(b) the full name and postal address of the designated proponent;

(c) a clear outline of the objective of the action;

(d) the location of the action;

(e) the background to the development of the action;

(f) how the action relates to any other actions (of which the proponent should reasonably be aware) that have been, or are being, taken or that have been approved in the region affected by the action;

(g) the current status of the action; and

(h) the consequences of not proceeding with the action.

(i) any consultation about the action including any consultation that has already taken place and any proposed consultation about relevant impacts of the action (see section 11 for First Nations consultation); and

(j) identification of affected parties, including a statement mentioning any communities that may be affected and describing their views.

4 DESCRIPTION OF THE ACTION

All construction, operational and (if relevant) decommissioning components of the action should be described in detail. This should include the precise location (including coordinates) of all works to be undertaken, structures to be built or elements of the action that may have impacts on matters of National Environmental Significance.

The description of the action must also include details on how the works are to be undertaken (including stages of development and their timing) and design parameters for those aspects of the structures or elements of the action that may have relevant impacts.

5 FEASIBLE ALTERNATIVES

Any feasible alternatives to the action to the extent reasonably practicable, including:

(a) if relevant, the alternative of taking no action;

(b) alternatives to turbine locations, in particular those within proximity of waterways carrying risk of sediment run off to the marine component of the Nooramunga area and Corner Inlet Ramsar Wetland.

(c) a comparative description of the impacts of each alternative on the NES matters protected by controlling provisions of Part 3 of the EPBC Act for the action; and

(d) sufficient detail to make clear why any alternative is preferred to another.

Short, medium and long-term advantages and disadvantages of the options should be discussed.

If there are no feasible alternatives, provide sufficient information as to why this is the case and why there are not alternatives for constructing this project elsewhere in lower biodiversity regions.

6 DESCRIPTION OF THE ENVIRONMENT

6.1 General description of the environment

The PER must contain a description of the existing environment of the proposed action area and the surrounding areas that may be affected by the action (this may include outside of the project site). This should include details of current and historical land use of the area. It is recommended that this includes, but is not limited to, the following information:

(a) Listed threatened and migratory species and ecological communities that are likely to be present in the vicinity of the site, including the following details:

i. Details of the scope, timing (survey season/s) and methodology for studies or surveys used to provide information on the listed species/community/habitat at the site (and in areas that may be impacted by the project).

ii. Details of any known habitat within or proximal to the site including but not limited to the Alberton and Gelliondale State Forest areas.

(b) An assessment of the hydrology within and adjacent to the project area of all major and minor water courses including, but not limited to, the Albert and Jack Rivers. The assessment must include a description addressing the interface between the project infrastructure and all relevant watercourses.

7 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Based on the information provided in your referral, and other available information, the department considers that the listed threatened species, listed migratory species and the Corner Inlet Ramsar Wetland identified below may be significantly impacted by the proposed action.

It is the proponent's responsibility to be aware of any changes to the distribution of listed threatened and migratory species and information available in the Species Profile and Threats (SPRAT) Database. The proponent must ensure that a recent Protected Matters Search Tool (PMST) report has been generated and considered before finalising the draft PER. This PMST should be provided as an attachment to the PER.

Habitat assessments must be informed by desktop (including the Atlas of Living Australia, Victoria's WildNet resources) and field surveys (in accordance with departmental guidelines or as defined by best practice surveys), and with reference to relevant departmental documents (e.g. approved Conservation Advices, Recovery Plans, draft referral guidelines and Listing Advices, and the SPRAT Database), including published research and other relevant sources.

The PER must provide information of the impacts to any MNES identified as potentially being significantly impacted by the proposed action.

7.1 Corner Inlet Ramsar Wetland

Provide a description of the ecological character of the Corner Inlet Ramsar Wetland adjacent to the project area that may be impacted by the proposed action, including the following information:

a) current status and condition of the Corner Inlet Ramsar Wetland, including the past and projected trends and existing threats, at both the scale of the impacts from the proposed action and the whole of the Ramsar Wetland scale;

b) Ramsar values (identified in the listing criteria in the Corner Inlet Ramsar Information Sheet), critical components, processes and services of the Corner Inlet Ramsar Wetland (identified in the Corner Inlet Ecological Character Description (ECD). This includes:

   i. extent and types of wetland habitats at the proposed action site and in areas that may be impacted by the proposed action;

   ii. listed threatened species, migratory birds and waterbird (including non-listed waterbirds) numbers, distribution and site fidelity at the proposed action site and in areas that may be impacted by the proposed action;

iii. the role of the Ramsar sites in maintaining populations of EPBC listed species, and species that are critical components of the ecological character of the Ramsar sites;

iv. locations of feeding and roosting habitats and numbers of listed migratory birds and waterbirds that contribute to the ecological character, the behavioural ecology which links these habitats, their site fidelity and their usage of the area in regional context;

v. water quality where the Albert River and Muddy Creek enter the Corner Inlet Ramsar Wetland area;

vi. soils and sediments, including acid sulphate soils (ASS) and potential acid sulphate soils (PASS);

c) the scope, timing (survey season/s) and methodology for studies or surveys used to provide the above baseline information at the site and in areas that may be impacted by the project;

d) how surveys were undertaken in accordance with relevant Commonwealth, State guidelines or best practice survey guidelines at the time of the surveys, or if relevant, the justification for divergence from relevant Commonwealth, State guidelines or best practice survey guidelines at the time of the surveys; and

e) detail of any known or potential sources of contaminated land in the vicinity of the site. Describe the risk of the development activities leading to land becoming contaminated and the potential consequences to the ecological character of the Corner Inlet Ramsar Wetland and dependant listed threatened species and listed migratory species.

7.2 Ramsar Wetland Impact Assessment

Describe and assess the impacts (direct and indirect) to the Corner Inlet Ramsar Wetland including upstream waterbodies such as Muddy Creek which is located within 500m from the project infrastructure, considering relevant Departmental policies and guidelines, including the Significant Impact Guidelines 1.1: Environment Protection and Biodiversity Conservation Act 1999 (2013). This must include an assessment of the potential for barrier effects of the proposed action on species that rely on the Wetland.

The PER must also provide an assessment of direct and indirect impacts as a result of the proposed action and the associated impacts on listed threatened species, listed migratory species (or their habitat) and native species dependent on the Corner Inlet Ramsar Wetland (Section 8).

In accordance with the department's Significant Impact Guidelines, provide an assessment of the potential for the proposed action to directly or indirectly result in:

a) an invasive species, or any diseases associated with invasive species, that is harmful to the ecological character of the wetland becoming established or encouraged by the proposed action. This includes but is not limited:
   i. to spread or introduction of terrestrial weeds from construction and
   ii. potential facilitated impacts from increased shipping for the construction of the proposed action introducing marine invasive species thorough ballast water or contaminated hulls;
b) changes to availability of foraging resources;
c) disturbances to listed threatened and listed migratory species roosting/foraging habitat;
d) increase in litter; and
e) increased predation

For threatened species and migratory species with habitat or lifecycle dependent upon the Corner Inlet Ramsar Wetland, assessment of impacts should also consider the requirements outlined in Section 8.

7.2.1 STATUTORY REQUIREMENTS

All actions and mitigation measures relating to the Ramsar Wetlands must be consistent with the Ramsar Convention and the Australian Ramsar management principles, which are set out in Schedule 6 of the EPBC Regulations. The assessment must provide a discussion that clarifies whether the action is consistent or inconsistent with these principles, which include:

a) to describe and maintain the ecological character of the wetland;
b) to formulate and implement planning that promotes conservation of the wetland, and wise and sustainable use of the wetland;
c) wetland management that allows for public consultation on decisions and actions that may have significant impact on the wetland;
d) wetland management should make special provision for the involvement of people who have a particular interest in the wetland and may be affected by the management of the wetland including First Nations people and organisations; and
e) wetland management should provide for continuing community and technical input.

For any referred action that was determined to be likely to have a significant impact on the ecological character of a Ramsar wetland, the assessment should:

f) identify any part of the ecological character of the wetland that is likely to be affected by the action;
g) examine how the ecological character of the wetland might be affected; and

h) provide adequate opportunity for public consultation.

7.3 Ramsar Wetland Water Quality Impacts

The discussion on hydrology and water quality impacts should include an assessment of potential alterations to water quality and potential hydrological changes on the Corner Inlet Ramsar Wetland arising as a result of the action.

This section must discuss, but not be limited to, the following potential impacts arising from the proposed action:

a) a review of potential disturbance of acid sulphate soils (ASS) on site and the implications on short- and long-term water quality in the wetland and potential impacts to MNES and MNES habitat onsite for species which rely on the wetland for parts or all of their lifecycles.

b) provide a description and mitigation measures to impacts by a suitably qualified and experienced hydrology expert on:

   i. the potential impact resulting from any changes to the physio-chemical status of Corner Inlet Ramsar Wetland (including turbidity, suspended sediment changes and acid sulphate soil introduction) during the construction, commissioning, operation and decommissioning stages of the action;

   ii. impacts by flood and high rainfall events

   iii. impacts from stormwater runoff, estimations of runoff volumes into the surrounding waterbodies and consideration of risks due to hazardous substance spills;

c) assessment of risks associated with increased erosion due to changes to the landscape including monitoring of sediment loads pre (baseline), during and post construction.

d) a discussion on the likelihood, significance, and extent of impacts and whether any relevant impacts are likely to be unknown, unpredictable, or irreversible.

7.4 Ramsar Wetland Mitigation Measures

The PER must include detailed descriptions of measures proposed to be undertaken by the proponent to avoid, mitigate and manage relevant direct and indirect impacts of the proposed action on the Corner Inlet Ramsar Wetland.

A risk assessment of impacts from the proposed action should be included, with associated mitigation measures.

The PER should also detail the likely effectiveness of the proposed mitigation measures, and the associated confidence in impact mitigation. Wherever possible, mitigation measures should be substantiated by referencing relevant guidelines, literature, or relevant case-studies.

Any specific wetland action management plans to be implemented should be listed here. Further guidance on mitigation measures is provided in section 9 of these guidelines.

7.5 Listed Threatened Species and listed Migratory Species

This section must address, at a minimum, the following listed threatened species and listed migratory species:

(a) Listed Threatened Species

- White-throated Needletail (*Hirundapus caudacutus*) -Vulnerable
- Gang-gang Cockatoo (*Callocephalon fimbriatum*) - Endangered
- Eastern Curlew, Far Eastern Curlew (*Numenius madagascariensis*) – Critically Endangered
- Blue-winged Parrot (*Neophema chrysostoma*) - Vulnerable
- Curlew Sandpiper (*Calidris ferruginea*) - Critically Endangered
- Swift Parrot (*Lathamus discolor*) - Critically Endangered
- Orange-bellied Parrot (*Neophema chrysogaster*) - Critically Endangered
- Regent Honeyeater (*Anthochaera phrygia*) - Critically Endangered
- Australian Painted Snipe (*Rostratula australis*) - Endangered
- Red Knot, Knot (*Calidris canutus*) - Endangered
- Pilotbird (*Pycnoptilus floccosus*) - Vulnerable
- Grey Falcon (*Falco hypoleucos*) - Vulnerable
- Painted Honeyeater (*Grantiella picta*) - Vulnerable
- Greater Sand Plover (*Charadrius leschenaultii*) - Vulnerable
- Growling Grass Frog (*Litroia raniformis*) - Vulnerable

- Grey-headed Flying-fox (*Pteropus poliocephalus*) - Vulnerable
- Campbell Albatross (*Thalassarche impavida*) - Vulnerable
- Antipodean Albatross (*Diomedea antipodensis*) - Vulnerable
- Northern Royal Albatross (*Diomedea sanfordi*) - Endangered
- Southern Royal Albatross (*Diomeda epomophora*) - Vulnerable
- Wandering Albatross (*Diomeda exulans*) - Vulnerable
- Gibson's Albatross (*Diomeda antipodensis gibsoni*) - Vulnerable
- Nunivak Bar-tailed Godwit (*Limosa lapponica baueri*) - Vulnerable
- Fairy Prion (southern) (*Pachyptila turtur subantarctica*) - Vulnerable
- Sooty Albatross (*Phoebetria fusca*) - Vulnerable
- Australian Fairy Tern (*Sternula nereis nereis*) - Vulnerable
- Indian Yellow-nosed Albatross (*Thalassarche carteri*) - Vulnerable
- Shy Albatross (*Thalassarche cauta*) - Endangered
- Eastern Hooded Plover (*Thinornis cucullatus cucullatus*) - Vulnerable
- White-capped Albatross (*Thalassarche steadi*) - Vulnerable
- Australian Grayling (*Prototroctes maraena*) – Vulnerable
- Swamp Skink, Eastern Mourning Skink (*Lissolepis coventryi*) - Endangered
- Eastern Dwarf Galaxias, Dwarf Galaxias (*Galaxiella pusilla*) - Vulnerable
- River Swamp Wallaby-grass (*Amphibromus fluitans*) - Vulnerable
- Swamp Everlasting (*Xerochrysum palustre*) - Vulnerable

(b) Migratory Species

- Lesser Sand Plover (*Charadrius mongolus*)
- Fork-tailed Swift (*Apus pacificus*)
- Sharp-tailed Sandpiper (*Calidris acuminata*)
- Grey-tailed Tattler (*Tringa brevipes*)
- Ruff (Reeve) (*Philomachus pugnax*)
- Pacific Golden Plover (*Pluvialis fulva*)
- Little Curlew, Little Whimbrel (*Numenius minutus*)
- Pin-tailed Snipe (*Gallinago stenura*)
- Latham's Snipe, Japanese Snipe (*Gallinago hardwickii*)

Note 1: The above lists are not exhaustive and may not include all listed threatened and migratory species that will or are likely to be impacted by the proposed action. It is the proponent's responsibility to ensure that any threatened and migratory species listed at the time of the controlled action decision, which will or are likely to be impacted by the project, are assessed for the Minister or delegate's consideration. Any listing events (e.g. the listing or up-listing of a species) that occur after the controlled action decision (17 October 2023) do not affect the assessment and approval process.

Note 2: Some of the listed migratory species requiring assessment are also listed as threatened under the EPBC Act. These species should be considered in accordance with their status as a threatened species. Assessment of these species does not need to be duplicated in the migratory species section.

7.6 General Information required for MNES listed threatened species	
7.6.1	Identify and describe known historical records of EPBC Act listed threatened species and listed migratory species within and surrounding the broader region of the proposed action area. All known records must be supported by: • the year of the record; • the timing of surveys with respect to locally known flowering periods; • a description of the habitat in which the record was identified, if available; • the appropriate source (i.e. Commonwealth and State databases, Victorian Government's Victoria Biodiversity Atlas (VBA), Atlas of Living Australia, published research, publicly available survey reports, etc.) Where this information can be found publicly or is available to the proponent.
7.6.2	With reference to species advice and all other relevant departmental documents (e.g. Conservation Advices, Recovery plans, etc.), provide a habitat assessment for relevant listed threatened species and listed migratory species within and surrounding the: • project footprint;

	• vicinity of the impact area; and • downstream of waterways which flow through the proposed action area and into the Corner Inlet Ramsar Wetland areas.
7.6.3	Provide detail on all surveys for all listed threatened species and migratory species impacted by the action. Surveys must target the proposed action area and any buffer areas requested by the department relevant to the current action and should not represent any areas which are not aligned with the current proposed action footprint. Attach all ecological surveys referenced in the referral and PER as supporting documents to the PER. Ensure versions are clearly labelled.
7.6.4	The PER must include details of the field surveys with respect to: • scope (how surveys were, or will be, undertaken in accordance with relevant Commonwealth and/or best practice survey guidelines); • location (include mapping of where field surveys were, or will be, undertaken); • methodology/ survey technique; • timing (e.g. time of day/ season/ year).
7.6.5	Include an assessment of the adequacy of any surveys undertaken. Discuss the extent to which these surveys were: • appropriate for the listed species or community (including with respect to survey effort and timing); • undertaken in accordance with relevant departmental survey guidelines; • if relevant, discuss the justification for divergence from relevant Commonwealth, State and/or best practice survey guidelines; and • justification for any data that is more than three years old and the reasons why supplementary data has or has not been collected to support the data set.
7.6.6	Provide detailed mapping of suitable habitat for all listed threatened species and migratory species impacted by the action. Ensure habitat mapping:

	• includes an overlay of the project disturbance footprint; • includes the total patch size of habitat which may include sections of the patch that fall outside of the project area (in hectares); • consider the regional context, describe the connectivity of habitat in the broader landscape; • aligns with the habitat descriptions in the department's SPRAT profiles and relevant departmental documents; • identifies key habitat characteristics (e.g. breeding habitat, foraging habitat etc.); • includes known records of individuals derived from desktop analysis and field surveys; and • is provided separately as attachments in JPEG format.

7.7 Information required for specific MNES listed threatened species	
White-throated Needletail (*Hirundapus caudacutus*) - Vulnerable	
7.7.1	With reference to the Conservation Advice for this species, discuss the potential roosting and foraging sites across the project area and within the vicinity of the project area boundary, notably the Gelliondale State and Alberton West State Forests.
7.7.2	Provide a map of habitat features (potential roosting and foraging sites) for this species across the project footprint and in the vicinity of the area.
7.7.3	Provide an assessment of collision risk for the White-throated Needletail using Mathematical Collision Risk Modelling (CRM), which must: • incorporate a project site-wide assessment and identify high risk turbines; • incorporate baseline data collected during the minimum 24 months of site utilisation surveys; • incorporate the recommendations of a model peer review (the peer review must be included as an appendix to the public environment report); and

	• include a literature review, justification of the choice of the model used, and a statement of all assumptions and uncertainties.
Gang-gang Cockatoo (*Callocephalon fimbriatum*) – Endangered	
7.7.4	Undertake targeted surveys for the Gang-gang Cockatoo in line with the current Conservation Advice within the project area boundary and the vicinity.
7.7.5	Provide an assessment of regional significance for the Gang-gang cockatoo within the project area boundary and the vicinity, including the Gelliondale State and Alberton West State Forests.
7.7.6	Provide a map of habitat features, notably hollow bearing trees suitable for breeding and foraging tree species, for the Gang-gang Cockatoo across the project footprint and in the vicinity of the area.
7.7.7	With reference to the Conservation Advice for this species, discuss the potential foraging sites across the project area and within the vicinity of the project area boundary, notably the Gelliondale State and Alberton West State Forests.
7.7.8	Provide an assessment of collision risk for the Gang-gang Cockatoo using Mathematical Collision Risk Modelling (CRM), which must: • incorporate a project site-wide assessment and identify high risk turbines; • incorporate baseline data collected during the minimum 24 months of site utilisation surveys; • incorporate the recommendations of a model peer review (the peer review must be included as an appendix to the public environment report); and include a literature review, justification of the choice of the model used, and a statement of all assumptions and uncertainties.
Grey-headed Flying-fox (*Pteropus poliocephalus*) – Vulnerable	
7.7.9	Provide an assessment of both seasonal and long-term camps for the Grey-headed flying fox in both known and unknown locations within 50km of the proposed action area. This should include but is not limited to the following information: • Maps which indicate the location of all identified camps including a foraging buffer and distance to the proposed action area; • identify if camps are listed as Nationally Important;

	• include the direction of travel from camps for foraging and seasonal migration; • a summary of the effects of climate change on the dispersal and foraging habits of identified camps; • a map of foraging habitat within a 100km buffer of each identified camp location;

8 IMPACT ASSESSMENT

8.1 General impact information

(a) The PER must include a description of all the relevant impacts of the action. Relevant impacts are impacts that the action will have or is likely to have on a matter protected by a controlling provision (as listed in the preamble of this document). Impacts during both the construction, operational and (if relevant) the decommissioning phases of the project should be addressed, and the following information provided:

- a detailed assessment of the nature and extent of the likely short-term and long-term relevant impacts;
- a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;
- analysis of the significance of the relevant impacts; and
- any technical data and other information used or needed to make a detailed assessment of the relevant impacts.

(b) The PER must identify any indirect impacts of the project on MNES. This includes, but is not limited to, sediment and erosion associated with construction and other activities impacting MNES within and adjacent to the project area, introduction of pests, weeds and pathogens and site alienation resulting in fauna avoiding the project area.

(c) The PER must include a detailed project design layout which includes locations of all infrastructure proposed for the action. This may be split across several maps within the PER to ensure ease of visual representation. The layout must include but is not limited to:

- Disturbance footprint (impact areas).
- Project area boundary.
- Precise locations of infrastructure proposed for development.

- Watercourses and wetlands within and surrounding the project area within 3km of the project area boundary.
- Scale bar.
- Access tracks.
- Topographic lines.

(d) The PER must identify and address cumulative impacts, where potential project impacts are in addition to existing impacts of other activities (including known potential future expansions or developments by the proponent and other proponents in the region and vicinity).

~~(e)~~ The PER must also address the potential cumulative impact of the proposal on ecosystem resilience. Where relevant to the potential impact, a risk assessment should be conducted and documented.

(f) The PER must include detailed information on the 25-kilometre transport route connecting the infrastructure component of the action via Port Anthony along Barry Road onto the South Gippsland Highway and how its use would impact on MNES.

(g) The PER must include information on how interactions between the proposed action and extreme environmental events (e.g. long-term drought, floods and bushfires) may impact on MNES, this should include but is not limited to:

i. an assessment and summary by a hydrology expert of flood longevity and pasture inundation within the proposed action area after high rainfall events, specifically the length of time and at what depth water may pool within pasture which may attract listed and migratory species as habitat. Discussion of impacts to listed and migratory species must be considered in the context of potential land inundation.

(h) The PER must also provide a detailed assessment of any likely impact that this proposed action may facilitate on the following (at the local, regional, state, national and international scale):

- Wetlands of international importance;
- Listed threatened species and ecological communities;
- Listed migratory species;

(i) The PER must include a description and mitigation measures by a hydrology expert on impacts by flood including erosion and sediment run-off within and adjacent to the project area. Discussion of impacts to listed and migratory species must be considered in the context of potential land inundation.

(j) The department considers the proposed action may result in, but is not limited to, the following impacts:

- Collision risk of birds and bats with wind turbines.
- Barotrauma risk of bats with wind turbines.
- Downstream impacts, where the Albert River enters the Corner Inlet Ramsar Wetland.
- Increased risk of fire incursion including increased fire incursion into Gelliondale and Alberton State Forest Areas adjacent to the project area.
- Increase light and noise pollution during the construction and operational phases, and
- Increased weed and pest invasion.

8.2 Impacts to threatened species

For listed threatened species, the PER should include relevant impacts listed in section 8.1 in addition to the following impacts listed in table 8.2.

Table 8.2 Listed Threatened Species

Information Required	
8.2.1	An assessment of the likely impacts associated with the construction, operation, maintenance and decommissioning stages and vegetation clearing of the project.
8.2.2	Include the direct and indirect loss and/or disturbance of MNES individuals and habitat as a result of the proposed action. This must include the ground truth quality of the habitat impacted and quantification of the individuals and habitat area (in hectares) to be impacted.
8.2.3	An assessment of the impacts of habitat fragmentation in the proposed action area (between drainage lines/waterways). Include a consideration of species' movement patterns and site utilisation notably species which may fly through the RSA toward or from the Corner Inlet Ramsar Wetland or between the Gelliondale and Alberton State Forests.
8.2.4	An assessment of impacts by light and noise pollution caused by each wind turbine generator.
8.2.5	An assessment of the likely duration of impacts to MNES as a result of the proposed action.
8.2.6	A discussion of whether any impacts are likely to be unknown, unpredictable or irreversible.
8.2.7	Justification, with supporting evidence, how the proposed action will not be inconsistent with: • Australia's obligations under the Biodiversity Convention, the Convention on Conservation of Nature in the South Pacific (Apia Convention), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); and • a recovery plan or threat abatement plan.
8.2.8	Assess the impacts, including but not limited to, noise, vibration, dust and vehicle strike resulting from the construction and operation of the project to habitat and species in the project site and surrounding areas.

8.3 Impacts to listed migratory species

For listed migratory species, the PER should include impacts listed in section 8.1 and table 8.2 in addition to the following impacts listed in table 8.3.

Table 8.3 Migratory Species

Information Required	
8.3.1	An assessment of light and noise pollution impacts to migratory birds including but not limited to: • Disorientation due to noise and light pollution during migration; and • Changes in roosting and foraging behaviour
8.3.2	Justify, with supporting evidence, how the proposed action will not be inconsistent with Australia's obligations under: • The Bonn Convention; • China-Australia Migratory Bird Agreement; • Japan-Australia Migratory Bird Agreement; • International Agreement – Republic of Korea-Australia Migratory Bird Agreement; and • Any international agreement approved under subsection 209(4) of the EPBC Act.

8.4 Impacts to listed threatened and migratory bird and bat species associated with wind turbines

Further information is required in the PER, with supporting evidence, in relation to the utilisation of the project site and its surrounds by the listed threatened and migratory bird and bat species at risk of turbine strike and barotrauma (see Appendix C). This information is required to enable a robust assessment of potential impacts associated with individual mortality from turbine collision and barotrauma, and potential changes to species utilisation of the project site and its surrounds as a result of the proposed action.

Table 8.4 Impacts to birds and bats associated with wind turbines

Information required	
8.4.1	*Desktop assessment* To predict the potential for at risk threatened and migratory bird and bat species and waterbirds associated with the Corner Inlet Ramsar Wetland to

	be using the project site and its surrounds, the PER must include the process and outcomes of: • A preliminary site characterisation (desktop and/or initial site visit) for each species to identify all drivers of presence on the project site and utilisation of the project site. This characterisation must include, but not limited to, the consideration of: i. <u>Site characteristics:</u> focal habitat features, topography, prevailing wind and weather patterns, wetlands (including adjacent to project site),and distance to potential nesting, roosting and foraging areas. ii. <u>Species characteristics:</u> behaviour, flight or demographic factors (e.g. species presence [ongoing, transitory/migratory]), site use iii. (e.g. transit, roosting, breeding and/or foraging), flight paths (including migratory flight paths), flight heights, soaring, flocking, and population numbers.
8.4.2	*Site-specific assessment* To validate the outcomes of the desktop assessment, the PER must include a detailed discussion of how at-risk listed threatened and migratory bird and bat species are using the project site (both project site and proposed disturbance footprint). This discussion must be informed by site-specific and species-specific site utilisation surveys (undertaken by a suitably qualified expert) and supported by other relevant scientific evidence. Further, this discussion must include detailed information on: i. How the design of the site utilisation surveys for each relevant species has been informed by its drivers of presence on the project site and utilisation of the project site and its surrounds (as determined through the preliminary site characterisation). ii. How site utilisation surveys for each relevant species have been designed to improve understanding of site utilisation on the project site and its surrounds, and support an ongoing Before-After, Control Impact (BACI) framework for an adaptive Bird and Bat Management Plan (BBMP). iii. The proposed site utilisation survey methodology for each relevant species must be included as an appendix to the PER. iv. Site utilisation surveys must be undertaken for each relevant season over a minimum two years (up to 8 survey events). Each site utilisation survey must be of an appropriate duration and spatial

	coverage (including taking into consideration the potential turbine layout and visibility) to adequately evaluate site utilisation. v. At a minimum, each site utilisation survey must record the relevant information specified in 'Species characteristics' of the 'Desktop Assessment' requirements for each relevant species (s 8.4.1).

9 PROPOSED SAFEGUARDS AND MITIGATION MEASURES

The PER must provide information on proposed safeguards and mitigation measures to deal with the relevant impacts of the action. Specific and detailed descriptions of proposed measures must be provided and substantiated, based on best available practices and must include the following elements.

(a) A consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action, including:

i. a description of the environmental outcomes the measures are expected to achieve including details of any baseline data or proposed monitoring to demonstrate progress towards achieving these outcomes;

ii. a description of proposed safeguards and mitigation measures to deal with relevant impacts of the action, including mitigation measures proposed to be taken by State governments, local governments or the proponent;

iii. assessment of the expected or predicted effectiveness of the mitigation measures;

iv. any statutory or policy basis for the mitigation measures; and

v. the cost of the mitigation measures.

(b) A detailed outline of a draft Environmental Management Plan (EMP) that sets out the framework for management, mitigation and monitoring of relevant impacts of the action, including any provisions for independent environmental auditing.

(c) The EMP needs to address the project phases (construction, operation, decommission) separately. It must state the environmental objectives, performance criteria, monitoring, reporting, corrective action, responsibility and timing for each environmental issue.

(d) The EMP should also describe contingencies for events such as failure of sewerage systems, heavy or prolonged rainfall, or saltwater intrusion into ground water.

(e) The name of the agency responsible for endorsing or approving each mitigation measure or monitoring program.

10 OTHER APPROVALS AND CONDITIONS

The PER must include information on any other requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action. This must include:

(a) details of any local or State Government planning scheme, or plan or policy under any local or State Government planning system that deals with the proposed action, including:

i. what environmental assessment of the proposed action has been, or is being, carried out under the scheme, plan or policy; and

ii. how the scheme provides for the prevention, minimisation and management of any relevant impacts;

(b) a description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the Act), including any conditions that apply to the action;

(c) a statement identifying any additional approval that is required; and

(d) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.

11 CONSULTATION

Any consultation about the action, including:

(a) any consultation that has already taken place;

(b) proposed consultation about relevant impacts of the action;

(c) if there has been consultation about the proposed action, any documented response to, or result of, the consultation; and

(d) identification of affected parties, including a statement mentioning any communities that may be affected and describing their views.

11.1 First Nations Consultation

The PER must include information on engagement with First Nations people whose rights, interests and aspirations may be affected by the proposed action, and include:

a) identification of the relevant Traditional Owners and other relevant First Nations people (including groups and organisations), taking account of any cultural sensitivities expressed by First Nations people;

b) details of engagement with Traditional Owners and other relevant First Nations people, and a description of how that engagement was, and in the future will be, conducted in a culturally appropriate manner and in accordance with First Nations people's preferences;

c) information on the rights, interests, views, aspirations and other concerns expressed by the Traditional Owners and other First Nations people in relation to the project, including Native Title and any other land and water rights and interests, land and water management arrangements, cultural heritage, and social and economic matters;

d) a description of any state government requirements or conditions that apply to the proposed action in relation to First Nations people;

e) information on how First Nations people's rights, interests, views and concerns will be addressed in design, construction and operation of the proposed action, and whether Traditional Owners and other relevant First Nations people are satisfied that they have been adequately consulted and that their project-related feedback and concerns have been addressed;

f) information on any project-related agreements, plans, ongoing engagement arrangements, partnerships and benefit-sharing arrangements entered into with Traditional Owners and other relevant First Nations people.

Engagement with First Nations people should apply principles set out in Interim Engaging with First Nations People and Communities on Assessments and Approvals under the Environment Protection and Biodiversity Conservation Act 1999 or any First Nations engagement standard (if one is in force); and Dhawura Ngilan: A vision for Aboriginal and Torres Strait Islander heritage in Australia and the Best Practice Standards in Indigenous cultural heritage management and legislation.

12 ENVIRONMENTAL RECORD OF PERSON(S) PROPOSING TO TAKE THE ACTION

The information provided must include details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

(a) the person proposing to take the action; and

(b) for an action for which a person has applied for a permit, the person making the application.

If the person proposing to take the action is a corporation, details of the corporation's environmental policy and planning framework must also be included.

13 ECONOMIC AND SOCIAL MATTERS

The economic and social impacts of the action, both positive and negative, must be analysed. Matters of interest may include:

a) details of any public consultation activities undertaken, and their outcomes;

b) projected economic costs and benefits of the project, including the basis for their estimation through cost/benefit analysis or similar studies;

c) employment opportunities expected to be generated by the project (including construction and operational phases).

d) short and long term impacts on the local and regional communities (including First Nations people) from implementation of the development.

e) any training, employment, business and other economic opportunities and social benefits (including energy use benefits) for First Nations people, communities and businesses in the region.

Economic and social impacts should be considered at the local, regional and national levels. Details of the relevant cost and benefits of alternative options to the proposed action, as identified in section 3 above, should also be included.

14 INFORMATION SOURCES PROVIDED IN THE PER/EIS

For information given in a draft Public Environment Report, the draft must state:

(a) the source of the information;

(b) how recent the information is;

(c) how the reliability of the information was tested; and

(d) what uncertainties (if any) are in the information.

15 CONCLUSION

An overall conclusion as to the environmental acceptability of the proposal should be provided, including discussion on compliance with principles of ESD and the objects and requirements of the EPBC Act. Reasons justifying undertaking the proposal in the manner proposed should also be outlined.

Measures proposed or required by way of offset for any unavoidable impacts on NES matters, and the relative degree of compensation, should be restated here.

APPENDIX A

THE OBJECTS AND PRINCIPLES OF THE

ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

SECTIONS 3 AND 3A

3 Objects of the Act

(a) to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance;

(b) to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources;

(c) to promote the conservation of biodiversity;

(d) to promote a co-operative approach to the protection and management of the environment involving governments, the community, land-holders and First Nation peoples;

(e) to assist in the co-operative implementation of Australia's international environmental responsibilities;

(f) to recognise the role of First Nations people in the conservation and ecologically sustainable use of Australia's biodiversity; and

(g) to promote the use of First Nations peoples' knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge.

3A Principles of Ecologically Sustainable Development

The following principles are principles of ecologically sustainable development.

(a) Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.

(b) If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

(c) The principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

(d) The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.

(e) Improved valuation, pricing and incentive mechanisms should be promoted.

APPENDIX B

MATTERS THAT MUST BE ADDRESSED IN A PER AND EIS

(SCHEDULE 4 OF THE EPBC REGULATIONS 2000)

1 General information

1.01 The background of the action including:

(a) the title of the action;

(b) the full name and postal address of the designated proponent;

(c) a clear outline of the objective of the action;

(d) the location of the action;

(e) the background to the development of the action;

(f) how the action relates to any other actions (of which the proponent should reasonably be aware) that have been, or are being, taken or that have been approved in the region affected by the action;

(g) the current status of the action; and

(h) the consequences of not proceeding with the action.

2 Description

2.01 A description of the action, including:

(a) all the components of the action;

(b) the precise location of any works to be undertaken, structures to be built or elements of the action that may have relevant impacts;

(c) how the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts;

(d) relevant impacts of the action;

(e) proposed safeguards and mitigation measures to deal with relevant impacts of the action;

(f) any other requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action;

(g) to the extent reasonably practicable, any feasible alternatives to the action, including:

(i) if relevant, the alternative of taking no action;

(ii) a comparative description of the impacts of each alternative on the matters protected by the controlling provisions for the action; and

(iii) sufficient detail to make clear why any alternative is preferred to another;

(h) any consultation about the action, including:

(i) any consultation that has already taken place;

(ii) proposed consultation about relevant impacts of the action; and

(iii) if there has been consultation about the proposed action — any documented response to, or result of, the consultation; and

(i) identification of affected parties, including a statement mentioning any communities that may be affected and describing their views.

3 Relevant impacts

3.01 Information given under paragraph 2.01(d) must include

(a) a description of the relevant impacts of the action;

(b) a detailed assessment of the nature and extent of the likely short term and long term relevant impacts;

(c) a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;

(d) analysis of the significance of the relevant impacts; and

(e) any technical data and other information used or needed to make a detailed assessment of the relevant impacts.

4 Proposed safeguards and mitigation measures

4.01 Information given under paragraph 2.01(e) must include:

(a) a description, and an assessment of the expected or predicted effectiveness of, the mitigation measures;

(b) any statutory or policy basis for the mitigation measures;

(c) the cost of the mitigation measures;

(d) an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing;

(e) the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program; and

(f) a consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action, including mitigation measures proposed to be taken by State governments, local governments or the proponent.

5 Other Approvals and Conditions

5.01 Information given under paragraph 2.01(f) must include:

(a) details of any local or State government planning scheme, or plan or policy under any local or State government planning system that deals with the proposed action, including:

(i) what environmental assessment of the proposed action has been, or is being carried out under the scheme, plan or policy; and

(ii) how the scheme provides for the prevention, minimisation and management of any relevant impacts;

(b) a description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the Act), including any conditions that apply to the action;

(c) a statement identifying any additional approval that is required; and

(d) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.

6 Environmental record of person proposing to take the action

6.01 Details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

(a) the person proposing to take the action; and

(b) for an action for which a person has applied for a permit, the person making the application.

6.02 If the person proposing to take the action is a corporation — details of the corporation’s environmental policy and planning framework.

7 Information sources

7.01 For information given the PER must state:

(a) the source of the information; and

(b) how recent the information is; and

(c) how the reliability of the information was tested; and

(d) what uncertainties (if any) are in the information.

APPENDIX C

BIRD AND BAT MANAGEMENT PLAN (BBMP)

The following table outlines the framework to assist in the preparation and submission of a draft BBMP which should address both Victorian State and Federal EPBC act matters. This should be included as an appendix to the public environment report (as required by Section 7 above). The purpose of the BBMP is to enable a robust long-term approach to mitigate and manage potential impacts of the proposed action associated with individual mortality from turbine collision and barotrauma, and potential changes to species utilisation of the project site and its surrounds on relevant listed threatened and migratory bird and bat species.

The draft BBMP must be prepared by a suitably qualified ecologist and in accordance with the department's *Environmental Management Plan Guidelines* (2014), available at: www.environment.gov.au/epbc/publications/environmental-management-plan-guidelines, and includes the following key requirements at a minimum. The draft BBMP must be informed by desktop and field-derived information, best available practices, appropriate standards, evidence of effectiveness for other similar actions and supported by published scientific evidence.

C1. Pre-commissioning requirements* *The department considers that these requirements must be completed during the EPBC Act and Victorian State Department of Transport and Planning assessment processes.	
C1.1	**Desktop assessment: Preliminary site characterisation** To predict the potential for the listed threatened and migratory bird and bat species and identified in Section 7.5 above (at a minimum) to be using the project site and its surrounds, the BBMP must include the process and outcomes of: • A preliminary site characterisation (desktop and/or initial site visit) for each species to identify all drivers of presence on the project site and utilisation of the project site. This characterisation must include, but not limited to, the consideration of: ○ site characteristics: focal habitat features, topography, prevailing wind and weather patterns, wetlands (including adjacent to project site), and distance to potential nesting, roosting and foraging areas. ○ species characteristics: behaviour, flight or demographic factors (e.g. species presence [ongoing, transitory/migratory]), site use

	(e.g. transit, roosting, breeding and/or foraging), flight paths (including migratory flight paths), flight heights, soaring, flocking, and population numbers.
C1.2	**Site-specific assessment: Site utilisation surveys** To validate the outcomes of the desktop assessment, the BBMP must include a detailed discussion of how at-risk listed threatened and migratory bird and bat species are using the project site (both project site and proposed disturbance footprint). This discussion must be informed by site-specific and species-specific site utilisation surveys (undertaken by a suitably qualified expert) and supported by other relevant scientific evidence. Further, this discussion must include detailed information on: • How the design of the site utilisation surveys for each relevant species has been informed by its drivers of presence on the project site and utilisation of the project site (as determined through the preliminary site characterisation). • How site utilisation surveys for each relevant species have been designed to improve understanding of site utilisation on the project site and its surrounds; and support the proposed ongoing BACI framework in this BBMP. The site utilisation survey methodology for each relevant species must be included as an attachment to the BBMP. **Note:** At least 24 months of site utilisation surveys must be undertaken to provide sufficient baseline data about a relevant species' potential to utilise the project site and its surrounds. Site utilisation surveys must be undertaken for each relevant season over a minimum two years (up to 8 survey events). Each site utilisation survey must be of an appropriate duration and spatial coverage (including taking into consideration the potential turbine layout and visibility) to adequately evaluate site utilisation. At a minimum, each site utilisation survey must record the relevant information specified in 'Species characteristics' of the 'Desktop assessment: Preliminary site characterisation' (Section C1.1 above).
C1.3	**Long-term impact risk assessment** To enable a robust assessment of potential impacts of the proposed action associated with individual mortality from turbine collision and barotrauma, and potential changes to species utilisation of the project site and its surrounds on relevant species, the BBMP must include, but not be limited to: • An assessment of the potential impact pathways on each relevant species (based on the desktop assessment [Section 1.1 above] and site utilisation surveys [Section 1.2 above]) including, but not limited to: ○ direct mortality from turbine collision and barotrauma; and

	○ potential changes to site utilisation during construction and operation of the proposed action. • Identification of potential impacts to each relevant species from direct mortality, including but not limited to: ○ analysis and mapping of suitable habitat, territories and activity/utilisation patterns/rates ('heat maps') in the project site and its surrounds; • Mathematical Collision Risk Modelling (CRM), which must: ○ incorporate a project site-wide assessment and identify high risk turbines; ○ incorporate baseline data collected during the minimum 24 months of site utilisation surveys; ○ incorporate the recommendations of a model peer review (the peer review must be included as an appendix to the public environment report); and ○ include a literature review, justification of the choice of the model used, and a statement of all assumptions and uncertainties. The BBMP must clearly demonstrate how relevant federal and state departmental policies and guidelines, and the SPRAT Database have been used to assess the potential impacts of direct mortality from turbine collision and barotrauma, and potential changes to site utilisation during construction and operation of the proposed action on relevant listed threatened and migratory bird and bat species. The BBMP must include a map for each relevant species which identifies area/s in the project site and its surrounds which have been determined as 'high risk' based on the outputs of the CRM.

C2. Post-Commissioning requirements	
C	**Environmental outcomes** To enable a robust long-term approach to mitigate and manage potential impacts associated with individual mortality from turbine collision and barotrauma, and potential changes to species utilisation of the project site and its surrounds on relevant species, the BBMP must include specific environmental outcomes to be achieved by the implementation of the BBMP. This may include, but is not limited to: • An improved understanding of the risk of turbine collision and barotrauma impacts on listed bird and bat species.

	• An improved understanding of whether or how project site usage changes as a result of wind farm construction and operation. • An improved monitoring approach for the timely identification of turbine collisions and the timely collection and analysis of data. • An improved approach to the timely and regular validation and update to the CRM using monitoring data and support a robust adaptive management approach. • The development and implementation of tangible, on-ground management measures and corrective actions to promote a long-term reduction in the risk of turbine collision and barotrauma impacts on listed bird and bat species.
C2.2	**Long-term site utilisation surveys** To detect potential long-term changes to species utilisation of the project site and its surrounds on relevant species as a result of operation, the BBMP must include a long-term site utilisation survey program (prepared by a suitably qualified expert) for each relevant species. The program must, at a minimum: • be designed to ensure that species behaviour responses, including avoidance of turbines, and changes to project site utilisation, can be detected; • be designed to support a BACI monitoring framework; • include site utilisation survey methodologies, and proposed timings, which are consistent with the pre-commissioning site utilisation survey methodologies; • be undertaken by a suitable qualified expert; • be statistically reliable; • be able to inform adaptive mitigation and management measures, and corrective actions, to ensure environmental outcomes will be achieved.
C2.3	**Long-term turbine collision and barotrauma monitoring** To manage potential long-term mortality impacts on relevant species as a result of turbine collision and barotrauma, the BBMP must include a long-term monitoring and CRM update approach. The approach must, at a minimum: • Include details of the nature, timing and frequency of monitoring to inform progress against achieving the environmental outcomes and be sufficient to determine whether the BBMP is likely to achieve those environmental outcomes in adequate time to implement all necessary corrective actions.

	• Demonstrate how site-specific and species-specific risks and uncertainties have informed the design of the monitoring program (e.g. scavenger activity, searcher efficiency, etc.). • Include a proposed timeframe for the regular validation and update of the CRM using site-specific data collected through ongoing monitoring activities. • Include a commitment to DNA test carcasses that cannot be otherwise identified by a bird or bat expert. • Include a commitment for carcass persistence trials to maximise turbine collision detection in a timely manner. • Include a commitment for searcher efficiency trials to maximise carcass detection in a timely manner.

C2.4	**Reporting requirements to the department**
	The BBMP must include, at a minimum, the following reporting commitments (and proposed timeframes) for the provision of site-specific and species-specific information to the department:
	• Immediate reporting for collisions of critically endangered species;
	• Immediate reporting for mass collision events of the following but not limited to:
	  • Marine listed species;
	  • Migratory species; and
	  • Listed threatened species.
	• Annual turbine strike reports comprising raw strike data and strike notifications, survey methodologies, results of detection/persistence trials, environmental/meteorological conditions and associated statistical analysis.
	• Estimations of annual mortality rate for each relevant species, comprising supporting evidence from case studies of EPBC species carcass size classes, results of persistence trials, searcher efficiency trials and substitute carrion trials, and annual probability of detection and monthly strike monitoring.
	• Species occurrence records in accordance with the department's *Guidelines for biological survey and mapped data* (2018) using the species observation data template on the department's website (sensitive ecological data must be identified and treated in accordance with the department's *Sensitive Ecological Data – Access and Management Policy V1.0* (2016) or subsequent revision).

C2.5	**Adaptive management framework**

	To ensure the environmental outcomes will be achieved for relevant species, the BBMP must include an adaptive management framework. The adaptive management framework must, at a minimum:
	• Be designed to clearly demonstrate the linkages between:
	  ○ environmental outcomes;
	  ○ implementation of mitigation and management measures;
	  ○ monitoring, reporting and investigations; and
	  ○ implementation of corrective actions to ensure environmental outcomes will be achieved.
	• Be designed to incorporate site-specific data collected through ongoing monitoring activities (see requirement C2.4 above), and take into account changes to turbine risk ratings based on the CRM outputs.
	• Identify, with proposed timeframes for implementation, tangible, on-ground corrective actions to be implemented if monitoring activities indicate the environmental outcomes have not been achieved.

Appendix 6: Historical records of EPBC Act listed threatened species within the search region

This appendix displays all the historical records of EPBC Act listed threatened species (migratory shorebirds excluded, which are in Appendix 7) that were considered to be likely to occur within the search region.

Source	Common Name	Scientific Name	Count	Date	Latitude	Longitude	Accuracy	EPBC	FFG Status
VBA	White-throated Needletail	Hirundapus caudacutus		1/01/1931	-38.4985	146.668	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/01/1931	-38.4985	146.668	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/07/1968	-38.4985	146.5013	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/01/1973	-38.4985	146.5013	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/01/1977	-38.5402	146.3763	4500	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/01/1977	-38.6235	146.6263	4500	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/01/1977	-38.6235	146.543	4500	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/01/1977	-38.5401	146.793	4500	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/01/1977	-38.7068	146.4597	4500	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/01/1977	-38.7902	146.4597	4500	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/01/1977	-38.7068	146.6263	4500	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/01/1977	-38.7068	146.543	4500	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/01/1977	-38.7902	146.543	4500	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/01/1977	-38.7068	146.7096	4500	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/03/1977	-38.6568	146.6596	900	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/03/1977	-38.6235	146.6263	4500	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		3/03/1977	-38.7735	146.7263	900	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		4/03/1977	-38.7902	146.543	4500	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		5/03/1977	-38.7902	146.543	4500	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		20/12/1977	-38.5818	146.7513	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		11/01/1978	-38.5818	146.5846	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		11/01/1978	-38.5818	146.7513	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/03/1978	-38.5818	146.7513	9000	Vulnerable	Vulnerable

Source	Common Name	Scientific Name	Count	Date	Latitude	Longitude	Accuracy	EPBC	FFG Status
VBA	White-throated Needletail	Hirundapus caudacutus		11/03/1978	-38.5818	146.2513	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/12/1978	-38.5818	146.418	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/12/1978	-38.7485	146.5847	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		11/12/1978	-38.5818	146.7513	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		27/01/1979	-38.7485	146.5847	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		11/02/1979	-38.5818	146.2513	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/03/1979	-38.5818	146.7513	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		31/03/1979	-38.7485	146.418	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		1/04/1979	-38.7485	146.5847	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus	6	1/01/1980	-38.583	146.2579	100	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		21/01/1980	-38.7485	146.418	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		27/01/1980	-38.7485	146.5847	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		24/02/1980	-38.7485	146.418	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		25/03/1980	-38.7485	146.418	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		5/04/1980	-38.5818	146.7513	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		25/04/1980	-38.7485	146.418	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		27/12/1980	-38.5818	146.5846	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		9/01/1981	-38.5818	146.7513	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		31/12/1981	-38.7485	146.7513	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		9/02/1992	-38.6457	146.348	100	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		11/01/1999	-38.5834	146.3164	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		29/01/1999	-38.5815	146.3107	9000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus	3	21/12/2002	-38.6478	146.3986	100	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus	2	21/12/2002	-38.6478	146.3986	100	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus	5	22/12/2002	-38.6478	146.3986	100	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus	1	22/12/2002	-38.6595	146.3996	100	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus	15	22/12/2002	-38.6478	146.3986	100	Vulnerable	Vulnerable

Source	Common Name	Scientific Name	Count	Date	Latitude	Longitude	Accuracy	EPBC	FFG Status
VBA	White-throated Needletail	Hirundapus caudacutus	200	26/12/2002	-38.5863	146.3543	100	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus	5	1/04/2003	-38.6497	146.4181	100	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus	70	29/02/2004	-38.6669	146.6674	100	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus	7	4/03/2005	-38.5609	146.4751	100	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus	1	8/03/2005	-38.5466	146.4976	100	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		13/03/2005	-38.5917	146.3583	1000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus	30	31/12/2005	-38.575	146.3083	1000	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus	10	21/02/2015	-38.6244	146.5536	200	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus	2	23/03/2018	-38.691	146.3352	50	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus	5	20/02/2019	-38.7115	146.7035	50	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus	5	20/02/2019	-38.7115	146.7035	50	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		22/02/2021	-38.6122	146.5329	700	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		22/02/2021	-38.6449	146.5241	500	Vulnerable	Vulnerable
VBA	White-throated Needletail	Hirundapus caudacutus		22/02/2021	-38.6443	146.5846	1500	Vulnerable	Vulnerable
Birdata	Swift Parrot	Lathamus discolor	1	22/05/2024	-38.7103	146.6	50		
VBA	Swift Parrot	Lathamus discolor	x	1/01/1977	-38.3735	146.293	4500		
VBA	Swift Parrot	Lathamus discolor	x	1/01/1977	-38.3735	146.3763	4500		
VBA	Swift Parrot	Lathamus discolor	x	19/05/1977	-38.9152	146.2513	9000		
VBA	Swift Parrot	Lathamus discolor	x	2/12/1978	-38.4152	146.418	9000		
VBA	Swift Parrot	Lathamus discolor	x	31/03/1979	-38.7485	146.418	9000		
VBA	Swift Parrot	Lathamus discolor	3	11/04/1991	-38.6735	146.6763	900		
VBA	Swift Parrot	Lathamus discolor	20	2/04/1992	-38.7815	146.455	100		
VBA	Swift Parrot	Lathamus discolor	x	14/08/1998	-39.1309	146.4188	9000		
VBA	Swift Parrot	Lathamus discolor	x	1/09/1998	-39.1309	146.4188	9000		
VBA	Swift Parrot	Lathamus discolor	x	1/10/1998	-39.0814	146.418	9000		
VBA	Swift Parrot	Lathamus discolor	x	16/04/2000	-39.1282	146.4257	9000		
VBA	Swift Parrot	Lathamus discolor	7	1/04/2018	-38.679	146.8163	50		

Source	Common Name	Scientific Name	Count	Date	Latitude	Longitude	Accuracy	EPBC	FFG Status
VBA	Swift Parrot	Lathamus discolor	7	1/04/2018	-38.679	146.8163	50		
VBA	Swift Parrot	Lathamus discolor	7	1/04/2018	-38.679	146.8163	50		
VBA	Latham's Snipe	Gallinago hardwickii		1/01/1977	-38.6235	146.6263	4500	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii		1/01/1977	-38.7068	146.7096	4500	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii		20/12/1977	-38.5818	146.7513	9000	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii		27/01/1979	-38.7485	146.5847	9000	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii	1	20/01/1996	-38.6667	146.7	100	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii	1	13/09/1997	-38.5923	146.7653	100	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii	20	3/03/1999	-38.7106	146.5418	900	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii		16/10/1999	-38.6245	146.6492	100	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii		5/07/2000	-38.6164	146.6469	100	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii		15/10/2000	-38.6245	146.6492	100	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii	2	1/12/2003	-38.6353	146.4113	900	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii	40	9/09/2004	-38.6688	146.6927	100	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii	80	10/09/2004	-38.6688	146.695	100	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii	1	6/10/2004	-38.6583	146.6917	1000	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii	1	20/12/2012	-38.643	146.5754	100	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii	1	21/11/2017	-38.575	146.6917	1000	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii	3	2/11/2018	-38.6417	146.675	1000	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii	12	22/10/2020	-38.6081	146.7745	10	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii	200	12/01/2021	-38.6873	146.746	500	Vulnerable	
VBA	Latham's Snipe	Gallinago hardwickii	1	22/08/2021	-38.5982	146.7795	10	Vulnerable	
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/01/1931	-38.4985	146.668	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/01/1931	-38.4985	146.668	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/07/1968	-38.4985	146.5013	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/01/1973	-38.5764	146.3931	300	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/01/1973	-38.606	146.488	300	Endangered	Endangered

Source	Common Name	Scientific Name	Count	Date	Latitude	Longitude	Accuracy	EPBC	FFG Status
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/01/1973	-38.4985	146.5013	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		21/11/1974	-38.4985	146.668	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/01/1977	-38.5402	146.6263	4500	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/01/1977	-38.6235	146.6263	4500	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/01/1977	-38.5402	146.543	4500	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/01/1977	-38.6235	146.543	4500	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/01/1977	-38.5401	146.793	4500	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/01/1977	-38.7068	146.6263	4500	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		20/12/1977	-38.5818	146.7513	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/03/1978	-38.5818	146.7513	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		20/05/1978	-38.5818	146.5846	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/06/1978	-38.5818	146.7513	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		27/09/1978	-38.5818	146.7513	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/12/1978	-38.5818	146.418	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/12/1978	-38.7485	146.5847	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		11/12/1978	-38.5818	146.7513	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		27/12/1978	-38.5818	146.418	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		11/02/1979	-38.5818	146.2513	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		28/04/1979	-38.5818	146.418	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/08/1979	-38.5818	146.7513	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		20/08/1979	-38.7485	146.418	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		16/09/1979	-38.5818	146.5846	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum	4	1/01/1980	-38.583	146.2579	100	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		2/05/1980	-38.5818	146.7513	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		25/02/1981	-38.5818	146.7513	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		11/01/1999	-38.5834	146.3164	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		29/01/1999	-38.5815	146.3107	9000	Endangered	Endangered

Source	Common Name	Scientific Name	Count	Date	Latitude	Longitude	Accuracy	EPBC	FFG Status
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		21/02/1999	-38.575	146.775	1000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		14/04/1999	-38.5833	146.3107	9000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		20/02/2000	-38.575	146.775	1000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		1/11/2003	-38.475	146.5583	1000	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum		13/09/2011	-38.5003	146.523	400	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum	2	22/12/2019	-38.6211	146.4035	10	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum	7	13/02/2020	-38.5414	146.7364	10	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum	1	10/08/2020	-38.6276	146.4034	10	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum	2	28/09/2020	-38.5958	146.5055	10	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum	2	30/09/2020	-38.571	146.4692	10	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum	2	14/12/2020	-38.5211	146.4664	10	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum	2	3/02/2021	-38.5983	146.468	10	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum	2	3/02/2021	-38.5991	146.4654	10	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum	2	4/02/2021	-38.5402	146.6036	10	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum	4	8/04/2021	-38.5955	146.7041	10	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum	5	8/07/2021	-38.5991	146.4654	10	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum	2	9/07/2021	-38.5402	146.6036	10	Endangered	Endangered
VBA	Gang-gang Cockatoo	Callocephalon fimbriatum	2	11/07/2021	-38.5948	146.5044	10	Endangered	Endangered
VBA	Fork-tailed Swift	Apus pacificus		1/07/1968	-38.4985	146.5013	9000		
VBA	Fork-tailed Swift	Apus pacificus		1/01/1973	-38.5764	146.3931	300		
VBA	Fork-tailed Swift	Apus pacificus	5	26/12/2002	-38.5863	146.3543	100		
VBA	Fork-tailed Swift	Apus pacificus	1	24/03/2003	-38.6497	146.4181	100		
VBA	Fork-tailed Swift	Apus pacificus		13/09/2011	-38.5003	146.523	400		
VBA	Fork-tailed Swift	Apus pacificus	1	21/02/2015	-38.6333	146.6392	200		
VBA	Blue-winged Parrot	Neophema chrysostoma		1/07/1968	-38.4985	146.5013	9000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		1/01/1973	-38.606	146.488	300	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		1/01/1973	-38.4985	146.5013	9000	Vulnerable	

Source	Common Name	Scientific Name	Count	Date	Latitude	Longitude	Accuracy	EPBC	FFG Status
VBA	Blue-winged Parrot	Neophema chrysostoma		1/01/1977	-38.6235	146.6263	4500	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		1/01/1977	-38.6235	146.543	4500	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		1/01/1977	-38.6235	146.793	4500	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		1/01/1977	-38.5402	146.7096	4500	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		1/01/1977	-38.7068	146.6263	4500	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		1/01/1977	-38.7068	146.543	4500	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		11/01/1978	-38.5818	146.7513	9000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		11/03/1978	-38.5818	146.2513	9000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		1/12/1978	-38.5818	146.418	9000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		1/12/1978	-38.7485	146.5847	9000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		11/12/1978	-38.5818	146.7513	9000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		27/01/1979	-38.7485	146.5847	9000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		28/04/1979	-38.5818	146.418	9000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		12/08/1979	-38.7485	146.5847	9000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		27/01/1980	-38.7485	146.5847	9000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		9/02/1992	-38.6871	146.3292	100	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	6	19/05/1992	-38.6871	146.3292	100	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	10	26/10/1992	-38.6402	146.543	900	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	1	26/10/1992	-38.6402	146.5596	900	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		5/07/2000	-38.6227	146.6435	100	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	2	11/01/2001	-38.5536	146.3144	100	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	1	12/01/2001	-38.5828	146.3692	100	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		7/03/2001	-38.6227	146.6435	100	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		24/05/2001	-38.6227	146.6435	100	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		12/06/2002	-38.6809	146.542	100	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	1	21/12/2002	-38.6423	146.3825	100	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	2	26/02/2003	-38.6505	146.3928	100	Vulnerable	

Source	Common Name	Scientific Name	Count	Date	Latitude	Longitude	Accuracy	EPBC	FFG Status
VBA	Blue-winged Parrot	Neophema chrysostoma	2	26/02/2003	-38.6505	146.3928	100	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	2	27/02/2003	-38.6514	146.3985	100	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	3	2/04/2003	-38.6505	146.3928	100	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		19/10/2003	-38.7083	146.4583	1000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	7	1/12/2003	-38.6353	146.4113	900	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		1/03/2004	-38.675	146.7083	1000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		25/04/2004	-38.6872	146.5443	100	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		25/04/2004	-38.725	146.5583	1000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	1	9/03/2005	-38.6709	146.3386	9000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	1	31/12/2005	-38.525	146.375	1000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	25	13/05/2006	-38.725	146.3917	1000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		6/12/2006	-38.5417	146.3917	1000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	10	15/12/2006	-38.5265	146.5846	100	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	1	1/05/2019	-38.7083	146.5417	1000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	13	1/05/2019	-38.675	146.5417	1000	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	2	12/12/2019	-38.6411	146.3069	10	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	9	12/01/2020	-38.6918	146.5456	10	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	5	12/01/2020	-38.7003	146.5465	10	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	13	12/01/2020	-38.7024	146.5526	5	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	2	5/05/2020	-38.5989	146.6989	10	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	12	5/05/2020	-38.5979	146.6959	10	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	20	1/07/2020	-38.7024	146.5526	5	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	3	13/10/2020	-38.6201	146.5608	10	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma	1	4/02/2021	-38.573	146.5068	10	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		13/11/2023	-38.6333	146.6392	200	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		13/11/2023	-38.6186	146.6183	200	Vulnerable	
VBA	Blue-winged Parrot	Neophema chrysostoma		13/11/2023	-38.5769	146.6175	200	Vulnerable	

Source	Common Name	Scientific Name	Count	Date	Latitude	Longitude	Accuracy	EPBC	FFG Status
VBA	Blue-winged Parrot	Neophema chrysostoma		13/11/2023	-38.5867	146.5992	200	Vulnerable	

Appendix 7: Summary of existing migratory shorebirds records from Corner Inlet (average counts)

SUMMER DATA

Decade	Survey Site	Asian Dowitcher	Bar-tailed Godwit	Black-tailed Godwit	Broad-billed Sandpiper	Common Greenshank	Common Redshank	Common Sandpiper	Curlew Sandpiper	Double-banded Plover	Eastern Curlew	Great Knot	Greater Sand Plover	Grey Plover	Grey-tailed Tattler	Latham's Snipe	Lesser Sand Plover
1980-89	Kate Kearney entrance - E	0.0	930.0	0.0	0.0	1.3	0.0	0.0	143.8	0.0	162.3	65.0	1.3	56.3	0.0	0.0	1.9
1980-89	McGloughlans entrance - J	0.0	260.0	0.2	0.0	21.8	0.0	0.0	116.7	0.0	66.5	1.7	0.0	0.0	0.0	0.0	0.0
1980-89	Box Bank Island - F	0.0	3433.3	0.2	0.0	1.1	0.0	0.0	706.7	0.3	240.6	216.7	3.4	207.2	0.0	0.0	25.4
1980-89	Clonmel Island - D	0.0	1033.3	0.0	0.0	16.6	0.0	0.0	106.0	0.1	375.6	5.6	0.0	36.7	0.0	0.0	0.0
1980-89	Dream Island - H	0.0	1441.7	0.0	0.0	48.7	0.0	0.0	383.3	0.0	100.0	70.0	0.2	71.7	4.3	0.0	0.2
1980-89	Dream south (shallow inlet) - G	0.0	257.1	0.0	0.0	0.0	0.0	0.0	468.6	0.0	56.4	28.6	0.0	100.0	0.0	0.0	22.9
1980-89	East Sunday Island / Drum Island - A	0.0	2.4	0.0	0.0	1.2	0.0	0.0	0.6	0.0	3.9	0.0	0.0	0.3	0.0	0.0	0.0
1980-89	North of St Margaret Island - L	0.0	90.0	0.0	0.0	26.7	0.0	0.0	266.7	0.0	63.3	0.0	0.0	0.0	0.0	0.0	0.0
1980-89	One Tree Island - G2 - now S	0.0	650.0	0.0	0.0	1.7	0.0	0.0	415.9	0.0	6.9	102.0	3.7	71.4	0.0	0.0	9.6
1980-89	Port Albert entrance - C	0.0	57.1	0.0	0.0	0.0	0.0	0.0	64.3	0.3	4.3	0.0	0.0	2.9	0.0	0.0	0.0
1980-89	Snake Island (east side) - G3 - now B	0.0	1390.0	0.0	0.0	4.8	0.0	0.0	31.1	0.0	203.0	2.2	0.0	113.6	7.8	0.0	0.0
1980-89	Sunday Island west end	0.0	0.0	0.0	0.0	26.0	0.0	0.0	14.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Kate Kearney entrance - E	0.0	200.0	0.0	0.0	0.0	0.0	0.0	48.0	0.0	58.7	0.0	0.0	53.0	0.0	0.0	0.0
1990-99	McGloughlans entrance - J	0.0	67.5	0.0	0.0	0.0	0.0	0.0	78.5	0.6	110.9	1.0	0.1	0.3	0.0	0.0	0.0
1990-99	Box Bank Island - F	0.0	2840.0	0.0	0.0	8.2	0.0	0.0	98.0	4.0	142.0	74.0	3.0	223.5	0.8	0.0	26.0
1990-99	Clonmel Island - D	0.0	955.0	0.0	0.0	1.0	0.0	0.0	275.0	0.6	388.5	0.0	0.0	18.0	0.0	0.0	0.0
1990-99	Dog Island south - M	0.0	972.0	0.0	0.0	8.5	0.0	0.0	207.1	1.1	34.3	5.0	0.0	13.1	0.0	0.0	2.0
1990-99	Dream Island - H	0.0	228.9	0.0	0.0	138.3	0.0	0.0	28.9	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Dream south (shallow inlet) - G	0.0	2563.1	0.1	0.0	0.0	0.0	0.0	375.0	0.0	41.5	37.5	10.4	106.3	1.4	0.0	29.4

Decade	Survey Site	Asian Dowitcher	Bar-tailed Godwit	Black-tailed Godwit	Broad-billed Sandpiper	Common Greenshank	Common Redshank	Common Sandpiper	Curlew Sandpiper	Double-banded Plover	Eastern Curlew	Great Knot	Greater Sand Plover	Grey Plover	Grey-tailed Tattler	Latham's Snipe	Lesser Sand Plover
1990-99	East Sunday Island / Drum Island - A	0.0	130.2	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	North of St Margaret Island - L	0.0	0.0	0.0	0.0	15.0	0.0	0.0	4.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	One Tree Island - G2 - now S	0.0	694.0	0.4	0.0	0.0	0.0	0.0	425.0	0.6	24.7	21.0	5.3	12.0	2.2	0.0	14.5
1990-99	Port Albert entrance - C	0.0	211.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.6	28.0	0.0	0.0	0.0
1990-99	Port Welshpool foreshore	0.0	0.0	0.0	0.0	19.7	0.0	0.0	12.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Robertsons Beach - K	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Snake Island (east side) - G3 - now B	0.0	1534.5	0.0	0.0	12.5	0.0	0.0	87.0	0.3	150.1	21.0	6.0	126.1	0.2	0.0	18.0
2000-09	Kate Kearney entrance - E	0.0	5342.9	0.0	0.0	0.0	0.0	0.0	267.6	0.6	17.7	54.3	1.4	160.6	0.0	0.0	3.6
2000-09	McGloughlans entrance - J	0.0	232.9	0.0	0.0	0.0	0.0	0.0	0.0	2.1	76.4	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Box Bank Island - F	0.0	1290.0	0.0	0.0	2.9	0.0	0.0	7.1	0.0	95.0	7.1	0.0	24.3	4.0	0.0	0.0
2000-09	Clonmel Island - D	0.0	1135.7	0.0	0.0	0.0	0.0	0.0	31.4	0.0	280.4	1.4	0.9	10.0	0.0	0.0	0.0
2000-09	Dog Island south - M	0.0	12.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	26.0	0.0	0.0	24.0	0.0	0.0	0.0
2000-09	Dream Island - H	0.0	25.2	0.0	0.0	35.2	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	12.5	0.0	0.0
2000-09	Dream south (shallow inlet) - G	0.0	198.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.0	10.4	0.0	36.8	0.4	0.0	0.0
2000-09	East Sunday Island / Drum Island - A	0.0	0.0	0.0	0.0	17.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	North of St Margaret Island - L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	One Tree Island - G2 - now S	0.0	723.3	0.0	0.0	0.0	0.0	0.0	75.0	1.0	27.5	5.0	0.0	28.5	0.2	0.0	0.3
2000-09	Port Albert entrance - C	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0

Decade	Survey Site	Asian Dowitcher	Bar-tailed Godwit	Black-tailed Godwit	Broad-billed Sandpiper	Common Greenshank	Common Redshank	Common Sandpiper	Curlew Sandpiper	Double-banded Plover	Eastern Curlew	Great Knot	Greater Sand Plover	Grey Plover	Grey-tailed Tattler	Latham's Snipe	Lesser Sand Plover
2000-09	Port Welshpool foreshore	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Robertsons Beach - K	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Snake Island (east side) - G3 - now B	0.0	1007.3	0.0	0.0	0.0	0.0	0.0	66.7	5.0	37.0	50.0	1.7	92.7	0.0	0.0	0.2
2010-19	Kate Kearney entrance - E	0.0	3921.0	0.0	0.0	0.0	0.0	0.0	112.2	0.1	77.3	36.6	5.1	143.0	2.1	0.0	1.2
2010-19	McGloughlans entrance - J	0.0	124.0	0.0	0.0	10.3	0.0	0.0	8.0	0.0	66.6	0.7	0.0	0.0	0.0	0.0	0.0
2010-19	Box Bank Island - F	0.0	1311.5	0.0	0.0	6.3	0.0	0.0	1.1	0.0	51.9	4.5	0.0	68.4	0.1	0.0	0.0
2010-19	Clonmel Island - D	0.0	564.3	0.2	0.0	0.0	0.0	0.0	80.1	0.8	150.1	0.5	2.2	30.1	0.0	0.0	0.2
2010-19	Dog Island south - M	0.0	27.3	0.0	0.0	19.9	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0
2010-19	Dream Island - H	0.0	225.0	0.0	0.0	23.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0
2010-19	Dream south (shallow inlet) - G	0.0	1822.2	0.0	0.0	0.1	0.0	0.0	18.9	0.0	27.2	2.7	0.2	2.6	1.8	0.0	1.1
2010-19	East Sunday Island / Drum Island - A	0.0	5.6	0.0	0.0	1.5	0.0	0.0	24.0	0.0	10.6	0.0	0.0	1.5	0.3	0.0	0.0
2010-19	North of St Margaret Island - L	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	128.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	One Tree Island - G2 - now S	0.0	806.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.7	24.0	0.0	0.0	0.0	0.0	0.0
2010-19	Port Albert entrance - C	0.0	456.4	0.0	0.0	0.0	7.8	0.0	31.1	2.0	52.9	0.4	0.3	0.3	0.0	0.0	0.0
2010-19	Port Welshpool foreshore	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	Robertsons Beach - K	0.0	0.0	500.0	0.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	Snake Island (east side) - G3 - now B	0.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Kate Kearney entrance - E	0.0	3637.6	0.0	0.0	10.8	0.0	0.0	367.8	13.4	49.4	21.4	2.2	101.8	5.4	0.0	1.2

Decade	Survey Site	Asian Dowitcher	Bar-tailed Godwit	Black-tailed Godwit	Broad-billed Sandpiper	Common Greenshank	Common Redshank	Common Sandpiper	Curlew Sandpiper	Double-banded Plover	Eastern Curlew	Great Knot	Greater Sand Plover	Grey Plover	Grey-tailed Tattler	Latham's Snipe	Lesser Sand Plover
2020-24	McGloughlans entrance - J	0.0	21.4	0.0	0.0	0.0	0.0	0.0	0.0	8.2	18.2	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Box Bank Island - F	0.0	4350.0	0.0	0.0	64.0	0.0	0.0	300.0	0.0	5.0	60.0	0.0	81.5	2.5	0.0	0.0
2020-24	Clonmel Island - D	0.0	360.2	0.0	0.0	0.0	0.0	0.0	0.0	0.8	37.0	0.0	0.0	11.2	0.0	0.0	0.0
2020-24	Dog Island south - M	0.0	0.0	0.0	0.0	35.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Dream Island - H	0.0	62.2	0.0	0.0	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Dream south (shallow inlet) - G	0.0	614.2	0.0	0.0	0.0	0.0	0.0	0.4	2.0	10.6	0.4	0.0	37.4	0.0	0.0	0.0
2020-24	East Sunday Island / Drum Island - A	0.0	162.5	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Port Albert entrance - C	0.0	3024.4	0.0	0.0	0.0	0.0	0.0	21.4	0.8	45.4	0.0	0.0	8.4	0.0	0.0	0.0
2020-24	Snake Island (east side) - G3 - now B	0.0	850.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Decade	Survey Site	Little Curlew	Long-toed Stint	Marsh Sandpiper	Oriental Plover	Pacific Golden Plover	Pectoral Sandpiper	Red Knot	Red-necked Stint	Ruddy Turnstone	Ruff	Sanderling	Sharp-tailed Sandpiper	Swinhoe's Snipe	Terek Sandpiper	unidentified medium wader
1980-89	Kate Kearney entrance - E	0.0	0.0	0.0	0.0	0.0	0.0	256.3	450.0	12.8	0.0	0.5	0.3	0.0	0.0	0.0
1980-89	McGloughlans entrance - J	0.0	0.0	0.0	0.0	1.2	0.0	16.7	436.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980-89	Box Bank Island - F	0.0	0.0	0.0	0.0	0.1	0.0	1627.8	2100.0	49.9	0.0	36.4	13.6	0.0	0.4	0.0
1980-89	Clonmel Island - D	0.0	0.0	0.0	0.0	0.0	0.0	264.4	561.1	4.4	0.0	0.0	0.0	0.0	0.0	0.0
1980-89	Dream Island - H	0.0	0.0	0.0	0.0	0.2	0.0	1251.7	1666.7	11.7	0.0	25.0	0.0	0.0	0.0	0.0
1980-89	Dream south (shallow inlet) - G	0.0	0.0	0.0	0.0	4.6	0.0	385.7	1730.7	13.4	0.0	4.4	13.6	0.0	0.0	0.0
1980-89	East Sunday Island / Drum Island - A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	93.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980-89	North of St Margaret Island - L	0.0	0.0	0.0	0.0	0.0	0.0	366.7	1066.7	0.0	0.0	0.0	66.7	0.0	0.0	0.0
1980-89	One Tree Island - G2 - now S	0.0	0.0	0.0	0.0	0.0	0.0	671.4	2228.9	15.0	0.0	23.6	66.4	0.0	0.0	0.0
1980-89	Port Albert entrance - C	0.0	0.0	0.0	0.0	0.0	0.0	20.0	795.7	1.4	0.0	0.0	0.1	0.0	0.0	0.0
1980-89	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0	0.0	0.0	62.8	697.2	4.1	0.0	6.9	0.0	0.0	0.0	0.0
1980-89	Sunday Island west end	0.0	0.0	0.0	0.0	0.0	0.0	0.0	336.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Kate Kearney entrance - E	0.0	0.0	0.0	0.0	0.0	0.0	7.0	966.5	1.0	0.0	0.5	0.0	0.0	0.0	0.0
1990-99	McGloughlans entrance - J	0.0	0.0	0.0	0.0	11.9	0.0	32.5	816.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Box Bank Island - F	0.0	0.0	0.0	0.0	0.0	0.0	1280.0	732.0	34.2	0.0	42.5	0.3	0.0	0.2	0.0
1990-99	Clonmel Island - D	0.0	0.0	0.0	0.0	0.0	0.0	210.0	415.0	0.1	0.0	3.8	0.0	0.0	0.0	0.0
1990-99	Dog Island south - M	0.0	0.0	0.0	0.0	0.0	0.0	80.0	423.0	1.3	0.0	0.0	2.5	0.0	0.0	0.0
1990-99	Dream Island - H	0.0	0.0	0.6	0.0	2.8	0.0	11.1	12.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Dream south (shallow inlet) - G	0.0	0.0	0.0	0.0	0.0	0.0	640.6	4362.5	18.1	0.0	66.5	20.4	0.0	0.1	0.0

Decade	Survey Site	Little Curlew	Long-toed Stint	Marsh Sandpiper	Oriental Plover	Pacific Golden Plover	Pectoral Sandpiper	Red Knot	Red-necked Stint	Ruddy Turnstone	Ruff	Sanderling	Sharp-tailed Sandpiper	Swinhoe's Snipe	Terek Sandpiper	unidentified medium wader
1990-99	East Sunday Island / Drum Island - A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	North of St Margaret Island - L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	One Tree Island - G2 - now S	0.0	0.0	0.0	0.0	0.0	0.0	435.2	1830.0	29.7	0.0	31.0	41.0	0.0	0.3	0.0
1990-99	Port Albert entrance - C	0.0	0.0	0.0	0.0	0.0	0.0	10.0	365.5	2.4	0.0	3.5	0.1	0.0	0.0	0.0
1990-99	Port Welshpool foreshore	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Robertsons Beach - K	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0	0.0	0.0	380.0	1433.0	5.0	0.0	8.0	1.2	0.0	0.1	0.0
2000-09	Kate Kearney entrance - E	0.0	0.0	0.0	0.0	0.0	0.0	472.9	6411.4	20.7	0.0	118.0	48.1	0.0	0.0	0.0
2000-09	McGloughlans entrance - J	0.0	0.0	0.0	0.0	0.0	0.0	11.4	781.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Box Bank Island - F	0.0	0.0	0.0	0.0	0.0	0.0	28.6	1642.9	0.9	0.0	3.1	4.3	0.0	0.0	0.0
2000-09	Clonmel Island - D	0.0	0.0	0.0	0.0	0.0	0.0	137.4	728.6	3.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Dog Island south - M	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Dream Island - H	0.0	0.0	0.0	0.0	0.0	0.0	3.3	8.3	0.0	0.0	0.0	0.0	0.0	3.0	0.0
2000-09	Dream south (shallow inlet) - G	0.0	0.0	0.0	0.0	0.0	0.0	80.0	130.0	0.4	0.0	4.2	0.0	0.0	0.0	0.0
2000-09	East Sunday Island / Drum Island - A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	North of St Margaret Island - L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	One Tree Island - G2 - now S	0.0	0.0	0.0	0.0	0.0	0.0	71.7	2483.3	2.0	0.0	0.2	18.3	0.0	0.0	0.0
2000-09	Port Albert entrance - C	0.0	0.0	0.0	0.0	0.0	0.0	9.7	1033.9	2.0	0.0	0.1	0.0	0.0	0.0	0.0

Decade	Survey Site	Little Curlew	Long-toed Stint	Marsh Sandpiper	Oriental Plover	Pacific Golden Plover	Pectoral Sandpiper	Red Knot	Red-necked Stint	Ruddy Turnstone	Ruff	Sanderling	Sharp-tailed Sandpiper	Swinhoe's Snipe	Terek Sandpiper	unidentified medium wader
2000-09	Port Welshpool foreshore	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Robertsons Beach - K	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0	0.0	0.0	191.7	1717.2	5.0	0.0	16.7	0.0	0.0	0.0	0.0
2010-19	Kate Kearney entrance - E	0.0	0.0	0.0	0.0	0.7	0.0	292.2	5733.0	9.5	0.0	138.7	95.1	0.0	0.7	0.0
2010-19	McGloughlans entrance - J	0.0	0.0	0.0	0.0	2.6	0.0	5.0	801.0	0.4	0.0	14.5	0.0	0.0	0.0	0.0
2010-19	Box Bank Island - F	0.0	0.0	0.0	0.0	0.0	0.0	57.6	1364.5	1.0	0.0	15.5	0.0	0.0	0.0	0.0
2010-19	Clonmel Island - D	0.0	0.0	0.0	0.0	0.0	0.0	35.5	1227.5	0.7	0.0	78.0	0.0	0.0	0.0	0.0
2010-19	Dog Island south - M	0.0	0.0	0.2	0.0	0.0	0.0	2.8	51.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	Dream Island - H	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	Dream south (shallow inlet) - G	0.0	0.0	0.0	0.0	0.0	0.0	133.4	651.6	9.4	0.0	20.7	0.0	0.0	0.0	0.0
2010-19	East Sunday Island / Drum Island - A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	237.5	0.0	0.0	5.3	1.0	0.0	0.0	0.0
2010-19	North of St Margaret Island - L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	One Tree Island - G2 - now S	0.0	0.0	0.0	0.0	0.0	0.0	90.0	1180.0	0.0	0.0	7.3	0.0	0.0	0.0	0.0
2010-19	Port Albert entrance - C	0.0	0.0	0.0	0.0	0.0	0.0	17.1	1958.9	1.7	0.0	16.8	0.2	0.0	0.0	0.0
2010-19	Port Welshpool foreshore	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	Robertsons Beach - K	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Kate Kearney entrance - E	0.0	0.0	0.0	0.0	10.8	0.0	272.4	5397.0	10.4	0.0	410.6	17.6	0.0	1.0	0.0

Decade	Survey Site	Little Curlew	Long-toed Stint	Marsh Sandpiper	Oriental Plover	Pacific Golden Plover	Pectoral Sandpiper	Red Knot	Red-necked Stint	Ruddy Turnstone	Ruff	Sanderling	Sharp-tailed Sandpiper	Swinhoe's Snipe	Terek Sandpiper	unidentified medium wader
2020-24	McGloughlans entrance - J	0.0	0.0	0.0	0.0	0.0	0.0	0.0	347.2	0.0	0.0	2.4	0.2	0.0	0.0	0.0
2020-24	Box Bank Island - F	0.0	0.0	0.0	0.0	0.0	0.0	1275.0	3650.0	15.0	0.0	210.0	1.5	0.0	0.0	0.0
2020-24	Clonmel Island - D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	441.0	0.2	0.0	24.0	0.0	0.0	0.0	0.0
2020-24	Dog Island south - M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Dream Island - H	0.0	0.0	0.0	0.0	0.0	0.0	24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Dream south (shallow inlet) - G	0.0	0.0	0.0	0.0	0.0	0.0	158.6	954.0	2.8	0.0	4.2	0.0	0.0	0.0	0.0
2020-24	East Sunday Island / Drum Island - A	0.0	0.0	0.0	0.0	0.0	0.0	5.0	3.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
2020-24	Port Albert entrance - C	0.0	0.0	0.0	0.0	0.0	0.0	113.0	4135.4	2.4	0.0	299.0	0.0	0.0	0.0	0.0
2020-24	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Decade	Survey Site	unidentified small wader	Wandering Tattler	Whimbrel	Wood Sandpiper
1980-89	Kate Kearney entrance - E	0.0	0.0	0.0	0.0
1980-89	McGloughlans entrance - J	0.0	0.0	0.0	0.0
1980-89	Box Bank Island - F	0.0	0.0	0.0	0.0
1980-89	Clonmel Island - D	0.0	0.0	8.9	0.0
1980-89	Dream Island - H	0.0	0.0	20.0	0.0
1980-89	Dream south (shallow inlet) - G	0.0	0.0	0.0	0.0
1980-89	East Sunday Island / Drum Island - A	0.0	0.0	0.0	0.0
1980-89	North of St Margaret Island - L	0.0	0.0	4.0	0.0
1980-89	One Tree Island - G2 - now S	0.0	0.0	0.0	0.0
1980-89	Port Albert entrance - C	0.0	0.0	0.0	0.0
1980-89	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0
1980-89	Sunday Island west end	0.0	0.0	0.0	0.0
1990-99	Kate Kearney entrance - E	0.0	0.0	0.0	0.0
1990-99	McGloughlans entrance - J	0.0	0.0	0.1	0.0
1990-99	Box Bank Island - F	0.0	0.0	0.0	0.0
1990-99	Clonmel Island - D	0.0	0.0	9.0	0.0
1990-99	Dog Island south - M	0.0	0.0	0.0	0.0
1990-99	Dream Island - H	0.0	0.0	14.1	0.0
1990-99	Dream south (shallow inlet) - G	0.0	0.0	3.8	0.0

Decade	Survey Site	unidentified small wader	Wandering Tattler	Whimbrel	Wood Sandpiper
1990-99	East Sunday Island / Drum Island - A	0.0	0.0	2.1	0.0
1990-99	North of St Margaret Island - L	0.0	0.0	0.0	0.0
1990-99	One Tree Island - G2 - now S	0.0	0.0	2.0	0.0
1990-99	Port Albert entrance - C	0.0	0.0	0.0	0.0
1990-99	Port Welshpool foreshore	0.0	0.0	0.0	0.0
1990-99	Robertsons Beach - K	0.0	0.0	0.0	0.0
1990-99	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0
2000-09	Kate Kearney entrance - E	0.0	0.0	0.0	0.0
2000-09	McGloughlans entrance - J	0.0	0.0	0.0	0.0
2000-09	Box Bank Island - F	0.0	0.0	0.0	0.0
2000-09	Clonmel Island - D	0.0	0.0	0.3	0.0
2000-09	Dog Island south - M	0.0	0.0	0.4	0.0
2000-09	Dream Island - H	0.0	0.0	10.3	0.0
2000-09	Dream south (shallow inlet) - G	0.0	0.0	0.0	0.0
2000-09	East Sunday Island / Drum Island - A	0.0	0.0	0.0	0.0
2000-09	North of St Margaret Island - L	0.0	0.0	25.0	0.0
2000-09	One Tree Island - G2 - now S	0.0	0.0	6.7	0.0
2000-09	Port Albert entrance - C	0.0	0.0	0.0	0.0

Decade	Survey Site	unidentified small wader	Wandering Tattler	Whimbrel	Wood Sandpiper
2000-09	Port Welshpool foreshore	0.0	0.0	0.0	0.0
2000-09	Robertsons Beach - K	0.0	0.0	0.0	0.0
2000-09	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0
2010-19	Kate Kearney entrance - E	0.0	0.0	0.0	0.0
2010-19	McGloughlans entrance - J	0.0	0.0	0.0	0.0
2010-19	Box Bank Island - F	0.0	0.0	0.4	0.0
2010-19	Clonmel Island - D	0.0	0.0	2.3	0.0
2010-19	Dog Island south - M	0.0	0.0	0.0	0.0
2010-19	Dream Island - H	0.0	0.0	12.5	0.0
2010-19	Dream south (shallow inlet) - G	0.0	0.0	0.1	0.0
2010-19	East Sunday Island / Drum Island - A	0.0	0.0	0.0	0.0
2010-19	North of St Margaret Island - L	0.0	0.0	0.0	0.0
2010-19	One Tree Island - G2 - now S	0.0	0.0	9.0	0.0
2010-19	Port Albert entrance - C	0.0	0.0	0.1	0.0
2010-19	Port Welshpool foreshore	0.0	0.0	0.0	0.0
2010-19	Robertsons Beach - K	0.0	0.0	0.0	0.0
2010-19	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0
2020-24	Kate Kearney entrance - E	0.0	0.0	0.0	0.0

Decade	Survey Site	unidentified small wader	Wandering Tattler	Whimbrel	Wood Sandpiper
2020-24	McGloughlans entrance - J	0.0	0.0	0.2	0.0
2020-24	Box Bank Island - F	0.0	0.0	0.0	0.0
2020-24	Clonmel Island - D	0.0	0.0	0.0	0.0
2020-24	Dog Island south - M	0.0	0.0	0.0	0.0
2020-24	Dream Island - H	0.0	0.0	16.0	0.0
2020-24	Dream south (shallow inlet) - G	0.0	0.0	0.0	0.0
2020-24	East Sunday Island / Drum Island - A	0.0	0.0	0.0	0.0
2020-24	Port Albert entrance - C	0.0	0.0	0.0	0.0
2020-24	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0

WINTER DATA

Decade	Survey Site	Asian Dowitcher	Bar-tailed Godwit	Black-tailed Godwit	Broad-billed Sandpiper	Common Greenshank	Common Redshank	Common Sandpiper	Curlew Sandpiper	Double-banded Plover	Eastern Curlew	Great Knot	Greater Sand Plover	Grey Plover	Grey-tailed Tattler	Latham's Snipe	Lesser Sand Plover	Little Curlew
1980-89	Box Bank Island - F	0.0	242.9	0.0	0.0	0.0	0.0	0.0	0.0	27.6	0.3	22.1	0.0	9.0	0.9	0.0	0.9	0.0
1980-89	Clonmel Island - D	0.0	433.7	0.0	0.0	0.9	0.0	0.0	20.0	169.7	15.4	5.6	0.0	2.8	0.0	0.0	0.0	0.0
1980-89	Dream Island - H	0.0	4.2	0.0	0.0	0.0	0.0	0.0	0.3	25.0	5.0	0.0	0.8	0.2	0.0	0.0	0.0	0.0
1980-89	Dream south (shallow inlet) - G	0.0	83.3	0.0	0.0	0.0	0.0	0.0	0.8	52.5	6.7	0.0	0.3	5.7	0.3	0.0	0.8	0.0
1980-89	East Sunday Island / Drum Island - A	0.0	181.4	0.0	0.0	2.4	0.0	0.0	0.0	6.4	7.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
1980-89	Kate Kearney entrance - E	0.0	68.8	0.0	0.0	0.0	0.0	0.0	0.8	48.3	0.5	1.3	0.0	0.3	0.0	0.0	0.0	0.0
1980-89	McGloughlans entrance - J	0.0	123.3	0.0	0.0	0.0	0.0	0.0	8.3	66.7	3.0	0.3	0.3	0.0	0.0	0.0	0.5	0.0
1980-89	North of St Margaret Island - L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980-89	One Tree Island - G2 - now S	0.0	202.5	0.0	0.0	0.0	0.0	0.0	0.0	113.3	0.0	25.0	2.0	6.8	8.5	0.0	0.8	0.0
1980-89	Port Albert entrance - C	0.0	158.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0
1980-89	Port Welshpool foreshore	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980-89	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Box Bank Island - F	0.0	146.2	0.0	0.0	0.0	0.0	0.0	0.0	41.4	2.0	0.3	0.4	5.2	2.6	0.0	0.8	0.0
1990-99	Clonmel Island - D	0.0	247.0	0.0	0.0	0.0	0.0	0.0	18.0	34.3	30.9	1.0	0.0	2.6	0.0	0.0	0.5	0.0

Decade	Survey Site	Asian Dowitcher	Bar-tailed Godwit	Black-tailed Godwit	Broad-billed Sandpiper	Common Greenshank	Common Redshank	Common Sandpiper	Curlew Sandpiper	Double-banded Plover	Eastern Curlew	Great Knot	Greater Sand Plover	Grey Plover	Grey-tailed Tattler	Latham's Snipe	Lesser Sand Plover	Little Curlew
1990-99	Dog Island south - M	0.0	68.8	0.0	0.0	0.0	0.0	0.0	1.1	26.7	8.9	0.0	0.0	3.8	0.0	0.0	0.0	0.0
1990-99	Dream Island - H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Dream south (shallow inlet) - G	0.0	90.0	0.0	0.0	0.4	0.0	0.0	1.3	6.3	0.0	5.0	0.3	18.0	0.4	0.0	1.5	0.0
1990-99	East Sunday Island / Drum Island - A	0.0	62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.6	0.0	0.0	0.0	0.0
1990-99	Kate Kearney entrance - E	0.0	8.0	0.0	0.0	0.0	0.0	0.0	1.0	31.1	0.0	0.1	0.0	2.4	0.1	0.0	0.0	0.0
1990-99	McGloughlans entrance - J	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	37.2	5.2	0.0	0.0	1.7	0.0	0.0	0.1	0.0
1990-99	North of St Margaret Island - L	0.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	One Tree Island - G2 - now S	0.0	80.0	0.0	0.0	0.0	0.0	0.0	1.1	201.0	0.0	0.0	1.0	1.7	0.0	0.0	0.4	0.0
1990-99	Port Albert entrance - C	0.0	157.5	0.0	0.0	0.0	0.0	0.0	0.0	5.1	3.0	6.0	0.0	5.2	0.0	0.0	0.0	0.0
1990-99	Port Welshpool foreshore	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Robertsons Beach - K	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Snake Island (east side) - G3 - now B	0.0	91.0	0.0	0.0	0.0	0.0	0.0	0.1	9.8	0.3	0.0	0.0	8.0	1.5	0.0	0.0	0.0
2000-09	Box Bank Island - F	0.0	685.7	0.0	0.0	0.4	0.0	0.0	0.0	44.3	6.1	7.1	0.0	0.7	1.4	0.0	0.0	0.0
2000-09	Clonmel Island - D	0.0	337.9	0.0	0.0	0.0	0.0	0.0	0.0	10.7	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Decade	Survey Site	Asian Dowitcher	Bar-tailed Godwit	Black-tailed Godwit	Broad-billed Sandpiper	Common Greenshank	Common Redshank	Common Sandpiper	Curlew Sandpiper	Double-banded Plover	Eastern Curlew	Great Knot	Greater Sand Plover	Grey Plover	Grey-tailed Tattler	Latham's Snipe	Lesser Sand Plover	Little Curlew
2000-09	Dog Island south - M	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	6.0	9.4	0.0	0.0	13.0	0.0	0.0	0.0	0.0
2000-09	Dream Island - H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Dream south (shallow inlet) - G	0.0	16.0	0.0	0.0	0.0	0.0	0.0	0.2	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	East Sunday Island / Drum Island - A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Kate Kearney entrance - E	0.0	832.9	0.0	0.0	0.0	0.0	0.0	1.3	120.0	3.6	3.6	0.1	0.7	0.0	0.0	0.0	0.0
2000-09	McGloughlans entrance - J	0.0	27.9	0.0	0.0	0.0	0.0	0.0	0.0	52.9	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	North of St Margaret Island - L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
2000-09	One Tree Island - G2 - now S	0.0	223.3	0.0	0.0	0.0	0.0	0.0	0.0	83.3	0.0	1.3	0.0	0.2	0.0	0.0	0.0	0.0
2000-09	Port Albert entrance - C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Port Welshpool foreshore	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Robertsons Beach - K	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0
2010-19	Box Bank Island - F	0.0	104.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.6	0.0	0.0	0.0	0.0
2010-19	Clonmel Island - D	0.0	56.3	0.0	0.0	0.0	0.0	0.0	0.0	69.6	12.1	0.0	0.0	2.8	0.0	0.0	0.4	0.0

Decade	Survey Site	Asian Dowitcher	Bar-tailed Godwit	Black-tailed Godwit	Broad-billed Sandpiper	Common Greenshank	Common Redshank	Common Sandpiper	Curlew Sandpiper	Double-banded Plover	Eastern Curlew	Great Knot	Greater Sand Plover	Grey Plover	Grey-tailed Tattler	Latham's Snipe	Lesser Sand Plover	Little Curlew
2010-19	Dog Island south - M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	Dream south (shallow inlet) - G	0.0	86.3	0.0	0.0	0.0	0.0	0.0	0.0	71.0	0.0	0.0	0.0	12.0	0.3	0.0	0.0	0.0
2010-19	East Sunday Island / Drum Island - A	0.0	200.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	Kate Kearney Entrance - E	0.0	716.0	0.0	0.0	0.0	0.0	0.0	0.0	202.1	0.7	1.4	1.0	3.7	0.6	0.0	0.9	0.0
2010-19	McGloughlans entrance - J	0.0	30.0	0.0	0.0	0.0	0.0	0.0	0.6	139.8	0.0	0.6	0.0	0.0	0.0	0.0	0.3	0.0
2010-19	One Tree Island - G2 - now S	0.0	133.3	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0
2010-19	Port Albert Entrance - C	0.0	128.6	0.0	0.0	0.1	0.0	0.0	0.0	38.3	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Clonmel Island - D	0.0	427.5	0.0	0.0	0.0	0.0	0.0	2.5	96.5	6.5	11.3	0.0	8.0	0.0	0.0	0.0	0.0
2020-24	Dog Island south - M	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Dream Island - H	0.0	41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Dream south (shallow inlet) - G	0.0	923.8	0.0	0.0	0.0	0.0	0.0	5.8	249.0	0.0	1.0	0.0	1.8	0.0	0.0	0.0	0.0
2020-24	East Sunday Island / Drum Island - A	0.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Decade	Survey Site	Asian Dowitcher	Bar-tailed Godwit	Black-tailed Godwit	Broad-billed Sandpiper	Common Greenshank	Common Redshank	Common Sandpiper	Curlew Sandpiper	Double-banded Plover	Eastern Curlew	Great Knot	Greater Sand Plover	Grey Plover	Grey-tailed Tattler	Latham's Snipe	Lesser Sand Plover	Little Curlew
2020-24	McGloughlans entrance - J	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	488.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Port Albert Entrance - C	0.0	147.8	0.0	0.0	0.0	0.0	0.0	11.0	228.3	0.8	0.0	0.0	3.0	0.0	0.0	0.0	0.0

Decade	Survey Site	Long-toed Stint	Marsh Sandpiper	Oriental Plover	Pacific Golden Plover	Pectoral Sandpiper	Red Knot	Red-necked Stint	Ruddy Turnstone	Ruff	Sanderling	Sharp-tailed Sandpiper	Swinhoe's Snipe	Terek Sandpiper	unidentified medium wader	unidentified small wader	Wandering Tattler	Whimbrel	Wood Sandpiper
1980-89	Box Bank Island - F	0.0	0.0	0.0	0.0	0.0	414.3	147.1	20.7	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980-89	Clonmel Island - D	0.0	0.0	0.0	0.0	0.0	322.4	188.9	15.4	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0
1980-89	Dream Island - H	0.0	0.0	0.0	0.0	0.0	0.3	5.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
1980-89	Dream south (shallow inlet) - G	0.0	0.0	0.0	0.0	0.0	0.3	35.2	1.7	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980-89	East Sunday Island / Drum Island - A	0.0	0.0	0.0	0.0	0.0	100.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0
1980-89	Kate Kearney entrance - E	0.0	0.0	0.0	0.0	0.0	3.9	47.5	8.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980-89	McGloughlans entrance - J	0.0	0.0	0.0	0.0	0.0	248.3	75.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.8	0.0
1980-89	North of St Margaret Island - L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980-89	One Tree Island - G2 - now S	0.0	0.0	0.0	0.0	0.0	620.0	50.0	5.0	0.0	3.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
1980-89	Port Albert entrance - C	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980-89	Port Welshpool foreshore	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980-89	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Box Bank Island - F	0.0	0.0	0.0	0.0	0.0	79.1	71.5	5.8	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
1990-99	Clonmel Island - D	0.0	0.0	0.0	0.0	0.0	288.0	159.0	4.2	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0

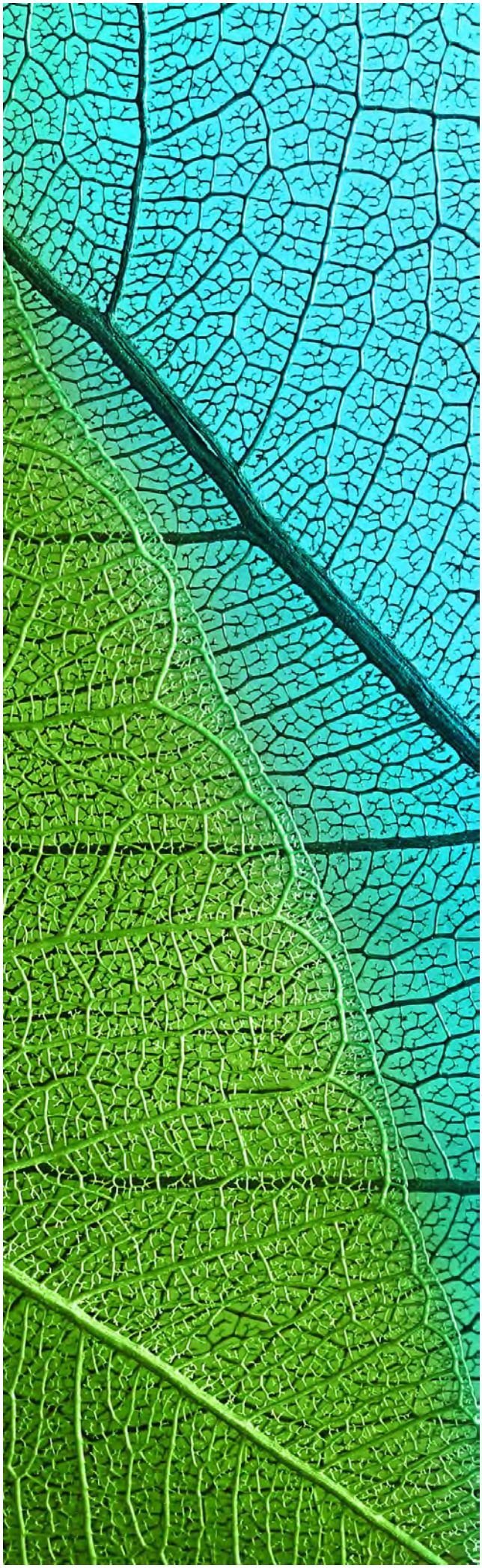
Decade	Survey Site	Long-toed Stint	Marsh Sandpiper	Oriental Plover	Pacific Golden Plover	Pectoral Sandpiper	Red Knot	Red-necked Stint	Ruddy Turnstone	Ruff	Sanderling	Sharp-tailed Sandpiper	Swinhoe's Snipe	Terek Sandpiper	unidentified medium wader	unidentified small wader	Wandering Tattler	Whimbrel	Wood Sandpiper
1990-99	Dog Island south - M	0.0	0.0	0.0	0.0	0.0	200.3	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Dream Island - H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0
1990-99	Dream south (shallow inlet) - G	0.0	0.0	0.0	0.1	0.0	152.5	16.4	3.8	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
1990-99	East Sunday Island / Drum Island - A	0.0	0.0	0.0	0.0	0.0	31.3	15.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Kate Kearney entrance - E	0.0	0.0	0.0	0.0	0.0	0.5	41.6	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	McGloughlans entrance - J	0.0	0.0	0.0	0.0	0.0	0.0	72.4	0.1	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
1990-99	North of St Margaret Island - L	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	One Tree Island - G2 - now S	0.0	0.0	0.0	0.0	0.0	67.6	105.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Port Albert entrance - C	0.0	0.0	0.0	0.0	0.0	101.0	33.1	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0
1990-99	Port Welshpool foreshore	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Robertsons Beach - K	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990-99	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0	0.0	35.5	96.4	2.5	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Box Bank Island - F	0.0	0.0	0.0	0.0	0.0	64.3	81.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Clonmel Island - D	0.0	0.0	0.0	0.0	0.0	37.9	64.3	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0

Decade	Survey Site	Long-toed Stint	Marsh Sandpiper	Oriental Plover	Pacific Golden Plover	Pectoral Sandpiper	Red Knot	Red-necked Stint	Ruddy Turnstone	Ruff	Sanderling	Sharp-tailed Sandpiper	Swinhoe's Snipe	Terek Sandpiper	unidentified medium wader	unidentified small wader	Wandering Tattler	Whimbrel	Wood Sandpiper
2000-09	Dog Island south - M	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Dream Island - H	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Dream south (shallow inlet) - G	0.0	0.0	0.0	0.0	0.0	20.0	13.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	East Sunday Island / Drum Island - A	0.0	0.0	0.0	0.0	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Kate Kearney entrance - E	0.0	0.0	0.0	0.0	0.0	192.9	762.1	2.3	0.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	McGloughlans entrance - J	0.0	0.0	0.0	0.0	0.0	11.4	28.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	North of St Margaret Island - L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	One Tree Island - G2 - now S	0.0	0.0	0.0	0.0	0.0	13.3	53.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Port Albert entrance - C	0.0	0.0	0.0	0.0	0.0	0.0	60.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Port Welshpool foreshore	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Robertsons Beach - K	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000-09	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0	0.0	0.0	150.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	Box Bank Island - F	0.0	0.0	0.0	0.0	0.0	35.0	71.4	0.0	0.0	0.9	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
2010-19	Clonmel Island - D	0.0	0.0	0.0	0.0	0.0	0.0	395.6	0.5	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Decade	Survey Site	Long-toed Stint	Marsh Sandpiper	Oriental Plover	Pacific Golden Plover	Pectoral Sandpiper	Red Knot	Red-necked Stint	Ruddy Turnstone	Ruff	Sanderling	Sharp-tailed Sandpiper	Swinhoe's Snipe	Terek Sandpiper	unidentified medium wader	unidentified small wader	Wandering Tattler	Whimbrel	Wood Sandpiper
2010-19	Dog Island south - M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	Dream south (shallow inlet) - G	0.0	0.0	0.0	0.0	0.0	0.0	55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	East Sunday Island / Drum Island - A	0.0	0.0	0.0	0.0	0.0	41.7	31.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	Kate Kearney Entrance - E	0.0	0.0	0.0	0.0	0.0	101.4	485.1	0.7	0.0	4.9	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
2010-19	McGloughlans entrance - J	0.0	0.0	0.0	0.0	0.0	8.5	119.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	One Tree Island - G2 - now S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010-19	Port Albert Entrance - C	0.0	0.0	0.0	0.0	0.0	42.9	113.0	1.1	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
2010-19	Snake Island (east side) - G3 - now B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Clonmel Island - D	0.0	0.0	0.0	0.0	0.0	120.0	741.0	1.0	0.0	14.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Dog Island south - M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Dream Island - H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Dream south (shallow inlet) - G	0.0	0.0	0.0	0.0	0.0	62.5	268.3	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	East Sunday Island / Drum Island - A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Decade	Survey Site	Long-toed Stint	Marsh Sandpiper	Oriental Plover	Pacific Golden Plover	Pectoral Sandpiper	Red Knot	Red-necked Stint	Ruddy Turnstone	Ruff	Sanderling	Sharp-tailed Sandpiper	Swinhoe's Snipe	Terek Sandpiper	unidentified medium wader	unidentified small wader	Wandering Tattler	Whimbrel	Wood Sandpiper
2020-24	McGloughlans entrance - J	0.0	0.0	0.0	0.0	0.0	0.0	111.3	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020-24	Port Albert Entrance - C	0.0	0.0	0.0	0.0	0.0	26.3	772.0	1.8	0.0	22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Appendix 8: Gelliondale Wind Farm: Flora and Fauna Assessment (4.4) (Nature Advisory 2025)



Gelliondale Wind Farm

Flora and Fauna Assessment

Prepared for Synergy Wind Pty Ltd

June 2025
Report No. 14107.20 (4.4)

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Executive Summary

Synergy Wind Pty Ltd (Synergy) proposes to build and operate a wind farm near the township of Alberton in south-eastern Victoria. The Gelliondale Wind Farm will comprise 13 wind turbines as well as access tracks and underground cables across approximately 1500 ha of predominantly agricultural land.

Synergy engaged Nature Advisory Pty Ltd to conduct pre-construction flora and fauna surveys for the proposed wind farm. The specific area investigated, referred to herein as the 'study area', comprised areas potentially impacted within the proposed wind farm boundary which is located on predominantly private land. Much of the study area is used for dairy farming. As such, most of the remnant native vegetation and original fauna habitats have been removed.

This assessment is based on an initial desktop evaluation of available information on the flora, fauna habitats and ecological communities of the study area and its surrounds, accompanied by detailed field assessments to ground truth the actual or potential occurrence of these matters.

This assessment is required as part of investigations to inform the proposed wind farm's feasibility analysis and layout. The Victorian *Planning Guidelines for Development of Wind Energy Facilities* (DTP 2023) require all wind farm proponents to assess the impacts of their projects on threatened species and communities listed under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This report evaluates the proposed wind farm site for the likelihood of occurrence and potential impacts to listed flora and fauna species and ecological communities and discusses the prospective implications for project planning and assessment.

The following biodiversity investigations have been undertaken:

- Native vegetation and flora surveys (Section 4)
- Fauna overview assessment (Section 5)
- Bird utilisation survey (Section 6)
- Bat utilisation survey (Section 7)
- Targeted bird surveys (Section 8)
- Shorebird assessment (Section 9)

The results of these investigations are summarised below and show that only a relatively small risk to threatened flora and fauna species occurs from this proposed 13-turbine wind farm, post mitigation. Native vegetation impacts have been minimised, and a small number of threatened bird and bat species are at risk of colliding with turbines occasionally, i.e. Grey-headed Flying Fox, Eastern Bent-wing Bat, Blue-winged Parrot and White-throated Needletail. A draft Bat and Avifauna Management Plan has been prepared prescribing monitoring and management actions to further reduce this risk of collision.

Native vegetation and fauna habitat

The study area supports eucalypt forest; agricultural pastures; native and introduced treed vegetation-rows; heathy woodland; and aquatic habitats (drainage lines, wetlands, dams).

A total of ***1.244 hectares*** of remnant patch native vegetation are ***proposed to be removed*** from the study area including two large trees.

Proposed vegetation removal would result in an ***offset requirement of 0.432 General Habitat Units (GHUs)*** with a minimum Strategic Biodiversity Score of 0.3056 and two large trees. Offsets would need to be achieved within the West Gippsland CMA or Wellington Shire Council and will need to be secured prior to the removal of native vegetation.

A permit is required under *Environmental Significance Overlay – Schedule 3* and *Significant Landscape Overlay – Schedule 3* within the South Gippsland Planning Scheme to remove, destroy or lop any vegetation, including dead vegetation. A planning permit under Clause 52.17 of the Wellington and South Gippsland Planning Schemes is also required for the removal of native vegetation in the relevant shires. The current proposal will be assessed under the detailed assessment pathway, specified in the Victorian Guidelines for the Removal, Destruction or Lopping of Native Vegetation, and will be referred to the state Department of Energy, Environment and Climate Action (DEECA).

A Referral under the Environment Protection and Biodiversity Conservation (EPBC) Act was submitted by Synergy in December 2016 for Alberton Wind Farm (34 turbines) and that project was determined to be a controlled action. The Alberton Wind Farm proposal was a similar project but larger and over a larger area of land. It did encompass the same land upon which the Gelliondale Wind Farm is proposed. The Alberton Wind Farm was assessed and approved under the bilateral agreement between the Commonwealth and the state of Victoria, but it did not go ahead. A new referral under the EPBC Act was submitted in July 2023 for the modified Gelliondale Wind Farm and this project was determined to be a controlled action. The project is being assessed by a Public Environment Report (PER), which is currently being prepared.

Threatened ecological communities and threatened flora species

A detailed native vegetation assessment was undertaken in September 2024. More than 90 patches (habitat zones) including 98 large trees in patches and 45 scattered trees were mapped within the study area. A total of eight Ecological Vegetation Classes were identified: Swamp Scrub (EVC 53), Tall Marsh (EVC 821), Aquatic Herbland (EVC 653) Heathy Woodland (EVC 48), Wet Heathland (EVC 8), Lowland Forest (EVC 16), Creekline Herb-rich Woodland (EVC 164) and Plains Grassy Forest (EVC 151).

Two EPBC Act listed threatened ecological communities were considered to potentially occur in the study area: Natural Damp Grassland of the Victorian Coastal Plains (within the proposed development footprint) and Subtropical and Temperate Coastal Saltmarsh (outside the proposed development footprint). These have not been recorded in the study area to date.

The following threatened flora species listed under the EPBC Act or the Flora and Fauna Guarantee (FFG) Act were recorded within 10km of the project site or have the potential to occur within the study area:

EPBC Act

- Clover Glycine (EPBC Act: Vulnerable; FFG Act: Vulnerable);
- Dense Leek-orchid (EPBC Act: Vulnerable; FFG Act: Critically Endangered);
- Eastern Spider-orchid (EPBC Act: Endangered; FFG Act: Endangered);
- Metallic Sun-orchid (EPBC Act: Endangered; FFG Act: Endangered);
- Maroon Leek-orchid (EPBC Act: Endangered; FFG Act: Endangered);
- River Swamp Wallaby-grass (EPBC Act: Vulnerable);
- Strzelecki Gum (EPBC Act: Vulnerable; FFG Act: Critically Endangered);

- Thick-lip Spider-orchid (EPBC Act: Vulnerable)

FFG Act

- Coast Grey-box (FFG Act: Endangered);
- Silver Everlasting (FFG Act: Endangered);
- Velvet Appleberry (FFG: Endangered);
- Creeping Rush (FFG Act: Endangered);
- Fringed Helmet-orchid (FFG Act: Endangered);
- Lizard Orchid (FFG Act: Endangered);
- Orange-tip Finger-orchid (FFG Act: Endangered);
- Large White Spider-orchid (FFG Act: Endangered);
- Southern Blue-gum (FFG Act: Endangered);
- Bog Gum (FFG: Critically Endangered);
- Spurred Helmet-orchid (FFG Act: Endangered);
- Small Wax-lip Orchid (FFG Act: Endangered);
- Lacy Wedge-fern (FFG Act: Endangered);
- Currant Wood (FFG: Endangered);
- Green Leek-orchid (FFG Act: Endangered);
- Slender Leek-orchid (FFG Act: Endangered);
- Slender Bog-sedge (FFG Act: Vulnerable); and
- Parsley Xanthosia (FFG Act: Endangered).

A targeted flora survey for EPBC Act-listed species and ecological communities was undertaken in November 2016 and none were recorded. The orchid species and Clover Glycine would only have the potential to occur within the adjacent Gelliondale State Forest, which is not going to be impacted. Coastal areas and wetlands (constituting suitable habitat for other listed species) will not be impacted, and no Strzelecki Gum are proposed to be removed. For this reason, targeted surveys for threatened flora species were not repeated in 2021, given that no suitable habitat for listed species will be impacted.

Threatened fauna species

The following threatened fauna species listed under the EPBC Act and/or the FFG Act were considered to be potentially impacted, as they have the potential to occur, or have been recorded within the study area, or fly at Rotor Swept Area (RSA) height:

- Blue-winged Parrot (EPBC Act: Vulnerable)
- Swift Parrot (EPBC Act: Critically Endangered; FFG Act: Critically Endangered)
- Gang–gang Cockatoo (EPBC Act: Endangered, FFG Act: Endangered)
- Grey-headed Flying Fox (EPBC Act: Vulnerable; FFG Act: Vulnerable)
- Eastern Bent-wing Bat (FFG Act: Critically Endangered)
- Powerful Owl (FFG Act: Vulnerable)

- White-throated Needletail (EPBC Act: Vulnerable & Migratory; FFG Act: Vulnerable)
- White-bellied Sea-Eagle (FFG Act: Endangered)
- Fork-tailed Swift (EPBC Act: Migratory)

Blue-winged Parrot has been detected in the study area and occasionally flies at RSA height and therefore could be at risk of collision with turbines, albeit likely in low numbers.

Swift Parrot prefers a select range of eucalypts in Victoria, including Yellow Gum, Grey Box, White Box, Red Ironbark, and Yellow Box, as well as River Red-gum when this species supports abundant 'lerp'. Several targeted Swift Parrot surveys yielded a single observation. It is likely to experience minimal impact from the proposed wind farm.

Gang–gang Cockatoo is a strict woodland species and would only occasionally venture outside the woodland and is not expected to be significantly impacted. During the first year of seasonal and targeted surveys, four individuals were observed. The most recent bird utilisation in March 2025 recorded a flock of up to 18 cockatoos twice. Collisions with wind turbines are possible, but given its foraging behaviour in the canopy and short-distance flights, it is considered unlikely.

The study area occurs <25 km from a known Grey-headed Flying Fox camp in Woodside, which is within the nightly foraging distance of the species. A variety of habitats in the study area provide flowers and potentially fruit, which could attract the species into the area to forage. Initial investigations in January 2025 noted an active camp at Port Welshpool with flying foxes flying out to Snake Island away from the wind farm site, but the Woodside camp was inactive. An additional assessment of camps in May 2025 noted all camps in the wind farm's vicinity were inactive, suggesting a possible seasonal fluctuation in camp activity. The Bat and Avifauna Management Plan (BAMP) includes guidelines for long-term and seasonal monitoring of flying-foxes to better understand their activity and possible use of the airspace over the wind farm. .

Bat detector survey results indicate nine calls across the three survey periods that could potentially be attributed to Eastern Bent-wing Bat but could not be reliably distinguished from Large Forest Bat. The results from this survey would indicate that although the Eastern Bent-wing Bat may be present across the study area, they are rare and are unlikely to regularly utilise the project site but could be at risk of colliding with turbines occasionally.

Powerful Owl generally confines itself to forested habitats and dispersal of juvenile owls after breeding is finished would be a rare event, most likely confined to the areas where treed habitats are closest. Where this habitat occurs either side of the South Gippsland Highway, no turbines are proposed to be constructed in between large forest habitat. The likelihood of the Project having an impact on this species is therefore considered to be low.

White-throated Needletails are aerial over all habitats, particularly over wooded areas, including open forest. They also often fly over heathland and less often above treeless areas such as grassland and swamps or farmland. Targeted White-throated Needletail surveys, and bird utilisation surveys yielded several observations, mostly over the Alberton State Forest along the ridge lines and along forest edges. This species is at risk of occasional collisions with turbines and will be addressed in the PER and BAMP.

White-bellied Sea-Eagle is not likely to be impacted by the operation of the wind farm as it is mostly found along the coast and was only found on three occasions to venture inland passing over the wind farm site. No White-bellied Sea-Eagle nests were found during extensive bird studies at or adjacent to the wind farm site.

Fork-tailed Swifts, similar to White-throated Needletail, are aerial over all habitats at height. Though, this species was only recorded incidentally once. It is likely the species may on occasion use the study area, but this would be considered uncommon.

Bird utilisation survey

In addition to bird utilisation surveys completed in 2015, Nature Advisory completed seven seasonal BUS in 2023 to 2025. A total of 112 bird species were recorded across all impact sites and survey seasons. The five most common and abundant bird species observed at the impact sites were Common Starling, Australian Magpie, Straw-necked Ibis, Little Raven and Eurasian Skylark with 94% of observed birds at impact sites flying below the minimum RSA height of 40m.

Threatened species observed during bird utilisation surveys to date include:

- Blue-winged Parrot (EPBC Act: Vulnerable), regularly in small numbers and one group with 39 birds
- Gang–gang Cockatoo (EPBC Act: Endangered; FFG Act: Endangered), 4 individuals recorded in Summer 2024 and a group of up to 18 individuals observed twice in autumn 2025 (all below RSA).
- Swift Parrot (EPBC Act: Critically Endangered; FFG Act: Critically Endangered), one bird
- White-bellied Sea-Eagle (FFG Act: Endangered), three observations, one of which at RSA height
- White-throated Needletail (EPBC Act: Vulnerable & Migratory; FFG Act: Vulnerable), numerous

Incidental observations included Latham Snipe (EPBC Act: Vulnerable), Eastern Great Egret (FFG Act: Vulnerable) and Fork-tailed Swift (EPBC Act: Migratory) in low numbers.

Eleven raptor species were recorded with the Wedge-tailed Eagle as the most abundant species. Raptor activity was relatively low, with only 1% of the observed birds being raptors. Other more common raptor species were Brown Falcon and Black-shouldered Kite.

Bat assessment

Bat utilisation surveys were conducted using ultrasonic detectors in November–December 2023, February–March 2024, August-September 2024, November-December 2024, and February-March 2025.

Nine bat species were recorded that are common and secure farmland species, and widespread throughout south-eastern Australia. One threatened species was potentially detected within a multi-species complex in low numbers (nine records across 1,213 detectors nights):

- Eastern Bent-wing Bat (FFG Act: Critically Endangered).

The results from this survey would indicate that if the call detected belongs to the Eastern Bent-wing Bat, the species is rare across the study area and unlikely to regularly use the project site. As of April 2025, confirmed locations of known caves are not available, however ongoing bat detector surveys at the wind farm, and continued liaison with the Department of Energy, Environment and Climate Action may help fill knowledge gaps about this species and whether it may utilise the site.

Swift Parrot and White-throated Needletail assessment

Targeted Swift Parrot surveys were carried out from April 2020 to June in 2021 and 2024. A single observation was recorded in a patch of Swamp Gum and Stringybark approximately 2 km west of the wind farm site. No significant impacts to the Swift Parrot population are expected from the wind farm.

Targeted White-throated Needletail surveys were carried out from December 2020 to April 2021 and February–March 2024. Several needletails were observed flying over the wind farm site at a median height range of 20 to 500 m. Given the species threatened and migratory status, and its confirmed presence on site, it is categorised as a potential moderate risk from the development. A draft Bat and Avifauna Management Plan (BAMP) has been prepared to detail monitoring and mitigate risks for this species.

Migratory shorebird assessment

Initial field investigations were conducted between 25th and 27th February 2015 at low tide to identify areas where shorebirds might be foraging on intertidal sandflats and mudflats. Nature Advisory also collected shorebird count data from December 2024 to June 2025. Analyses also used existing shorebird count data from 1980 to June 2024 obtained for the eastern part of Corner Inlet by BirdLife Australia. These data showed Corner Inlet east consistently held 3,000 to 4,000 individual birds over winter, and over 20,000+ in summer, including several EPBC and FFG-listed species.

The wind farm is sited a minimum of 3 km away from intertidal habitats, and up to 7 km from known important shorebird habitat, therefore, significant disturbance by the project on important shorebird habitat is considered unlikely. Given the consistent behaviour of migratory shorebirds, their high rate of climb on departure, and the distance of the project site from the shore, it is highly unlikely that shorebirds migrating northwards from the nearby important habitats would be at a low enough altitude to interact with operating wind turbines. Therefore, direct mortality of migrating shorebirds is considered unlikely.

Fauna susceptibility and risk assessment

The following fauna species were assigned an impact risk rating of moderate:

- Blue-winged Parrot
- Grey-headed Flying Fox
- White-throated Needletail
- Eastern Bent-wing Bat (low-moderate)[1]

No species are categorised as high or very high risk.

Recommendations

Section 13 details recommendations to address the assessment findings, which included avoiding impacts to large hollow-bearing trees that may support Gang-gang Cockatoo and Blue-winged Parrot and micrositing ancillary site infrastructure to further reduce impacts to native vegetation and fauna habitat.

Further bird utilisation surveys will continue to meet the two-year data requirements of the Commonwealth survey guidelines. Post-construction bird and bat utilisation surveys will be undertaken and provide further information on species with a risk of turbine collision, particularly Blue-winged Parrot, Wedge-tailed Eagle, White-throated Needletail and Eastern Bent-wing Bat. It is recommended that operational monitoring be a requirement of the BAMP and should be conducted

[1] Allocated a risk of low to moderate as a precautionary measure. Bat survey data has not recorded individuals on site, and detailed information about caves and populations is currently unavailable.

during peak activity seasons to assess the effectiveness of implemented mitigation measures and to track any changes in bird behaviour in turbine operations.

To minimise collision risks, monitoring during peak activity periods for species like Blue-winged Parrot and White-throated Needletail should be considered and seasonal adjustments to turbine operations should be considered if higher numbers of these species are present. Details will be provided in the BAMP.

Carcass management should be employed to minimise scavenger attraction to areas near turbines, helping to lower the risk for Wedge-tailed Eagle.

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1. Introduction

1.1. Background and scope

Synergy Wind Pty Ltd (Synergy) proposes to build and operate a wind farm near the township of Alberton in south-eastern Victoria. The Gelliondale Wind Farm, hereafter referred to the 'project' site, will incorporate 13 wind turbines (each with an adjacent hardstand required for construction), access tracks, underground cabling, a substation and battery energy storage system, and four construction compounds/operations and maintenance areas, across approximately 1500 ha of predominantly agricultural land (Figure 1).

A Referral under the Environment Protection and Biodiversity Conservation (EPBC) Act was submitted by Synergy in December 2016 for Alberton Wind Farm (34 turbines) and that project was determined to be a controlled action. The Alberton Wind Farm proposal was a similar project but larger and over a larger area of land. It did encompass the same land upon which the Gelliondale Wind Farm is proposed. The Alberton Wind Farm was assessed and approved under the bilateral agreement between the Commonwealth and the state of Victoria, but it did not go ahead. A new referral under the EPBC Act was submitted in July 2023 for the modified Gelliondale Wind Farm and this project was determined to be a controlled action. The project is being assessed by a Public Environment Report (PER), which is currently being prepared.

Synergy engaged Nature Advisory Pty Ltd to conduct pre-construction flora and fauna surveys for the proposed project. The specific area investigated, referred to herein as the 'study area', comprised areas within the proposed wind farm boundary which is located on predominantly private land. Much of the study area is used for dairy farming. As such, most of the remnant native vegetation and original fauna habitats have been removed.

This assessment is based on a desktop evaluation of available information on the flora, fauna habitat and ecological communities of the study area and its surrounds, completed initially in 2015 and then reassessed in 2024, accompanied by detailed field assessments to ground truth the actual or potential occurrence of these matters. These field assessments occurred between 2015 and 2025. In addition, this investigation also provides baseline data on the pre-construction status of flora and fauna, particularly the threatened species that could potentially occur within or close to the wind farm site.

This investigation aims to assess potential impacts arising from the project and inform the project design and mitigations. The Victorian *Planning Guidelines for Development of Wind Energy Facilities* (DTP 2023) require all wind farm proponents to assess the impacts of their projects on threatened species and communities listed under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This report evaluates the proposed wind farm site for the likelihood of occurrence and potential impacts to listed flora and fauna species and ecological communities and discusses the prospective implications for project planning and assessment.

Specifically, the scope of the investigation included the following activities:

- Review of existing information within the project boundary and a ten-kilometre buffer search region from the following sources:
  - *Victorian Biodiversity Atlas* (VBA) administered by the Department of Energy, Environment and Climate Action (DEECA);
  - The Commonwealth EPBC Act *Protected Matters Search Tool*;

  - DEECA's *Native Vegetation Information Management system* (NVIM);
  - DEECA's *NatureKit*;
  - BirdLife Australia Atlas database;
  - BirdLife Shorebirds database; and
  - Atlas of Living Australia.
- Flora and fauna field assessments including:
  - Characterisation and mapping of native vegetation on the site that might be impacted as defined in Victoria's *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017a) (the 'Guidelines');
  - Assessment of native vegetation in accordance with the Guidelines, including habitat hectare assessment and/or scattered tree assessment;
  - Compilation of a flora species list for the study area;
  - Assessment of the likelihood of occurrence of listed flora, fauna and ecological communities in the study area;
  - Targeted surveys for threatened flora species in the study area;
  - Detailed bird and bat utilisation surveys within the project site; and
  - Detailed assessments of threatened fauna species that were considered to potentially occur on or near the study area including Swift Parrot and White-throated Needletail.
- Update fauna susceptibility and risk assessment following the procedure for risk assessment of AS ISO 31000:2018, which includes:
  - Short-listing species or groups of concern based on their likelihood of occurrence at the site;
  - Assessment of preliminary potential impact pathways; and
  - Determination of the risk level for each species or group of concern, consistent with a risk matrix.
- Consider possible implications of the wind farm development on these listed species and their habitat, and recommendations on avoidance and minimising of such impacts.
- Consider the key legislative constraints for the project including details of all relevant Commonwealth, State and local legislation and policies.

For this assessment, the following definitions have been used:

- *Study area*: This represents the general area of investigation including a 10km radius from the project site;
- *Project site*: This is the area within which the project will be located and includes the wind farm site boundary;
- *Development footprint:* This is the actual footprint of the wind farm within the project site.

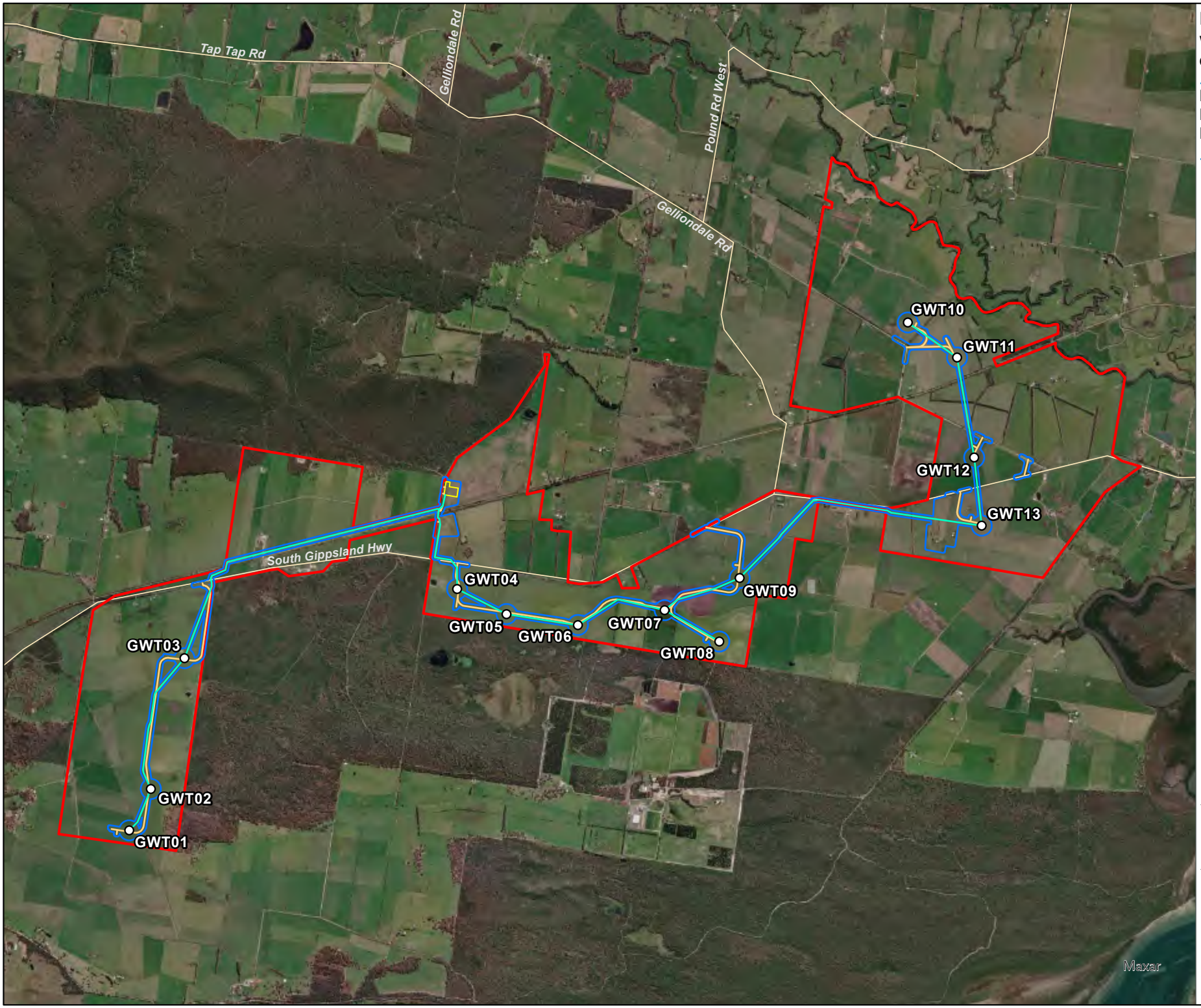

Figure 1: Study area and wind farm layout - overview

Project No: 14107_20
Project: Gelliondale Wind Farm
Date: 9/10/2024

- Wind farm boundary
- Turbine
- Application footprint
- Substation
- Electrical cable
- Access track

N

Metres

0 370 740 1,110 1,480 1,850

GDA2020 MGA Zone 55

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1.2. Timeline of ecological surveys

Table 1 outlines surveys completed to inform this assessment.

Table 1: Surveys completed (to June 2025)

Survey	2015				2016				2020				2021				2023	2024				2025			
	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp	Sp	Su	Au	Wi	Sp	Su	Au	Wi	Sp
Overview flora and fauna assessment		■		■			■																		
Detailed native vegetation assessment								■								■									
Bird utilisation surveys	■																■	■	■	■	■	■	■	■	
Bat surveys	■																■	■	■	■	■	■	■		
White-throated Needletail													■	■				■	■						
Swift Parrot and Gang Gang Cockatoo										■				■	■				■	■					
Grey-headed Flying-fox																						■	■		
Migratory shorebirds (Corner Inlet)																						■		■	

This report is divided into the following sections:

Section 2 provides the legislative background including details of all relevant Commonwealth, State, and local legislation and policies.

Section 3 describes the study area including the vegetation and fauna habitat.

Section 4 presents the methods and assessment results of the native vegetation and flora surveys to date, including listed flora and ecological communities.

Section 5 details the fauna assessment including broad-scale mapping and high-level characterisation of existing fauna habitat within the disturbance footprint that could support EPBC Act or FFG Act listed threatened fauna species.

Section 6 presents the methodology and results of the Bird Utilisation Surveys (BUS) completed to date, including threatened species.

Section 7 presents the methodology and results of the bat surveys completed to date, including threatened species.

Section 8 presents the methodology and results of the targeted fauna surveys completed to date (including Swift Parrot and White-throated Needletail).

Section 9 presents the methodology and results of the Corner Inlet shorebird assessment.

Section 10 provides the results of the fauna susceptibility and risk assessment.

Section 11 provides recommendations to inform the design process of the wind farm layout, as well as recommendations for future surveys and investigations.

Section 12 details the potential implications of the findings under the relevant legislation.

Sections 13 and 14 provide recommendations and conclusions.

The following Nature Advisory team members completed this investigation: Arend Kwak (Botanist), Ezra Janetski (Botanist), Peter Lansley (Zoologist), Malan Bothma (Zoologist), Curtis Doughty (Senior Zoologist), Guille Mayor (Senior Zoologist), Luke Halpin (Zoologist), Liz Brown (Zoologist), Joab Wilson (Senior Ornithologist), Mike Hitchcock (Senior Zoologist), Kylie Patrick (Senior Ecologist and Project Manager) and Inga Kulik (Project Director).

2. Planning and legislative considerations

This section sets out the legislation and planning provisions relevant to the project. The implications of these controls for the project are addressed in Section 12 of this report.

The Victorian wind farm planning guidelines (DTP 2023) state that proponents of a wind energy facility must consider risk factors, impacts and mitigation measures to environmental values. During the design and planning process, the responsible authorities must be aware of the following controls related to flora and fauna:

- The EPBC Act provides for the protection of matters of national environmental significance, including nationally significant threatened species and wetlands protected under the Convention of Wetlands of International Importance (the Ramsar Convention).
- The habitat values of wetlands and wetland wildlife habitat designated under the *Ramsar Convention or* utilised by designated species under the Japan-Australia Migratory Birds Agreement (JAMBA), the China-Australia Migratory Birds Agreement (CAMBA), and/or the Republic of Korea – Australia Migratory Birds Agreement (ROKAMBA).
- The FFG Act which provides protection for species and ecosystems that are of state-wide importance.
- The Planning Policy Framework (PPF), which sets out the state planning objectives for protection and conservation of biodiversity - refer to Clause 12.01 (Biodiversity) of the Victorian Planning Policy (VPP).
- *Clause 52.17 (Native vegetation)* of the VPP which provides the relevant decision-making framework for native vegetation protection and conservation.
- Other sections of the Planning Scheme may require additional consideration of flora and fauna matters. These may be found in the PPF and the zone and overlay provisions.

The above-mentioned legislation and policy relevant to the project is discussed in further detail in the subsections below.

2.1. Commonwealth

2.1.1. Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act protects a number of threatened species and ecological communities that are considered to be of national conservation significance. Any project that may have a significant impact on these species is required to be referred for a decision on whether the project is a controlled action requiring assessment and approval under the EPBC Act.

EPBC Act implications are discussed in Section 12.3.

2.2. Victoria

2.2.1. Planning and Environment Act 1987

The Victorian *Planning and Environment Act 1987* (P&E Act) establishes a framework for planning the use, development and protection (or conservation) of land in Victoria.

Section 4A (1-2) of the Act allows the Minister for Planning to prepare and approve standard planning provisions (i.e., Victorian Planning Provisions, or VPPs). VPPs are implemented through Victoria's planning schemes which are constituted and approved under the Act.

VPPs within each planning scheme are divided into State Planning Provisions, which apply across Victoria; and Local Planning Provisions, which apply specifically to the applicable local planning scheme in the relevant municipality.

This section discusses planning provisions in the Wellington planning scheme applicable to flora, fauna and native vegetation.

2.2.2. Planning controls

Zoning of land within the broader study area is detailed in Appendix 2. Zones in the broader study area comprise the following:

- Farming Zone
- Transport Zone – Category 2
- Public Conservation and Resource Zone
- Industrial 1 Zone

The entire study area is located within a Bushfire-prone Area.

2.2.3. Local provisions

Local Planning Policy Framework

There are no local planning policies relevant to the current investigation.

Overlays

The study area is subject to the following overlays relevant to this assessment. The purpose of these overlays in the Wellington Planning Scheme are also discussed below.

- *Environmental Significance Overlay – Schedule 2* (*ESO2*) – The purpose of this overlay is to ensure the long-term protection and enhancement of the environmental quality, natural beauty, cultural and scientific value and visual amenity of wetland environs. This overlay covers areas of the Gelliondale State Forest. A permit is required to remove any vegetation under this overlay.
- *Environmental Significance Overlay – Schedule 3* (*ESO3*) – The purpose of this overlay is to ensure the long-term protection and enhancement of the environmental quality, natural beauty, cultural and scientific value and visual amenity of the coastal areas of South Gippsland. This overlay covers areas of proposed road widenings south of Agnes. A permit is required to remove any vegetation under this overlay.
- *Significant Landscape Overlay – Schedule 3* (*SLO3*) – The purpose of this overlay is to protect the environmental values and landscape character of the Corner Inlet Amphitheatre, which is a known area of high environmental significance and is identified as supporting important bird habitat by the RAMSAR convention. This overlay covers areas of proposed road widenings in the vicinity of Agnes. A permit is required to remove any living vegetation under this overlay.

2.2.4. State planning provisions

State planning provisions are established under the *Victorian Planning and Environment Act 1987*.

Clause 52.17 of all Victorian Planning Schemes states the following:

A permit is required to remove, destroy or lop native vegetation, including dead native vegetation.

A permit is not required if any of the following apply:

- An exemption in Table 52.17-7 specifically states that a permit is not required.

- A native vegetation precinct plan corresponding to the land is incorporated into the planning scheme and listed in the schedule to Clause 52.16.
- The native vegetation is specified in a schedule to Clause 52.17.

Exemptions

Exemptions listed in Table 52.17-7 relevant to the study area include the following:

- *Dead native vegetation:* Native vegetation that is dead is exempt and does not require a planning permit. This does not apply to a standing dead tree with a trunk diameter of 40 cm or more at a height of 1.3 m above ground level. As such, any dead trees with a diameter at breast height (DBH) of 40 cm or more have been included in the tree data collected for this investigation.
- *Planted vegetation:* Native vegetation that is to be removed, destroyed or lopped that was either planted or grown as a result of direct seeding. This exemption does not apply to native vegetation planted or managed with public funding for the purpose of land protection or enhancing biodiversity.
- *Regrowth:* Native vegetation that is to be removed, destroyed or lopped that has been naturally established or regenerated on land lawfully cleared of naturally established native vegetation and meets the following criteria:
    - Is less than 10 years old; or
    - Is Austral Bracken (Pteridium esculentum); or
    - Falls within the boundary of a timber production plantation, as indicated on a Plantation Development Notice or other documented record and has become established after the plantation; or
    - Is less than 10 years old at the time of a property vegetation plan being signed by the Secretary to the Department of Environment, Land, Water and Planning (DELWP) (as constituted under Part 2 of the *Conservation, Forests and Lands Act 1987*) and is shown on that plan as being 'certified regrowth'; and occurs on land that is to be used or maintained for cultivation or pasture during the term of that plan.

This exemption does not apply to land where native vegetation has been destroyed or otherwise damaged as a result of flood, fire or other natural disaster.

Application requirements

Any application to remove, destroy or lop native vegetation must comply with the application requirements specified in the Victorian *Guidelines for the Removal, Destruction or Lopping of Native Vegetation* (DELWP 2017), herein referred to as the 'vegetation guidelines'.

When assessing an application, Responsible Authorities are also obligated to refer to Clause 12.01-2 (Native vegetation management) in the Planning Scheme that, in addition to the Guidelines, refers to the following:

- Assessor's handbook – applications to remove, destroy or lop native vegetation (Version 1.1) (DELWP 2018).
- Statewide biodiversity information maintained by DEECA.

The application of the vegetation guidelines (DELWP 2017) is explained further in Appendix 1.

Referral to DEECA

Clause 66.02-2 of the planning scheme determines the role of DEECA in the assessment of native vegetation removal permit applications. If an application is referred, DEECA may make certain recommendations to the responsible authority in relation to the permit application.

Any application to remove, destroy or lop native vegetation must be referred to DEECA if any of the following apply:

- The impacts to native vegetation fall within the Detailed Assessment Pathway;
- A property vegetation plan applies to the site; or
- The native vegetation is on Crown land that is occupied or managed by the responsible authority.

2.2.5. Flora and Fauna Guarantee Act 1988

The Victorian FFG Act lists threatened and protected species and ecological communities (DELWP 2022). Any removal of threatened flora species or communities (or protected flora) listed under the FFG Act from public land requires a Protected Flora Permit under the Act, obtained from DEECA.

The FFG Act only applies to private land where a license is required to remove grass trees, tree ferns and sphagnum moss for sale, or where an Interim Conservation Order has been made to protect critical habitat for a threatened species or community.

Implications under the FFG Act for the current proposal are discussed in Section 12.4.

2.2.6. Environmental Effects Act 1978

The project was referred under the EE Act to DEECA and determined that it did not require assessment under the EE Act.

2.2.7. Catchment and Land Protection Act 1994

The CaLP Act requires that landowners (or a third party to whom responsibilities have been legally transferred) must eradicate regionally prohibited weeds and prevent the growth and spread of regionally controlled weeds.

Weed species listed on the CaLP Act that have been recorded in the study area are discussed in Section 12.5.

2.3. Local

2.3.1. Local laws and regulations

Section 111, Part 5 of the *Local Government Act 1989* gives authority to local governments to make local laws for or with respect to any act, matter or thing that it has jurisdiction over under any Act.

There are no local laws relevant to biodiversity that relate to the project and associated infrastructure.

3. Site description

3.1. Location

The study area for this investigation was approximately 621 hectares of private and public land located at Alberton West, approximately 13 km south-west of Yarram and 167 km south-east of Melbourne CBD (Figure 1).

3.2. Site description

The study area and surrounding land is situated in a region that has been historically cleared of native vegetation for the provision of stock grazing. Other land uses within the study area include a rail reserve and several road reserves, as well as Alberton West State Forest to the north and Gelliondale State Forest to the south.

The study area supported heavy alluvial soils on a very gently undulating plain. These soils gradually graded into light-loamy to sandy soils on the southern extent.

The study area supported many small to large farm dams, divided by numerous minor to prominent man-made drainage channels. Many of these water bodies were inundated during investigations. Groundwater had also been significantly drained across the extent of the study area, likely resulting in the loss of many ephemeral wetlands. One DEECA-mapped wetland occurred in the northernmost point of the study area.

3.3. Vegetation

Vegetation in the study area primarily consisted of extensive grazing paddocks, supporting an assortment of exotic pasture species. These notably included Rye, Cocksfoot, Sweet Vernal, Toowoomba Canary-grass and Brome. Broadleaf weeds were frequently interspersed and included White Clover, Flatweed, Capeweed, Ribwort and Narrow-leaf Clover.

Remnant native vegetation was largely restricted to roadsides and within the extent of windbreaks. This comprised occurrences of Swamp Scrub (EVC 53) and comparatively limited Wet Heathland (EVC 8) vegetation. Both Ecological Vegetation Classes (EVCs) were characterised by a dominant Swamp Paperbark component, overlying a lesser occurrence of Seaberry Saltbush. Native groundcovers were often scarce, being composed of Native Rushes, Spike-rushes, Sheep's Burr, Heron's Bill and Wallaby-grasses. Where Swamp Scrub and Wet Heathland were contiguous with Gelliondale State Forest, understory diversity was considerably higher than most roadside patches. Within these patches, Scrub She-oak, Common Reed, Pithy Sword-sedge, Spear Grasses and Common Raspwort were particularly abundant.

Vegetation occurring within the roadside reserves of the Great Southern Rail Trail supported highly modified occurrences of Heathy Woodland (EVC 48). These patches were characterised by a canopy of Swamp Gum and Manna Gum, overlying a primarily exotic understory. Native Rush, Austral Bracken and Tall Sedge were occasionally interspersed, though they generally demonstrated limited cover. Higher-quality occurrences of Heathy Woodland supported a more structurally diverse remnant understorey of native shrubs, notably including Swamp Paperbark, Blackwood and Scrub Sheoak. Native graminoids such as Thatch Saw-sedge, Small Grass-tree and assorted Spear-grass and Wallaby-grass species were also prominent.

Grazing paddocks held Aquatic Herbland (EVC 653) in low laying areas, dominated by native graminoids such as Spike-rush, Native Rushes, Common Reed, Cumbungi, and aquatic herbs such as Pondweed and Swamp Crassula. Where drainage lines transect these paddocks, Tall Marsh

(EVC 851) was also present and supported dense tracts of the aforementioned wetland graminoids, as well as a notable occurrence of Duckweed, Knotweed and Azolla.

The study area lies within the Gippsland Plain bioregion, the South East Coastal Plain IBRA bioregion, and falls within the West Gippsland catchment.

The following DELWP BioSites occurred within the study area:

- Albert River (Site No. 1903) – national significance;
- Gelliondale Railway (Site No. 1955) – regional significance; and
- Hedley (Site No. 1914) – regional significance.

The disused Gelliondale Railway which crosses the study area provided the only narrow, densely vegetated east to west wildlife corridor through the otherwise cleared landscape.

The key habitat areas listed below occurred within the region.

- **Alberton West State Forest** - This area comprised an extensive forest remnant on the foothills of the Strzelecki Ranges, immediately north-west and contiguous with remnant forest blocks in the central north-western part of the broader study area.
- **Strzelecki Ranges** - The main expanse of remaining remnant native forest covering the Strzelecki Ranges occurred less than 10 km to the north-west. This habitat was somewhat linked to the broader study area via a patchwork of cleared farmland and small to large patches of remnant native forest.
- **Gelliondale State Forest** - This area supported extensive heathy woodlands and other near-coastal vegetation types. It extended southwards from the southern edge of the broader study area.
- **Nooramunga Marine and Coastal Parks** - This area supported extensive coastal banksia woodlands, saltmarshes and other coastal vegetation types, as well as areas of intertidal sand and mud flats and shallow marine waters. It extended southwards from the southern edge of the abovementioned unnamed state forest to Corner Inlet. Nooramunga Marine Coastal Park occurs approximately 3.5 km south of the broader study area.
- **Corner Inlet** - Ramsar and listed Important Wetland. This area extended westward from the southern end of Nooramunga Marine Coastal Park. Corner Inlet lies approximately 7 km southwest of the broader study area.
- **Wilsons Promontory National Park** - This area extended southward from Corner Inlet, approximately 15 km south-west of the study area.

3.4. Fauna habitats

The broader study area supported the five fauna habitat types listed below.

- Eucalypt Forest;
- Agricultural pastures;
- Native and introduced treed vegetation-rows;
- Heathy woodland; and
- Aquatic habitats (drainage lines, wetlands, dams).

Eucalypt forest

This habitat type was predominately present in the outlying area in the north-west section of the broader study area (Alberton West State Forest). Species primarily comprised Yellow Stringy-bark, Mountain Grey Gum, Messmate, and Tasmanian Blue Gum, with an open understory of grasses and shrubs. Hollows that provide habitat for tree-dwelling fauna were present in some large trees. The ground layer comprised a mixture of weeds and native species. Leaf litter and fallen timber were present throughout the forest, which provided suitable habitat for reptiles. As the forest sits just outside the broader study area, it has been included due to its direct proximity and its influence on the fauna of the broader study area.

Agricultural land

Grazing pastures were the dominant habitat type across most of the broader study area and primarily comprised of introduced grass species. This habitat is largely devoid of native vegetation due to historic clearing for agriculture and the introduction of pasture grasses for dairy farms. Habitat components for ground-dwelling fauna, such as leaf litter, rocks and woody debris, were scarce across the broader study area, however some artificial refuges were being utilised by some common reptile and frog species.

Native and introduced treed vegetation-rows

Linear patches of treed vegetation (tree-rows, wind breaks etc) along roadsides and rail-reserves in the broader study area, supported native and introduced plant species. Various eucalyptus species and swamp paperbark with the occasional she-oak species dominated this habitat. It provided foraging opportunities for several common and generalist fauna species.

Importantly, connectivity to similar habitats within the landscape, provided by linear strips of vegetated habitat, increased the value of habitats to fauna. The broader study area was connected to Alberton West State Forest to the north and the Gelliondale State Forest in the south. These large remnant forest blocks flanked the north-west and southern wind farm boundaries and formed a network of wider, regional value that provides dispersal, commuting routes, as well as foraging habitat for species that may move between forest blocks.

Heathy woodland

This habitat was located along the southern boundaries of the broader study area, in association with the Gelliondale State Forest and in degraded form along the rail reserve. This habitat was dominated by Coast Manna Gum, Messmate and Swamp Gum. Gelliondale State Forest is an intact remnant forest with a ground layer consisting of native grasses and a shrub layer dominated by grasstree species. As the woodland sits just outside the broader study area, it has been included due to its influence on the fauna of the broader study area. Additionally, due to the quality of habitat, it is likely to act as an attraction for fauna species as a place to feed and roost.

Aquatic habitats (drainage lines, creeks, rivers)

Aquatic habitats scattered across the broader study area consisted of drainage lines, ephemeral wetlands and farm dams.

Most farm dams were accessible to stock and supported little or no vegetation. Ephemeral drainage lines were common throughout the broader study area as a method of draining water from low-lying agricultural land. These were often in poor condition and dominated by native and weed species such as sedges and rushes. Although in poor condition, they provide potential habitat for several frog species and migratory species such as Latham's Snipe and Eastern Great Egret.

Where more permanent water bodies were allowed to flow naturally and excluded from grazing pressure, low and high marshes occurred, particularly in the north-east of the site in association with the Albert River. These marshes were dominated by reeds, rushes and sedges, providing good intact and connected vegetation cover. Consequently, they provided dispersal and foraging opportunities as well as critical refuges for several fauna species.

4. Vegetation and flora surveys

4.1. Introduction

The detailed native vegetation assessments aimed to determine the extent and condition of native vegetation in accordance with the Guidelines, and the presence of ecological communities listed as threatened under the FFG Act or the EPBC Act. Additionally, targeted flora surveys determined the presence of threatened flora species that had the potential to occur or were likely to occur within the wind farm footprint. The information from these surveys will be used to inform the proposed wind farm layout by applying the 'avoid' and 'minimise' principles in accordance with the Guidelines.

This section of the report presents the results of the native vegetation and targeted flora surveys. The methods used and sources of information are considered first. The native vegetation threatened flora species and threatened ecological communities recorded within the investigation area are then described. Potential implications of the project under applicable legislation and planning policies are summarised in Section 12.

Table 2 summarises the compliance of the information in this report with the application requirements of the Guidelines (DELWP 2017a).

Table 2: Application requirements under the Guidelines

Application requirement		Response
1.	Information about the native vegetation to be removed	See Section 11.3.1
2.	Topographic and land information relating to the native vegetation to be removed	See Section 3.2
3.	Recent, dated photographs of the native vegetation to be removed	See Appendix 8 for representative photos of native vegetation in the study area.
4.	Details of any other native vegetation approved to be removed, or that was removed without the required approvals, on the same property or on contiguous land in the same ownership as the applicant, in the five-year period before the application for a permit is lodged	It is understood that no native vegetation has been removed in relation to the current project within the last five years.
5.	An avoid and minimise statement	See Section 12.2.1
6.	A copy of any Property Vegetation Plan (PVP) contained within an agreement made pursuant to section 69 of the *Conservation, Forests and Lands Act 1987* that applies to the native vegetation to be removed	It is understood that no PVP applies to any of the native vegetation proposed for removal.
7.	Where the removal of native vegetation is to create defendable space, a written statement explaining why the removal of native vegetation is necessary. This statement is not required when the creation of defendable space is in conjunction with an application under the BMO.	The removal of native vegetation is not to create defendable space.
8.	If the application is under Clause 52.16, a statement that explains how the proposal responds to the Native Vegetation Precinct Plan considerations (at decision guideline 8).	The application is not being made under Clause 52.16.

Application requirement		Response
9.	An offset statement providing evidence that an offset that meets the offset requirements for the native vegetation to be removed has been identified and can be secured in accordance with the Guidelines.	See Section 12.2.4
Additional requirements for applications in the Detailed Assessment Pathway		
10.	▪ A site assessment report of the native vegetation to be removed, including: ▪ A habitat hectare assessment of any patches of native vegetation, including the condition, extent (in hectares), EVC and bioregional conservation status. ▪ The location, number, circumference (in centimetres measured at 1.3 m above ground level) and species of any large trees within patches. ▪ The location, number, circumference (in centimetres measured at 1.3 m above ground level) and species of any scattered trees, and whether each tree is small or large.	See Section 4.4.1

4.2. Methods

This section describes the existing information, definitions and methods used for the native vegetation surveys and targeted flora surveys within the wind farm study area.

4.2.1. Existing information and documentation

The following relevant information and documentation were reviewed to ensure a comprehensive consideration of native vegetation and flora species was undertaken.

- Wellington Planning Scheme (DTPLI 2015)
- VBA administered by DEECA;
- EPBC Protected Matters Search Tool (DCCEEW 2024);
- Pre-1750 (pre-European settlement) vegetation mapping administered by DEECA was reviewed to determine the type of native vegetation likely to occur in the study area and surrounds. Information on Ecological Vegetation Classes was obtained from published EVC benchmarks. These sources included:
- Relevant EVC benchmarks for the Gippsland Plain bioregion[1] (DSE 2004); and
- DEECA's *NatureKit* (DEECA 2024a);
- Alberton Wind Farm - Flora and Fauna Assessment - Report No. 14107 (3.3) (BL&A 2016);
- Alberton Wind Farm - Bird and Bat Assessment - Report No. 14107 (1.3) (BL&A 2016a);
- Alberton Wind Farm – Targeted Flora Survey - Report 14107 (5.0) (BL&A 2016b); and
- Gelliondale Wind Farm – Flora and Fauna Assessment – Report No. 14107 (3.9) (Nature Advisory 2023).

4.2.2. Definitions

Native vegetation

Native vegetation is currently defined in Clause 73.01 of all Victorian planning schemes as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses. The Guidelines (DELWP 2017a) further classify native vegetation as belonging to two categories:

- Patch; or
- Scattered tree.

The definitions of these categories are provided below, along with the prescribed DEECA methods to assess them.

Patch

A patch of native vegetation is either:

- An area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native; or
- Any area with three or more native canopy trees[2] where the drip line[3] of each tree touches the drip line of at least one other tree, forming a continuous canopy; or
- Any mapped wetland included in the *Current wetlands map*, available at *MapShareVic* (DTP 2022).

Scattered tree

A scattered tree is:

- A native canopy tree[2] that does not form part of a patch.

Scattered trees are counted and mapped, the species identified and their circumference at 1.3 m above the ground is recorded.

4.2.3. Desktop methods

Native vegetation

Pre-1750 (pre-European settlement) vegetation and current wetland mapping administered by DEECA was reviewed to determine the type of native vegetation likely to occur in the study area and surrounds. Information on EVCs was obtained from published EVC benchmarks. These sources included:

- Relevant EVC benchmarks for the Gippsland bioregion[4] (DSE 2004);
- *NatureKit*.

Listed Matters

[2] A native canopy tree is a mature tree (i.e. it can flower) that is greater than 3 m in height and is normally found in the upper layer of the relevant vegetation type.

[3] The drip line is the outermost boundary of a tree canopy (leaves and/or branches) where the water drips onto the ground.

[4] A bioregion is defined as "a geographic region that captures the patterns of ecological characteristics in the landscape, providing a natural framework for recognising and responding to biodiversity values". In general, bioregions reflect underlying environmental features of the landscape (DNRE 1997).

Existing flora species records and information about the potential occurrence of listed matters was obtained from an area termed the 'search region', defined here as the wind farm boundary with a 10-kilometre buffer applied (coordinates: latitude 38° 37' 22" S and longitude 146° 35' 42" E).

A list of the flora species recorded in the search region was obtained from VBA, a database administered by DEECA (DELWP 2022b).

The online EPBC Act *Protected Matters Search Tool* (DCCEEW 2024) was consulted to determine whether nationally listed species or communities potentially occurred in the search region based on habitat modelling.

4.2.4. Field methods

Native vegetation assessments

A detailed habitat hectare assessment of the Alberton Wind Farm was undertaken on 21st and 23rd September 2016. The layout that now forms the Gelliondale Wind Farm required an additional native vegetation field survey of 603 hectares, which occurred on 20th – 23rd September 2021. Further detailed native vegetation assessments were consequently conducted on the 16th – 18th September 2024, to confirm the validity of lapsed habitat hectare assessments and identify any additional areas of native vegetation.

During these assessments, the study area was surveyed initially by vehicle and areas supporting native vegetation were inspected in more detail on foot. The areas surveyed comprised several buffer areas around intersections (both private and public land) and some selected roadsides where wind farm infrastructure impacts native vegetation.

Sites found to support native vegetation (patches or scattered trees) were mapped through a combination of aerial photograph interpretation and ground-truthing using a hand-held GPS (accurate to approximately 5 m). Species and ecological communities listed as threatened under the EPBC Act or FFG Act (where they occurred on public land) were also mapped using the same method.

Native vegetation condition was assessed using the habitat hectare method (Parkes *et al.* 2003; DSE 2004a) whereby components of each patch (e.g. tree canopy, understorey and ground cover) are assessed against an EVC benchmark. The score effectively measures the percentage resemblance of the vegetation to its original condition.

Records of flora species were made in conjunction with sampling methods used to undertake habitat hectare assessments of native vegetation described above. Specimens requiring identification using laboratory techniques were collected. Species protected under the FFG Act were determined by crosschecking against the FFG Act *Protected Flora List* (DEECA 2024).

Targeted flora surveys

A targeted flora survey for EPBC Act listed species and ecological communities was undertaken between the 2nd and 4th November 2016 (BL&A 2016b). Targeted surveys were undertaken for the following listed flora species and communities:

- Natural Damp Grassland of the Victorian Coastal Plains
- Clover Glycine
- Eastern Spider-orchid
- Maroon Leek-orchid
- Metallic Sun-orchid

- River Swamp Wallaby-grass
- Strzelecki Gum and
- Thick-lip Spider-orchid

The study area was assessed against published descriptions of relevant listed ecological communities modelled to potentially occur in the study area.

Reviewed ecological community descriptions comprised identification criteria and condition thresholds from listing advice for EPBC Act communities as well as FFG Act listed community descriptions (SAC 2015).

One notable threatened flora consideration is the differentiation between Swamp Gum and Strzelecki Gum. Both species are very similar in their morphology, and there are multiple records of Strzelecki Gum in the immediate vicinity and within the study area, as per the Victorian Biodiversity Atlas. When assessing the presence of Strzelecki Gum, the primary diagnostic characteristic considered was the presence of glaucous/glossy new leaf growth. This is apparent in spring, which also coincides with the timing of repeated field surveys. Other characteristics such as more ovoid bud caps, a more upright 'plantation' habit, lower bark stocking and narrower leaves can also support differentiation. Though these diagnostic characteristics are less reliable than glossy growth given they can be variable across subpopulations, and alone are not considered comprehensive for identification, they nonetheless further support the differentiation of Swamp Gum from Strzelecki Gum. All Swamp Gum were assessed for these morphological characteristics during the identification process, and these were determined to be absent in all individuals identified as Swamp Gum.

The orchid species and Clover Glycine would only have the potential to occur within the adjacent Gelliondale State Forest, which is not going to be impacted. Coastal areas and wetlands (constituting suitable habitat for other listed species) will not be impacted, and no Strzelecki Gum are proposed to be removed. For this reason, targeted surveys for threatened flora species and listed ecological communities were not repeated, given that no suitable habitat for listed species will be impacted.

Threatened ecological communities

Threatened ecological community surveys were undertaken in conjunction with the native vegetation assessments described above. Native vegetation in the study area was assessed against published descriptions of relevant listed ecological communities modelled to potentially occur in the study area. Reviewed ecological community descriptions comprised identification criteria and condition thresholds from listing advice for EPBC Act communities as well as FFG Act-listed community descriptions (DEECA 2024).

4.3. Limitations

The short duration of field assessments can result in a failure to record all species and life forms because of the seasonal absence of some species. However, this limitation was not considered to undermine the current investigation, which was designed to provide an indicative, rather than exhaustive inventory of flora and fauna species in the study area.

The site assessments were carried out in early autumn (overview assessment), early summer (detailed flora and fauna assessment), early spring (habitat hectare assessment of powerline layout) and spring (2016 targeted EPBC Act species surveys and 2021 and 2024 native vegetation assessments).

Some paddocks had been heavily grazed during the assessments, leaving little vegetation available to determine the presence, extent and/or composition of native vegetation. The timing of the survey and condition of vegetation was otherwise considered suitable to ascertain the extent and condition of native vegetation and fauna habitats.

Identification of EVCs considers vegetation types which would have naturally occupied the landscape prior to European impacts. Significant past alteration of parts of the study area's landform, hydrology and soil composition as well as past vegetation clearance has resulted in the emergence of an artificial site ecology and the reestablishment of vegetation that is likely to be notably different to what would have naturally occupied the study area. Identification of EVCs in altered areas was therefore based upon consideration of:

- Modelled EVC mapping (DELWP 2021);
- Observations of adjacent landforms that had not been significantly altered;
- Observations of nearby natural vegetation remnants;
- Any observed indigenous flora species that are useful for determining EVCs; and
- Relevant published EVC benchmark descriptions.

EVC identification was based upon the structure and floristic composition of current observed vegetation if the above information was not sufficient to allow for a reasonable conclusion to be made on which EVC would have naturally occurred and the observed vegetation resembled an EVC, which is likely to have naturally occurred in the region.

No information was available on whether planted vegetation had been planted and maintained with public or private funding. Therefore, for the purposes of the current investigation, vegetation planted on private land was assumed to have been planted and maintained with private funding while that on public land was assumed to have been planted and maintained with public funding.

4.4. Assessment results

4.4.1. Native vegetation

Patches of native vegetation

Pre–European EVC mapping (DELWP 2021) indicated that the study area and surrounds would have supported Swamp Scrub (EVC 53), Plains Grassland (EVC 132), Heathy Woodland (EVC 48), Wet Heathland (EVC 8), Damp Sands Herb-rich Woodland (EVC 3), Shrubby Foothill Forest (EVC 45), Lowland Forest (EVC 16), Coastal Saltmarsh (EVC 9), Mangrove Shrubland (EVC 140) and Estuarine Wetland (EVC 10) prior to European settlement based on modelling of factors including rainfall, aspect, soils and remaining vegetation.

Evidence on site, including floristic composition and soil characteristics, suggested that Swamp Scrub (EVC 53), Tall Marsh (EVC 821), Aquatic Herbland (EVC 653) Heathy Woodland (EVC 48), Wet Heathland (EVC 8), Lowland Forest (EVC 16), Plains Grassy Forest (EVC 151) and Creekline Herb-rich Woodland (EVC 164) were present in remnant patches throughout the study area (Figure 1). A description of these EVCs is provided within the EVC benchmarks in Appendix 10.

More than 90 patches (referred to herein as habitat zones) comprising the abovementioned EVCs, were identified in the study area (Table 3). This totalled an area of 26 hectares of native vegetation in patches and included 98 large trees.

Table 3: Description of habitat zones in the study area

Habitat Zone	EVC	Description
A	Aquatic Herbland (EVC 653)	This habitat zone comprised of a semi-permanent wetland occurring in a drainage line. Vegetation in this habitat zone primarily consisted of graminoids such as Spike-rush, Rush and Tall Sedge, as well as Creeping Monkey-flower and Fennel Pondweed. Bryophyte and soil crusts were virtually absent. Weed cover was low (~10%) and was primarily composed of grasses such as Toowoomba Canary-grass, Rye, and Cocksfoot. Organic litter was low (~5%), and mostly native. There was relatively little bare ground available for recruitment (~15%).
B, EA-EC	Swamp Scrub (EVC 53)	These highly modified occurrences of Swamp Scrub occurred in semi-permanent wetlands and along drainage lines. Vegetation primarily comprised Rush, with a comparatively limited occurrence of Tall Sedge. Emergent Swamp Paperbark was present in some zones, but of limited cover. Bryophyte and soil crusts were virtually absent. Weed cover was high (55%) and was primarily composed of grasses such as Toowoomba Canary-grass, Rye and Yorkshire Fog. Organic litter cover was low-moderate (10-25%) and mostly exotic.
C, AB, CJ	Aquatic Herbland (EVC 653)	These habitat zones comprised semi-permanent wetlands occurring in low-lying areas of paddocks. Native vegetation in these habitat zones primarily consisted of Spike-rush and Rush, with herbs such as Willow-herb and Common Duckweed also occurring. Bryophyte and soil crusts were virtually absent. Weed cover was moderate (~30%) and was primarily composed of grass such as Toowoomba Canary-grass, Fescue and Cocksfoot. Organic litter was low (~5-10%), and exotic for HZ C and native for HZ AB and CM. There was little bare ground available for recruitment (~5%).
D, E, K, M, N, Q, R-T, W, AC, AD, AE, AI, AF-AH, CF, CL-CN, DB, DH	Swamp Scrub (EVC 53)	These habitat zones primarily comprised vegetation occurring in road reserves, often in slight depressions. The canopy cover was generally absent. In the few HZs where it was present it was low (5%) but very healthy and was largely comprised of Swamp Paperbark with occasional Blackwood present. Native vegetation in the understory was often scarce, being composed of Seaberry Saltbush, Rushes, Spike-rushes, Sheep's burr, Heron's Bill and Wallaby Grasses. Most woody species observed were recruiting. Bryophytes soil crusts were present at very low cover (<1-4%). Weed cover was moderate to very high (25-80%) and primarily composed of Toowoomba Canary-grass and Rat's-tail Grass.

Habitat Zone	EVC	Description
		Organic litter was moderate-high (~40-70%) and largely native, having been attributed to a buildup of Swamp Paperbark leaf litter.
F, G, H, CK	Swamp Scrub (EVC 53)	These habitat zones occurred in wind breaks on grazing and cropping land. While they occurred in stands of planted eucalypts, the understory vegetation had occurred naturally. Canopy cover was low (5%) to absent, but very healthy where present, and was largely comprised of Swamp Paperbark with occasional Blackwood present. Native vegetation in the understory was composed of Seaberry Saltbush, Tree violet, Rushes, Common Reed, Nodding Saltbush, Spike-rushes, and Sheep's burr. Bryophytes and soil crusts were present at very low cover (<1-1%). Weed cover was moderate (30-45%) and primarily composed of Toowoomba Canary-grass, Cocksfoot, Panic Veldt-grass, and Rat's-tail Grass. Organic litter was moderate (40-45%) and largely native.
I, L, O, U, CB, CC, CG-CI	Swamp Scrub (EVC 53)	These habitat zones primarily comprised vegetation occurring in road reserves, often in slight depressions. The canopy cover was generally absent. In the few HZs where it was present it was low (5%) but very healthy and was largely comprised of Swamp Paperbark with occasional Blackwood present. Native vegetation in the understory was composed of Seaberry Saltbush, Common Woodruff, Tussock Grasses, Rushes, Spike-rushes, Sheep's burr, Heron's Bill and Kangaroo Grass. Most woody species observed were recruiting. Bryophytes and soil crusts were present at low cover (<1%). The weed cover was variable but generally moderate-high (15-65%) and primarily composed of Toowoomba Canary-grass and Rat's-tail Grass. Organic litter was moderate-high (40-70%) and largely native.
V, X1, X2, Y, Z, AA, ED	Tall Marsh (EVC 821)	These habitat zones mostly comprised artificial water bodies and surrounding low-lying inundated areas. Native vegetation in these habitat zones primarily consisted of Common Reed (*Phragmites australis*), Cumbungi (*Typha orientalis*), Spike-rush, Rush and a variety of herbs including Tiny Duckweed (*Wolffia australiana*), Common Duckweed, Slender Knotweed (*Persicaria descipiens*) and thick mats of Azolla (*Azolla spp.).* Bryophyte and soil crusts had negligible cover (<1%). Weed cover was low (~5-10%) and was primarily composed of grasses such as Toowoomba Canary-grass and Cocksfoot as well as Common Starwort and Ribwort. Organic litter was low (~5%), and mostly native. There was relatively little bare ground available for recruitment (~3-15%).
AK, AL	Swamp Scrub (EVC 53)	These habitat zones occurred along the rail trail reserve. Several planted spotted gums occurred in these habitat zones, but the understory was naturally established.

Habitat Zone	EVC	Description
		Canopy cover was absent from these habitat zones. Native vegetation in the understory was composed of Swamp Paperbark, Seaberry Saltbush, Smooth Rice-flower, Rushes, Spike-rushes, Sheep's burr, Small Grass-tree, Prickly tea-tree and Kangaroo Grass. Very few woody species observed were recruiting. Bryophytes and soil crusts were present at negligible cover (<1%). Weed cover was moderate (~40%) and primarily composed of Toowoomba Canary-grass and Drain Flat-sedge. Organic litter was moderate (~30%) and largely native.
AN- AU, BR, BS, BX, DJ	Swamp Scrub (EVC 53)	These habitat zones occurred along the rail trail reserve and were heavily degraded by grazing and soil disturbance. Canopy cover was effectively absent in these zones (<5%). Native vegetation in the understory was composed of Swamp Paperbark, Seaberry Saltbush, Willow Herb, Rushes, Saw-sedge, Spike-rushes, and Mat-rush. Most woody species observed were recruiting. Bryophytes and soil crusts were absent. The weed cover was high (40-75%) and primarily composed of Toowoomba Canary-grass, Blackberry and Kikuyu. Organic litter was low-moderate (~10-30%) and largely exotic.
AV- AX, AZ, BA-BD, BF, BI, BK, BM-BO, BW, BM1, BN1	Heathy Woodland (EVC 48)	These habitat zones occurred along the rail trail reserve and were heavily degraded by grazing and soil disturbance. The majority of these patches contained large trees, which were generally in good health. The canopy cover was moderate-high (20-50%) and consisted of Swamp Gum and Coast Manna-gum which were generally in good health. Understory vegetation was sparse, primarily consisting of scattered Swamp Paperbark, Rush, Spike-rush, and Austral Bracken. Blackwood, Thatch Saw-sedge, Wattle Mat-rush. Recruitment of woody species was only observed in approximately half of these habitat zones. Bryophytes and Soil Crusts were virtually absent. Weed cover was high (50-70%) and primarily comprised introduced pasture grasses such as Toowoomba Canary-Grass, Sweet Vernal Grass and Cocksfoot. Blackberry and Sweet Briar were also common. Organic litter was low-moderate (15-25%) and mostly native, having been attributed to a build-up of eucalypt leaf litter. Large and small logs were abundant and often exceeded the benchmark.
BE, BP, BQ, BT	Heathy Woodland (EVC 48)	These habitat zones occurred along the rail trail reserve. Most of these patches contained large trees, which were generally in good health. The canopy cover was high (40-50%) and consisted of Swamp Gum and Coast Manna-gum which were generally in good health.

Habitat Zone	EVC	Description
		Understory vegetation was diverse, consisting of Swamp Paperbark, Scrub She-oak, Blackwood, Rush, Austral Bracken, Small Grass-tree and Spear Grasses. Most woody species observed were recruiting. Bryophytes and Soil Crusts were generally present at negligible covers (<1%). Weed cover was high (40-50%) and primarily comprised introduced pasture grasses such as Toowoomba Canary-Grass, Sweet Vernal Grass and Cocksfoot. Blackberry and Sweet Briar were also common. Organic litter was moderate (20-45%), and mostly native. Large and small logs were abundant and often exceeded the benchmark.
BY	Swamp Scrub (EVC 53)	This habitat zone occurred as part of the western boundary of Gelliondale State Forest. The canopy cover was low (5%), but very healthy. Native vegetation in the understory was extremely diverse. Swamp Paperbark, Scrub She-oak Common Reed, Pithy Sword-sedge, Spear Grasses and Common Raspwort were particularly abundant. Most woody species observed were recruiting. Bryophytes and lichen were abundant (20%), and soil crusts had negligible cover (<1%). Weed cover was low (10%) and primarily low threat, although Blackberry was present. Organic litter was high (60%) and largely native. This habitat zone was found to support orchids, but as they were not in flower they could not be identified.
BZ	Heathy Woodland (EVC 48)	This habitat zone occurred as part of the western boundary of Gelliondale State Forest. 12 large trees were recorded, which were in good health. The canopy was open (5%) and consisted of Messmate and Coast Manna-gum which were in good health. Understory vegetation was diverse, consisting of Beard Heath, Seaberry Saltbush, Mat-rush, Austral Bracken, Small Grass-tree, Spear Grasses and abundant small herbs such as Kidneyweed, Ivy-leaved Violet and Sieber Crassula. Most woody species observed were recruiting. Bryophyte cover was high (25%), and Soil Crusts were also prevalent (10%). Weed cover was moderate (25%) but primarily comprised introduced pasture grasses such as Toowoomba Canary-Grass and restricted to the edge of the patch. Organic litter was high (40%), and mostly native. Logs were present at a low cover, with large logs effectively absent relative to the patch size.

Habitat Zone	EVC	Description
CD	Wet Heathland (EVC 8)	This habitat zone occurred as part of the eastern boundary of Gelliondale State Forest. Native vegetation in the understory was extremely diverse. Swamp Paperbark, Scrub She-oak, Seaberry Saltbush, Common Reed, Pithy Sword-sedge, Spear Grasses and Common Raspwort were particularly abundant. Most woody species observed were recruiting. Bryophytes and lichen were abundant (20%), and soil crusts had low cover. Weed cover was low (5%) and primarily low threat, although Blackberry was present. Organic litter was moderate (20%) and largely native. This habitat zone was found to support orchids, but as they were not in flower they could not be identified.
CE	Wet Heathland (EVC 8)	This habitat zone occurred in the road reserve adjacent to of the eastern boundary of Gelliondale State Forest. Native vegetation in this habitat zone comprised Swamp Paperbark, Seaberry Saltbush, Common Reed, Spike-rushes, Rough Fireweed, Variable Plantain, Sheep's Burr, and Spear Grass. Most woody species observed were recruiting. Bryophytes were present (10%), and soil crusts were present at low cover (2%). Weed cover was moderate (40%) and was largely high-threat, including Spear Thistle, Blackberry and Drain Flat-sedge. Organic litter was low (15%) and largely exotic.
DA	Heathy Woodland (EVC 48)	This habitat zone occurred on private land associated with the Barry Beach port where road widening is proposed. Native vegetation in this habitat zone was dominated by Coast Wattle as well as a diversity of other shrubs such as Prickly Currant-bush, Swamp Paperbark and Coast Tea-tree. Canopy trees in the form of Saw Banksia and Manna Gum formed an open cover (5%) with three large trees in good health. Native vegetation in the understory was spare, mainly comprising graminoids such as Common Reed, Sword-sedge, and Spiny-headed Mat-rush. All woody species were observed to be recruiting. Bryophytes and lichens were present at low cover (5%), while soil crust cover was negligible. Leaf litter was moderate (35%) and predominantly native. Weed cover was moderate (30%) and predominantly composed of high-threat grassy species such as Couch, Sweet Vernal and Tall Fescue. This habitat zone extends south to the coastline, but the full habitat zone could not be assessed as access to this land had not been arranged.
DC	Heathy Woodland (EVC 48)	This habitat zone occurred in the road reserve of Barry Road adjacent to the property at 367 Barry Road, Welshpool. A single large Coast Manna-gum in good health formed the canopy of this patch (20%). Native understory comprised several shrubs of Saw Banksia, Scented Paperbark, Prickly Tea-tree, and Coast Beard-heath with patches of dense Pale Rush and Knobby Club-sedge. Coast Manna-gum and Prickly Tea-tree were observed to be recruiting.

Habitat Zone	EVC	Description
		Bryophytes and lichens were present at very low cover (2%), while soil crust cover was negligible. Leaf litter was moderate (40%) and predominantly exotic. 14m of small logs and 12m of large logs were recorded. Weed cover was very high (65%) and predominantly composed of high-threat grassy species such as Couch, Cocksfoot and Sweet Vernal.
DD	Heathy Woodland (EVC 48)	This habitat zone occurred on the roadside of Barry Road north of the port at Barry Beach, and was dominated by a healthy, dense (20%) canopy of Saw Banksia with occasional Coast Manna-gum. Thirteen large trees were present. Native understory was diverse, comprising a mixture of shrubs, herbs and graminoids such as Coast Beard-heath, Coast Wattle, Scented Paperbark, Broom Spurge, Short Purple-flag, Austral Grass-tree, Red-fruit Saw-sedge and Common Correa. All woody species were observed to be recruiting other than Dagger Wattle and Coast Manna-gum. Bryophytes and lichens were present at low cover (3%), while soil crusts were absent. Leaf litter was high (50%) and predominantly native. Small logs were abundant, and 41.5m large logs were recorded. Weed cover was moderate (10%) and predominantly composed of high-threat species such as Stinkwort, Sweet Vernal, Blackberry and Sweet Pittosporum.
DE	Lowland Forest (EVC 16)	This habitat zone occurred in the road reserve of Barry Road adjacent to the property at 10 Barry Road, Agnes. Young Messmate Stringybark formed an open canopy (8%) in good health. No large trees were recorded. Native understory comprised several shrubs of Swamp Paperbark and Prickly Tea-tree with scattered Slender Wallaby-grass, Weeping Grass, Tassel Rope-rush, and Shade Raspwort. All woody species were observed to be recruiting. Bryophytes and lichens were present at moderate cover (8%), while soil crusts were absent. Leaf litter was moderate (30%) and predominantly native. No logs were recorded. The weed cover was very high (75%) and predominantly composed of high-threat grassy species such as Yorkshire Fog, Buffalo Grass, Paspalum and Sweet Vernal.
DF	Lowland Forest (EVC 16)	This habitat zone occurred on the roadside of Shands Road and South Gippsland Highway adjacent to the property located at 4 Shands Road Welshpool, and was dominated by a healthy, moderate (20%) canopy of Messmate Stringybark. Eighteen large trees were present. Native understory was diverse, comprising a mixture of shrubs, herbs and graminoids including Prickly Currant-bush, Common Beard-heath, Sweet Bursaria, Austral Grass-tree, Forest Wire-grass, Austral Bracken and Common Rice-flower. The majority of woody species were observed to be recruiting. Bryophytes and lichens were present at low cover (5%), while soil crusts were absent. Leaf litter was high (50%) and predominantly native. Small logs were abundant, and 26.5m of large logs were recorded. The weed cover was high (45%) and predominantly composed of high-threat woody species such as Sweet Pittosporum and Montpellier Broom. <u>Six individuals of the FFG Act listed critically endangered species Bog Gum were recorded in this HZ.</u>
DG	Creekline Herb-rich	This habitat zone occurred on the roadside of Barry Road directly south of the intersection with South Gippsland Highway, and was dominated by a healthy,

Habitat Zone	EVC	Description
	Woodland (EVC 164)	moderate (20%) canopy of Coast Manna Gum, Swamp Gum, and Messmate Stringybark. Three large trees were present. Native understory was dominated by shrubs such as Blackwood, Snowy Daisy-bush, Prickly Tea-tree, Hop Goodenia and Sweet Bursaria with a ground layer of Austral Bracken and scattered herbs and graminoids such as Crane's Bill, Variable Groundsel and Weeping Grass. The majority of woody species were observed to be recruiting. Bryophytes and lichens were present at low cover (3%), while soil crusts were absent. Leaf litter was moderate (25%) and predominantly native. 42m of small logs and 12m of large logs were recorded. Weed cover was very high (55%) and predominantly composed of high-threat species such as Blackberry, Sweet Pittosporum and Couch.
DI	Plains Grassy Forest (EVC 151)	This habitat zone occurred in the north-east of the study area in the Great Southern Rail Trail corridor and supported an open (5%) canopy of Swamp Gum and Coast Grey-box in good health. Two large trees were recorded in this HZ. This habitat zone occurred amongst a broader row of planted Blue Gum. Native understory largely comprised a dense cover of Seaberry Saltbush with scattered shrubs, herbs and graminoids such as Blackwood, Black Sheoak, Weeping Grass, Tall Sedge and Nodding Saltbush. Bryophytes, lichens, and soil crusts were present at negligible cover (<1%), and leaf litter was moderate (35%) and predominantly native. No logs were recorded. Weed cover was high (45%) and predominantly comprised high-threat grasses such as Cocksfoot, Couch and Toowoomba Canary-grass. This habitat zone supported one individual of the FFG Act listed Endangered species Coast Grey-box.

The habitat hectare assessment results for these habitat zones are provided in Table 4. More detailed habitat scoring results are presented in Appendix 3. Details of large trees in patches are provided in Appendix 4.

Table 4: Summary of habitat hectare assessment results

Habitat Zone	EVC	Area (ha)	Condition score (out of 100)	No. of Large Trees in HZ
A	Aquatic Herbland (EVC 653)	0.042	39	0
B	Swamp Scrub (EVC 53)	0.023	11	0
C	Aquatic Herbland (EVC 653)	0.323	26	0
D	Swamp Scrub (EVC 53)	0.069	26	0
E	Swamp Scrub (EVC 53)	0.282	25	0
F	Swamp Scrub (EVC 53)	0.627	43	0
G	Swamp Scrub (EVC 53)	0.724	35	0
H	Swamp Scrub (EVC 53)	1.241	35	0
I	Swamp Scrub (EVC 53)	0.071	45	0
J	Swamp Scrub (EVC 53)	0.066	40	0
K	Swamp Scrub (EVC 53)	0.095	35	0
L	Swamp Scrub (EVC 53)	0.375	35	0
M	Swamp Scrub (EVC 53)	0.106	27	0
N	Swamp Scrub (EVC 53)	0.037	23	0
O	Swamp Scrub (EVC 53)	0.010	27	0
Q	Swamp Scrub (EVC 53)	0.227	27	0
R	Swamp Scrub (EVC 53)	0.073	22	0
S	Swamp Scrub (EVC 53)	0.023	32	0
T	Swamp Scrub (EVC 53)	0.077	27	0
U	Swamp Scrub (EVC 53)	0.699	30	0
V	Tall Marsh (EVC 821)	0.063	39	0
W	Swamp Scrub (EVC 53)	0.036	20	0
X1	Tall Marsh (EVC 821)	0.275	50	0
X2	Tall Marsh (EVC 821)	0.036	2	0
Y	Tall Marsh (EVC 821)	0.062	46	0
Z	Tall Marsh (EVC 821)	0.054	50	0
AA	Tall Marsh (EVC 821)	0.192	46	0
AB	Aquatic Herbland (EVC 653)	0.005	21	0
AC	Swamp Scrub (EVC 53)	0.100	21	0
AD	Swamp Scrub (EVC 53)	0.110	30	0
AE	Swamp Scrub (EVC 53)	0.011	30	0
AF	Swamp Scrub (EVC 53)	0.063	30	0
AG	Swamp Scrub (EVC 53)	0.023	30	0
AH	Swamp Scrub (EVC 53)	0.013	30	0
AI	Swamp Scrub (EVC 53)	0.084	30	0
AK	Swamp Scrub (EVC 53)	0.240	28	0
AL	Swamp Scrub (EVC 53)	0.190	28	0

Habitat Zone	EVC	Area (ha)	Condition score (out of 100)	No. of Large Trees in HZ
AM	Swamp Scrub (EVC 53)	0.010	23	0
AN	Swamp Scrub (EVC 53)	0.005	23	0
AO	Swamp Scrub (EVC 53)	0.066	25	0
AP	Swamp Scrub (EVC 53)	0.079	25	0
AQ	Swamp Scrub (EVC 53)	0.098	25	0
AR	Swamp Scrub (EVC 53)	0.150	25	0
AS	Swamp Scrub (EVC 53)	0.130	25	0
AT	Swamp Scrub (EVC 53)	0.170	25	0
AU	Swamp Scrub (EVC 53)	0.063	25	0
AV	Heathy Woodland (EVC 48)	0.085	31	5
AX	Heathy Woodland (EVC 48)	0.048	38	3
AZ	Heathy Woodland (EVC 48)	0.046	36	3
BA	Heathy Woodland (EVC 48)	0.019	34	1
BB	Heathy Woodland (EVC 48)	0.099	40	5
BC	Swamp Scrub (EVC 53)	0.069	34	0
BD	Swamp Scrub (EVC 53)	0.173	31	6
BE	Heathy Woodland (EVC 48)	0.173	40	0
BF	Heathy Woodland (EVC 48)	0.059	25	3
BG	Heathy Woodland (EVC 48)	0.018	40	2
BI	Heathy Woodland (EVC 48)	0.054	33	4
BK	Heathy Woodland (EVC 48)	0.035	38	2
BM	Heathy Woodland (EVC 48)	0.012	27	0
BM1	Heathy Woodland (EVC 48)	0.019	28	0
BN	Heathy Woodland (EVC 48)	0.019	28	0
BN1	Heathy Woodland (EVC 48)	0.029	38	1
BO	Heathy Woodland (EVC 48)	0.130	38	4
BP	Heathy Woodland (EVC 48)	0.510	51	4
BQ	Heathy Woodland (EVC 48)	0.150	43	1
BR	Swamp Scrub (EVC 53)	0.005	23	0
BS	Swamp Scrub (EVC 53)	0.011	23	0
BT	Heathy Woodland (EVC 48)	0.320	31	1
BU	Heathy Woodland (EVC 48)	0.151	27	0
BW	Heathy Woodland (EVC 48)	0.180	31	1
BX	Swamp Scrub (EVC 53)	0.096	28	0
BY	Swamp Scrub (EVC 53)	7.400	68	0
BZ	Heathy Woodland (EVC 48)	0.810	75	12
CB	Swamp Scrub (EVC 53)	0.130	48	0
CC	Swamp Scrub (EVC 53)	0.073	48	0

Habitat Zone	EVC	Area (ha)	Condition score (out of 100)	No. of Large Trees in HZ
CD	Wet Heathland (EVC 8)	0.260	76	0
CE	Wet Heathland (EVC 8)	0.045	67	0
CF	Swamp Scrub (EVC 53)	0.700	25	0
CG	Swamp Scrub (EVC 53)	0.034	21	0
CH	Swamp Scrub (EVC 53)	0.068	21	0
CI	Swamp Scrub (EVC 53)	0.110	22	0
CJ	Aquatic Herbland (EVC 653)	2.000	28	0
CK	Swamp Scrub (EVC 53)	3.259	44	0
CL	Swamp Scrub (EVC 53)	0.184	27	0
CM	Swamp Scrub (EVC 53)	0.040	27	0
CN	Swamp Scrub (EVC 53)	0.027	33	0
DA	Heathy Woodland (EVC 48)	0.470	62	3
DB	Swamp Scrub (EVC 53)	0.026	30	0
DC	Heathy Woodland (EVC 48)	0.029	45	1
DD	Heathy Woodland (EVC 48)	0.270	74	13
DE	Lowland Forest (EVC 16)	0.043	20	0
DF	Lowland Forest (EVC 16)	0.340	56	18
DG	Creekline Herb-rich Woodland (EVC 164)	0.350	51	3
DH	Swamp Scrub (EVC 53)	0.128	28	0
DI	Plains Grassy Forest (EVC 151)	0.176	34	2
DJ	Swamp Scrub (EVC 53)	0.053	21	0
EA	Swamp Scrub (EVC 53)	0.019	23	0
EB	Swamp Scrub (EVC 53)	0.030	23	0
EC	Swamp Scrub (EVC 53)	0.037	16	0
ED	Tall Marsh (EVC 821)	0.070	50	0
Total		**26.001**		**98**

Scattered trees

Scattered trees recorded in the study area would have once comprised the canopy component of Lowland Forest (EVC 16) and Heathy Woodland (EVC 48).

45 scattered trees occurred in the study area including:

- 25 large, scattered trees (≥40 DBH for *Banksia spp.* and ≥ 50 DBH for *Eucalyptus spp*. in Heathy Woodland; ≥70 DBH for *Eucalyptus spp*. in Lowland Forest); and
- 20 small, scattered trees (<40 DBH for *Banksia spp.* and < 50 DBH for *Eucalyptus spp*. in Heathy Woodland; <70 DBH for *Eucalyptus spp*. in Lowland Forest).

Details of all scattered trees recorded are listed in Appendix 4.

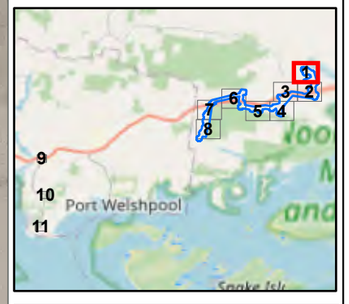
Figure 2-1 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 9/10/2024

Project area
Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- DEECA mapped wetland
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- Native vegetation to be removed



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Metres
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Figure 2-2 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 9/10/2024

Project area
Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- DEECA mapped wetland
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- Native vegetation to be removed

N

Metres
0 80

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Figure 2-3 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 9/10/2024

Project area
Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- DEECA mapped wetland
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- Native vegetation to be removed

N

Metres
0 80

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Figure 2-4 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 9/10/2024

Project area
Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- DEECA mapped wetland
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- Native vegetation to be removed

N

Metres
0 80

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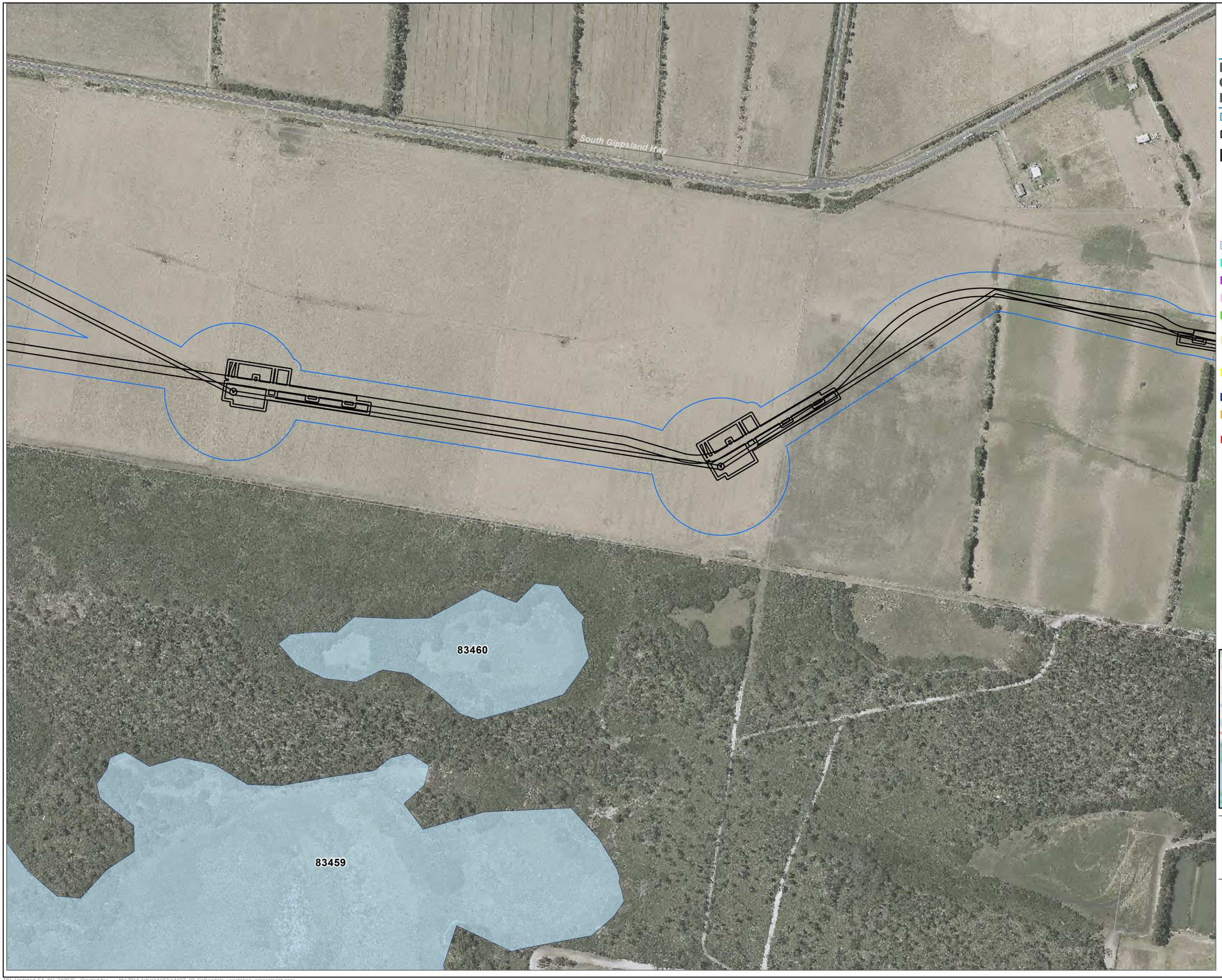
Figure 2-5 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 9/10/2024

Project area
Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- DEECA mapped wetland
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- Native vegetation to be removed



N

Metres
0 80

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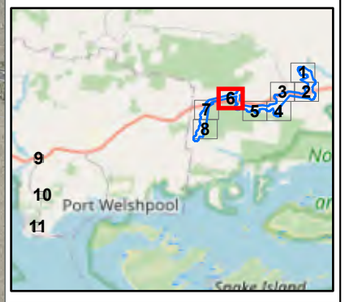
Figure 2-6 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 9/10/2024

Project area
Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- DEECA mapped wetland
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- Native vegetation to be removed



N

Metres
0 80

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Figure 2-7 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 9/10/2024

Project area
Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- DEECA mapped wetland
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- Native vegetation to be removed

N

Metres
0 80

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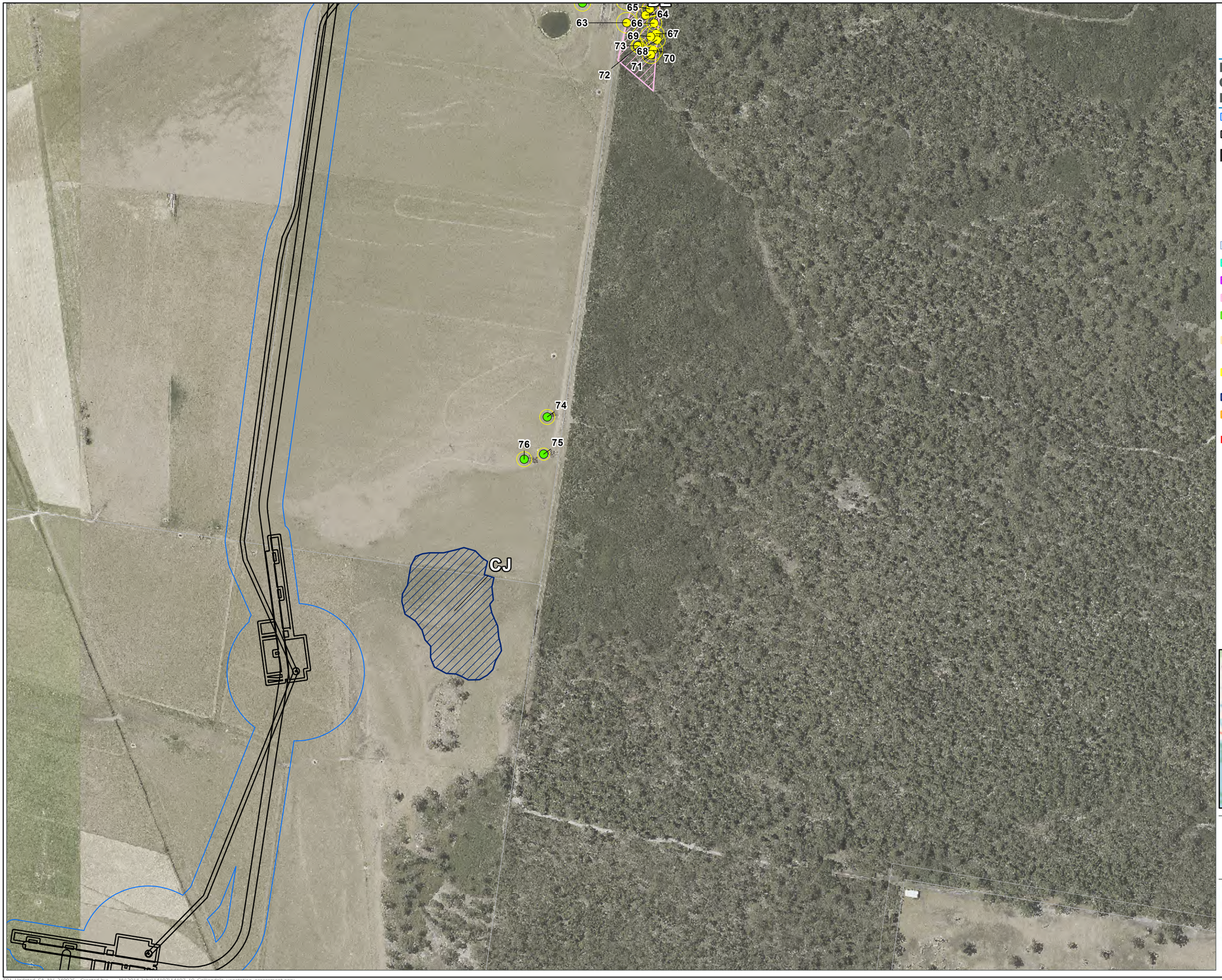

Figure 2-8 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 9/10/2024

Project area
Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- DEECA mapped wetland
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- Native vegetation to be removed

N

Metres
0 80

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Figure 2-9 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 9/10/2024

Project area
Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- DEECA mapped wetland
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- Native vegetation to be removed

N

Metres
0 30

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Figure 2-10 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 9/10/2024

Project area
Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- DEECA mapped wetland
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- Native vegetation to be removed

N

Metres
0 30

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Figure 2-11 Native vegetation to be removed

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 9/10/2024

Project area
Project footprint

Native vegetation

- Large Scattered Tree
- Large Tree in Patch
- Small Scattered Tree
- Tree to be removed
- DEECA mapped wetland
- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)
- Native vegetation to be removed

N

Metres
0 30

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4.4.2. Flora species

Flora species recorded

One hundred and sixteen plant species were recorded during the current field assessment. Of these, 74 (64%) were indigenous and 42 (36%) were introduced or non-indigenous native in origin (Appendix 5).

Listed species

VBA records (DELWP 2022c) and the EPBC Protected Matters Search Tool (DAWE 2022) indicated that within the search region there were records of, or there occurred potential suitable habitat for, nine species listed under the Commonwealth EPBC Act and seven listed under the state FFG Act, including seven listed under both Acts. No flora species listed under the EPBC Act were recorded. The following species listed under the FFG Act were recorded during the field survey:

- Coast Grey-box (FFG Act: Endangered)
- Bog Gum (FFG Act: Critically Endangered)

The likelihood of occurrence in the study area of species listed under the EPBC Act and FFG Act is addressed in Table 3. Species considered 'likely to occur' are those that have a very high chance of being in the study area based on numerous records in the search region and suitable habitat in the study area. Species considered to have the 'potential to occur' are those where suitable habitat exists, but recent records are scarce.

This analysis indicates that the following further 25 listed flora species are likely to occur or have the potential to occur:

EPBC Act

- Clover Glycine (EPBC Act: Vulnerable; FFG Act: Vulnerable);
- Dense Leek-orchid (EPBC Act: Vulnerable; FFG Act: Critically Endangered);
- Eastern Spider-orchid (EPBC Act: Endangered; FFG Act: Endangered);
- Metallic Sun-orchid (EPBC Act: Endangered; FFG Act: Endangered);
- Maroon Leek-orchid (EPBC Act: Endangered; FFG Act: Endangered);
- River Swamp Wallaby-grass (EPBC Act: Vulnerable);
- Strzelecki Gum (EPBC Act: Vulnerable; FFG Act: Critically Endangered);
- Thick-lip Spider-orchid (EPBC Act: Vulnerable)

FFG Act

- Silver Everlasting (FFG Act: Endangered);
- Velvet Appleberry (FFG: Endangered);
- Creeping Rush (FFG Act: Endangered);
- Fringed Helmet-orchid (FFG Act: Endangered);
- Lizard Orchid (FFG Act: Endangered);
- Orange-tip Finger-orchid (FFG Act: Endangered);
- Large White Spider-orchid (FFG Act: Endangered);
- Southern Blue-gum (FFG Act: Endangered);

- Bog Gum (FFG: Critically Endangered);
- Spurred Helmet-orchid (FFG Act: Endangered);
- Small Wax-lip Orchid (FFG Act: Endangered);
- Lacy Wedge-fern (FFG Act: Endangered);
- Currant Wood (FFG: Endangered);
- Green Leek-orchid (FFG Act: Endangered);
- Slender Leek-orchid (FFG Act: Endangered);
- Slender Bog-sedge (FFG Act: Vulnerable); and
- Parsley Xanthosia (FFG Act: Endangered).

None of these species were recorded within the Alberton Wind Farm project area in 2016. Most threatened groundcover species (i.e. orchid species, Silver Everlasting, Lacy Wedge-fern, Slender Bog-sedge, Parsley Xanthosia and Clover Glycine) would only have potential to occur within the heathland and heathy woodland areas of the adjacent Gelliondale State Forest, which is not going to be impacted. River Swamp Wallaby-grass and Creeping Rush are likely to only occur in higher-quality wetlands and permanent swamps that are not proposed to be impacted. Additionally, the location and species of all trees within the study area was recorded, and it was determined that no threatened tree species (i.e. Southern Blue-gum, Coast Grey-box, Bog Gum and Strzelecki Gum) recorded within the study area will be impacted by the proposed wind farm layout.

Listed ecological communities

Two EPBC-listed ecological communities were modelled to potentially occur in the study area. Based on an assessment of native vegetation in the study area against published descriptions and condition thresholds, the communities below were found not to occur in the study area based on the factors described:

- ***Natural Damp Grassland of the Victorian Coastal Plains*** – listed as critically endangered under the EPBC Act (potential to occur in damp areas in the south-eastern corner of the broader study area). However, no grassland habitat was identified within the development footprint and targeted surveys confirmed that this community is not present in the study area.
- ***Subtropical and Temperate Coastal Saltmarsh*** – listed as vulnerable under the EPBC Act (in areas of coastal saltmarsh, where tidal inundation is infrequent). Areas of suitable habitat for this community occur outside the proposed development footprint.

Based on an assessment of native vegetation in the study area against published descriptions and condition thresholds, the FFG-listed communities below were found not to occur in the study area based on the factors described below.

- ***Central Gippsland Plains Grassland*** - Native grasslands in the broader study area did not support the structure or floristic assemblage described in the Characteristics of Threatened Communities description of this community (e.g., dominance of Kangaroo Grass). Additionally, this community is highly restricted in its distribution, with less than 20-30 hectares remaining and all of these occurring beyond the study area.
- ***Warm Temperate Rainforest (E.Gipps. Alluvial Terraces)*** – Rainforest habitat was absent from the study area, and remnant native vegetation lacked characteristic canopy components of this community (i.e. Lilly Pilly and Muttonwood). Therefore, remnant native vegetation was not consistent with the Characteristics of Threatened Communities description of this community.

Table 5: FFG Act and EPBC Act listed flora species and likelihood of occurrence

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Sticky Wattle	*Acacia howittii*		VU	Occurs in moist forest habitat in eastern Victoria, though the species is also widely cultivated and naturalised. Distributed in the vicinity of the Upper Macallistar River area near Mount Howitt, Yarram and Tabberabbera. Flowers October (RBVG 2023).	VBA	18	15/11/2018	Within endemic range. However, no moist forest habitat in the study area, and wooded habitats degraded. Conspicuous species not recorded in the field survey. **Unlikely to occur.**
Broad-leaf Prickly Moses	*Acacia verticillata subsp. ruscifolia*		EN	Tas. Victoria, where apparently restricted to Wilsons Promontory and Sunday Island; phyllodes 3–5 mm wide; plants with intermediate phyllodes found in Otway Range but these seem to be better placed in *A. verticillata* subsp. *verticillata* due to the absence of plants with broader phyllodes (3–5 mm wide) in this region (VicFlora 2022).	VBA	2	14/11/2011	Study area outside of known distribution of highly localised subspecies. **Unlikely to occur.**
River Swamp Wallaby-grass	*Amphibromus fluitans*	VU		River Swamp Wallaby-grass grows mostly in permanent swamps and lagoons, billabongs, dams and roadside ditches. The species requires moderately fertile soils with some bare ground; conditions that are caused by seasonally fluctuating water levels (DCCEEW 2023).	PMST & VBA	2	18/04/2007	Habitat present within drainage channels, vegetated dams and waterways, though recent records within the search region are limited. **Potential to occur.**
Silver Everlasting	*Argentipallium dealbatum*		EN	In near coastal heathlands of the south-west (Portland-Digby areas) and South Gippsland (Cape Liptrap to Yarram) (Short 1999).	VBA	3	9/12/1978	Heathland and heathy woodland patches within Gelliondale State Forest supported less degraded ground layers that may be suitable for the species.

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
								However, nearby records are pre-2000. **Potential to occur.**
Marsh Saltbush	*Atriplex paludosa subsp. paludosa*		EN	Occurs in coastal and near-coastal saltmarsh habitat. Distribution begins west of Wilsons Promontory, however two records exist in the northwest of Victoria around Murrayville and Lake Hindmarsh. Flowers all year (RBGV 2023).	VBA	2	02/05/1853	No saltmarsh habitat is present in the study area. **Unlikely to occur.**
Grey Mangrove	*Avicennia marina subsp. australasica*		EN	Grows in tidal mudflat habitats, situated in bays, estuaries and creek mouths. This species is locally common from western Port Phillip Bay to Corner Inlet. Flowers all year (RBGV 2023).	VBA	19	17/05/2017	The study area does not include any tidal areas that could support Mangrove growth. **Does not occur.**
Velvet Apple-berry	*Billardiera scandens s.s.*		EN	An uncommon species that favours dry open-forest and woodland habitat. The species is distributed in the northeast of Victoria, with some isolated occurrences noted in Mount Macedon, the Eltham-Hurstbridge area, Eildon and Orbost. Flowers November to February (RBGV 2023).	VBA	2	18/04/2019	The study area supports habitat in the form of roadside heathy woodland near Agnes. **Potential to occur.**
Variable Bossiaea	*Bossiaea heterophylla*		EN	Favours sandy soils in a variety of habitats including heath and open woodlands. Confined to Gippsland east of Rosedale (Walsh & Entwisle 1996).	VBA	1	28/02/2006	Study area outside of known distribution, which extends southwards from Rosedale to Won Wron and includes a population in Wilsons Promontory. Forest and woodland habitat within the study area is highly degraded. **Unlikely to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
River Leafless Bossiaea	*Bossiaea riparia*		EN	NSW and Tasmania. Victoria, uncommon to rare, in south-west, Grampians and east, growing on streambanks, and in moist and dry situations in dry sclerophyll forest, often at relatively high altitudes (VicFlora 2022).	VBA	1	3/06/2019	No streams occur in the study area, which largely comprises low-altitude plains. Woodland habitat within the study area is highly degraded. **Unlikely to occur.**
Lizard Orchid	*Burnettia cuneata*		EN	Favours wet heathy habitat, primarily in near-coastal regions. Distributed from Portland to Mallacoota, with a single inland occurrence noted in the Grampians. Flowers from September to November, though primarily following summer fires (RBGV 2023).	VBA	1	9/12/1978	Heathland and heathy woodland patches within Gelliondale State Forest supported less degraded ground layers that may be suitable for the species. However, nearby records are very limited and pre-2000. **Potential to occur.**
Orange-tip Finger-orchid	*Caladenia aurantiaca*		EN	Grows in heathy habitat on well-drained sandy soils. Occurs in coastal and near-coastal areas east of Melbourne and as far east as Mallacoota. Flowers from September to October (RBGV 2023).	VBA	6	30/10/2004	Heathland and heathy woodland patches within Gelliondale State Forest supported less degraded ground layers that may be suitable for the species, and multiple nearby records are present. **Potential to occur.**
Christmas Spider-orchid	*Caladenia flavovirens*		CR	Grows in habitats ranging from heathy woodland to moist foothill-forest when inland, and scrubland in coastal and near-coastal settings. Distributed around Portland, the Dandenong Ranges and north-east Victoria. Flowers December to January (Jeanes & Backhouse 2006; RBGV 2023).	VBA	2	01/01/1770	The study area occurs outside the known distribution of the species. Nearby records are very limited and pre-1800. **Unlikely to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Eastern Spider-orchid	*Caladenia orientalis*	EN	EN	Grows on well-drained sandy soils, in coastal heathland and heathy woodland habitat. This species is primarily distributed around Grantville and Yarram. Flowers from September to October (Jeanes & Blackhouse 2006; RBGV 2023).	PMST & VBA	2	4/10/1939	Heathland and heathy woodland patches within Gelliondale State Forest supported less degraded ground layers that may be suitable for the species. However, nearby records are pre-2000. **Potential to occur.**
Thick-lip Spider-orchid	*Caladenia tessellata*	VU		Coastal open woodlands, lowland forest, heathy woodland (Entwisle 1994).	PMST & VBA	2	15/04/1992	Heathland and heathy woodland patches within Gelliondale State Forest supported less degraded ground layers that may be suitable for the species. However, nearby records are pre-2000. **Potential to occur.**
Large White Spider-orchid	*Caladenia venusta*		EN	Grows in woodland and heathy woodland habitat, on well-drained to moist soils. Usually found in coastal and sub-coastal areas, though the species is also known from the Grampians. Flowers from September to November (RBGV 2023).	VBA	1	1/10/1931	Heathland and heathy woodland patches within Gelliondale State Forest supported less degraded ground layers that may be suitable for the species. However, nearby records are pre-2000. **Potential to occur.**
River Hook-sedge	*Carex nemoralis*		EN	Temperate rainforests and shaded tall open forests of the Strzelecki and Bowen Ranges, and catchments of the major East Gippsland river systems	VBA	1	11/07/7199 7	The study area lies to the south of known distribution and does not support rainforest or tall open forest vegetation. **Unlikely to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Pale Swamp Everlasting	*Coronidium gunnianum*		CR	Occurs predominantly in grasslands and riverine River Red-gum woodland of fertile plains on soils that are prone to inundation (e.g., gilgai depressions and seasonal herbaceous wetlands) (DEECA 2023; RBGV 2023).	VBA	3	6/06/2016	Most areas in the study area are prone to inundation, but no grassland was recorded and woodlands typically dominated by heathy vegetation and not including River Red-gum. **Unlikely to occur.**
Spurred Helmet-orchid	*Corybas aconitiflorus*		EN	Grows on damp sands in association with shrubbery and ferns. Known from the southeast of Victoria, with outlying populations near Portland and Edenhope in the far west of the state. Flowers from May to July (RBGV 2023).	VBA	2	30/10/1983	Heathland and heathy woodland patches within Gelliondale State Forest supported less degraded ground layers that may be suitable for the species. However, nearby records are pre-2000. **Potential to occur.**
Fringed Helmet-orchid	*Corybas fimbriatus*		EN	Found in colonies in moist, shaded habitat on sandy soils. The species is primarily found east of Western Port, though outlying occurrences have been noted east and northeast of Melbourne (RBGV 2023).	VBA	3	14/06/2020	Heathland and heathy woodland patches within Gelliondale State Forest supported less degraded ground layers that may be suitable for the species. **Potential to occur.**
Spotted Gum	*Corymbia maculata*		VU	Coastal Plains and hills. Endemic to the Tara range in East Gippsland (Walsh & Entwistle 1999).	VBA	1	1/03/2006	Study area outside of endemic range. Nearby record likely represents a cultivated individual. **Does not occur as remnant vegetation.**
Grey Billy-buttons	*Craspedia canens*		CR	Lowland grasslands, often on swamp fringes. Current records occur between Cranbourne and Traralgon (Everett 1999).	VBA	1	29/10/1983	No grassland vegetation occurs in the study area. No nearby recent records. **Unlikely to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Coast Boronia	*Cyanothamnus anemonifolius subsp. variabilis*		CR	Grows in heathland habitat. Records are only known from Sunday and Snake Islands, in the vicinity of Wilsons Promontory (RBGV 2024).	VBA	2	14/06/1965	Although some suitable heathland habitat is present, this species is only known from more coastal areas on the Sunday and Snake Islands. **Unlikely to occur.**
Slender Tree-fern	*Cyathea cunninghamii*		CR	Deep loamy humus soils on the banks of sheltered gullies in wet, hilly regions. Found in Otway Ranges, Dandenong Ranges, Tarra-Bulga National Park, Wilsons Promontory and Mt Drummer (Entwisle 1994).	VBA	79	26/07/2012	No sheltered gullies and associated wet forest and rainforest vegetation occur in the study area. **Unlikely to occur.**
Matted Flax-lily	*Dianella amoena*	EN	CR	Mostly found in drier lowland grassland and grassy woodlands on well-drained to seasonally waterlogged fertile sandy loams to heavy cracking soils derived from sedimentary or volcanic geology. Commonly associated native species include *Themeda triandra, Microlaena stipoides* var. *stipoides, Anthosachne scaber, Poa labillardierei* and *Rytidosperma racemosum* var. *racemosum*. Most sites contain a high cover of introduced plant species, and the surrounding landscape is often highly altered. Widely distributed from eastern to south-western Victoria. Flowers from December to February (Carter 2010; RBGV 2023).	PMST	No VBA records	N/A	Soils largely non-clay within study area. No grassland habitat occurs, and woodlands typically dominated by heath. **Unlikely to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Coast Coral Heath	*Epacris microphylla s.s.*		VU	Grows in low damp heath and scrub on granite-derived soils. Known from Wilsons Promontory and far eastern Victoria (RBGV 2024).	VBA	1	01/12/1882	Although some suitable heathland and scrub habitat is present, this species is believed to be restricted Wilsons Promontory and the far east of the state. **Unlikely to occur.**
Gippsland Lakes Peppermint	*Eucalyptus arenicola*		EN	Occurs in coastal and near-coastal areas in sandy soils.	VBA	3	11/12/1996	Some habitat occurs, but the study area is outside of known distribution which has a southern extent north of Yarram. **Unlikely to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Southern Blue-gum	*Eucalyptus globulus subsp. globulus*		EN	Occurs in wet forests on a range of aspects, often in association with Mountain Ash or Mountain Grey-gum (DEECA 2023). In Victoria, the natural distribution of subsp. *globulus* is thought to be the area south of the Strzelecki Range, e.g. Port Franklin, Wilsons Promontory, and that other populations in south Gippsland and the Otway Ranges probably represent intergrades between the other sub-species (RBGV 2023). Indigenous occurrences of the taxon are reliably recorded also for French Island and Phillip Island in Western Port Bay (DEECA 2023). The taxon intergrades extensively with subsp. *globulus, bicostata* and *pseudoglobulus* which can make it almost impossible to definitively attribute to a certain subspecies (RBGV 2023). All other records of the taxon throughout Victoria, particularly in the Melbourne and Ballarat regions, but extending as far as Hamilton, Bendigo and the La Trobe Valley, are either plantings, garden escapes or wildings from plantations (DEECA 2023).	VBA	11	17/01/2019	Within endemic distribution, and habitat occurs. Several planted individuals were observed in windbreaks throughout the study area, and an individual was observed in rail-trail corridor east of the study area during field assessment. **Known to occur.**
Bog Gum	*Eucalyptus kitsoniana*		CR	Known from lowland areas along the coast of the state. The species is distributed from Portland in the far west, to Port Welshpool in the east. Flowers from August to March (RBGV 2023).	VBA	16	6/06/2016	Habitat is present throughout the study area and recorded in roadside heathy woodland near Agnes. **Known to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Strzelecki Gum	*Eucalyptus strzeleckii*	VU	CR	The species grows on deep, fertile loams in damp hilly country and along the banks of watercourses. It is distributed along the western Strzelecki Ranges, as far north as Neerim South and potentially as far south as Wilsons Promontory. Survey in spring to best identify glossy new growth (Carter 2006).	PMST & VBA	4	24/02/2012	The study area is dominated by lowland plains with heavy soils grading into coastal sands. Some habitat occurs, but treed vegetation largely cleared from the study area. **Potential to occur.**
Promontory Peppermint	*Eucalyptus willisii s.s.*		VU	Confined to granite hills and sandy areas within Wilsons Promontory.	VBA	1	17/12/1996	Sandy habitat occurs within the study area, but the study area outside of endemic range. **Unlikely to occur.**
Coast Ballart	*Exocarpos syrticola*		EN	A locally common species found in coastal dunes and along cliffs. Distributed along the coast from Wilsons Promontory and to the west. Flowers from September to December (RBGV 2023).	VBA	5	28/09/2004	The study area is near-coastal but does not support coastal dunes and cliffs. **Unlikely to occur.**
Small Wax-lip Orchid	*Glossodia minor*		EN	Coastal heathlands, moist and sandy (Entwisle 1994). Largely restricted to east Gippsland, with some records near Traralgon, Yarram and Wilsons Promontory (RBGV 2024).	VBA	1	1/11/1929	Heathland and heathy woodland patches within Gelliondale State Forest supported less degraded ground layers that may be suitable for the species. However, nearby records are very limited and pre-2000. **Potential to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Clover Glycine	*Glycine latrobeana*	VU	VU	Primarily favours grassland and grassy woodland, though also known from dry forest and rarely heathland. This species mostly grows on clays and sometimes more loamy soils. Distribution is widespread but sporadic across the state. Flowers during spring at lower elevations, and during summer at higher elevations (Carter & Sutter 2010).	PMST & VBA	1	18/04/2019	Habitat present within more open areas of heathy woodland and swamp scrub with intact grassy ground layer within Gelliondale State Forest. **Potential to occur.**
Creeping Rush	*Juncus revolutus*		EN	Found growing in damp, saline habitat. Primarily concentrated along the coast, though the species is also known from saline lakes on the volcanic plain. Flowers from October to January (EBGV 2023).	VBA	6	11/12/1983	Some degraded subsaline wetland habitat occurs in the study area. **Potential to occur.**
Purple Blown-grass	*Lachnagrostis semibarbata var. semibarbata*		EN	Grow in partially saline depressions in grassland and sometimes woodland habitat. Occurs in the south of the state, where distribution is scattered from around Sale to the South Australian border. Flowers from October to February (RBGV 2023).	VBA	1	01/01/1876	Grassland habitat was absent and woodland habitat lacked suitable subsaline depressions. **Unlikely to occur.**
Salt Lawrencia	*Lawrencia spicata*		EN	Found sporadically in saline habitat, such as saltmarsh, around salt lakes and within saline depressions. This species is primarily coastal in distribution, with inland occurrences in south-west Victoria. Flowers from January to April (RBGV 2023).	VBA	7	28/09/2004	No saltmarsh or saline depression habitat occurs in the study area. **Unlikely to occur.**
Yellow Sea-lavender	*Limonium australe var. australe*		EN	In Victoria, occurs in mangrove and saltmarsh communities from near Point Lonsdale through to Corner Inlet (RBGV 2023). It is absent from the low-rainfall	VBA	13	29/09/2004	No saltmarsh or mangrove communities occurs in the study area. **Unlikely to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
				saltmarsh on the western shores of Port Phillip Bay (DEECA 2023).				
Giant Honey-myrtle	*Melaleuca armillaris subsp. armillaris*		EN	Near coastal sandy heaths from Marlo eastwards. Widely planted.	VBA	1	1/03/2006	The study area outside of endemic range. Nearby records likely comprise planted or naturalised individuals. **Does not occur.**
Lacy Wedge-fern	*Lindsaea microphylla*		EN	Found amongst undergrowth vegetation in heath, open-forest and man-made habitats (e.g. excavations). The species is widespread across east Gippsland and is rarer and more localised in west Gippsland (RBGV 2023).	VBA	1	1/10/1945	Heathland and heathy woodland patches within Gelliondale State Forest supported less degraded ground layers that may be suitable for the species. However, nearby records are very limited and pre-2000. **Potential to occur.**
Currant-wood	*Monotoca glauca*		EN	Occurs on infertile sandy soils at sea-level or on near-coastal high-rainfall ranges. Grows in open-forest, heathy woodland, wet closed scrub and margins of cool-temperate rainforest (Albrecht 1996).	VBA	2	1/09/2003	Habitat occurs in heath and heathy woodland throughout the study area. **Potential to occur.**
Coast Fescue	*Poa billardierei*		EN	Occurs patchily along the entire Victorian coast on stable or semi-stable foredunes, primarily along high-energy ocean beaches. Flowers from September to October (DEECA 2023; RBGV 2023)	VBA	2	15/04/1992	The study area does not support coastal sand dunes. **Unlikely to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Tasman Pomaderris	*Pomaderris apetala subsp. maritima*		EN	Grows on low dunes and sea cliffs. Known from Wilsons Promontory, Corner Inlet, and the western limit of the Ninety Mile Beach (RBGV 2024).	VBA	2	15/11/2011	The study area does not support coastal sand dunes or sea cliffs. **Unlikely to occur.**
Maroon Leek-orchid	*Prasophyllum frenchii*	EN	EN	Distributed sporadically throughout the whole of southern Victoria where it grows mostly in the lowlands with rare occurrences in the foothills. Occurs in grassland, grassy woodland, heathland and open forest on well-drained but usually damp sandy to black clay loams, although some sites are seasonally waterlogged. This includes sites that occur in seasonally damp transition zones on the margins of shallow freshwater swamps and marshlands. Flowers from October to November (DEECA 2023; RBGV 2023; Duncan 2010).	PMST & VBA	4	1/09/2003	Habitat present within more open areas of heathy woodland and swamp scrub with intact grassy ground layer within Gelliondale State Forest. **Potential to occur.**
Green Leek-orchid	*Prasophyllum lindleyanum*		EN	Widely distributed throughout the whole of Victoria, but occurrence is sporadic. Occurs in near-coastal scrub, coastal heath, scrubby heath, dry woodlands further inland, mountain open forest and sub-alpine herb fields on fertile, light sandy loam to heavier clay loam soils. Flowers from September to January (DEECA 2023; RBGV 2023).	VBA	1	4/10/1939	Habitat present within more open areas of heathy woodland and swamp scrub with intact grassy ground layer within Gelliondale State Forest. However, nearby records are pre-2000. **Potential to occur.**
Slender Leek-orchid	*Prasophyllum parviflorum*		EN	Scattered through near-coastal heaths in sandy loam or peaty soils east of French Island and is apparently rare (Bates 1994).	VBA	9	12/11/1932	Habitat present within more open areas of heathy woodland and swamp scrub with intact grassy ground layer within Gelliondale State Forest.

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
								However, nearby records are pre-2000. **Potential to occur.**
Dense Leek-orchid	*Prasophyllum spicatum*	VU	CR	Distributed across southern Victoria primarily along the coast from the South Australian border to Wonthaggi. Primarily occurs in low, windswept coastal and near-coastal heathland, sandhills and heathy woodland where soils are generally sand and clay loams which are usually damp but well-drained, although some sites can experience seasonal waterlogging. Also found in grasslands. Flowers from October to December (DEECA 2023; RBGV 2023; Duncan 2010).	PMST	No VBA records	N/A	The study area supports near-coastal heathland and heathy woodland within Gelliondale State Forest, with sandy soils prone to waterlogging. **Potential to occur.**
Coastal Greenhood	*Pterostylis alveata*		VU	Coastal tea-tree heath and dunes (Jones 1994).	VBA	3	7/05/1940	No suitable tea-tree heath or dune habitat present in the study area. **Unlikely to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Green-striped Greenhood	*Pterostylis chlorogramma*	VU	EN	Found growing on sandy-loam soils in Box-Stringybark Forest, often supporting a canopy of *Eucalyptus obliqua, Eucalyptus radiata, Eucalyptus cephalocarpa* and/or *Eucalyptus cypellocarpa*. The understory typically comprises a dominant Pteridium esculentum component, and may also include *Hakea ulicina, Dillwynia glaberrima, Pultenaea scabra, Banksia spinulosa, Epacris impressa, Acacia mucronata, Leptospermum laevigatum, Monotoca scoparia*, and *Bursaria spinosa*. The species has a scattered distribution from Yarram to Edenhope. Flowers from July to September (Duncan, Pritchard & Coates 2009).	PMST	No VBA records	N/A	No Box-stringybark forest occurs in the study area. **Unlikely to occur.**
Fisch's Greenhood	*Pterostylis fischiorum*		EN	Among grass and low shrubs in moist areas of open forest, uncommon in Victoria (Jones 1994).	VBA	1	10/05/1968	No grassy open forest occurs in the study area. **Unlikely to occur.**
Cobra Greenhood	*Pterostylis grandiflora*		EN	Occurs in open forest on damp, shady slopes supporting well-drained soils. Distributed in the east of Victoria, primarily in near-coastal areas. Flowers from May to August (RBGV 2023).	VBA	41	3/06/2019	No suitable tall wet forest or gully habitat occurs in the study area. Remnant Heathy Woodland and Lowland Forest patches demonstrated a high cover of weeds in their ground layer, which is likely to exclude this species. **Unlikely to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Small Sickle Greenhood	*Pterostylis lustra*		EN	Restricted to waterlogged black, peaty alkaline soils in closed, Woolly Tea-tree scrub within swamps and along watercourses. Vegetation considered to be a suitable habitat provides a continuous canopy over a relatively open understorey with a herbaceous ground layer. *Gahnia* species, *Viola hederacea, Lobelia species, Selliera radicans* and *Geranium molle* are notable associated species (Duncan et al. 2009).	VBA	1	1/10/1946	No suitable tea-tree scrub habitat is present in the study area. **Unlikely to occur.**
Sharp Greenhood	*Pterostylis X ingens*		VU	Grows on heavy soils around swamps and waterways. Primarily distributed across the south of Victoria, where distribution is scattered from the Heywood area in the far west to the Mallacoota area in the far east. Flowers from August to November (RBGV 2023).	VBA	1	30/09/1970	The surrounding wetland habitat and waterways were generally subject to grazing pressures, which is likely to result in the loss of this species. Records are also very limited and pre-2000. **Unlikely to occur.**
Mentone Greenhood	*Pterostylis X toveyana*		EN	Favours sandy soils in coastal scrub and damp open forest. Known from Port Phillip Bay, Meredith, Ararat, Port Welshpool and near Traralgon. Flowers from May to August (RBGV 2023).	VBA	1	1/06/1931	Suitable coastal scrub and damp forest habitats was absent from the study area. Nearby records are also very limited and pre-2000. **Unlikely to occur.**
Lacey River Buttercup	*Ranunculus amplus*		CR	Grows on swamp margins.	VBA	1	1/12/2023	Freshwater wetlands and swamp habitats are limited within the study area and comprise low-diversity artificial farm dams and drainage lines. **Unlikely to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Slender Bog-sedge	*Schoenus lepidosperma subsp. pachylepis*		VU	The species is known from woodland and heath, though information for this subspecies is limited. It occurs from east Gippsland to Sunday Island (RBGV 2024).	VBA	1	2/09/1952	Habitat is present within areas with a relatively intact and diverse grassy or heathy understory within Gelliondale State Forest. However, nearby records are limited and pre-2000. **Potential to occur.**
Swamp Fireweed	*Senecio psilocarpus*	VU		Herb-rich winter-wet swamps on volcanic clays or peaty soils (Walsh & Entwisle 1999). Known from approximately 10 sites between Wallan, about 45 km north of Melbourne, and Honans Scrub in south-eastern South Australia (TSSC 2008).	PMST	No VBA records	N/A	Wetland and swamp habitats are degraded in the study area and not derived from volcanic clay. No nearby records. **Unlikely to occur.**
Tasman Fan-fern	*Sticherus tener s.s.*		EN	Grows in wet forests in gullies and sheltered slopes, as well as on rocky streams.	VBA	1	13/02/2003	No wet forest, gullies or sheltered slopes occur in the study area. **Unlikely to occur.**
Metallic Sun-orchid	*Thelymitra epipactoides*	EN	EN	Primarily found in coastal areas, growing on dry sand loams or loamy sands in heathland, grassland and woodland habitat. The species is also found further inland in comparable habitat (Backhouse & Jeanes 1995). Distribution ranges as far west as the South Australian border, north to the Nhill-Dimboola area and as far east as the Bairnsdale area. Flowers from September to November, during sunny periods (RBGV 2023).	VBA	1	9/12/1978	Habitat is present within areas with a relatively intact and diverse grassy or heathy understory within Gelliondale State Forest. However, nearby records are limited and pre-2000. **Potential to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Spiral Sun-orchid	*Thelymitra matthewsii*	VU	EN	A rare species known from coastal to slightly elevated areas (to 400m), where it occurs on well-drained soils of sandy flats and open forest. The species often colonises disturbed sites but may be outcompeted as the site regenerates. Distributed around the Grampians, Anglesea, near Woodside and the Mallacoota area. Flowers from August to October, during sunny periods (RBGV 2023).	PMST	No VBA records	N/A	The study area comprises lowland areas and largely poorly draining soils. No nearby records. **Unlikely to occur.**
Austral Toad-flax	*Thesium australe*	VU	EN	Grows in damp habitat of grasslands, woodlands and herb fields. Thought to be extinct across much of its former distribution, with all recent collections being from the highlands near Wulgulmerang. Flowers from spring to summer (RBGV 2023).	PMST	No VBA records	N/A	Thought to be extinct across much of its former range, potentially restricted to the Wulgulmerang highlands. **Unlikely to occur.**
Slender Fork-fern	*Tmesipteris elongata*		CR	Epiphyte of Soft Tree-fern (*Dicksonia antarctica*)	VBA	2	11/07/1997	No Soft Tree-fern recorded in the study area, nor is there suitable habitat. **Does not occur.**
Tiny Arrowgrass	*Triglochin minutissima*		EN	Found near salt lakes and in the herb fields of coastal saltmarsh habitat. Mostly distributed along the coast, with inland occurrences noted in the west of Victoria. Flowers from August to November (RBGV 2023).	VBA	5	28/09/2004	No saline lakes or saltmarshes occur in the study area. **Unlikely to occur.**
Dusky Violet	*Viola fuscoviolacea*		EN	Grows in damp herb fields of alpine regions. Isolated occurrences are also known from near-coastal *Lepidosperma longitudinale* sedgeland between Wilsons Promontory and Sale (RBGV 2024).	VBA	2	31/10/1995	No sedgeland recorded in the study area. **Unlikely to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Source	No. of VBA records	Date of last record	Likelihood of occurrence
Parsley Xanthosia	*Xanthosia leiophylla*		EN	Grows in sandy heathland and heathy woodland, from the far west of Victoria to near Orbost. Flowers from spring to summer (RBGV 2023).	VBA	1	9/12/1978	Habitat is present within areas with a relatively intact and diverse heathy understory within Gelliondale State Forest. However, nearby records are limited and pre-2000. **Potential to occur.**
Swamp Everlasting	*Xerochrysum palustre*	VU	CR	Often growing on heavy black clay soils in wetlands including sedge swamps, shallow freshwater marshes and seasonally wet areas within native grasslands and heaths. Commonly associated genera include *Amphibromus, Baumea, Carex, Chorizandra, Craspedia, Eleocharis, Isolepis, Lachnagrostis, Lepidosperma, Myriophyllum, Phragmites australis, Themea triandra* and *Villarsia*. May occur in the threatened ecological communities SHWTLP, NTGVVP and Gippsland Red Gum Grassy Woodland and Associated Native Grassland (DAWE 2021). Distributed in lowland swamps in Victoria from near the South Australian border to near Bairnsdale. Also, an isolated occurrence near Cobberas. Flowers from November to March (RBGV 2023).	PMST & VBA	9	12/12/2023	Lack of wetland habitat dominated by associated genera on heavy clay soils. **Unlikely to occur.**

Notes: *Shaded rows indicate threatened species*

EPBC *= threatened species status under EPBC Act: EX = presumed extinct in the wild; CR = critically endangered; EN = endangered; VU = vulnerable;*
FFG *= threatened species status under the FFG Act: EX = presumed extinct in the wild; CR = critically endangered; EN = endangered; VU = vulnerable.*

5. Fauna assessment

5.1. Introduction

The fauna overview assessment aimed to undertake broad-scale mapping and high-level characterisation of existing fauna habitat within the development footprint. A key objective was to identify habitat that could support EPBC Act or FFG Act listed threatened fauna species, which would thus be considered to have the potential to occur within the disturbance footprint, and to assess the likelihood of significant impacts to such species.

Fauna habitats were categorised by type based on habitat components that include native and exotic vegetation, areas of woodland, watercourses and waterbodies, soil cracks and surface rocks. The study area's habitat connectivity (i.e., degree of isolation/fragmentation), including linkages to other habitats in the region, was determined using field observations, recent aerial photography and DEECA's *NatureKit* (DELWP 2020).

Incidental fauna observations were recorded throughout the study area. Previous land use and anthropogenic disturbance were considered in assessing habitat quality for listed fauna species.

5.2. Existing information

Existing information was reviewed from the following sources:

- VBA administered by DEECA;
- The Commonwealth EPBC Act Protected Matters Search Tool;
- DEECA's NVIM;
- DEECA's NatureKit;
- BirdLife Australia Atlas database;
- BirdLife Shorebirds database; and
- Atlas of Living Australia.

5.3. Methods

The techniques below were used to detect fauna species utilising the study area during the initial fauna survey in 2016:

- Incidental searches for mammal scats, tracks and signs (e.g., diggings, signs of feeding and nests/burrows);
- Turning over logs/rocks and other ground debris for reptiles, frogs and mammals;
- Bird observation during the day in addition to transect surveys in relevant habitats in association with the proposed wind farm;
- General searches for reptiles and frogs; including identification of frog calls in seasonally wet areas; and
- General searches for bat habitat including waterbodies, potential commuting corridors, foraging sites and potential roosting sites such as caves, trees with hollows and lifted bark for crevice dwelling species.

The broader study area's habitat connectivity (i.e., degree of isolation/fragmentation), including linkages to other habitats in the region, was determined using field observations, recent aerial photography and *NatureKit* (DELWP 2020).

In addition to the fauna assessment in this report, detailed avifauna and bat investigations have been undertaken in the broader study area and its environs, in particular:

- Bird Utilisation Studies 2015 and 2023/24 (see Section 6);
- Bat Utilisation Studies 2015 and 2023/24 (see Section 7);
- Targeted Swift Parrot and White-throated Needletail surveys (see Section 8); and
- Migratory and resident shorebird surveys of the intertidal and shallow marine habitats in the nearby parts of the Nooramunga Marine and Coastal Parks (Section 9).

Wherever appropriate, a precautionary approach was adopted in determining the likelihood of occurrence or fauna listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and Victorian *Flora and Fauna Guarantee Act 1988*. That is, where insufficient evidence was available on the potential occurrence of a listed species, it is assumed that it could be in an area of suitable habitat.

- High level assessment of the nature and quality of native fauna habitat, identifying areas of high, moderate and low ecological value for fauna; and
- Assessment of the likelihood of occurrence of listed fauna in the study area.
- Fauna susceptibility and risk assessment following the procedure for risk assessment of AS ISO 31000:2018, which includes:
    - Short-listing species or groups of concern based on their likelihood of occurrence at the site;
    - Assessment of preliminary potential impact pathways;
    - Determination of the risk level for each species or group of concern, consistent with a risk matrix.
- Consideration of possible implications of the wind farm development on these listed species and their habitat.

Site assessments were conducted in 2015 and 2023/24, encompassing all seasons. Rainfall over this timeframe was good, resulting in many habitats being observed in relatively good condition. Timing of the surveys was considered suitable to ascertain the extent and condition of fauna habitats for the fauna that was present during that time of the year.

5.3.1. Limitations

Duration and seasonal timing of field assessments can result in some species not being detected when these may occur at other times.

5.4. Assessment results

5.4.1. Fauna species

Species recorded

During the fauna field assessment 122 fauna species were recorded. This included 103 bird (eight introduced), 10 mammal (five introduced), six reptile, three frogs and an array of invertebrate species (Appendix 6).

Listed fauna species

The review of existing information indicated that 54 fauna species listed under the Commonwealth EPBC Act and the state FFG Act have previously been recorded within the search region in the last

40 years or for which potential habitat occurs according to the EPBC Act Protected Matters Search Tool. The listed fauna included, 33 birds, 11 mammals, three reptiles, three amphibians, two fish and two invertebrates. The likelihood of occurrence of these species in the study area was assessed and the results are presented in Table 6.

Species considered '**Likely to occur**' are those that have a very high chance of being in the study area given the existence of numerous records in the search region and suitable habitat in the study area. Using the precautionary approach, species considered to have the '**Potential to occur**' (at least occasionally) are that where suitable habitat exists or is situated close to the wind farm boundaries, but recent records are scarce.

Twenty-nine fauna species (17 EPBC Act-listed and 12 FFG Act-listed) were considered to potentially occur or likely to occur, including 23 bird, four mammal and two fish species.

Two species, namely, the **Swift Parrot** and the **White-throated Needletail** were considered higher risk by DCCEEW for the Alberton Wind Farm application, the Swift Parrot due to its conservation status (Section 8.1), and the White-throated Needletail due to its aerial foraging habits and consequent potential exposure to collision with operating turbines (Section 8.2). Both species were subject to detailed targeted surveys as discussed in Section 8.

This assessment of potential occurrence of listed fauna species excludes:

- Marine mammals (three species, such as whales, dolphins and sea lions) given that the study area is inland with no significant marine linkages;
- Strictly oceanic bird species (22 species, such as albatrosses and petrels) given that the study area is inland and such birds are not known to venture inland; and
- Migratory shorebirds (33 species) given that the study area is inland and not likely to provide shoreline habitats for these birds.

Table 6: Listed fauna species from the search region and likelihood of occurrence in the study area.

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Birds								
Australasian Bittern	*Botaurus poiciloptilus*	EN		CR	Terrestrial wetlands, including a range of wetland types but prefer permanent water bodies with tall dense vegetation, particularly those dominated by sedges, rush, reeds or cutting grass (Marchant & Higgins 1990).	0	N/A	Potential wetlands in the wider study area. However no recent records from the broader study area; **unlikely to occur**
Australasian Shoveler	*Spatula rhynchotis*			VU	Large and deep permanent bodies of water and aquatic flora. Also occurs on billabongs, watercourses and flood waters on alluvial plains, freshwater meadows, shallow swamps, reed swamps, wooded lakes, sewage farms and farm dams (Marchant & Higgins 1990).	6	8/07/2019	Potential wetlands in the wider study area; **potential to occur**
Australian Gull-billed Tern	*Gelochelidon macrotarsa*			EN	Shallow freshwater and saline wetlands; intertidal mudflats, also in sheltered inshore marine waters where they roost on sandbars and beaches (Higgins & Davies 1996).	9	30/01/1988	Would likely occur in the Corner Inlet Ramsar Site. May fly over in the study area occasionally, although there is no suitable habitat for the species within the study area itself; **potential to occur**
Australian Painted-snipe	*Rostratula australis*	EN	CA CAMBA MBA	CR	Generally, inhabits shallow terrestrial freshwater wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of *Lignum muehlenbeckia* or cane grass or sometimes tea-tree (Melaleuca). Sometimes utilises areas that are lined with trees, or that have some scattered fallen or washed-up timber (DAWE 2020).	0	N/A	Although suitable wetland habitat is present in the broader study area. The nearest recent records are in wetlands around Melbourne and at Sale and there are no records either in the VBA or in the Atlas of Australian Birds; **unlikely to occur**
Australian Masked Owl	*Tyto novaehollandiae*			CR	Open woodlands and forests that provide dense and tall tree cover and adjoining open habitats such as cleared farmlands. In Victoria, most widespread in east Gippsland (Higgins 1999).	2	2/05/2013	Widespread but elusive; may occur in close-by eucalypt forests; rarely in open areas; **unlikely to occur**
Barking Owl	*Ninox connivens*			CR	Eucalyptus dominated forests and woodlands, commonly near waterbodies, such as streams and rivers, and requires hollow trees for nesting and trees with dense foliage for roosting (Higgins 1999).	1	1/01/1973	Suitable forest and woodland habitats exist, however no recent records from the broader study area; **unlikely to occur**
Bar-tailed Godwit	*Limosa lapponica*		M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)	VU	Mainly coastal species, usually in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats. In Vic. Found mainly around Port Phillip Bay (Higgins & Davies 1996).	25	28/02/2020	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur**

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Black-tailed Godwit	*Limosa limosa*	EN	M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)	CR	Mainly coastal species, usually in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats. In Vic. Found mainly around Port Phillip Bay (Higgins & Davies 1996).	1	31/01/1987	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur**
Blue-billed Duck	*Oxyura australis*			VU	Terrestrial wetlands. Prefers deep permanent, well-vegetated waterbodies (Marchant & Higgins 1990).	4	8/04/2021	Potential wetlands in the wider study area; not recorded in the current study; **potential to occur**
Blue-winged Parrot	*Neophema chrysostoma*	VU			Occupies coastal, subcoastal and inland habitats ranging into semi-arid zones. Throughout much of their range, they inhabit grasslands and grassy woodlands and forests (Higgins 1999).	27	04/04/2021	**Recorded** in the study area. Frequently observed at most BUS Points, in flocks of up to 8 in spring-summer. In autumn, flocks are significantly larger (up to 39 individuals). Occasionally seen at RSA height.
Brown Treecreeper	*Climacteris picumnus*	VU			Woodlands dominated by eucalypts, especially Stringybarks or other rough-barked eucalypts usually with open grassy understorey (Higgins et al. 2001)	0	N/A	Typically confined to dry woodland areas inland of the Great Dividing Range; **unlikely to occur**
Caspian Tern	*Hydroprogne caspi*		M (CAMBA, JAMBA)	VU	Sheltered coastal embayment, including harbours, lagoons, inlets, estuaries and river deltas, usually with sandy or muddy margins (Higgins & Davies 1996).	40	12/01/2020	Known to occur in the Corner Inlet Ramsar Site, which is one of three significant breeding colonies in Victoria (Minton and Deleyev 2001). May fly over in the study area occasionally, although there is no suitable habitat for the species within the study area itself; **potential to occur**
Chestnut-rumped Heathwren	*Calamanthus pyrrhopygius*			VU	Dense heathland and dense understorey or ground layer in sclerophyll forests and woodlands; also, in Box-ironbark forests. Widespread but sparsely distributed (Higgins & Peter 2002; Tzaros 2005).	1	3/07/2013	Potential habitat may occur within wind farm boundaries; **potential to occur**
Common Greenshank	*Tringa nebularia*	EN	M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)	EN	Inhabits a wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands (Higgins & Davies 1996).	26	06/09/2018	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur**
Common Sandpiper	*Actitis hypoleucos*		M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)	VU	Inhabits a wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands. In Victoria, mostly found Westernport and Port Phillip Bay (Higgins & Davies 1996).	6	27/02/2005	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur**
Curlew Sandpiper	*Calidris ferruginea*	CR	M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)	CR	Inhabits a wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands (Higgins & Davies 1996).	16	01/03/2004	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur**

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Diamond Firetail	*Stagonopleura guttata*	VU		VU	Commonly found in box-ironbark forests and woodlands and also occurs along watercourses and in farmland areas. Widespread but scattered. Forages on a wide range of seeds, which in some cases a large portion can be derived from weed species (Read 1994). Populations have declined in Victoria since the 1950s (Emison et al. 1987; Tzaros 2005).	0	N/A	Typically confined to dry woodland areas inland of the Great Dividing Range; **unlikely to occur**
Double-banded Plover	*Charadrius bicinctus*		M (Bonn A2H)		Inhabits a wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands (Marchant & Higgins 1993).	0	N/A	Migratory; usually coastal and near coastal habitats; not recorded in the current study; **unlikely to occur**
Eastern Curlew	*Numenius madagascariensis*	CR	M (Bonn A1, JAMBA, CAMBA, ROKAMBA)	CR	Inhabits sheltered coasts, especially estuaries, embayment, harbours, inlets and coastal lagoons with large intertidal mudflats or sandflats, often with beds of seagrass (Higgins & Davies 1996).	61	28/02/2020	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur**
Eastern Great Egret	*Ardea alba modesta*		M (JAMBA, CAMBA)	VU	Widespread in Australia; both freshwater and tidal, also in flooded grasslands. Usually solitary when fishing. Nest colonially in wetlands with fringing trees.	24	03/05/2019	**Recorded** in the study area
Fairy Tern	*Sternula nereis*	VU	M	CR	Generally restricted to sheltered coasts both on the mainland, and inshore and offshore islands. Occurs in embayment, such as harbours, inlets, bays, estuaries, lagoons, and ocean beaches. Also found on lakes and salt ponds (Higgins & Davies 1996).	10	22/02/2020	Would likely occur in the Corner Inlet Ramsar Site. May fly over in the study area occasionally, although there is no suitable habitat for the species within the study area itself; **potential to occur**
Fork-tailed Swift	*Apus pacificus*		M (CAMBA, ROKAMBA, JAMBA)		The species can occur in wet sclerophyll forests but mainly prefers open forests or plains. It is almost exclusively aerial and feeds up to hundreds of metres above the ground but can feed in open forest canopies. The species breeds internationally and seldom roosts in trees (Higgins 1999).	0	N/A	**Recorded** in the study area (one observation in summer BUS 2015)
Freckled Duck	*Stictonetta naevosa*			EN	Terrestrial wetlands; prefer fresh, densely vegetated waters, particularly floodwater swamps and creeks vegetated with lignum or cane grass. During dry seasons or droughts, move off ephemeral breeding swamps and occupy large permanent waters (Marchant & Higgins 1990).	1	8/12/1992	May occur in any large freshwater wetland; suitable habitat may occur in the study area; **potential to occur**
Gang-gang Cockatoo	*Callocephalon fimbriatum*	EN		EN	In summer generally in tall mountain forests and woodlands, particularly in heavily timbered, mature wet sclerophyll forests and woodlands. Prefer Eucalyptus-dominated assemblages. Also occurs in subalpine snow gum woodlands and occasionally in temperate rainforests and regenerating forests. In winter occurs at lower altitudes in drier, more open Eucalyptus woodland (Higgins 1999).	64	11/07/2021	Common cockatoo in eucalypt forests surrounding study area; been recorded previously in such forests; recorded in nearby woodlands; **recorded in the study area**
Great Egret	*Ardea alba*		M (CAMBA, JAMBA)		A range of wetland habitats, including coastal, freshwater, saline, permanent and ephemeral (Marchant & Higgins 1990).	0	N/A	Suitable wetland may exist, but egret is uncommon in area. Not recorded in the study area, therefore **unlikely to occur**

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Glossy Ibis	*Plegadis falcinellus*		M (Bonn A2S)		Prefer freshwater inland wetlands, in particular, permanent or ephemeral water bodies and swamps with abundant vegetation (Marchant & Higgins 1990).	1	7/03/2001	May occasionally pass through the study area; **potential to occur**
Great Knot	*Calidris tenuirostris*	VU	M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)	CR	In Australasia, the species typically prefers sheltered coastal habitats, with large intertidal mudflats or sandflats. This includes inlets, bays, harbours, estuaries and lagoons. They are occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in saltworks, at swamps near the coast, salt lakes and non-tidal lagoons. The Great Knot rarely occurs on inland lakes and swamps (DCCEEW 2023).	4	30/01/1988	Few records, and the most recent from many decades ago, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**
Greater Sand Plover	*Charadrius leschenaultii*	VU	M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)	VU	Entirely coastal; mainly on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks. In Vic. Mostly in Corner Inlet, Westernport and Port Phillip Bay (Marchant & Higgins 1993).	5	30/01/1988	Few records, and the most recent from many decades ago, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**
Grey Falcon	*Falco hypoleucos*	VU		VU	Inhabits arid and semi-arid zones; mainly on sandy and stony plains of inland drainage systems, lightly timbered with acacia. Hunt far into open areas, over spinifex, tussock grasslands and low shrublands. In Victoria, few records mostly in north and north-western regions (Marchant & Higgins 1993).	None	N/A	No suitable habitat; **unlikely to occur**
Grey Goshawk	*Accipiter novaehollandiae*			EN	Inhabit rainforests, open forests, swamp forests, woodlands and plantations; most abundant where forest or woodland provide cover for hunting from perches. in Vic., most common in Otway ranges (Marchant & Higgins 1993).	2	1/02/1922	Suitable habitat exists, but there are no recent records of the species in this part of South Gippsland in the Atlas of Australian Birds) or in the VBA since 2003; **unlikely to occur**
Grey Plover	*Pluvialis squatarola*	VU	M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)	VU	Entirely coastal, but occasionally inland. Mainly on marine shores, inlets, estuaries and lagoons where there are nearby large tidal mudflats for feeding and sandy beaches for roosting (Marchant & Higgins 1993).	12	02/03/2004	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur**
Grey-tailed Tattler	*Tringa brevipes*		M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)	CR	Often found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. It can also be found at intertidal rocky, coral or stony reefs as well as platforms and islets that are exposed at low tide. It has been found around shores of rock, shingle, gravel or shells and on intertidal mudflats in embayments, estuaries and coastal lagoons, especially fringed with mangroves. The species is rarely recorded in Victoria, however sightings have been reported in Gippsland, and east of McLaughlans Beach. The largest populations in Victoria are located at Corner Inlet, west to Westernport and Port Phillip Bays (DCCEEW 2023).	6	27/06/1987	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur**

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Ground Parrot	*Pezoporus wallicus*			EN	Inhabits mainly heathlands, sedgeland or button-grass plains providing dense cover. In Victoria, the species is largely restricted to closed coastal heathland and sedgeland, which is generally found in Gippsland (Higgins 1999). It is also known to occur in similar habitats in western Victoria, including Discovery Bay National Park and Lake Connewarre (Higgins 1999).	2	6/03/1977	Occurs in coastal heathland and sedgeland with no suitable habitat in the study area. **Unlikely to occur**
Hooded Plover	*Thinornis rubricollis*	VU	M	VU	Inhabits sandy ocean beaches, especially those that are broad and flat, with a wide wave-wash zone for feeding. Widespread and scattered across coastal Victoria. Numbers reduced due to disturbance by recreational activities on beaches (Marchant & Higgins 1993).	3	01/03/2004	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur**
Hooded Robin	*Melanodryas cucullata*	EN		VU	Occur mostly in open Grey Box, White Box, Yellow Box, Yellow Gum and Ironbark woodlands with pockets of saplings or taller shrubs, an open shrubby understorey, sparse grasses and patches of bare ground and leaf-litter, with scattered fallen timber. The population has declined throughout range, especially since the early 1980s. This species typically occurs north of the great divide in shrubland or woodland dominated by acacias (Higgins & Peter 2002; Tzaros 2005).	0	N/A	Typically confined to dry woodland areas inland of the Great Dividing Range; **unlikely to occur**
Latham's Snipe	*Gallinago hardwickii*	VU	M (Bonn A2H, ROKAMBA, JAMBA)		Occurs in a wide variety of permanent and ephemeral wetlands; it prefers open freshwater wetlands with dense cover nearby, such as the edges of rivers and creeks, bogs, swamps, waterholes. The species is widespread in southeast Australia and most of its population occurs in Victoria, except in the northwest of the state (Naarding 1983; Higgins & Davies 1996).	13	2/11/2018	**Recorded** in the study area
Lesser Sand Plover	*Charadrius mongolus*	EN	M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)	EN	Inhabits beaches of sheltered bays, harbours, and estuaries with large intertidal sandflats or mudflats. Regularly seen in Corner Inlet, Westernport and Port Phillip Bay (Marchant & Higgins 1993).	3	03/01/1988	Few records, and the most recent from many decades ago, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**
Little Curlew	*Numenius minutus*		M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)		Occurs in short, dry grasslands and sedgelands with scattered shallow freshwater pools. Occasionally occurs in open woodland with grassy or burn understorey. Can be found in coastal swamps and on sheltered coasts on mudflats or sandflats (Higgins & Davies 1996).	0	N/A	Few records, and the most recent from many decades ago, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**
Little Egret	*Egretta garzetta*			EN	It occurs in a range of coastal and terrestrial wetlands, including freshwater wetlands with vegetation such as bulrush and requires trees for roosting and nesting (Marchant & Higgins 1990).	25	28/02/2020	**Recorded** in the study area

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Little Tern	*Sternula albifrons*		M (Bonn, JAMBA, CAMBA, ROKAMBA)	CR	Sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets, especially those with exposed sandbanks or sand spits. In Victoria, they are found mainly on the east coast between Mallacoota and Corner Inlet, rare elsewhere (Higgins & Davies 1996).	8	23/10/2018	Would likely occur in the Corner Inlet Ramsar Site. May fly over in the study area occasionally, although there is no suitable habitat for the species within the study area itself; **potential to occur**
Lewin's Rail	*Lewinia pectoralis*			VU	Occurs in a variety of densely vegetated wetland habitats, fresh or saline, and usually with areas of standing water. Requires shallow water areas for foraging (Marchant & Higgins 1993).	2	18/07/1981	In coastal and near coastal wetlands; rather uncommon and no recent records; **unlikely to occur**
Magpie Goose	*Anseranas semipalmata*			VU	Terrestrial and aquatic habitats, but activities centred on wetlands, mainly those on floodplains of rivers (Marchant & Higgins 1990).	1	2/11/1994	No suitable habitats; uncommon in Gippsland shores; **unlikely to occur**
Marsh Sandpiper	*Tringa stagnatilis*		M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)	EN	Inhabits sandy, muddy or rocky shores, usually coastal, rarely far inland. Often on beaches and mudflats, sandflats and occasionally rock shelves (Higgins & Davies 1996).	1	19/05/1992	Few records, and the most recent from many decades ago, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**
Musk Duck	*Biziura lobata*			VU	It inhabits terrestrial wetlands, estuarine habitats and sheltered inland waters. Almost entirely aquatic; preferring deep water of large swamps, lakes and estuaries, where conditions are stable and aquatic flora abundant (Marchant & Higgins 1990).	12	3/05/2019	Suitable habitat found within the study area; not recorded in the current survey; **likely to occur**
Orange-bellied Parrot	*Neophema chrysogaster*	CR		CR	The Orange-bellied Parrot is endemic to south-eastern Australia. Its current non-breeding mainland distribution is from the mouth of the Murray River in South Australia, along the coast, to the east of Jack Smith Lake in South Gippsland, Victoria, covering approximately 1000 km of coastline. The most used sites in Victoria are around Port Phillip Bay and Bellarine Peninsula. In South Australia, Carpenter Rocks is the main site. During winter on the mainland, found mostly within 3 km of the coast. In Victoria, they mostly occur in sheltered coastal habitats, such as bays, lagoons and estuaries, or, rarely, saltworks. They are also found in low samphire herbland dominated by Beaded Glasswort *Sarcocornia quinqueflora*, Sea Heath *Frankenia pauciflora* or Sea-blite *Suaeda australis*, and in taller shrubland dominated by Shrubby Glasswort *Sclerostegia arbuscula*. They are sometimes found in low samphire dominated by Grey Glasswort *Halosarcia halocnemoides* or in *Chenopodium* herbfield. Breeds at Melaleuca in Tasmania during spring/summer months (DAWE 2020).	1	1/03/2004	There is limited suitable saltmarsh habitat within the broader study area and this species may on rare occasions pass through the region; **unlikely to occur**

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Pacific Golden Plover	*Pluvialis fulva*		M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)	VU	Inhabits sandy, muddy or rocky shores, usually coastal, rarely far inland. Often on beaches and mudflats, sandflats and occasionally rock shelves (Marchant & Higgins 1993).	2	06/04/1978	Few records, and the most recent from many decades ago, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**
Painted Honeyeater	*Grantiella picta*	VU		VU	Inhabits box-ironbark forests and woodlands and mainly feeds on the fruits of mistletoe. Strongly associated with mistletoe around the margins of open forests and woodlands. Can also be found in farmland containing remnant treed vegetation. Occurs at a few localities. Uncommon breeding migrant from further north, arriving in October and leaving in February (Higgins et al. 2001; Tzaros 2005).	None	N/A	No suitable habitat; **unlikely to occur**
Pectoral Sandpiper	*Calidris melanotos*		M (Bonn A2H, JAMBA, ROKAMBA)		Inhabit shallow fresh to saline wetlands, usually coastal to near coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins & Davies 1996).	0	N/A	No records, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**
Pilotbird	*Pycnoptilus floccosus*	VU		VU	Common in wet sclerophyll forests and coastal heath, often in gullies; usually hoping across forest floor; generally, keeps to cover.	1	01/01/1973	May occur in Alberton State Forest, but is a low-flying, sedentary species (DAWE 2022b) unlikely to leave the forest and enter the wind farm area; **unlikely to occur**
Pin-tailed Snipe	*Capella stenura*		M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)		Outside the breeding season, this species is typically found in or at the edge of shallow freshwater swamps, ponds, and lakes with varying levels of grass and vegetation cover. They can be spotted in drier wetlands like claypans, especially in arid regions within their range. Additionally, this species is often observed near sewage ponds but is rarely seen in saline or inter-tidal wetlands (DEECA 2023).	0	N/A	No records, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**
Plumed Egret (Intermediate Egret)	*Ardea plumifera*			CR	It mainly inhabits terrestrial wetlands; only occasionally visit coastal wetlands and forages amongst aquatic vegetation in shallow water and requires trees for roosting and nesting. It often occurs in wetlands that contain vegetation, including bulrush (Marchant & Higgins 1990).	9	5/08/2021	Suitable wetland may exist, but egret species is uncommon in the area; **may occasionally occur**

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Powerful Owl	*Ninox strenua*			VU	Found in open and tall wet sclerophyll forests with sheltered gullies and old growth forest with dense understorey. They are also found in dry forests with box and ironbark eucalypts and River Red Gum. Large old trees with hollows are required by this species for nesting. In Victoria, the Powerful Owl is widespread, having been recorded from most of the state. However, throughout its range, it is uncommon and occurs in low densities (Higgins 1999). Also occurs in highly urbanised areas, such as metropolitan Melbourne, where they are heavily reliant upon various forms of movement corridors (riparian strips, roadside vegetation and recreational reserves) to both hunt within and navigate throughout the landscape (Carter et al. 2019).	15	10/12/2020	Suitable forest and woodland habitats exist and recent records near the broader study area; **likely to occur**
Red Knot	*Calidris canutus*	VU	M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)	EN	In Australasia, the Red Knot mainly inhabits intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps (DCCEEW 2023).	10	02/03/2004	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur**
Red-necked Stint	*Calidris ruficollis*		M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)		Inhabit shallow fresh to saline wetlands, usually coastal to near coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins & Davies 1996).	0	N/A	No records, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**
Regent Honeyeater	*Anthochaera phrygia*	CR		CR	Inhabits dry box-ironbark eucalypt forests near rivers and creeks on inland slopes of the Great Dividing Range. Can also occur in small remnant patches or mature trees in farmland or partly cleared agricultural land (Higgins et al. 2001).	0	N/A	No suitable habitat; **unlikely to occur**
Ruddy Turnstone	*Arenaria interpres*	VU	M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)	EN	Inhabit shallow fresh to saline wetlands, usually coastal to near coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins & Davies 1996).	3	30/01/1988	Few records, and the most recent from many decades ago, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**
Ruff	*Calidris pugnax*		M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)		Inhabit shallow fresh to saline wetlands, usually coastal to near coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins & Davies 1996).	0	N/A	No records, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Sanderling	*Calidris alba*		M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)		Inhabits open sandy beaches exposed to sea swells; also on exposed sandbars and spits (Higgins & Davies 1996).	0	N/A	No records, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**
Sharp-tailed Sandpiper	*Calidris acuminata*	VU	M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)		Inhabit shallow fresh to saline wetlands, usually coastal to near coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins & Davies 1996)	6	01/07/2020	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur.**
Swift Parrot	*Lathamus discolor*	CR		CR	Prefers a select range of eucalypts in Victoria, including Yellow Gum, Grey Box, White Box, Red Ironbark and Yellow Box, as well as River Red-gum when this species supports abundant 'lerp' (Saunders & Tzaros 2011). The species is also known to forage within planted stands of Spotted Gum and Sugar Gum (Nature Advisory; unpublished data). Breeds in Tasmania. Migrates to mainland Australia for the autumn, winter and early spring months. It lives mostly north of the Great Dividing Range, passing through two areas of Victoria on migration: the Port Phillip district and Gippsland (Emison et al. 1987; Higgins 1999; Kennedy & Tzaros 2005. It is not uncommonly sighted in urban areas (Nature Advisory; unpublished data). Species occurrence on the mainland can substantially change from year to year depending on food availability, giving potential for this species to occur almost anywhere throughout its range (Emison et al. 1987).	1	11/04/1991	**Recorded.** A single individual was recorded from Swift Parrot Survey Area 9 during targeted surveys
Swinhoe's Snipe	*Capella megala*		M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)		In Australia, they prefer habitats characterized by dense grass and rushes along the edges of both fresh and brackish wetlands, including swamps, billabongs, river pools, small streams, and sewage ponds. Additionally, they can be found in drying claypans and inundated plains with crab holes (DEECA 2023).	0	N/A	No records, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**
Terek Sandpiper	*Xenus cinereus*	VU	M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)	EN	Inhabits saline intertidal mudflats in sheltered estuaries, harbours and lagoons; on islets, mudbanks, sandbanks or spits. In Victoria, they occur in Corner Inlet, Westernport Bay and Port Phillip Bay (Higgins & Davies 1996).	1	01/02/1987	Few records, and the most recent from 1987, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**
Whimbrel	*Numenius phaeopus*		M (Bonn A2H, JAMBA, CAMBA, ROKAMBA)	EN	Inhabit intertidal mudflats of sheltered coasts, harbours, lagoons, estuaries and river deltas. Prefer mudflats with mangrove, but also occur on open, unvegetated mudflats. In Victoria, small numbers occur at Gippsland lakes; most from Corner Inlet, Westernport and Port Phillip Bays (Higgins & Davies 1996).	14	28/02/2020	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur**

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
White-bellied Sea-Eagle	*Haliaeetus leucogaster*			EN	Maritime habitats, terrestrial large wetlands and coastal lands of tropical and temperate Australia and offshore islands, ranging far inland only over large rivers and wetlands. The eagles usually breed on the coast and offshore islands and inland beside large lakes or rivers, usually in tall trees in or near water, also in cliffs, rock pinnacles and escarpments (Marchant & Higgins 1993).	30	4/02/2021	**Recorded**. Suitable habitat exists and recent records in the study area**.**
White-throated Needletail	*Hirundapus caudacutus*	VU	M (CAMBA, ROKAMBA, JAMBA)	VU	Aerial, over all habitats, but probably more over wooded areas, including open forest and rainforest. Often over heathland and less often above treeless areas such as grassland and swamps or farmland (Higgins 1999).	53	20/02/2019	**Recorded** flying over the broader study area
Wood Sandpiper	*Tringa glareola*		M (Bonn A2H, CAMBA, ROKAMBA, JAMBA)	EN	Inhabits well-vegetated, shallow, freshwater wetlands, such as swamps, lakes, pools, and waterholes; typically with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reed. In Victoria, they are mostly from Port Phillip Bay and in mid-Murray Valley (Higgins & Davies 1996).	0	N/A	No records, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**
Yellow Wagtail	*Motacilla flava*		M (CAMBA, ROKAMBA, JAMBA)		A common migrant from Asia. Inhabits moist, grassy or muddy areas, sewage treatment plants, sports fields, tracks or bare ground, occasionally on beaches (Menkhorst et al. 2017).	0	N/A	Rare vagrant to Victoria; **unlikely to occur**
Mammals								
Broad-toothed Rat	*Mastacomys fuscus mordicus*	EN		VU	Specialist herbivore which occurs in high rainfall areas in the eastern highlands, south Gippsland highland and Otway ranges. Habitats include alpine herb field, heath, woodland, sedgeland and coastal tussock grassland (Menkhorst 1996). This species has also been known to inhabit dense, heathy vegetation within disturbed areas such as powerline easements and alpine ski slopes (Clarke & White 2008; Whisson et al. 2015).	0	N/A	No records in or around the wind farm area; **unlikely to occur**
Eastern Bent-wing Bat	*Miniopterus orianae oceanensis*	CR		CR	Roosts in caves during the day, dispersing over a range of habitats at night. Its feeding areas tend to be associated with major drainage systems (Menkhorst 1996).	1	8/03/2005	Might fly across during non-breeding season; main known cave in Gippsland is at Bairnsdale; **potential to occur**
Grey-headed Flying Fox	*Pteropus poliocephalus*	VU		VU	Brisbane, Newcastle, Sydney and Melbourne are occupied continuously. Elsewhere, during spring, they are uncommon south of Nowra and widespread in other areas of their range. Roosts in aggregations of various sizes on exposed branches. Roost sites are typically located near water, such as lakes, rivers or the coast. Roost vegetation includes rainforest patches, stands of Melaleuca, mangroves and riparian vegetation, but colonies also use highly modified vegetation in urban and suburban areas (DAWE 2020).	15	17/02/2002	No recent VBA records in the search area and the Woodside seasonal camp is approximately 25 km from the proposed wind farm site. Approximately 2000 individuals are inhabiting a a newly established site at Port Welshpool; **likely to occur**

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Long-nosed Potoroo	*Potorous tridactylus trisulcatus*	VU		VU	In Victoria, the species occupies a wide variety of wet forest and wet scrub, usually occurring on sandy loam soils where rainfall exceeds 750mm annually (Menkhorst 1996). Dense understorey vegetation is an essential component for the species persistence, which can consist of grass trees, sedges, ferns, heath, tea-tree or melaleucas (Menkhorst 1996).	0	N/A	Suitable nearby habitat; **potential to occur**
New Holland Mouse	*Pseudomys novaehollandiae*	VU		EN	Suitable habitat includes coastal heath and scrub, heathy woodland, open forest and vegetated sand-dunes, with dry heath regenerating post-fire appearing to be optimal for the species (Menkhorst 1996). Victorian records are largely restricted to the localities of Anglesea, Westernport and Gippsland lakes.	0	N/A	No records in or around the wind farm area; **unlikely to occur**
Platypus	*Ornithorhynchus anatinus*			VU	Inhabits freshwater streams, ranging from alpine creeks to tropical lowland rivers; also, lakes, shallow reservoirs and farm dams (Menkhorst and Knight 2010).	6	10/08/2022	Habitat may exist in the river system adjacent to the wind farm area, not recorded during the current survey, but **likely to occasionally occur**
Southern Brown Bandicoot	*Isoodon obesulus obesulus*	EN		EN	Suitable habitat for Southern Brown Bandicoots (eastern) is defined to be any patches of native or exotic vegetation, within their distribution, which contains understorey vegetation structure with 50–80% average foliage density in the 0.2–1 m height range. In areas where native habitats have been degraded or diminished, exotic vegetation, such as Blackberry (Rubus spp.), can and often does, provide important habitat (DAWE 2020).	1	12/04/1962	Suitable nearby habitat; **potential to occur**
Southern Greater Glider	*Petauroides volans*	EN		EN	In Victoria, this species inhabits forest habitats dominated by peppermint, stringybark, ash and gum eucalypts (Menkhorst 1996). Restricted to the central highlands and eastern Victoria, and common in areas of high rainfall. Rare in dry stringybark-box and Snow Gum Forest and does not occur in the box-ironbark or River Red-gum dominated Riverina regions (Menkhorst 1996).	43	11/12/2020	Might be found at the forested northern fringes of the wind farm; not recorded in the current survey; **unlikely to occur**
Spot-tailed Quoll	*Dasyurus maculatus maculatus*	EN		EN	Rainforest, wet and dry forest, coastal heath and scrub and River Red-gum woodlands along inland rivers (Menkhorst 1996).	0	N/A	Rare, may be confined to coastal heath south of the wind farm site; **unlikely to occur**
Swamp Antechinus	*Antechinus minimus maritimus*	VU		VU	Dense wet heath, tussock grassland, sedgeland heathy woodland and coastal heath and scrub (Menkhorst 1996). Requires mature, dense vegetation with thick ground cover (DAWE 2020). Shelters in short burrows or underneath dense leaf litter. Rarely occurs more than 200m above sea level. Though this species has also previously been detected at sites that had experienced some structural disturbance in the South Gippsland region (Nature Advisory; unpublished data).	10	30/03/1991	Suitable nearby habitat: **likely to occur**

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
White-footed Dunnart	*Sminthopsis leucopus*			VU	Coastal tussock grassland and sedgeland, wet heath, and forest or woodland with a dense heathy understorey or mid-storey vegetation (Menkhorst 1996).	1	1/01/1976	No suitable habitat; rarely recorded; **unlikely to occur**
Yellow-bellied Glider	*Petaurus australis*	VU		VU	Patchily distributed in wet sclerophyll forests from Mackay, Qld to Melbourne, Vic.	0	N/A	No suitable habitat; rarely recorded; **unlikely to occur**
Yellow-bellied Sheathtail Bat	*Saccolaimus flaviventris*			VU	Common in north Australia, but rare late summer-autumn in the south. Known to occur from urban, agricultural semi-arid and tall wet forest habitats (Menkhorst 1996). This species occupies most wooded habitats, including both wet and dry sclerophyll forest, mallee and Acacia shrubland, desert, and open woodland. They are a hollow-roosting species, so tend to be found in proximity of adequate old-growth trees. (Atlas of Living Australia 2024)	1	25/04/2000	Rarely recorded within the ROI and not recorded on site; **unlikely to occur**
Reptiles								
Glossy Grass Skink	*Pseudemoia rawlinsoni*			EN	Swamps, lake edges, salt marsh, and boggy creeks with dense vegetation (Wilson & Swan 2003).	1	6/10/2004	No suitable habitat; **unlikely to occur**
Lace Monitor	*Varanus varius*			EN	Well-timbered areas from dry woodland to wet southern forests and rainforests (Wilson & Swan 2003).	11	18/11/1992	Habitat exists at timbered areas north of the wind farm site; **unlikely to occur**
Swamp Skink	*Lissolepis coventryi*	EN		EN	Wetlands including swamp margins, lakes, rivers, creeks and even tidal salt marshes, are often associated with tea-tree thickets (Wilson & Swan 2003).	1	6/10/2004	Habitat may exist at the southern fringes of the wind farm site; **unlikely to occur.** Removal of potential habitat will be avoided where possible.
Frogs								
Growling Grass Frog	*Litoria raniformis*	VU		VU	Permanent, still or slow-flowing water with fringing and emergent vegetation in streams, swamps, lagoons and artificial wetlands such as farm dams and abandoned quarries (Clemann & Gillespie 2004).	1	1/01/1788	Suitable habitat exists in the broader study area though lack of nearby records: **unlikely to occur**
Martin's Toadlet	*Uperoleia martini*	EN		CR	Dry forest and coastal heath, breeds in flooded grassy depressions (Cogger 2000).	0	N/A	Habitat may exist within coastal heath; lack of recent records; **unlikely to occur**
Southern Toadlet	*Pseudophryne semimarmorata*			EN	Damp areas in forests and woodlands (Cogger 2000). In Victoria, the Southern Toadlet is mainly found on and south of the Great Dividing Range although there are records as far north as the Little Desert (SWIFFT 2020).	12	2/06/1996	Habitat may exist as the species may be found in damp woodlands, heath or grassland but not at the wind farm site; **unlikely to occur**
Fish								
Australian Grayling	*Prototroctes maraena*	VU		EN	Large and small coastal streams and rivers with cool, clear waters with a gravel substrate and altering pools and riffles (Cadwallader & Backhouse 1983).	20	18/02/1990	Suitable habitat exists in the broader study area with historical records in the Albert River in the north-east of the study area: **likely to occur**

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Coxs Gudgeon	*Gobiomorphus coxii*			EN	Usually flowing, upland waters, often in rapids. Are rarely found close to sea (Allen et al. 2002).	2	5/01/1982	No suitable habitat; rarely recorded; **unlikely to occur**
Dwarf Galaxias	*Galaxiella pusilla*	EN		EN	Ranges from the far west of the state through to the Mitchell River basin in central Gippsland. Vegetated margins of still water, ditches, swamps and backwaters of creeks, both ephemeral and permanent (Allen et al. 2002). Some wetlands where it occurs may partially or completely dry up during summer, with such wetlands reliant on seasonal flooding plus linkages to other sites where the species occurs, for habitat and population replenishment (Saddlier, Jackson & Hammer 2010). Dwarf Galaxias is also often found in association with burrowing freshwater crayfish (*Engaeus* spp.), with the crayfish burrows reportedly providing refuge from predators and dry conditions for the species (Saddlier, Jackson & Hammer 2010).	0	N/A	Suitable habitat exists in the broader study area within tributaries associated with the Albert and Jack Rivers in the north-east of the site, but no historical records: **potential to occur**
Macquarie Perch	*Macquaria australasica*	EN		EN	Cool, clear water of rivers and lakes. Favours slower-moving water (Allen et al. 2002).	2	1/01/1981	There are no records from the catchment the study area is in. If present, this is a large species that would likely have been detected more recently by anglers; **unlikely to occur**
Murray Cod	*Maccullochella peelii*	VU		EN	Slow-flowing turbid water of rivers and streams of low elevation; also fast-flowing clear upland streams (Allen et al. 2002).	1	1/01/1970	There are no records from the catchment the study area is in. If present, this is a large species that would likely have been detected more recently by anglers; **unlikely to occur**
Decapod crustacea								
South Gippsland Spiny Crayfish	*Euastacus neodiversus*			EN	occurs at Wilsons Promontory and the Strzelecki Ranges in southern Victoria; appears to be restricted to the southern side of the Strzelecki Ranges. The species occurs in streams in sclerophyll forests where the streamside vegetation is dominated by Mountain Ash, tree ferns and Lilly Pilly.	12	20/03/2018	No suitable habitat; **unlikely to occur**
Strzelecki Burrowing Crayfish	*Engaeus rostrogaleatus*			EN	Has a very restricted distribution and occurs along a 30 km section of the Eastern Strzelecki Ranges in South Gippsland. Inhabits small creek wet sclerophyll forest dominated by Mountain Ash and abundant tree ferns.	12	9/06/1999	No suitable habitat; **unlikely to occur**

Notes:

Shaded rows indicate threatened species

EPBC-T = threatened species status under EPBC Act:
- EX = presumed extinct in the wild
- CE = critically endangered
- EN = endangered
- VU = vulnerable

EPBC-M = migratory status under the EPBC Act:
- Bonn Convention (A2H) = Convention on the Conservation of Migratory Species of Wild Animals – listed as a member of a family
- Bonn Convention (A2S) = Convention on the Conservation of Migratory Species of Wild Animals - species listed explicitly
- CAMBA = China- Australia Migratory Birds Agreement
- JAMBA = Japan-Australia Migratory Birds Agreement
- ROKAMBA = Republic of Korea Australia Migratory Birds Agreement

FFG = threatened species status under the FFG Act:
- EX = presumed extinct in the wild
- CE = critically endangered
- EN = endangered
- VU = vulnerable

5.4.2. Susceptibility of listed fauna to impacts

The following analysis identifies the susceptibility of listed fauna species which may utilise the study area to the potential impacts of the proposed wind farm. This analysis includes consideration of several factors such as, abundance of the species, habitat availability within and in the wider area of the wind farm site, mobility and flight heights.

Mammals

Based on the assessment in Table 6, the following three EPBC Act listed ground-dwelling mammals have the potential to occur in suitable habitats within the study area and in adjacent remnant blocks of vegetation:

- Southern Brown Bandicoot
- Long-nosed Potoroo
- Swamp Antechinus

These species prefer habitat with dense vegetation cover (Menkhorst 1996). There are old records of Swamp Antechinus, dated back to 1999, close to the wind farm boundary. Given that most of these habitats have been avoided, no significant impacts are anticipated from the proposed wind farm.

In addition, the **Platypus** is likely to inhabit the Albert River, which sits outside the wind farm site. Given that no direct impacts to the Albert River are proposed, and indirect impacts will be avoided during the construction phase via a CEMP, no effect is anticipated on the Platypus population.

The study area occurs <25 km from a known **Grey-headed Flying Fox** camp in Woodside, which is within the nightly foraging distance of the species (Eby 1991, DAWE 2021b). In January 2025, a new camp was confirmed in Port Welshpool comprising of approximately 2000 individuals who departed their camp to access foraging resources on Snake Island. This camp, and all others in the vicinity, were inactive during a re-assessment in May 2025. A variety of habitats in the study area provide flowers and potentially fruit, which could attract the species into the area to forage. A comprehensive assessment of the significance of impacts on this species is pending long-term seasonal monitoring program (detailed in the BAMP), which will be used to inform the wind farm's adaptive management approach, that may involve periodic curtailment.. Refer to Section 7 for more details.

Susceptibility of non-listed mammal species to impacts

A well-known Koala population (probably around 500 animals) inhabits the South Gippsland Strzelecki Ranges. This non-threatened species in Victoria may occasionally visit the broader wind farm area. Koalas are an iconic species in Australia and any incursion of individuals of this species into the wind farm site should be managed, and proper mitigation techniques applied to relocate the koala to a nearby suitable habitat.

Birds – EPBC Act listed, non-migratory

VBA records (DEECA 2024) and the EPBC Protected Matters Search Tool (DCCEEW 2024) indicated that within the search region there were records of, or there occurred potential suitable habitat for nine EPBC Act-listed non-migratory bird species. Four of these species are considered to have the potential to occur or are likely to occur in the study area due to suitable habitat, including:

Blue-winged Parrot (EPBC-VU): Recorded in the study area during Nature Advisory ecological surveys. The wind farm occurs within the breeding range of the species, and observations of

moderately small numbers (up to eight individuals) in spring-summer suggest a small breeding population occurs in the region. The larger numbers of individuals present in autumn (up to 39 individuals) may reflect the recruitment of new individuals into the population from breeding, arrivals migrating from Tasmania, or both. The estimated population of Blue-winged Parrot is 10,000 individuals (Garnet and Baker 2021, DCCEEW 2023a). Blue-winged Parrot mortalities from turbine collisions have been reported in small numbers across several Victorian wind farms (Symbolix 2020). However, given that the Blue-winged Parrot has been detected in the study area, and the occasional flights of the species at RSA height, it should be acknowledged that there is a potential risk of collision with turbines. Blue-winged Parrot breed in hollow-bearing trees. Avoidance of removal of all hollow-bearing trees on-site is recommended, to avoid loss of breeding sites for the species.

Gang-gang Cockatoo (EPBC-EN; FFG-EN): Recorded in the study area during Nature Advisory ecological surveys. Gang-gang Cockatoos have previously been documented colliding with turbines (Nature Advisory unpub. data). The national population of the species is estimated at 17,600-35,200 individuals (DAWE 2022a). The summer 2023/24 BUS recorded four individuals, and the autumn 2025 BUS recorded a flock of up to 18 individuals twice. Gang-gang Cockatoos typically breed in old-growth forests. Most of the forested habitat in the study area is not old-growth and would, therefore, not offer suitable nesting habitat for the species in a significant way. Since Gang-gang Cockatoos have been recorded during BUS in the area, collisions with wind turbines are possible, but given its foraging behaviour in the canopy and short-distance flights, this woodland-dependent species is unlikely to often utilise the site and therefore is unlikely to be at a high collision risk?.

Swift Parrot (EPBC-CR; FFG-CR): Recorded in the study area during Nature Advisory ecological surveys. This species has the potential to forage in indigenous and planted eucalypts in the study area. The Swift Parrot could occur occasionally during dispersive movements, particularly when in transit between large, forested areas. This species has only been recorded on two occasions (1991) in the search region, only once during targeted surveys, and is therefore expected not to occur regularly within the study area. It is likely to experience minimal impact from the proposed wind farm. They may occasionally fly at RSA height, making it potentially vulnerable to collisions with wind turbines. Section 8.1 details the targeted surveys completed for this species

White-throated Needletail (EPBC-VU; FFG-VU): Recorded in the study area during Nature Advisory ecological surveys. This species was recorded in the study area BUS and during targeted surveys. They are likely to occur over large, forested areas adjacent to the study area during the migratory dispersal period (mostly late spring and summer). The White-throated Needletail has been recorded colliding with wind turbines at several south-eastern Australian wind farms in recent years and it is likely the occasional individual will be affected by the proposed project. Details of targeted surveys are provided in Section 8.2.

Birds – EPBC Act listed - migratory species

Several bird species listed as migratory under the EPBC Act are considered likely to occur within the study area. These include:

Caspian Tern (EPBC-M; FFG-VU): Not recorded in the study area during Nature Advisory ecological surveys. Unlikely to fly over the project site frequently, as there is no suitable habitat for them in the study area. However, the species is likely to fly at RSA and could occasionally fly into the wind farm airspace. Their global population is estimated at 240,000 individuals (BirdLife International 2010) which means 2400 collisions per year would need to occur to have a significant impact on

the global population if the guidelines for terrestrial migratory bird species are applied (DoE 2015), and the likelihood of this is negligible.

Double-banded Plover (EPBC-M): Not recorded in the study area during Nature Advisory ecological surveys. This is a migratory species from New Zealand, visiting south-eastern Australia from mid-February to late-August. It is known from mainly coastal and near-coastal areas and freshwater wetlands but also ventures to inland open grasslands. The VBA listed 38 records within the 10 km search area, some as recent as 2021 and may regularly occur in the study area. The flight height is not known, but they are considered unlikely to fly at RSA height regularly. It is unlikely therefore that the project will represent a significant impact to the species' population.

Eastern Great Egret (EPBC-M; FFG-VU): Not recorded in the study area during Nature Advisory ecological surveys. The Australian population is poorly understood (Maddock 2000) and the global population is estimated at 25,000-100,000 individuals (Wetlands International 2006). To begin affecting an ecologically significant proportion (1% if DoE 2015 is applied) of this population, 250-1000 collisions per year would be required. Not observed during surveys and a significant impact to this species is considered unlikely.

Fairy Tern (EPBC-VU; EPBC-M; FFG-CR): Not recorded in the study area during Nature Advisory ecological surveys. The national population is estimated at 7,450 individuals (DAWE 2020). If the thresholds from DoE (2015) are adopted, 75 collisions per year are needed to have a significant impact on the national population. Although not recorded during BUS to date, it may fly through wind farm airspace occasionally, however the high number of collisions needed to have a nationally significant impact is highly unlikely and therefore the project is unlikely to have a significant impact on this species.

Fork-tailed Swift (EPBC-M): Once recorded as an incidental in the study area during Nature Advisory ecological surveys. Likely to occur over large areas of the proposed study area during the migratory dispersal period (mostly late spring and summer). It is an aerial forager, spending most of its time flying in search of aerial insect prey; usually flying hundreds of metres high but can descend close to the ground following food availability (Higgins 1999; Menkhorst *et al*. 2017). They have been documented colliding with turbines, although it appears to be a very uncommon occurrence (Moloney et al. 2019). According to DoE (2015), an ecologically significant proportion of this species is 1000 individuals, and further investigation is required if 100 individuals are affected in a year. It is implausible that such a high number of collisions of this species with the 13 turbines of this project would occur and therefore significant impacts to the population are unlikely.

Glossy Ibis (EPBC-M): Not recorded in the study area during Nature Advisory ecological surveys. They visit south-eastern Australia from August to February, inhabiting ephemeral and permanent freshwater wetlands on the site in spring when these hold water or after heavy rainfall events. It is a rare species with only one record in the study area since 2001. It may occasionally pass through the study area and may use areas temporarily inundated after rainfall, so it has the potential to occur however significant impacts to the population are unlikely.

Latham's Snipe (EPBC-VU; EPBC-M): Recorded in the study area during Nature Advisory ecological surveys. Important habitat for the species is defined as an area that supports at least 18 individuals of this species (DCCEEW 2024a). Given the low number of observations to date in the study area it is unlikely that important habitat for this species occurs within the wind farm site. There would be some potential for the species to collide with turbines as it is known to forage in the local area and is likely to fly through the wind farm airspace. However, the global population of the species, based on surveys in Hokkaido, Japan, was estimated at 20,300 individuals (DCCEEW

2024a). If the DoE (2015) threshold is applied, it would take 203 or more collisions per year to affect an ecologically significant proportion of the species (1%). This is not considered likely, and extensive mortality monitoring efforts at other wind farms have not detected mortalities of this species (Moloney et al. 2019, Symbolix 2020). As such it is considered unlikely that the project would have a significant impact on this species.

Little Tern (EPBC-M; FFG-CR): Not recorded in the study area during Nature Advisory ecological surveys. The national population is estimated at 2,200 individuals (Garnett and Baker 2021). If the thresholds from DoE (2015) are applied, it would take 22 collisions per year to have a significant impact on the national population (1%). Considering the species has not been seen during BUS and would fly through wind farm airspace only occasionally, this number of annual collisions is unlikely, and no significant impacts are expected for this species.

Rufous Fantail (EPBC-M): Not recorded in the study area during Nature Advisory ecological surveys. Suitable forest and woodland habitats exist and some records in the nearby search region. However, 4,800 or more individuals per year would need to collide with turbines, or 750 ha of habitat would need to be removed, to meet even the lowest thresholds for a significant impact (DoE 2015). Significant impacts are considered highly unlikely.

Birds - FFG listed species

Several FFG-listed birds were expected to occur in the wider search area based on VBA records (Table 6). Of these FFG-listed species, sixteen are considered likely to utilise the wind farm site and were either recorded to occur or have the potential to occur in the study area. These include:

EGRETS

Eastern Great Egret (FFG-VU), Little Egret (FFG-EN), Intermediate Egret (FFG-CR): The first two species were recorded during the BUS. The Intermediate Egret could potentially occur in the study area and has previously been recorded (12 records, latest in 2021). Egrets use wetlands, creeks, rivers and farm dams. The number and frequency of occurrence of these species on the site is low and the likelihood of turbine collision is considered very low. To avoid the direct loss of habitat for these species, turbines and associated infrastructure have been placed to avoid drainage lines, ponds, dams, marshes and the Albert River.

DUCKS

Australasian Shoveler (FFG-VU), Blue-billed Duck (FFG-VU), Freckled Duck (FFG-EN), Musk Duck (FFG-VU): Not recorded in the study area during Nature Advisory ecological surveys. These ducks use freshwater wetlands, creeks, rivers and farm dams; most prefer deep permanent freshwater wetlands with an abundance of aquatic vegetation, which are limited within the study site. Ducks are limited to wetlands and usually fly below RSA heights when moving between their habitats. Records of collision with operating wind farms are very low and these species are unlikely to be impacted by operating turbines.

OWLS

Barking Owl (FFG-CR), Powerful Owl (FFG-VU): Not recorded in the study area during Nature Advisory ecological surveys. Usually found in Eucalyptus-dominated forests and woodlands, with large old trees with hollows for nesting and roosting.

The Barking Owl is commonly found near water bodies, such as streams and rivers (Higgins 1999). The owls are usually restricted in their activities to the wooded areas, and seldom forage outside these habitats, unless during dispersal. Flight heights of owls are not known, but no incidence of collision with operating turbines has been previously reported from other wind farms in south-eastern Australia

The Powerful Owl is widespread, having been recorded from most of the state. However, throughout its range, it is uncommon and occurs in low densities. . It has been historically recorded within habitats associated with the Alberton West State Forest to the north of the proposed wind farm site. Additionally, it has been seen within the northern section of the wind farm (local landholder *pers. comm.*). It is possible Powerful Owl may use some wooded areas of the study area and move occasionally into the southern forest at Hedley, where there are large hollow-bearing trees. The primary risk to this species is during nocturnal dispersive and foraging movements when they may potentially fly at RSA heights. Movements by the Powerful Owl are generally confined within forest habitats, which would therefore not involve any part of the proposed wind farm. Juvenile owl dispersal from a breeding territory may result in a one-off flight across a gap between forest patches, such as north and south of the South Gippsland Highway between large nearby forest blocks. No turbines are proposed at the narrowed gap between Gelliondale Forest and the Alberton West State Forest, and thus the likelihood of Powerful Owl being affected by nearby wind turbines is considered low. It is anticipated that the construction of the wind farm would have little impact on the owl population.

TERNS

Caspian Tern (EPBC-M; FFG-VU): See section above.

Little Tern (CR): See section above.

Fairy Tern (EPBC-VU; FFG-CR): See section above.

Australian Gull-billed Tern (FFG-EN): Not recorded in the study area during Nature Advisory ecological surveys. Unlikely to fly over the study area frequently, as there is no suitable habitat for them in the study area. They prefer shallow freshwater and saline wetlands; intertidal mudflats, also in sheltered inshore marine waters. However, the species may fly at RSA and could occasionally fly into the wind farm airspace. Most recent record was recorded in 1988.

OTHER SPECIES

White-bellied Sea-Eagle (FFG-EN): Recorded in the study area during Nature Advisory ecological surveys. They could potentially fly over the wind farm site and have been observed during BUS on three occasions. They are usually restricted to coastal habitats, but may occasionally travel inland along the river systems, including possibly the Albert River, whilst foraging or moving about its territory. This species has been recorded south of the broader study area boundaries, in association with its preferred habitat of coastal and estuarine ecosystems.

Sea-Eagles are vulnerable to collision with operating turbines. No evidence was found for nesting near proposed turbine locations during site studies, however the species may occasionally fly across the wind farm site given its proximity to coastal habitats. This could put individuals at risk of occasionally colliding with operating wind turbines. The frequency of such collisions is likely to be very low, so population consequences are not considered significant given the state population is estimated at 100 adult pairs plus sub-adults, with the Corner Inlet area in South Gippsland supporting approximately 25 of these pairs (DSE 2003). It will be important to monitor for the presence of this species as part of the BAMP.

Chestnut-rumped Heathwren (FFG-VU): Not recorded in the study area during Nature Advisory ecological surveys. Could potentially occur based on the VBA records. There were five records from the search area (most recent 2013). The Heathwren inhabits dense heathland and dense understorey or ground-layer in sclerophyll forests and woodlands; widespread but sparsely distributed (Higgins & Peter 2002; Tzaros 2005). The species does not fly high and restricts its movement to the forest understorey. It will therefore not be impacted by operating turbines.

Swift Parrot (EPBC-CR; FFG-CR): See section above.

White-throated Needletail (EPBC-VU; FFG-VU): See section above.

Susceptibility of non-listed bird species to impacts

The **Wedge-tailed Eagle** is a high-profile species and one of the most vulnerable species to collision with operating turbines. The VBA provided many records (121 records) taken over the last 50 years from the search region (10 km radius from the centre of the wind farm site), indicating that eagles could regularly fly over the wind farm site.

This species has been recorded flying over the wind farm site as incidental observations and during targeted White-throated Needletail surveys. At heights of 50 to 300 m above ground.

No evidence was found of eagles nesting within the wind farm boundary or nearby. Based on the above, the wind farm site is likely to be part of the territory of one or possibly two pairs of eagles that reside and may breed in woodland located north of the wind farm site. They are likely to regularly forage over the wind farm site; and it may well be part of the eagle's home range (see also BL&A 2016). This could put individuals at risk of occasionally colliding with operating wind turbines. Any impact will be monitored as part of the BAMP implementation.

Reptiles

No listed reptile species have the potential to occur in the study area.

Frogs

No listed frog species have the potential to occur on the proposed wind farm site. Frog species are not considered at risk from proposed wind farm developments because they generally occur on lowlands or near water bodies. Provided a suitable buffer of at least 50 m is provided from waterways and wetland habitats impacts on frog habitat are not expected.

Fish

Two listed fish species are considered to have the potential to occur in the study area. The likelihood of occurrence in the study area and the vulnerability of these species to possible impacts from the proposed development are discussed below.

- Australian Grayling (EPBC Act: vulnerable; FFG Act: Listed)
- Dwarf Galaxias (EPBC Act: vulnerable; FFG Act: Listed)

Australian Grayling exists in large and small coastal streams and rivers with cool, clear waters with a gravel substrate and altering pools and riffles (Cadwallader and Backhouse 1983). Suitable habitat exists within the study area and there are historical records in the Albert River in the north-east of the study area. Provided there are no impacts on flows or water quality in the Albert River from construction and operation of the proposed wind farm then impacts are not expected on this species. This has been achieved by implementing at least 500 m separation between the development footprint (i.e., turbines, access tracks and power cabling) and the Albert River and any significant tributaries on the site. Furthermore, a CEMP will include measures to avoid indirect impacts to watercourses through sediment and erosion management.

Dwarf Galaxias occur amongst marginal vegetation in still or gently flowing water of roadside ditches, swamps, and backwaters of creeks (Allen *et al*. 2002). Suitable habitat exists near the study area, particularly with tributaries associated with the Albert and Jack Rivers north-east of the site. Provided there are no impacts on flows or water quality in the Albert River from construction and operation of the proposed wind farm then impacts are not expected on this species. This can be assured by ensuring a minimum 30 m separation between the development footprint (i.e.,

turbines, access tracks and power cabling) and the Albert River and any significant tributaries on the site.

Invertebrates

No listed invertebrate species (whether EPBC or FFG Acts) have been recorded historically within the broader study area. No suitable habitats for the two species listed in VBA records were found during the fauna overview assessment. Therefore, these species are not expected to occur in the wind farm study area.

6. Bird Utilisation Surveys

6.1. Methods

The bird utilisation survey (BUS) was undertaken consistent with the requirements for a "Level One" bird risk assessment in accordance with 'Wind Farms and Birds - Interim Standards for Risk Assessment' issued by the Australian Wind Energy Association (AusWEA 2005) which has also been adopted by the Best Practice Guidelines for Wind Energy Developments in Australia issued by the Clean Energy Council (2018).

Experienced zoologists undertook eight pre-construction bird utilisation surveys between November 2023 and June 2025, one in each season, to account for seasonal differences in bird activity and species presence (due to migration). The survey dates are detailed below.

- Spring 2023 (13-16 November 2023)
- Summer 2024 (12-19 February 2024)
- Autumn 2024 (13-18 April 2024)
- Winter 2024 (7-12 August 2024)
- Spring 2024 (12-16 November 2024)
- Summer 2025 (3-6 February 2025)
- Autumn 2025 (24-28 March 2025)
- Winter 2025 (2-8 June 2025)

6.1.1. Fixed-point bird count

The BUS involves the fixed-point bird count survey methodology, a standard and effective method for estimating bird species diversity (number of species) and the abundance of individuals counted for each species. For each fixed-point bird count, the surveyor stands in one place for 20 minutes and records all bird species and the number of individual birds observed, as far as the eye can see.

During this period, the diversity (number) of bird species and the abundance of individuals counted for each species were recorded. For each record, the distance of the bird from the observer and the bird's height when first observed were documented. For species of concern (listed threatened and migratory species and raptors), the minimum and maximum heights were recorded.

Flight height is presented as below, at or above the rotor swept area (RSA) height detailed below.

A = Below RSA (< 40 m above ground).
B = At RSA (40 – 210 m above ground).
C = Above RSA (> 210 m above ground).

The BUS were undertaken during four different time periods, corresponding with the four seasons to account for changes in composition of bird communities.

6.1.2. Survey site selection

Survey effort

Species accumulation curves are a common method used to evaluate and/or confirm survey effort for a study (Watson 2003). A species accumulation curve generated for this study confirmed the adequacy of eight replicates to represent the bird community data in the study area. The

cumulative number of species observed from the consecutive fixed-point bird counts conducted at the observation points during the survey period has been plotted (Figure 3). The data indicated that during the survey period the number of species recorded levelled out after around 80 counts. This supports the adequacy of using eight replicates to generate representative data on bird species in the study area during the relevant times of year.

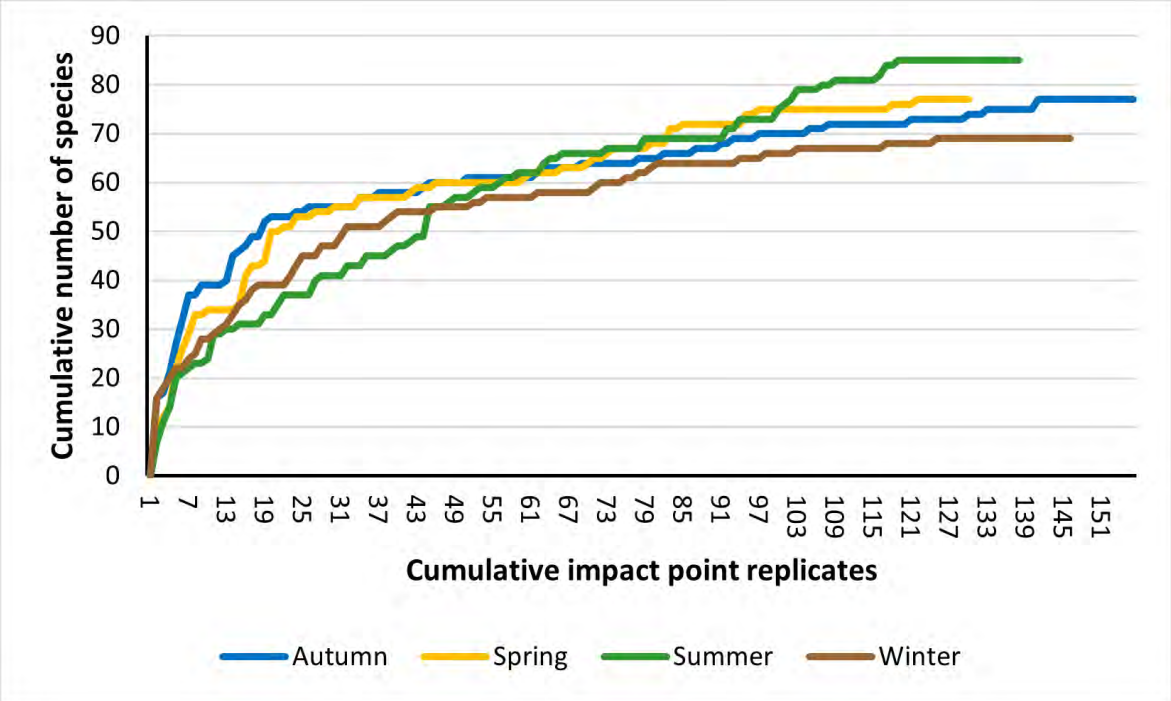

Figure 3: The cumulative number of bird species recorded during consecutive counts.

Location and details of survey points

Eight impact points and two reference points were surveyed (Figure 4), with an additional impact point (B9) and a third reference point (R3) within the Gelliondale State Forest added in summer and winter 2024 on request of DEECA. To ensure comprehensive coverage of the wind farm, the survey points were evenly distributed, considering access constraints. Survey points were ideally located on elevated ground to provide a clear view in all directions. Impact points were situated near the proposed turbine locations, while reference points were positioned at least 500 meters away in similar habitats. Table 7 details the habitats associated with each impact and reference point.

Figure 4: BUS point and threatened or sensitive fauna

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 09/02/2024

Wind farm boundary
Turbine

BUS point

Impact
Reference

Threatened fauna species

Blue-winged Parrot
Hardhead
Latham's snipe
White-bellied Sea-Eagle

N

Metres
0 400

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Layers - Created by: franciscod - \\Nat-haw-dt04\E\GIS\2014 Jobs\14107\14107_11 FIG1 BUS points 231110.mxd

Table 7: Habitat descriptions associated with each survey point

Survey point	Habitat description
B1	The landscape is largely cleared and dominated by introduced pasture grasses. Swamp scrub along roadside (100-150 m), with aquatic herbland patch 150 m south-east
B2	The landscape is largely cleared and dominated by introduced pasture grasses. Line of Melaleuca 150-200 m west, and swamp scrub along roadside 150-200 m north.
B3	The landscape is largely cleared and dominated by introduced pasture grasses. No trees near the impact point except swamp scrub along roadside 300 m north and non-native cypress 300 m south-east.
B4	A paddock dominated by introduced pasture grasses bordered by native forest 150 m South (dense melaleuca scrub with a sparse canopy of eucalyptus). Line of native tree 250 m east, and non-native cypress 500 m west. One large, scattered Swamp Gum 250 m north.
B5	A paddock dominated by introduced pasture grasses bordered by native forest 100 m south: dense corridor of Melaleuca scrub and wet heathland with a sparse canopy of eucalyptus further south. Few ponds border the woodland area. Line of non-native cypresses 250-300 m east.
B6	A paddock dominated by introduced pasture grasses bordered by native forest 200 m west and 250 m south: dense corridor of melaleuca scrub and wet heathland with a sparse canopy of eucalyptus further in. One larger pond 100 m north-west.
B7	A paddock dominated by introduced pasture grasses bordered by native forest 150 m east: swamp scrub with a sparse canopy of eucalyptus and tea tree. Ponds 130 m north-west and 280 m south. Line of native trees (eucalyptus) 350 m north-west.
B8	A paddock dominated by introduced pasture grasses bordered by native forest 400 m east: swamp scrub with a sparse canopy of eucalyptus and tea tree. Aquatic herbland 250 m east, and few large, scattered trees (swamp gums) 350 m north-east and south-east.
B9	A paddock dominated by introduced pasture grasses. Line of non-native cypresses 200 m west, and swamp scrub along roadside 200 m north.
R1	A point located on top of a hill. Paddock dominated by introduced pasture grasses. Swamp scrub along roadside 350 m north and east. Line of native trees dominated by eucalyptus 400 m south and 200-300 m west. Patch of woodland 250 m west (mix of native eucalyptus and non-native pine tree).
R2	A point located in a paddock dominated by introduced pasture grasses in the immediate vicinity of native forest 50 m east (swamp scrub with a sparse canopy of eucalyptus and tea tree). Patches of heathy woodland 250 m north along the roadside. Line of native tree (eucalyptus) 450-500 m west.
R3	Located along a track within Gelliondale State Forest.

6.1.3. Survey schedule

A five-day survey schedule was produced, allowing an even spread of times each site is surveyed across eight replicates (Table 8) This schedule accounts for, and removes, observation biases relating to time-of-day differences in bird movements and activity. This schedule was amended to allow for nine impact and three reference points in summer and winter 2024.

Table 8: Times when points were counted for each fixed-point bird count survey day

Time	Day 1	Day 2	Day 3	Day 4	Day 5
7:20	R1	6	2	7	4
8:00	1	R2	3	8	5
8:40	2	7	4	R1	6
9:20	3	8	5	1	R2
10:00	4	R1	6	2	7
10:40	5	1	R2	3	8
11:20	6	2	7	4	R1
12:00	R2	3	8	5	1
12:30	7	4	R1	6	2
13:20	8	5	1	R2	3
14:00	R1	6	2	7	4
14:40	1	R2	3	8	5
15:20	2	7	4	R1	6
16:00	3	8	5	1	R2
16:40	4	R1	6	2	7
17:20	5	1	R2	3	8

Notes: R = Reference sites

6.1.4. Incidental observations

In addition to the observations during formalised, fixed-point counts, incidental observations of birds of concern (listed threatened and migratory species and raptors) were recorded whilst travelling throughout the wind farm study area.

6.1.5. Data collection and analysis

Survey details for bird species observations were recorded in ArcGIS Field Maps application. Data were then entered into spreadsheet files and tables and graphs were extracted. Graphs were generated in Microsoft Excel and R (R Core Team 2018).

First, the suitability of the survey method was checked using a cumulative species number graph as described in section 6.1.2. To investigate the variations of species diversity and abundance between impact and reference points and between different BUS, analysis of variance (ANOVA) was performed, with species diversity and abundance as dependent factors and point types (impact/reference) as predicting parameters.

6.1.6. Limitations

The data on bird abundance can be skewed during certain times due to species such as starlings, cockatoos, magpies or ravens, which can occur in large flocks generating larger counts.

6.2. Results

6.2.1. Bird species composition

Diversity and abundance

After eight BUS, 113 bird species and 41,430 individuals were recorded across all sites and seasons. A total of 111 bird species and 33,616 individuals were observed at the impact sites. At the reference sites, surveys recorded 88 bird species and 7,815 individuals.

Notably, 26 bird species were exclusively found at the impact sites, and 2 species were unique to the reference sites. An additional 12 raptor and threatened bird species were recorded incidentally while travelling within the study area between survey points.

Overall the most commonly recorded species were similar at impact and reference sites. At the impact survey points, the five most common and abundant bird species were Common Starling, Australian Magpie, Straw-necked Ibis, Little Raven, and Eurasian Skylark (Table 9). The most common species at the reference points were Common Starling, Australian Magpie, Straw-necked Ibis, Little Raven and Raven sp. The five most common bird species recorded at the impact points accounted for 66% of the total abundance of individuals counted. At reference points, they accounted for 48% of the total abundance of individuals counted.

Table 9: Five most common bird species recorded at impact sites at Gelliondale Wind Farm relative to the number and proportion of the total abundance of individuals counted.

Impact points			Reference points		
Species	Total abundance	% of bird records	Species	Total abundance	% of bird records
Common Starling	10,604	32%	Common Starling	1,434	18%
Australian Magpie	5,756	17%	Australian Magpie	802	10%
Straw-necked Ibis	2,309	7%	Straw-necked Ibis	645	8%
Little Raven	2,014	6%	Little Raven	512	7%
Eurasian Skylark	1,400	4%	Raven sp.	390	5%
Total for top 5	**22,083**	**66%**	**Total for top 5**	**3,783**	**48%**

Table 10: Numbers and height distributions of bird species observed at survey points during seasonal surveys at the Gelliondale Wind Farm study area

Species	B01			B02			B03			B04			B05			B06			B07			B08			B09			Impact Total			R01			R02			R03			Reference Total			Grand total		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Australasian Grebe																						2						2	0	0										0	0	0	2	0	0
Australasian Swamphen													11															11	0	0										0	0	0	11	0	0
Australian Hobby				1			3			1						1						1						7	0	0										0	0	0	7	0	0
Australian Magpie	445	29		664	2		992	4		546	3		391	3		383	8		1296			751	62		177			5645	111	0	285			378			139			802	0	0	6447	111	0
Australian Pelican		1		6				3			3																	6	7	0		2								0	2	0	6	9	0
Australian Pipit	8			13			58			6			18			15			9			13			149			289	0	0	35			31			3			69	0	0	358	0	0
Australian Raven													1						1						2			4	0	0	2			1						3	0	0	7	0	0
Australian Shelduck	13			7			63			47	8		82	2		26	5		171	16		11	8		65			485	39	0	26	12		196	4		9			231	16	0	716	55	0
Australian White Ibis	75	6		106	25		151	132		9			6				9		3				17		28			378	189	0	22	3	2	1						23	3	2	401	192	2
Australian Wood Duck	2									12			50			9			132			5						210	0	0	78			19			8			105	0	0	315	0	0
Black Swan	541			70			36			2	1		32						2				16		298			981	17	0	4			9						13	0	0	994	17	0
Black-faced Cuckoo-shrike	27			7	8		12			5	2		1			1												53	10	0										0	0	0	53	10	0
Black-shouldered Kite	7	1		8	3		2			1			2	1		2			1			1						24	5	0	8				2					8	2	0	32	7	0
Blue-winged Parrot	105	6		27	1		6	2		1			3			8	6		29	28		125	17					304	60	0	179	13		48	37					227	50	0	531	110	0
Brown Falcon	9	1		1	3		3						2	1		6	1		2	1		2	1		5			30	8	0	7	1		2						9	1	0	39	9	0
Brown Goshawk					1														1			1						2	1	0				1						1	0	0	3	1	0
Brown Honeyeater													2															2	0	0										0	0	0	2	0	0
Brown Songlark	1			6			1			1						3			4			5						21	0	0										0	0	0	21	0	0
Brown Thornbill	14			3			2			2			7			8			3			3			2			44	0	0	2			16			30			48	0	0	92	0	0
Brown-headed Honeyeater										2									3			4						9	0	0										0	0	0	9	0	0
Brush Bronzewing													2															2	0	0										0	0	0	2	0	0
Chestnut Teal																2			80									82	0	0				50						50	0	0	132	0	0
Collared Sparrowhawk				1																								1	0	0					1					0	1	0	1	1	0
Common Blackbird	1									6			30			2			5			1						45	0	0	5			20						25	0	0	70	0	0
Common Bronzewing										1																		1	0	0				1						1	0	0	2	0	0
Common Myna	72			26			118			147	2		33	70		53			73			119			91	16		732	88	0	161			145	80		2			308	80	0	1040	168	0
Common Starling	672			2276	281		2333	15		1151			442	8		648			528	11		1421			518	300		9989	615	0	580	67		766		12	9			1355	67	12	11344	682	12
Corella sp.																						40						40	0	0				15						15	0	0	55	0	0
Crescent Honeyeater																			1			2						3	0	0										0	0	0	3	0	0
Crested Pigeon				2			12									3			3						3			23	0	0	2			2			2			6	0	0	29	0	0
Crimson Rosella	8			12			17			51			73	2		56			30			17			1			265	2	0	28			25			13			66	0	0	331	2	0
Eastern Cattle Egret	24						3									3									1			31	0	0				1						1	0	0	32	0	0
Eastern Rosella	15			51			14			62			10	3		14	2		7			24			5			202	5	0	27			11			3			41	0	0	243	5	0
Eastern Spinebill							1			1			2															4	0	0							5			5	0	0	9	0	0
Eastern Yellow Robin										6			13			5			6			3			2			35	0	0				4			18			22	0	0	57	0	0
Eurasian Coot													4			4												8	0	0										0	0	0	8	0	0
Eurasian Skylark	229	2		192	2		201	2		105	1		131	1		99	3		156	1		208	1		62	4		1383	17	0	166	2		72	3		28	4		266	9	0	1649	26	0
Eurasian Tree Sparrow																						4						4	0	0	5									5	0	0	9	0	0
European Goldfinch	16			1			3			2			23			50			51			71			1			218	0	0	6			41						47	0	0	265	0	0
Fairy Martin													3						2			2						7	0	0				13						13	0	0	20	0	0
Fan-tailed Cuckoo	1															2			1									4	0	0	1						1			2	0	0	6	0	0
Flame Robin	10									7						1			1			5						24	0	0	1			9						10	0	0	34	0	0

Species	B01			B02			B03			B04			B05			B06			B07			B08			B09			Impact Total			R01			R02			R03			Reference Total			Grand total		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Forest Raven	40			18			26			49			34			13	5		36			29			6			251	5	0	42			36	1		4			82	1	0	333	6	0
Galah	23			1				10		5						6			17			29			2			83	10	0	42			12			10			64	0	0	147	10	0
Gang-gang Cockatoo	4																											4	0	0	31									31	0	0	35	0	0
Golden Whistler	1									1						2			2			3			1			10	0	0							3			3	0	0	13	0	0
Golden-headed Cisticola	6			7			2																		11			26	0	0	2									2	0	0	28	0	0
Great Cormorant	1						3															1						5	0	0				1						1	0	0	6	0	0
Great Crested Grebe																			1									1	0	0										0	0	0	1	0	0
Grey Butcherbird	21			16			10			24			14			14			13			18			7			137	0	0	28			9			16			53	0	0	190	0	0
Grey Currawong	5						7			11	2		10	2		9			6			1			1			50	4	0	1			5			5			11	0	0	61	4	0
Grey Fantail	31						5			23			26			10			30			6			2			133	0	0	23			20			33			76	0	0	209	0	0
Grey Shrike-thrush	40			10			11			19			16			28			33			17			5			179	0	0	29			28			24			81	0	0	260	0	0
Grey Teal										2			31						35									68	0	0										0	0	0	68	0	0
Hoary-headed Grebe																3												3	0	0										0	0	0	3	0	0
Horsfield's Bronze-cuckoo				1						3												1						5	0	0	1									1	0	0	6	0	0
House Sparrow	3			2			24						10												4			43	0	0				18						18	0	0	61	0	0
Laughing Kookaburra	3						2			12			6			3			3			5			5			39	0	0	10			3						13	0	0	52	0	0
Lewin's Honeyeater																1												1	0	0										0	0	0	1	0	0
Little Corella	14	3								8						13			50			145						230	3	0				9						9	0	0	239	3	0
Little Grassbird	1						1						3						1			2						8	0	0				3						3	0	0	11	0	0
Little Lorikeet										2																		2	0	0										0	0	0	2	0	0
Little Pied Cormorant													2									1						3	0	0										0	0	0	3	0	0
Little Raven	140			384			138	1		141			201	4		179	9		488	6		97			223	3		1991	23	0	155	2		319	2		32	2		506	6	0	2497	29	0
Little Wattlebird	6						1			25			16			31			5			3			1			88	0	0				9			15			24	0	0	112	0	0
Magpie-lark	75			180			55			40			76			15			52			46			38			577	0	0	75	5		43			14			132	5	0	709	5	0
Martin sp.																						2						2	0	0										0	0	0	2	0	0
Masked Lapwing							2			10			21			1			2			3			3			42	0	0	1			2						3	0	0	45	0	0
Musk Lorikeet										19						2			5			1						27	0	0				9						9	0	0	36	0	0
Nankeen Kestrel	3			1			3			1									4				1					12	1	0				2						2	0	0	14	1	0
New Holland Honeyeater	1												3						5						1			10	0	0				2			7			9	0	0	19	0	0
Noisy Miner	3						8			67			3			2			9			11			4			107	0	0	2			1						3	0	0	110	0	0
Olive Whistler							1																					1	0	0										0	0	0	1	0	0
Pacific Black Duck	3	4					1			13			61			18			50			2			21			169	4	0	10			58			4			72	0	0	241	4	0
Peregrine Falcon							1						1						1						2	1		5	1	0	1			2						3	0	0	8	1	0
Pied Cormorant																						1						1	0	0										0	0	0	1	0	0
Pied Currawong	3			3			1			5			3			21			6			2			2			46	0	0	2			1						3	0	0	49	0	0
Rainbow Lorikeet	3	1		39				4		38	17		11	86		21	8		15	12		9	10		8	6		144	144	0	5			59	25			7		64	32	0	208	176	0
Raven sp.	147	15		122	9		144	2		82			75	6		194	4		107	14		147	60		18	3		1036	113	0	124	17		226	13	3	7			357	30	3	1393	143	3
Red Wattlebird	53			27			24			125			81			34			42			29			14			429	0	0	42			34			71			147	0	0	576	0	0
Red-browed Finch										29			40			15												84	0	0				6			2			8	0	0	92	0	0
Reed-Warbler	1																		1			2						4	0	0	2			1						3	0	0	7	0	0
Rufous Whistler	6			1						1			9			6			5									28	0	0	14			14			2			30	0	0	58	0	0
Sacred Kingfisher																			1									1	0	0										0	0	0	1	0	0
Scarlet Robin																												0	0	0	2									2	0	0	2	0	0

Species	B01			B02			B03			B04			B05			B06			B07			B08			B09			Impact Total			R01			R02			R03			Reference Total			Grand total		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Shining Bronze-cuckoo													1			1												2	0	0										0	0	0	2	0	0
Silvereye	8												24			7			2									41	0	0	6			15			1			22	0	0	63	0	0
Spotted Dove							2						4						5						4			15	0	0				11						11	0	0	26	0	0
Spotted Harrier											1																	0	1	0										0	0	0	0	1	0
Spotted Pardalote	2						3			29			20			7			14			5			5			85	0	0	1			3			26			30	0	0	115	0	0
Straw-necked Ibis	87	143		338	92		74	443		32	208		145	32	220	15	6		41			66			157	210		955	1134	220	221	180	70		152		22			243	332	70	1198	1466	290
Striated Fieldwren																						1						1	0	0										0	0	0	1	0	0
Striated Pardalote							5			15			4			3			10			1			4			42	0	0				2			10			12	0	0	54	0	0
Striated Thornbill	9															2						6			2			19	0	0							31			31	0	0	50	0	0
Stubble Quail	53			53			13			14			21			19			43			25						241	0	0	57			40						97	0	0	338	0	0
Sulphur-crested Cockatoo	22			4						18			20			23	1		70	5		90	20		4	3		251	29	0	47			152	63					199	63	0	450	92	0
Superb Fairy-wren	39			5			9			24			114			46			40			8			2			287	0	0	20			129			35			184	0	0	471	0	0
Swamp Harrier				2			2			3	1		1	1		1			1	1								10	3	0	1									1	0	0	11	3	0
Tree Martin																			2			18						20	0	0	20									20	0	0	40	0	0
Wattlebird sp.																5												5	0	0										0	0	0	5	0	0
Wedge-tailed Eagle	4	5	1	1	4		1	12			10		2	8		1	4		5	11		3	14		2	2		19	70	1		9		6	12					6	21	0	25	91	1
Welcome Swallow	46			7			20			68			31			40			23			52			6	17		293	17	0	99	20		153			2			254	20	0	547	37	0
Whistling Kite				1						1													1		1			3	1	0										0	0	0	3	1	0
White-bellied Sea-Eagle								1															1					0	2	0				1						1	0	0	1	2	0
White-browed Scrubwren										1			6			1			3			1						12	0	0				4			1			5	0	0	17	0	0
White-eared Honeyeater	11			5			9			27			29			18			33			15			7			154	0	0	8			15			69			92	0	0	246	0	0
White-faced Heron	11		2	1			30			3			12			15	1		5			2			34			113	1	2	5			3			1			9	0	0	122	1	2
White-fronted Chat													1												2			3	0	0										0	0	0	3	0	0
White-naped Honeyeater																4			3			1						8	0	0							7			7	0	0	15	0	0
White-necked Heron	14	1											2			2	1		5						3			26	2	0	1	1		3						4	1	0	30	3	0
White-throated Needletail	2									5																		7	0	0										0	0	0	7	0	0
White-throated Treecreeper																												0	0	0							3			3	0	0	3	0	0
Willie Wagtail	5			3			11			1			6			3						6			20			55	0	0	5			7			2			14	0	0	69	0	0
Yellow-billed Spoonbill										1																		1	0	0							1			1	0	0	2	0	0
Yellow-faced Honeyeater	3						9			22			36			35			56			4			3			168	0	0	5			25			52			82	0	0	250	0	0
Yellow-rumped Thornbill	8															2									15			25	0	0	2									2	0	0	27	0	0
Yellow-tailed Black-Cockatoo	4						17			4			46	1		11			5			5			2			94	1	0	43			1	6		1	3		45	9	0	139	10	0
Grand Total	3260	218	3	4712	431		4706	631		3197	259		2652	231	220	2306	73		3992	106		3763	229		2062	565		30650	2743	223	2815	334	72	3379	401	15	783	16		6977	751	87	37627	3494	310

6.2.2. RSA height evaluation

Bird heights were classified as below (< 40 m), at (40–210 m), and above (> 210 m) RSA height. Most birds recorded during the BUS flew below RSA height at the impact (91%), and reference (89%) points. Birds observed flying at RSA height accounted for 8.2% of all birds recorded at impact points and accounted for 9.6% of records at reference points 0.66% of all birds at impact points and 1.1% of all birds observed at reference points flew above RSA height (Table 11).

The main five bird species found flying within the RSA height were unlisted species, except for the Blue-winged Parrot that accounted for 6.7% of flights at RSA at reference points (Table 12).

Table 11: Summary of bird records within RSA height (B) and below (A) and above (C) heights at the survey site within the impact area

Height	Impact points		Reference points	
	Number	% of total	Number	% of total
A (below RSA)	30650	91.18%	6977	89.28%
B (at RSA)	2743	8.16%	751	9.61%
C (above RSA)	223	0.66%	87	1.11%
Total	33616	100.00%	7815	100.00%

Table 12: The most abundant species flying at RSA height

Impact survey points	% of RSA total	Reference survey points	% of RSA total
Straw-necked Ibis	41.3	Straw-necked Ibis	44.2
Common Starling	22.4	Common Myna	10.7
Australian White Ibis	6.9	Common Starling	8.9
Rainbow Lorikeet	5.2	Sulphur-crested Cockatoo	8.4
Raven sp.	4.1	Blue-winged Parrot	6.7
Total	80.0	**Total**	78.8

Listed threatened and migratory species

Most birds recorded throughout the proposed wind farm study area were common birds. Of the species recorded during the bird utilisation surveys, the following four species were listed under the EPBC Act and/or the Victorian FFG Act):

Blue-winged Parrot (EPBC Act: Vulnerable) During impact point surveys, it was observed 103 times totalling 364 counts, with most records (75%) in autumn. During reference point surveys it was observed 50 times totalling 277 counts, with most records (89%) in autumn. Blue-winged Parrot was mostly observed in small numbers with some groups of up to 35-39 birds. Most individuals (84%) were recorded flying below RSA height. However, 16% were recorded at RSA height. Some Blue-winged Parrots have been recorded to collide with operating turbines in Victoria.

Gang-gang Cockatoo (EPBC Act: Endangered; FFG Act: Endangered). Gang-gang Cockatoos were observed 3 times during the BUS, with a flock of up to 18 recorded twice during autumn 2025. All were observed below RSA height. This species is woodland-dependent and spends most of its time foraging in the canopy and shrubs; only flying small distances above this height. Chances of collision are considered low.

White-bellied Sea-Eagle (FFG Act: Endangered): White-bellied Sea-Eagle was recorded three times during the BUS, totalling three counts, with two of the records at RSA height. The species was

recorded in low numbers but is known to be at risk of collision with wind turbines due to soaring flight patterns at RSA. No White-bellied Sea-Eagle nests were found during extensive bird studies at or adjacent to the wind farm site.

White-throated Needletail (EPBC Act: Vulnerable & Migratory; FFG Act: Vulnerable): Seven counts were recorded during summer (2 individuals) and autumn (5 individuals) BUS surveys. Although the species is known to fly at high altitudes and is particularly risky to turbines, all these records were below RSA height. Separate targeted surveys for this species were undertaken and are detailed in Section 8.2.

Incidental observations included low numbers of Latham Snipe (EPBC Act: Vulnerable), Eastern Great Egret (FFG Act: Vulnerable) and Fork-tailed Swift (EPBC Act: Migratory). Both Latham snipe and Eastern Great Egret will utilise the edges of waterbodies such as dams, wetlands, and flooded paddocks (McCrimmon et al., 2020; van Gils, et al., 2020). Little of these habitats exist onsite compared to the abundance of high-quality habitat nearby, particularly in the Corner Inlet Ramsar site. So the study area is unlikely to be an important habitat or regularly used relative to the nearby context. Fork-tailed Swifts, similar to White-throated Needletails, are known to fly at altitude and may experience collision impacts. However, due to the few records the study area it is considered to occur uncommonly.

Raptors

Twelve raptor species were recorded at the BUS points in the study area, comprising 263 observations in total (Table 13). The number of raptors recorded was relatively low in relation to all the other birds recorded during the surveys comprising 0.6% of total flights.

Wedge-tailed Eagle was the most abundant raptor species seen at the study area. It was counted 117 times for the BUS and comprised 45% of all records of raptors. Wedge-tailed Eagle were most frequently recorded in autumn (46% of records) and spring (31%), followed by summer (16%) and winter (7%). The next most abundant species was Brown Falcon (48 counts, 18% of raptor records) followed by Black-shouldered Kite (39 counts, 15% of raptor records).

Eleven raptor species accounted for 118 (3.4%) of the 3494 individuals counted at RSA height. Wedge-tailed Eagle accounted for 77% of raptors observed at RSA height. Brown Falcon accounted for 7.6% and Black-shouldered Kite accounted for 5.9% with the remaining 8 species accounting for 0.85-2.5% each. Australian Hobby was the only raptor species observed during the BUS that was not observed flying at RSA height. White-bellied Sea Eagle was recorded twice at RSA height.

Table 13: Investigation of raptor species and RSA flight height records at the BUS points at Gelliondale Wind Farm.

Year	2023		2024								2025							Total Flights	Total Flights at RSA	Total Flights (%)	Relative to total raptor flights at RSA (%)	Relative to all species flights at RSA (%)
Season	Spring		Autumn		Spring		Summer		Winter		Autumn		Summer			Winter						
Species / Height class	A	B	A	B	A	B	A	B	A	B	A	B	A	B	C	A	B					
Australian Hobby			1				1				3		2					7	0	2.66	0.00	0.00
Black-shouldered Kite	2	1	16	3			1	1	1		7		3	2		2		39	7	14.83	5.93	0.20
Brown Falcon	6	1	7	7	1	1	2		7		6		5			5		48	9	18.25	7.63	0.26
Brown Goshawk	1								1			1				1		4	1	1.52	0.85	0.03
Collared Sparrowhawk								1					1					2	1	0.76	0.85	0.03
Nankeen Kestrel			8	1			3		1		1		1					15	1	5.70	0.85	0.03
Peregrine Falcon			1		2		1	1					3			1		9	1	3.42	0.85	0.03
Spotted Harrier								1										1	1	0.38	0.85	0.03
Swamp Harrier	2		1		1	2	3	1	1		1		2					14	3	5.32	2.54	0.09
Wedge-tailed Eagle	2	31	10	29		3	1	6	1	3	3	12	6	5	1	2	2	117	91	44.49	77.12	2.60
Whistling Kite							2									1	1	4	1	1.52	0.85	0.03
White-bellied Sea-Eagle		2							1									3	2	1.14	1.69	0.06
Grand Total	**13**	**35**	**44**	**40**	**4**	**6**	**14**	**11**	**13**	**3**	**21**	**13**	**23**	**7**	**1**	**12**	**3**	**263**	**118**	**100**	**100**	**3.38**
Total Flights (All Birds)	**4837**	**493**	**11154**	**1398**	**2844**	**28**	**3479**	**19**	**3602**	**34**	**5857**	**1231**	**2295**	**157**	**1**	**3559**	**134**	**41431**	**3494**			

6.3. Conclusions

The two year BUS recorded a diverse bird population, with 113 species and a total of 41,340 individuals recorded across all sites and seasons. Most of the observed species were common farmland and woodland species, but four key species listed under the EPBC Act and/or the FFG Act were also observed. The main five bird species found flying within the RSA height at impact sites were Straw-necked Ibis, Common Starling, Australian White Ibis, Rainbow Lorikeet, and Raven sp. At reference sites, the main five bird species found flying within the RSA height were Straw-necked Ibis, Common Myna, Common Starling, Sulphur-crested Cockatoo and Blue-winged Parrot. These species accounted for 80.0% of all individuals recorded at RSA height at impact points and 78.8% of individuals recorded at reference sites.

Blue-winged Parrot was observed 153 times for a total of 641 flights, with 81% of the sightings occurring in autumn. They were observed mostly as individuals or in small groups, with some groups of up to 39 individuals. While most (84%) of these individuals were observed flying below RSA height, 16% were recorded at RSA height, presenting a collision risk for this species. Four Gang-gang Cockatoo were counted during the first year BUS, and a flock of up to 18 was recorded twice during the recent autumn 2025 BUS, all below RSA height. Given its foraging behaviour in the canopy and short-distance flights, this woodland-dependent species is unlikely to face significant risk from wind turbines. White-bellied Sea Eagle was recorded three times, with two instances at RSA height, posing a risk of collision. White-throated Needletail was observed seven times during the BUS surveys. Sightings were below RSA, but the species is known to fly at RSA and above. Targeted surveys for this species were undertaken and are detailed in Section 8.2.

As expected for apex predators in any ecosystem, raptors were a small part of the overall bird population and represented 0.6% of all bird records. Wedge-tailed Eagle was the most frequently recorded raptor (45% of raptor sightings), with a peak in activity during autumn and spring. This species accounted for 77% of raptor observations at RSA height, indicating a heightened risk of turbine collisions compared to other raptors. White-bellied Sea Eagle, while recorded less frequently (only three observations), remains a species of concern for wind turbine interactions due to their known susceptibility to collisions (NA unpublished data).

6.3.1 Implications

While most bird species recorded are common, the presence of threatened and endangered species, such as Blue-winged Parrot, Gang-gang Cockatoo, White-bellied Sea-eagle, and White-throated Needletail, introduces additional conservation considerations. The Blue-winged Parrots occasional presence at RSA height presents a low risk of collision, particularly during autumn. In addition, the White-bellied Sea-eagle's flight behaviour similarly puts it at risk of turbine collision, however it has only been observed in low numbers. Gang-gang Cockatoo are at lower risk due to their habitat and flight height preferences. White-throated Needletail and Swift Parrot are addressed in Sections 8.1 and 8.2

Wedge-tailed Eagle poses the greatest collision risk among raptors, with 77% of observed raptor flights at RSA height being from WTE. Given their soaring habits they are particularly vulnerable to wind turbine interactions.

A draft Bat and Bird Management Plan (BAMP) has been prepared to detail mitigation measures and further monitoring.

6.3.2. Recommendations

The following monitoring surveys and mitigation measures are recommended to consolidate the current knowledge about the usage of the site by threatened bird species and minimise potential impacts on these species.

- **Pre-construction monitoring**: The pre-construction bird utilisation surveys have met the first-year requirements for establishing baseline bird and bat activity. Further surveys will continue to meet the two-year data requirements of the Commonwealth survey guidelines. These surveys also comply with the planning guidelines for the development of wind energy facilities in Victoria (DTP 2023), and the local planning provisions and controls detailed in Section 2.
- **Avoidance of removal of all hollow-bearing trees** on the project site is recommended, to avoid loss of breeding sites for Blue-winged Parrot and Gang-gang Cockatoo.
- **Targeted post-construction monitoring**: Post-construction BUS will be undertaken and provide further information on species with a risk of turbine collision, particularly Blue-winged Parrot, Wedge-tailed Eagle and White-throated Needletail. Monitoring should be conducted during peak activity seasons to assess the effectiveness of implemented mitigation measures and to track any changes in bird behaviour during turbine operations.
- **Mitigation strategies for at-risk species**: To minimise collision risks, monitoring during peak activity periods for species like Blue-winged Parrot and White-throated Needletail should be considered and seasonal adjustments to turbine operations should be considered if higher numbers of these species are present. Details will be provided in the Bat and Avifauna Management Plan (BAMP). Carcass management should also be employed to minimise scavenger attraction to areas near turbines, helping to lower the risk for Wedge-tailed Eagle.

These recommendations prioritise the protection of vulnerable species while ensuring that wind farm operations remain compliant with environmental regulations and contribute to sustainable energy development.

7. Bat utilisation survey

7.1. Introduction

The bat utilisation surveys were undertaken in accordance with *Survey Guidelines for Australia's threatened bats* (DEWHA 2010), and consistent with methods adopted at many wind farms in eastern Australia over the last 20 years that have satisfied the information requirements of decision-makers and regulators.

Three bat utilisation surveys for the initial planning phase of the proposed wind farm have been conducted to date in November – December (spring/summer) 2023, February – March (summer/autumn) 2024 and August (winter) 2024. In addition, one bat survey was undertaken for Alberton Wind Farm in February/March (summer/autumn) 2015. The main objective of the bat surveys is to provide baseline data on the utilisation by bats of the site.

7.2. Methods

Automated bat detectors (SongMeter Mini Bat, Wildlife Acoustics) were deployed close to the proposed turbine sites, plus two additional reference sites along the border of the native wooded vegetation areas (Figure 5). A SongMeter was placed at each proposed turbine site across the proposed wind farm site and recorded species-specific echolocation calls of free-flying bats for a total of 1213 bat detector nights across three seasons. SongMeters were secured to trees, fence posts or stakes approximately 0.5-2 m above ground and were programmed to commence operation approximately 30 minutes before dusk, and to cease approximately 30 minutes after dawn.

SongMeter deployment (and retrieval) occurred on the following dates:

- Deploy: 26/02/2015 (retrieve: 11/03/2015)
- Deploy: 8-10/11/2023 (retrieve: 11-12/12/2023)
- Deploy: 20-21/02/2024 (retrieve: 2-4/04/2024)
- Deploy: 5-6/08/2024 (retrieve: 9-10/09/2024)
- Deploy: 11-12/11/2024 (retrieve: 18-19/12/2024) – call analysis in progress
- Deploy: 5-6/02/2025 (retrieve: 12-13/03/2025) – call analysis in progress
- Deploy: 28/03/2025 (retrieve: *in situ*)

Each SongMeter unit used a 128GB SDHC card that recorded bat echolocation calls, along with the date and time of each call.

Calls from the units were downloaded and sent to Rob Gration (EcoAerial Environmental Services, Newport VIC) for identification. The analysis involved the development of a decision tree in Anabat Insight (Ver 2 2.1.0-9g6e822da) based on specific call metrics used for identification. The decision tree was run multiple times checking a random sample of labelled calls and call metric parameters and where required the call metrics were adjusted. A personal call library from various sources was used for the call metrics in the decision tree. Calls labelled to a species or complex were reviewed and re-labelled if required.

Identification is largely based on changes to frequency patterns over time, with such changes being characteristic of individual species for most genera. Only those recordings that contained at least two definite and discrete calls were classified as bat calls. For most species, a call sequence of several seconds in duration is required before identification can confidently be made.

Presence and absence were analysed for all common species per site and survey, while the number of calls was analysed for all threatened species and species complexes containing threatened bat species.

7.3. Survey effort

The total number of detector nights for each survey season were: spring/summer 367 nights, summer/autumn 332 nights, and winter 552 nights. This survey effort is considered sufficient to obtain a baseline level of bat activity during the survey period. A total of eight bat utilisation surveys will be conducted at the wind farm site spanning two years and including four seasonal surveys each year.

7.3.1. Location of bat survey sites

The location and characteristics of the recording sites are described in Table 14 and their locations are shown in Figure 5.

Table 14: Bat recorder locations

Survey Site	Habitat/landscape description
GWT 01	Cropped land with drainage line 200m to the east.
GWT 02	A paddock dominated by introduced pasture grasses bordered by native forest 400m east: swamp scrub with a sparse canopy of eucalyptus and tea tree. Aquatic herbland 250m east, and few large, scattered trees (swamp gums) 350m north-east and south-east.
GWT 03	A paddock dominated by introduced pasture grasses bordered by native forest 150m east: swamp scrub with a sparse canopy of eucalyptus and tea tree. Ponds 130m north-west and 280m south. Line of native trees (eucalyptus) 350m north-west.
GWT 04	A paddock dominated by introduced pasture grasses bordered by native forest 200m west and 250m south: dense corridor of melaleuca scrub and wet heathland with a sparse canopy of eucalyptus further in. One larger pond 100m north-west.
GWT 05	A paddock dominated by introduced pasture grasses bordered by native forest 100m south: dense corridor of Melaleuca scrub and wet heathland with a sparse canopy of eucalyptus further south.
GWT 06	A paddock dominated by introduced pasture grasses bordered by native forest 100m south: dense corridor of Melaleuca scrub and wet heathland with a sparse canopy of eucalyptus further south. Few ponds border the woodland area. Line of non-native cypresses 250-300m east.
GWT 07	Cropped land with rows of non-native cypresses 200m to the east and west.
GWT 08	A paddock dominated by introduced pasture grasses bordered by native forest 150m south (dense melaleuca scrub with a sparse canopy of eucalyptus). Line of native tree 250m east, and non-native cypress 500m west. One large, scattered Swamp Gum 250m north.
GWT 09	A paddock dominated by introduced pasture grasses.
GWT 10	Largely cleared landscape and dominated by introduced pasture grasses. Swamp scrub along roadside (100-150m), with aquatic herbland patch 150m south-east.
GWT 11	Largely cleared landscape and dominated by introduced pasture grasses. Line of Melaleuca 300m east, and swamp scrub along roadside 300m south.
GWT 12	Largely cleared landscape and dominated by introduced pasture grasses. Line of Melaleuca 150-200m west, and swamp scrub along roadside 150-200m north.

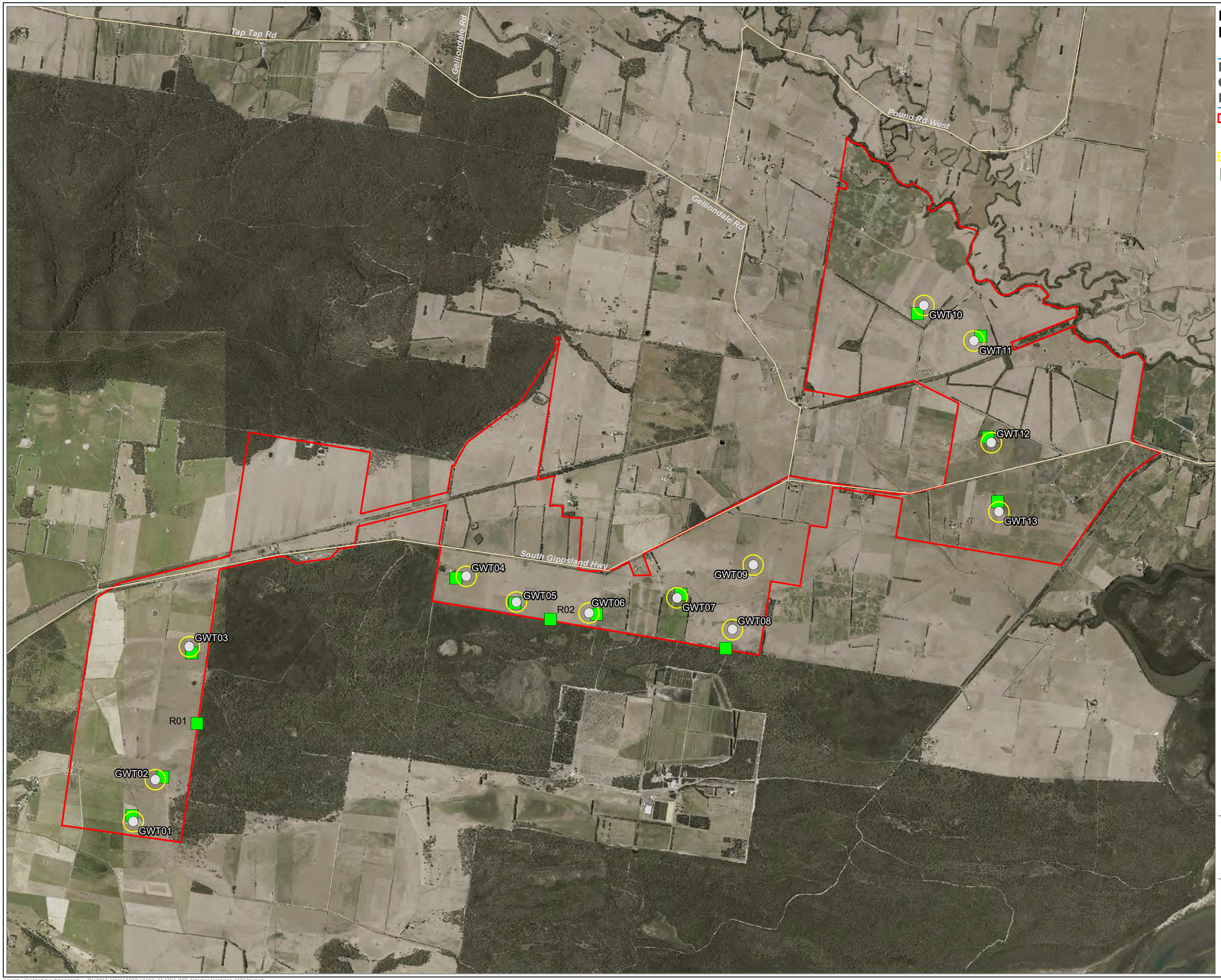
Survey Site	Habitat/landscape description
GWT 13	Largely cleared landscape and dominated by introduced pasture grasses. No trees in direct vicinity of the impact point except swamp scrub along roadside 300m north and non-native cypress 300 south-east.
REF 01	Western forest edge of Gelliondale State Forest, facing open paddocks.
REF 02	Northern forest edge of Gelliondale State Forest, facing open paddocks.

Note: GWT = turbine location

Figure 5: Bat detector locations

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 5/02/2024

Wind farm boundary
Turbine
Turbine buffer (100 m)
Bat detector



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Layers - Created by: franciscod - M:\2014 Jobs\14107\14107_11 FIG1 BAT detector locations 240130.mxd

7.3.2. Limitations

During the 2023 spring/summer survey, site 9 could not be accessed due to OH&S issues, as there was a bull on the paddock. The SongMeter at site 12 did not record any calls, due to a technical failure.

The identification of echolocation calls from microbats in south-eastern Australia is facilitated by the fact that many calls are species-specific. Calls that could not be identified definitively were allocated to species complexes comprising a group of species with similar sonogram characteristics.

A limitation in the use of this technique is that it is not possible to census bat numbers. For example, ten calls of a particular species may be recorded but it is not known if this represents ten individuals of that species or one individual flying past the bat recorder ten times. Therefore, it is not possible to determine utilisation rates, only activity levels.

Occasionally, recording devices such as those used in the survey experience technical difficulties, which are not uncommon. As a result, short periods of time may not be recorded and total hours of recording varies between the different recorders. Weather conditions including severe storms during the recording period may interfere with the recording process.

The bat detectors used during this survey sample limited airspace to approximately 20-30 m.

Finally, bat activity levels may vary in response to weather variables such as air temperature, relative humidity, barometric pressure, wind speed, direction and gusts and rain, and moonlight. Typically, bats are found to be less active during the following circumstances:

- During periods of full moon, and when the moon is high in the sky;
- At higher wind speeds over 10 m per second; and
- During moderate to heavy rainfall.

The identification of echolocation calls from microbats in south-eastern Australia is facilitated by the fact that many calls are species-specific; however, not all species can be consistently or reliably identified using this technique.

7.3.3. Surveying at height limitations

The absence of meteorological masts at the proposed wind farm site restricted the scope to record bats at height. Nature Advisory investigated the use of tethered helium ballons (Mills and Pennay 2017) however based on the following logistical restrictions, did not deem this a feasible option:

- Mills and Pennay (2017) found a high interference to recordings using balloons caused by wind generated noises on the balloon apparatus due to high wind speeds at 100m height limiting the number of identifiable bat calls.
- The rate of helium leaking from the balloon means the time available each night would only be 4 – 5 hours, not covering the dusk and dawn period when bats are active. Refilling at the start of each survey night, plus the requirement of field staff to be present to release and retrieve the balloon each day (and in response to inclement weather), would require a heavy labour cost to continue recordings for a reasonable period (i.e., 4 – 6 weeks in line with the period the ground level detectors are used for).

Furthermore, Eurobats (Rodrigues et al, 2014) do not recommend the use of tethered balloons for collecting bat call data due to the limited usefulness of the data collected.

7.4. Survey results

Surveys recorded nine bat species across the three survey periods in 2023 and 2024 (Table 15). These species are common, widespread, and secure, and usually occur in farmland and other habitats throughout south-eastern Australia. Two additional common species were recorded at Alberton Wind farm in 2015, the Eastern Freetail Bat *(Mormopterus ridei)* and Southern Freetail Bat *(Mormopterus planiceps)*.

Four species complexes were created due to the similarity of calls from several species, these complexes are as follows:

- Eastern Bent-wing Bat (*Miniopterus orianae oceanensis)* and Large Forest Bat *(Vespadelus darlingtoni)* complex.
- Long-eared Bat Complex – ultrasonic calls of Long-eared Bats (*Nyctophilus* spp.) are difficult to distinguish to species level and hence are grouped under their generic name. The species that are likely to occur at the wind farm site are Lesser Long-eared Bat (*Nyctophilus geoffroyi*) or Gould's Long-eared Bat (*Nyctophilus gouldi)*. These species are not listed as threatened.
- Forest Bat Complex - calls from species of Forest Bats (*Vespadelus* spp.) can be difficult to differentiate and, therefore, some of their calls have been combined into the Forest Bat Complex for the purposes of analysis. The species that are likely to occur at the wind farm site are Large Forest Bat, Little Forest Bat *(V. vulturnus)* Southern Forest Bat *(V. regulus).* None of these species are threatened.
- Eastern Broad-nosed Bat (*Scotorepens orion)* and Eastern Falsistrelle (*Falsistrellus tasmaniensis)* complex.

The South-eastern Free-tail Bat (*Ozimpos planiceps*) was recorded, which is outside this species current distribution on BatMap (Australasian Bat Society 2024). These calls underwent quality assurance by Greg Ford and were confirmed to be this species.

The Bent-wing Bat / Large Forest Bat complex includes the Eastern Bent-wing Bat, which is listed as critically endangered under the FFG Act.

7.4.1. Bat activity

All species, except the EBWB/LFB complex, were widespread across the study area, being recorded at every site at least once across the three seasons (Table 15). Site 8 had the largest number of bat calls, with 6,425 recorded calls across the survey period, averaging 221 calls per night. Bat activity was also relatively high at sites 4, REF 01 and REF 02.

The higher number of calls at sites 8, REF 01 and REF 02 are likely associated with proximity to woodland and swamp scrub habitat. Site 4 was located near a larger waterbody and is likely an area that is frequented by bats to drink (Figure 5).

Nine bat calls were attributed to the EBWB/LFB complex. All three calls occurred within the same hour at site REF 02 (two calls) and site 6 (one call), which are neighbouring survey sites. It is therefore possible that these calls were all produced by a single bat.

Table 15: Bat diversity at Gelliondale Wind Farm in 2023 and 2024

Common name	Scientific name	Conservation status	Timing	Site(s)
Chocolate Wattled Bat	*Chalinolobus morio*		All seasons	All sites
Eastern Falsistrelle	*Falsistrellus tasmaniensis*		All seasons	All sites
Eastern Broad-nosed Bat	*Scotorepens orion*		All seasons	All sites

Common name	Scientific name	Conservation status	Timing	Site(s)
Gould's Wattled Bat	*Chalinolobus gouldi*		All seasons	All sites
Large Forest Bat	*Vespadelus darlingtoni*		All seasons	All sites
Little Forest Bat	*Vespadelus vulturnus*		All seasons	All sites
Ride's Freetail Bat	*Ozimops ridei*		All seasons	All sites
South-eastern Freetail Bat	*Ozimpos planiceps*		All seasons	All sites
White-striped Freetail Bat	*Austronomus australis*		All seasons	All sites
Species complex				
Eastern Bent-wing Bat / Large Forest Bat complex	*Miniopterus orianae oceanensis / V. darlingtoni*	FFG Act: CR	Spring 2023 Summer 2023 Winter 2024	5, 6, 7, 12, REF 02
Little Forest Bat / Large Forest Bat/ Southern Forest Bat complex	*V. darlingtoni / V. vulturnus / V. regulus*		All seasons	All sites
Long-eared Bat sp. complex	*Nyctophilus geoffroyi / N. gouldi*		All seasons	All sites
Eastern Falsistrelle / Eastern Broad-nosed Bat complex	*S. orion / F. tasmaniensis*		All seasons	All sites

7.4.2. Threatened species

Eastern Bent-wing Bat (Miniopterus orianae oceanensis)

The Eastern Bent-wing Bat is listed as critically endangered under the FFG Act (DELWP 2022d). The species occurs in coastal eastern Australia from the northern tip of Queensland down the east coast including New South Wales and extending into Victoria.

The Eastern Bent-wing Bat can live up to 20 years. Habitat preference is associated with the availability of foraging areas and proximity to suitable roosting caves, for example, many of the roosting caves are located near coastal cliffs, old mine shafts and rock caves.

Foraging areas include forested areas, Volcanic Plains, wetlands and coastal vegetation including beaches. Distances travelled from roosting caves are often less than several kilometres and are dependent upon reproductive condition, for instance lactating females travel shorter distances than pregnant or non-breeding females. Where roost sites are located in sub-optimal foraging habitat the distances travelled may increase, perhaps up to 30km. Pregnant females undertake much longer journeys when they fly to maternity caves to give birth (Kunz & Lumsden 2003).

There is only one recognised maternity cave in Victoria; in East Gippsland near Bairnsdale, located approximately 130 km from the proposed project site. DEECA have indicated that there is another potential maternity cave located at Wilson's Promontory, however Nature Advisory have been unable to confirm this. During the non-breeding season, the species congregates in smaller colonies in caves and other man-made structures. These sites are referred to as roosting sites. The bats will then migrate to maternity sites where they gather in larger numbers and the females give birth and raise the young.

The non-breeding season is generally from late March to September. During this time bats will congregate in smaller colonies with a ratio of half females and half males. Conditions in these roosting sites are usually cool, which enables individuals to enter torpor. Females will emerge from torpor in August. Females remain at these roosting sites until September when they begin to move to maternity caves (Hoye and Spence 2004). During these migrations, females have been recorded

moving at least 70 km overnight between roosts (AEEFP 1965) and may travel several hundred kilometres between roosting sites and maternity sites (Hoye and Spence 2004).

Survey results indicate nine calls across the three survey periods that could potentially be attributed to Eastern Bent-wing Bat but could not be reliably distinguished from Large Forest Bat. The results from this survey would indicate that although the Eastern Bent-wing Bat is present across the study area, they are rare and are unlikely to regularly utilise the project site but could be at risk to collide with turbines occasionally.

Grey-headed Flying-fox (Pteropus poliocephalus)

A desktop assessment has occurred to assess the presence of seasonal and long-term camps for the Grey-headed Flying Fox) in the vicinity of the wind farm site. On-ground investigations of possible camps are scheduled for January 2025, and ongoing liaison with the University of Western Sydney (UWS) will continue to access data from their flying-fox tracking program.

Information from the UWS Animal Ecology Lab indicated two new roost locations have been identified relatively close to Gelliondale:

1. A forested site north of Port Welshpool (-38.682712, 146.454993) was used for around a month by one tracked female in January 2024. As this location was occupied for a longer period, UWS assume that it is likely that it is a new colony (i.e. more than one animal is likely to have roosted there) but this has not been confirmed.
2. A small forest north of Agnes (-38.649472, 146.379182) was used by one animal roosting here for 2 nights in December 2023.

Both sites are well within the foraging distance to Gelliondale (site 1 is c. 7.5 km away and site 2 c. 13km). Tracking data also suggests a potential new colony on Snake Island, recent data indicates a site at location -38.767848, 146.538662, and older data suggests two other locations (-38.7610, 146.5870 and -38.7692, 146.5261).

The closest confirmed colony per the National Flying-fox Monitoring program (NFFMP) is Woodside, Bruthen Cresent, approximately 23 km east of the wind farm site (https://www.environment.gov.au/webgis-framework/apps/ffc-wide/ffc-wide.jsf).

Refer to Figure 6 regarding the location of the abovementioned sites.

Additionally, DEECA have provided a broad indication of possible flying fox activity at Snake Island and Woodside, which corresponds with the UWS tracking data, and a location near Mcloughlins Beach which warrants further investigation.

Preliminary investigations at the aforementioned sites noted that only the Port Welshpool camp (Telegraph Rd) was active in January 2025. On 22/01/2025, the flying-fox departure from this camp occurred between 20:56-21:22 hrs, with all (~2000 individuals) departing to the SSE to access foraging resources on Snake Island. A re-assessment of these camps in May 2025 noted all sites were inactive, suggesting a seasonal departure of flying-foxes from the area. Long-term seasonal monitoring, described in the BAMP, will likely help inform a broader understanding of how flying foxes are using the landscape. A phenological review of flora within the wind farm's vicinity may also assist this understanding. This information can then be used to inform the adaptative management approach detailed in the BAMP.

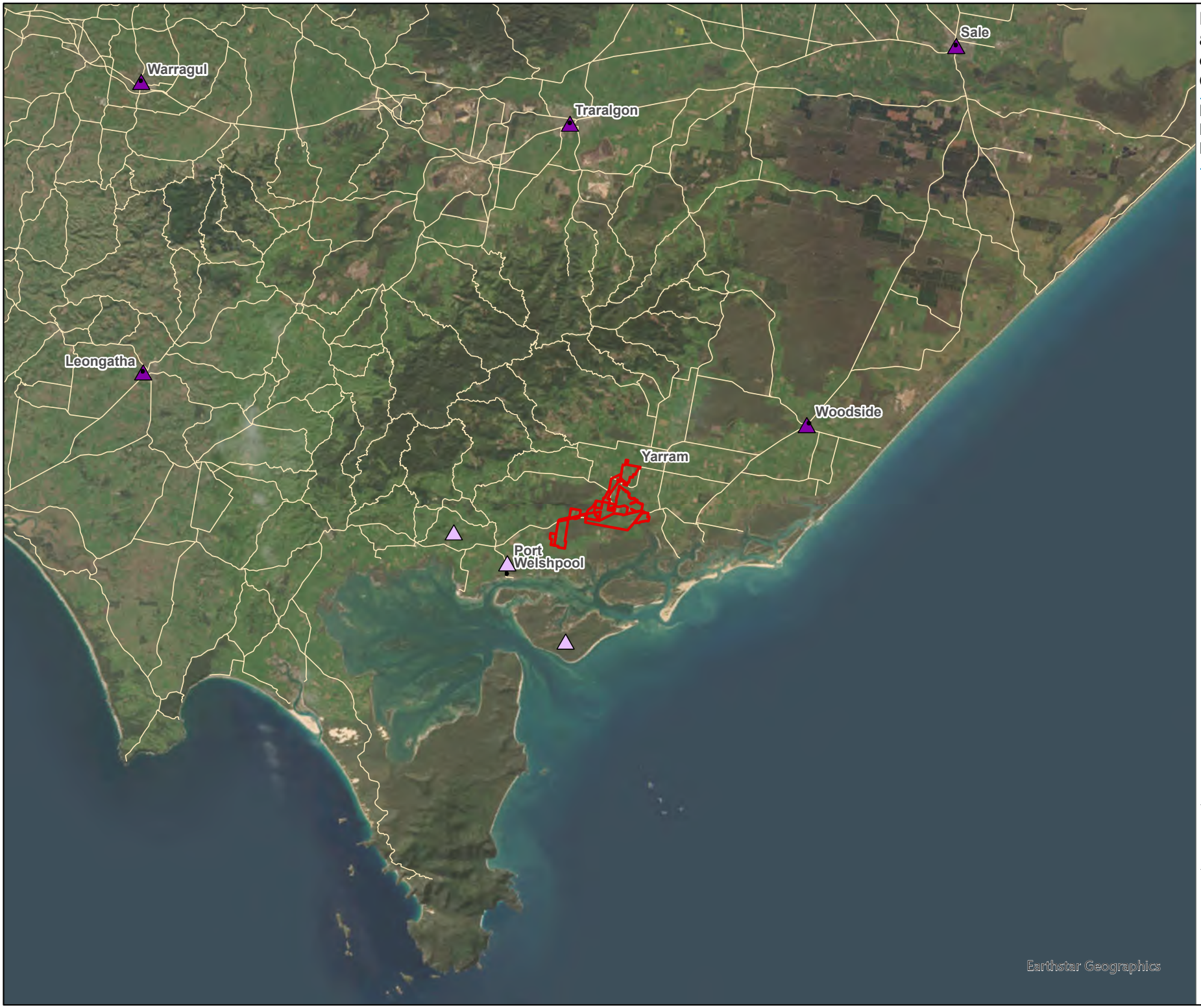

Figure 6: Location of known and potential flying-fox colonies in the vicinity of Gelliondale Wind Farm

Project No: 14107.22
Project: Synergy Wind Pty Ltd
Date: 17/04/2025

Study area
Confirmed bat colony
Potential bat colony

N

Kilometres
0 2 4 6 8 10
GDA2020 Vicgrid

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7.4.3. Bats of special concern

White-striped Freetail Bat (Austronomus australis)

Bats forage at different heights with most of the common species flying close to the ground, below RSA heights, but some species are known to fly at RSA heights.

Among the species known to fly at heights is the White-striped Freetail Bat. It has been recorded flying at heights of over 50 m above ground at many wind farms and become exposed to collision with operating turbines. This impact was evident as the majority of mortality among bats at wind farms in Victoria and NSW were of this species (Nature Advisory; unpublished data).

Surveys detected the White-striped Freetail Bat across all recording sites at the project site.

7.4.4. Previous bat survey

Earlier bat utilisation surveys were conducted for 13 nights in February 2015 at five sites across the study area, including one survey point at 50 m on a meteorological tower (detailed in Nature Advisory, 2016b).

Eight species and three multi-species complexes were recorded, with the same species being recorded as the 2024 survey except Eastern Broad-nosed Bat and the EBWB/LFB complex. Therefore, no threatened species were recorded during these surveys. Detailed species analysis occurred for this survey data, indicating that Large Forest Bat and Little Forest Bat were recorded most frequently, with their calls constituting 49.4% and 25% of all bat calls respectively. Similarly to the 2024 study, the site near turbine 04 recorded a high number of calls, likely due to the nearby waterbody.

The detector at height failed to record any bats, however, at the time it was unclear whether this was due to technical issues or no bats being present.

7.5. Conclusions

The nine bat species recorded are common and secure farmland species that are widespread throughout south-eastern Australia. Nine calls over 1,213 detector nights were attributed to the Eastern Bent-wing Bat and Large Forest Bat complex. The results from this survey would indicate that the Eastern Bent-wing Bat is present across the study area, however recordings were rare and therefore they are unlikely to regularly use the proposed wind farm site.

8. Targeted fauna surveys

Targeted fauna surveys were completed for **Swift Parrot** and **White-throated Needletail**. These surveys aimed to provide detailed information regarding the presence or otherwise of the species in the study area, and to outline any implications under state legislation and policy. Details of these surveys are provided below.

8.1. Swift Parrot

8.1.1. Introduction

A targeted survey for Swift Parrot (*Lathamus discolor*) was conducted at the wind farm site from April 2020 to June in 2021 and again in 2024, following its confirmed presence around the study area (i.e., within a radius of 20 km from the boundary of the site) based on a single VBA record (see Section 5.4.1). Given the species' threatened status and its classification as facing a potential, albeit low, risk from the development (Section 10.3), this survey was conducted aiming to establish a baseline for spatial utilisation patterns, assess potential impacts, and identify relative risks linked to specific turbines. The data collected from the targeted survey are also essential for guiding mitigation strategies, ensuring regulatory compliance, and shaping any necessary post-construction monitoring.

8.1.2. Species information

Swift Parrot is endemic to southeastern Australia, breeding primarily in Tasmania during spring and summer before migrating to the mainland for autumn and winter. It typically nests in dry grassy Blue Gum Forests, with a smaller population found in shrubby stringybark forests in northern Tasmania (Swift Parrot Recovery Team 2011). This medium-sized migratory bird, approximately 25 cm long, is predominantly green with distinctive blue and red markings.

Typical Swift Parrot wintering habitat is dry open eucalyptus forests and woodlands, usually box-ironbark communities, especially those with Red Ironbark, Mugga Ironbark, Grey Box, Coast Grey Box, White Box and Yellow Gum. This species has also been recorded in River Red-gum, Blakely's Red-gum, Yellow Box, Spotted Gum and Swamp Mahogany (Higgins 1999). On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp infestations (from the sugary exudations of scale insects [Psylllids] (DECC 2005). Swift Parrots prefer to forage in large trees, defined as those greater than 60 cm in diameter at breast height Kennedy and Tzaros (2005).

The total population of Swift Parrots has declined dramatically, from an estimated 2,000 mature birds in 2010 to approximately 750 individuals (Roderick 2021; Garnett et al. 2011; Garnett and Baker 2021). This decline is exacerbated by the introduction of the Sugar Glider (*Petaurus breviceps*) in Tasmania, which preys on their nests, leaving only small populations on offshore islands like Bruny and Maria with sufficient breeding success (Stojanavic et al. 2014 cited in Commonwealth of Australia 2019). Additionally, the species may occasionally fly at RSA height, making it potentially vulnerable to collisions with wind turbines.

Swift Parrot is listed as Critically Endangered under the EPBC Act and FFG Act.

8.1.3. Methods

Swift Parrot surveys were undertaken using methods consistent with the DELWP Biodiversity Precinct Planning Kit (DSE 2010) and aligns with the Survey Guidelines for Australia's Threatened Birds (DCCEEW, 2017). These consisted of roaming surveys for up to half an hour in each suitable patch of habitat, mapped in April 2020 by Nature Advisory. Treed habitat within 5 km of proposed

turbines were inspected to ground-truth tree species and to identify potential Swift Parrot habitat. The presence of flowering trees or trees carrying lerp infestation were noted for subsequent surveys. A total of 17 habitat patches were mapped for Swift Parrot surveys (Figure 8) based on suitable foraging habitat for this species. Some of these patches contained planted Southern Blue Gums and Spotted Gums, which are a known winter-flowering foraging resource of Swift Parrot, but not indigenous to the local area. The larger forest areas contained Swamp Gum, Manna Gum and Saw Banksia, which are also suitable for foraging.

Ten Swift Parrot targeted surveys were conducted in eucalypt remnants within the wind farm footprint. Several sites in larger blocks in surrounding state forests were also included in the sample since these areas were likely to provide feeding habitat for the species (Table 16).

Eleven surveys were undertaken, these included:

- 28 April – 02 May 2020 (incl. habitat assessment)
- 12–14 April 2021
- 03–05 May 2021
- 24–26 May 2021
- 22–24 June 2021
- 21–23 July 2021
- 02–05 April 2024
- 15–17 April 2024
- 27–29 May 2024
- 11–13 June 2024
- 10–12 July 2024

All surveys were undertaken around autumn when the parrots were flying from Tasmania to their wintering ground in mainland Australia. Figure 7 shows the number of Victoria eBird records in 2021 and 2024. It confirms that the major migration period occurs between April and September. Each of the surveys lasted two to three days, with the search sites visited twice (once a day) during the survey. The overall weather conditions and timing of the surveys were suitable for maximising species detection and recording its occurrence in the study area.

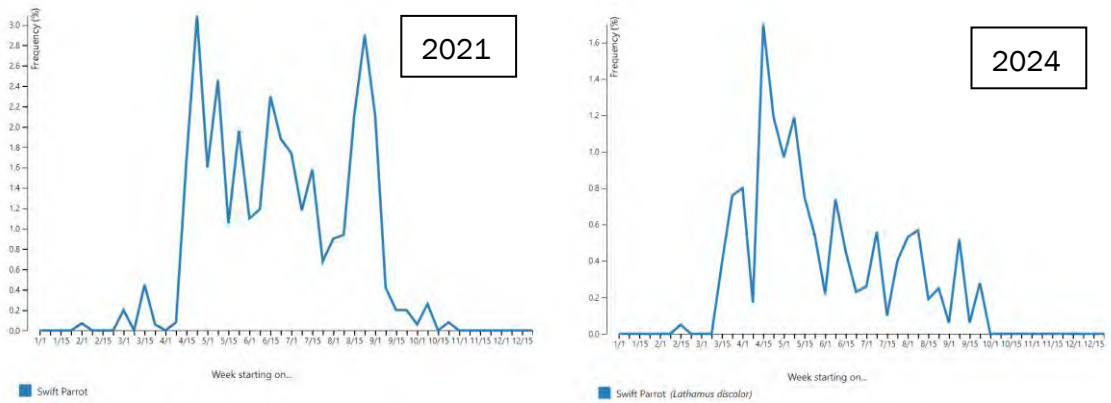

Figure 7: Swift Parrot records in Victoria during 2021 and 2024 (eBird)

Table 16: Swift Parrot assessment of potential habitats within 5 km of Gelliondale Wind Farm in 2020/21.

Site	Site name	Potential foraging resource	Flowering/lerp present			
			1/04/2020	12/04/2021	24/05/2021	22/06/2021
1	Yarram - Windmill Caravan Park	Blue Gum (planted)	Yes	No	No	No
		Southern Mahogany (planted)	No	No	No	No
		Spotted Gum (planted)	No	Yes	Yes	Yes
		Un-ID Eucalypts (planted)	Yes	No	No	No
2	Albert River Reserve	Red Ironbark (planted)	Yes	No	No	No
		Yellow Gum (planted)	Yes	No	No	No
		Spotted Gum (planted)	No	Yes / Lerp	Yes	Yes
		Southern Mahogany (planted)	No	Yes / Lerp	No	Lerp
3	Telegraph Rd	Golden Wattle - small grove	No	No	No	No
4	Nooramunga Marine & Coastal Park	Coast Banksia	Yes	No	No	No
		Manna Gum	Yes	Yes	No	No
5	Gelliondale Nursery	Blue Gum (planted)	No	-	No	No
6	Gellions Run SF - central, east	Manna Gum	No	Lerp	No	No
		Saw Banksia	No	Yes	No	No
7	Gellions Run SF - west	Swamp Gum	No	Buds	No	No
		(Silver Banksia)	Yes	no	No	No
8	Todds Rd bush, Hedley	Manna Gum	No	Yes	No	No
		Saw Banksia	No	Buds	No	No
		Swamp Gum	No	Buds	No	No
9	South Gippsland Hwy, Hedley	Swamp Gum	No	No	No	No
		Stringybark	No	No	No	No
10	7085 South Gippsland Hwy, Hedley	Yellow Gum (planted)	Yes	No	No	No

Site	Site name	Potential foraging resource	Flowering/lerp present			
			1/04/2020	12/04/2021	24/05/2021	22/06/2021
11	James Rd North - Alberton West SF southern edge (McPhails Track - South Boundary Track)	Swamp Gum	No	Buds/no lerp	No	Yes
		Southern Blue Gum	No	No	Yes	
12	Alberton West SF southern edge (Coalmine Rd)	Swamp Gum	No	Many buds	No	No
13	Wests Rd	Southern Blue Gum	No	Buds	Yes	Yes
		Yellow Gum (planted)	No	Yes	Yes	Yes
14	Askews Rd	Spotted Gum (plantation)	No	Buds	Yes	Yes
		Southern Mahogany (plantation)	No	No	No	Lerp
15	Alberton West (Crangs Rd)	Eucalyptus spp. Un-ID (planted)	Yes	No	No	No
16	Great Southern Rail Trail from Gelliondale east to Albert River	Blue Gum (planted)	No	Yes	No	No
		Swamp Gum/Strzelecki Gum (planted)	No	Buds	No	No
17	Pound Rd West/Blackshaws Rd	Blue Gum (planted)	No	No	No	No
		Southern Mahogany (plantation)	No	No	No	No

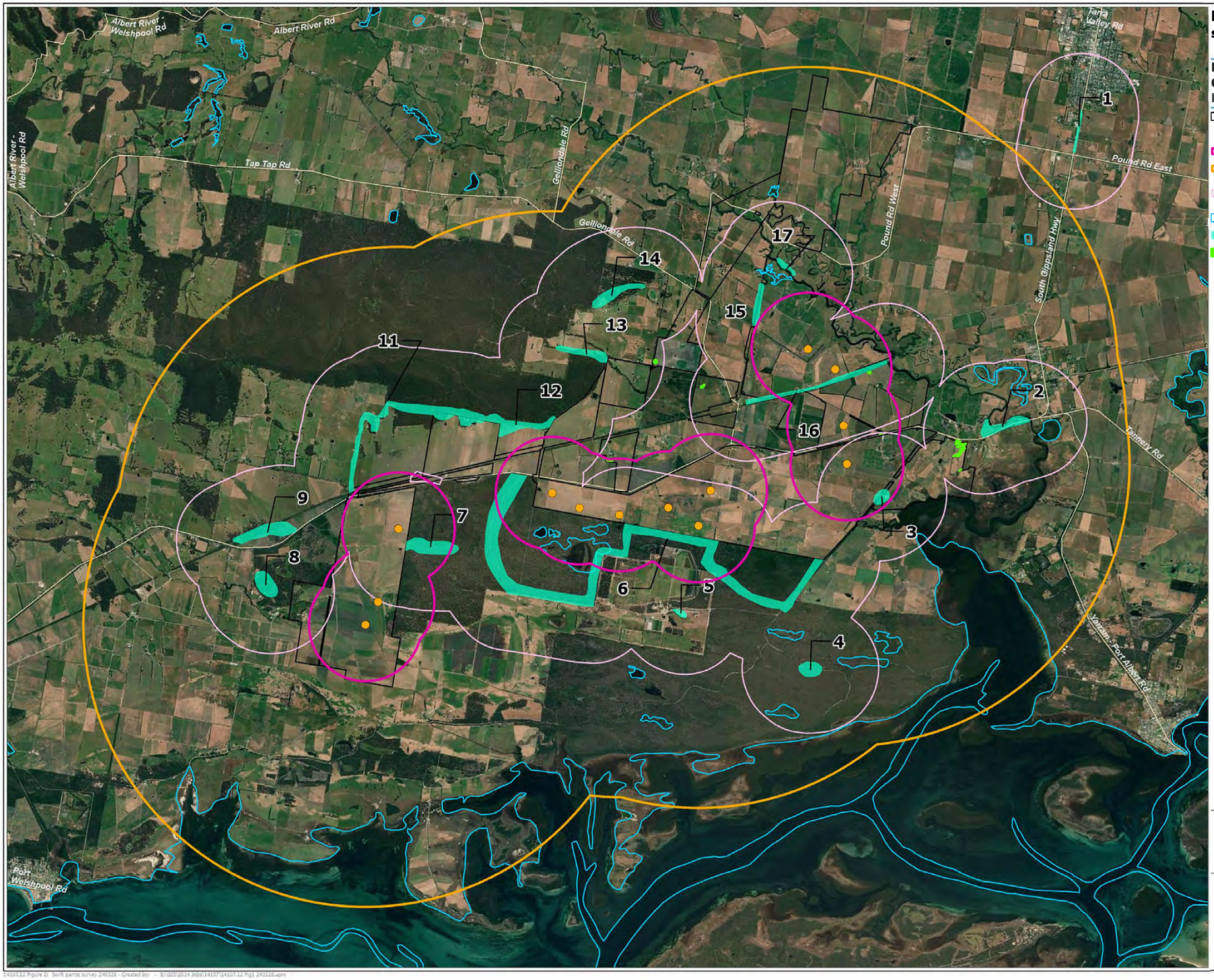

Figure 8: Swift parrot survey

Project: Gelliondale Wind Fa
Client: Synergy Wind
Date: 26/03/2024

- Property boundary
- Turbine
- Turbines buffer 1km
- Turbines buffer 5km
- Swift Parrot suitable habitat buffer 1km
- DELWP wetlands
- Swift Parrot survey sites
- Swamp Gum area

N

Metres
0 1,000

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8.1.4. Results

The VBA holds one record of Swift Parrot within 20 km radius search region based on the wind farm locality. The record is 30 years old (dated back to 1991) and taken 3 km south of the wind farm site.

During the targeted survey, a single Swift Parrot was observed in a patch of Swamp Gum and Stringybark approximately 2 km west of the wind farm site. The sighting occurred on 28 May 2024 at Site 9 (Figure 8) around Great Southern Rail Trail at Hedley (see Table 17) between 08:50 and 09:16 AEST. The parrot was perched in a *Eucalyptus ovata* and took off swiftly in an east-southeast direction while calling. The initial sighting height was 20 m above ground, with the bird flying between 20 and 25 m above ground. This is well below the lower RSA of 40 m.

Flowering was reasonable at the sampling sites and attracted many nectar-eating lorikeets and honeyeaters but does not seem to attract the targeted species, at least regularly.

8.1.5. Conclusions and recommendations

Based on the low numbers observed and the lack of high-quality or extensive habitat that would support these species in the vicinity of the wind farm site, regular movements of Swift Parrot across the wind farm site are not anticipated.

Individuals may occasionally visit the forest areas adjacent to the wind farm site temporarily when food resources are available. The low number of turbines reduces the collision risk to this species. Based on the above, no significant impact on the overall population of this species is expected.

Mitigation measures could include adaptive management actions when Swift Parrots are sighted at or adjacent to the wind farm site. These will be detailed in the BAMP.

8.2. White-throated Needletail

8.2.1. Introduction

A targeted survey for the White-throated Needletail was conducted at the wind farm site from December 2020 to April 2021 and February–March 2024, following its confirmed presence within and around the study area. The VBA holds several historical needletail records from a search region of a 10 km radius around the wind farm site (Section 5.4.1) from 1977 to 2015. In addition, needletails have been recorded during bird surveys at the wind farm site (Section 6).

Given the species threatened and migratory status, its confirmed presence on site, and its classification as facing a potential 'moderate' risk from the development (Section 10.3), the targeted survey aimed to establish a baseline for spatial use patterns, assess potential impacts, and identify relative risks associated with specific turbines. The findings are essential for guiding mitigation strategies, ensuring regulatory compliance, and shaping any necessary post-construction monitoring.

8.2.2. Species information

The nominate subspecies *Hirundapus caudacutus caudacutus* is a trans-equatorial migrant widely found in eastern and southeastern Australia. *H. c. caudacutus* is the only subspecies that migrates to Australia during the non-breeding season, typically arriving around October. Large populations are typically observed in Victoria and southeastern New South Wales during December, peaking as they migrate toward Tasmania from February to March. From mid-March to April, most birds are generally leaving for their breeding grounds outside Australia— reviewed in the species *SPRAT* (DCCEEW 2024).

White-throated Needletail populations in Victoria, once estimated at 50,000–100,000, have declined by 49 percent between 1979–1981 and 1998–2000, with daily sightings in eastern Australia more than halving over the past several decades (Garnett and Baker 2021). Threats to the White-throated Needletail are primarily driven by the destruction of Siberian forests, which is crucial for their breeding habitat. Additionally, organochlorine pesticides may further contribute to their decline by reducing the availability of invertebrate prey (Tarburton 2014).

Threats to the White-throated Needletail also include collisions with wind turbines (Hull 2013) and other artificial structures. In Australia, there are documented incidents involving collisions with wind turbines (Hull 2013), powerlines (Cameron & Hinchey 1981), windows (Slater 1964), and lighthouses (Draffen et al. 1983; Stokes 1983). The risk of collision is heightened due to the species' reliance on aerial foraging for flying insects and its tendency to fly at altitudes ranging from less than one meter to over 1,000 meters, primarily above wooded areas and open pastures (Higgins 1999; TSSC 2019).

The current listing status of the White-throated Needletail is as follows:

- Listed as **Vulnerable** (Date effective 04-Jul-2019) under the EPBC Act and FFG Act;
- Listed **Marine** under the EPBC Act; and
- Listed **Migratory** under the EPBC Act (CAMBA, JAMBA, and ROKAMBA).

8.2.3. Methods

The fixed-point bird count method, used to collect data on the number of needletails visiting or using the wind farm site, involved an observer stationed at a fixed survey point for a period of time (i.e., 30–60 min) and counting all observed birds passing over the observation point. During this period, numbers of individual needletails observed or were recorded. The number of birds, the approximate height when first sighted and flight direction were documented.

The targeted survey was carried out during four survey periods when the needletails are known to occur in Australia. At each survey period, the number of needletails observed flying over the survey point was counted four times, at different times of the day (early morning, mid-morning, early afternoon, and late afternoon). The timing of the three survey periods and number of observation points were as follows:

- **7–11 December 2020**: Six points were surveyed over four days (total of 24 replicates), with a period of one hour at each survey point (total of 24 hours of survey effort)
- **22–26 March 2021**: 10 points were surveyed over four days (total of 40 replicates), with a period of 30 minutes at each survey point (Total of 20 hours of survey effort)
- **25–29 April 2021**: 10 points were surveyed over four days (total of 40 replicates), with a period of 40 minutes at each survey point (Total of 20 hours of survey effort)
- **26–29 February 2024**: Eight points were surveyed over four days (total of 28 replicates), with a period of 40 minutes at each survey point (Total of 18.7 hours of survey effort)
- **01–08 and 18–22 March 2024**: Eight points were surveyed over 11 days (total of 68 replicates), with a period of 40 minutes at each survey point (Total of 45.3 hours of survey effort)

The increase in the number of survey points in 2021, along with a balanced reduction in observation time as the surveys progressed, aimed to increase the likelihood of detecting needletails if they were present in the area. Sites 1 and 2 are now outside the project site due to

layout changes. In addition, as part of the survey protocol, when a flock was observed, it was monitored for the entire duration of the sighting.

The points selected for the counting of the needletails were located within the wind farm site, scattered along public roads and reserves throughout the study area, provided they offered good visual coverage Figure 9. Habitats on the selected points varied between pasture paddocks, planted Cypress and Eucalypts, and small sections of state forests and plantations.

The overall weather conditions and timing of the surveys were suitable for maximising species detection and recording its occurrence in the study area.

Limitations

Targeted surveys aimed to address the peak of abundance for the species in the area, but did not capture the entire time of residence. However, the use of BUS surveys and data complemented the information from targeted surveys and enhanced the coverage and reliability of targeted surveys.

8.2.4. Results

During the targeted surveys conducted in 2020/2021 and 2024, several needletails were observed flying over the wind farm site at a median (first observed) height of 40 m, with a range of 20 to 500 m. The median of the maximum recorded flight heights recorded during each observation was 60 m, with a maximum observed flying height of approximately 800 m. The encounter rate was approximately 17%, calculated as the number of replicates with detections divided by the total number of replicates, multiplied by 100.

A total of 45 detections during the targeted surveys resulted in 1,066 cumulative counts, with a median of six individuals per detection, ranging from single birds to flocks of up to 160. In the 2020/21 survey period, there were 15 detections and 510 cumulative counts, while in 2024, there were 30 detections and 556 cumulative counts, along with one incidental observation of a flock of five individuals. Cumulative observations do not reflect absolute abundance, as they represent total counts across replicates. This likely includes repeated counts of the same individuals or flocks, given the species' high mobility. The cumulative numbers observed were consistent across both survey periods and directly comparable as the survey effort was the same, with 64 hours of observations in each period.

There were distinct temporal peaks in needletail counts. Notably, none were observed during the targeted survey in December 2020, suggesting that the species had not yet arrived in significant numbers to the region around the study area. The highest counts were recorded in February, with 469 cumulative observations in 2021 and 484 in 2024. However, there was a sharp decline in March, with only 41 cumulative counts in 2021 and 72 in 2024.

Individuals were mostly recorded from observation points 8 and 9, followed by points 6 and 7 (Figure 9).

The common flight patterns observed are summarised below and illustrated in Figure 10:

- Foraging above forest canopy (Alberton West State Forest, Gelliondale State Forest) in a linear trajectory, back and forth (20-100m above ground) and parallel to ridge or to forest edge with paddock.
- Traveling over paddocks between large patches of forest (30-200m above ground).

- Circling on thermal updrafts over paddocks to gain height, then travel (50-800m above ground).

Table 17: Summarised observations during White-throated Needletail targeted surveys.

Date	Survey point	No. of WTNT	Flight direction	Height above ground (m)	Flight type	Behaviour
Feb-21						
22/02/2021	7	**3**	W	20	Foraging	Foraging over the Gelliondale State Forest canopy
23/02/2021	8	**80**	N	500	Circling	Coming from the south, catching a thermal and disappearing in height
23/02/2021	8	**30**	SW-NE-SW	100	Foraging	Foraging over the Alberton West State Forest ridge and slopes, over canopy
23/02/2021	8	**68**	SW-NE-SW	60	Foraging	Foraging over the Alberton West State Forest canopy and chasing each other until dusk.
25/02/2021	8	**80**	NE	200	Circling	Catching a thermal over the paddocks, then descending in a north direction into the Alberton West State Forest hills
25/02/2021	7	**160**	E, then N	200	Circling	Circling in a thermal, then heading north into the Alberton West State Forest
25/02/2021	8	**5**	N	50	Direct	Traveling at low distance from the Gelliondale State Forest over paddocks into the Alberton West State Forest
25/02/2021	8	**10**	E-W-E	300	Direct, circling	Flock leaves ridge and stays at ridge level to catch a thermal on the paddocks, gain height, and come back to the Alberton West State Forest ridge at a higher altitude
25/02/2021	9	**20**	E-W-E	100	Foraging	Foraging over the canopy and chasing each other.
26/02/2021	10	**3**	N-S-N	30	Foraging	Foraging low over canopy of the Gelliondale State Forest.
26/02/2021	5	**10**	N-S-N	50	Foraging	Foraging over canopy
Mar-21						
23/03/2021	9	**6**	E	50	Direct	Foraging in circular but sinuous flight easterly direction over farm paddocks and woodland breaks.
26/03/2021	7	**1**	NW	75	Direct	Generally flying north-west and circling occasionally above both forest and paddock
26/03/2021	10	**16**	NW-SE	75	Circling	Group was circling in a north-west direction over the forest and switched to fly south-east back over the paddock, foraging.
26/03/2021	9	**18**	E-W	100	Circling	Group foraging above the Alberton West State Forest back and forth east and west about 100m above the trees.
Feb-24						
26/02/2024	3	**1**		50	Direct	Just travelling.

Date	Survey point	No. of WTNT	Flight direction	Height above ground (m)	Flight type	Behaviour
28/02/2024	8	**58**	NE	30	Circling, foraging	Circling and flying at different heights. Flying all over the ride along the Alberton West State Forest. Some of the group was seen moving slowly north-east.
28/02/2024	9	**1**	N	30	Direct	Flew directly over observer from the Gelliondale State Forest in a northerly direction towards the Alberton West State Forest.
28/02/2024	9	**50**	E	30	Circling, foraging, direct	Large flock, flying at different heights above the ridge. Moved west across the ridge, circled around in the polygon flying up and down for approximately 10 minutes before moving east along the ridge.
28/02/2024	10	**85**	E, then W	70	Circling, foraging, direct	Circling at different heights, moving east and then west along the ridge slowly.
28/02/2024	9	**1**	N	30	Direct	Flying north, then lost sight when it went over the woodland.
28/02/2024	9	**8**		50	Foraging, circling	Flapping and gliding at varied heights, circling above the ridge.
28/02/2024	9	**2**	W	30	Direct	Flying west from the Gelliondale State Forest across pasture.
28/02/2024	9	**3**	NW	30	Direct	Flying northwest from the Gelliondale State Forest across pasture.
29/02/2024	9	**20**		40	Circling, foraging	Circling at varied heights above the ridge.
29/02/2024	9	**3**	E	50	Circling, foraging, direct	Circling around the top of the ridge and then traveling east.
29/02/2024	10	**45**	N	30	Direct	Traveling slowly in a northerly direction, at varied heights from over the Gelliondale State Forest.
29/02/2024	10	**83**	N	40	Direct	Traveling in a northerly direction. Flying at varied heights but in a consistent direction, no circling.
29/02/2024	7	**4**	N	50	Circling, foraging, direct	Flying at different heights seen circling, gaining height until lost out of sight. Moving slowly north.
29/02/2024	7	**20**		50	Foraging, circling	Flying at varied heights, manoeuvring up and down. The group circled in the same area for most of the survey period.
29/02/2024	8	**2**	N	30	Direct	Flew over the observer in a northerly direction towards the Alberton West State Forest.
29/02/2024	8	**3**	E	30	Direct	Travelling towards state forest.
29/02/2024	8	**90**		70	Foraging, circling	Circling around the polygon area, all at very varied heights.
29/02/2024	10	**5**		60	Foraging, circling, direct	Flying and circling at varied heights over the ridge. Disappeared in an unknown direction.

Date	Survey point	No. of WTNT	Flight direction	Height above ground (m)	Flight type	Behaviour
Mar-24						
5/03/2024	8	**2**	E, then SE	40	Direct, circling	Travelled east low along northern slope of the Alberton West State Forest then turned to circle above survey point before departing south-east towards the Gelliondale State Forest.
5/03/2024	9	**1**	E	50	Direct	Travelled eastwards across the southern paddock towards the Gelliondale State Forest.
5/03/2024	10	**2**	W	30	Direct	Headed west from a paddock, small loop after crossing the tree line then headed further west.
6/03/2024	6	**5**	S	30	Foraging, circling	Foraging above the Gelliondale State Forest, circled slowly further south.
6/03/2024	7	**1**	NW	40	Circling, direct	Circled across the northern paddock heading north-west towards the Alberton West State Forest.
6/03/2024	7	**2**	W	30	Direct, foraging	Headed west along the edge of the Gelliondale State Forest, one swooped quite low along the edge at one point.
6/03/2024	8	**18**	SE	30	Direct	Circled low above survey point before climbing steeply and heading south-east.
6/03/2024	9	**6**	NE	40	Circling, foraging, direct	Circled in place over a paddock foraging for a while before slowly heading north-east towards the Alberton West State Forest and disappearing.
20/03/2024	6	**19**	W	30	Circling, foraging	Circled and moved back and forth slowly heading west along the edge of the Gelliondale State Forest.
20/03/2024	3	**14**	S	30	Direct	Moved slowly in an arc across the pasture to the south.
20/03/2024	4	**2**	E	30	Direct	Flew low across a paddock and then along a tree line towards the Gelliondale State Forest.

Notes: **Foraging**: Flight includes a variety of fast direct bursts, changes of direction, glides, sudden stops, and hawking; **Circling**: Mainly used to gain height passively using an ascending warm air current, soaring in circles until desired height is reached, then birds glide to next current or foraging area; **Direct**: Either gliding or flapping wings, flight aimed in a particular direction.

8.2.5. Conclusions and recommendations

Needletails were recorded at the wind farm site throughout the targeted surveys in February and March, a period when needletails most commonly occur over southern Victoria including east Gippsland. As noted in the results section, needletails were previously recorded at a similar period during a previous bird and bat assessment conducted in 2015 (BL&A 2016a).

Needletail mortality from collision with wind turbines within Australia is known to occur, although it is a low severity threat, affecting a small number of birds (Hull *et al*. 2013). Over several years, an estimated 22 birds collided with turbines at Bluff Point and Studland Bay Wind Farms, Tasmania (Hull *et al*. 2013), and other casualties have been reported at other wind farms in south-east mainland Australia (Nature Advisory, unpubl. data). However, the annual cumulative impact of current operating wind farms in south-east Australia is unknown.

The number of needletails observed flying within the proposed wind farm footprint is considered low to moderate. However, their occurrence may be relatively higher in the forested areas and adjacent paddocks. These numbers are likely to persist for only four months each year, as per their migratory behaviour detailed in Section 8.2.2, specifically from December to April. Occasional impacts may occur in days of peak occurrence in the study area, given the presence of proposed turbines close to areas where flocks were seen flying at RSA height.

While regular collisions may have a low overall impact on the species, implementing an adaptive and hierarchical management strategy is recommended to ensure an effective and timely response, thereby mitigating the risk of significant impacts. This strategy may include:

- **Post-construction monitoring of needletail mortality and activity** during their first two years of operation;
- **A hierarchical management strategy** that adjusts based on impact triggers, specifically focusing on the occurrence of mortalities at and around turbines where collisions are identified. The specifics of the strategy are detailed in the BAM Plan; and
- **Implementation of effective mitigation measures in response to impact triggers** aimed at minimising the likelihood of significant impacts on needletail populations. These measures may include seasonal or temporal curtailments of one or more turbines, as well as any other proven methods if available.

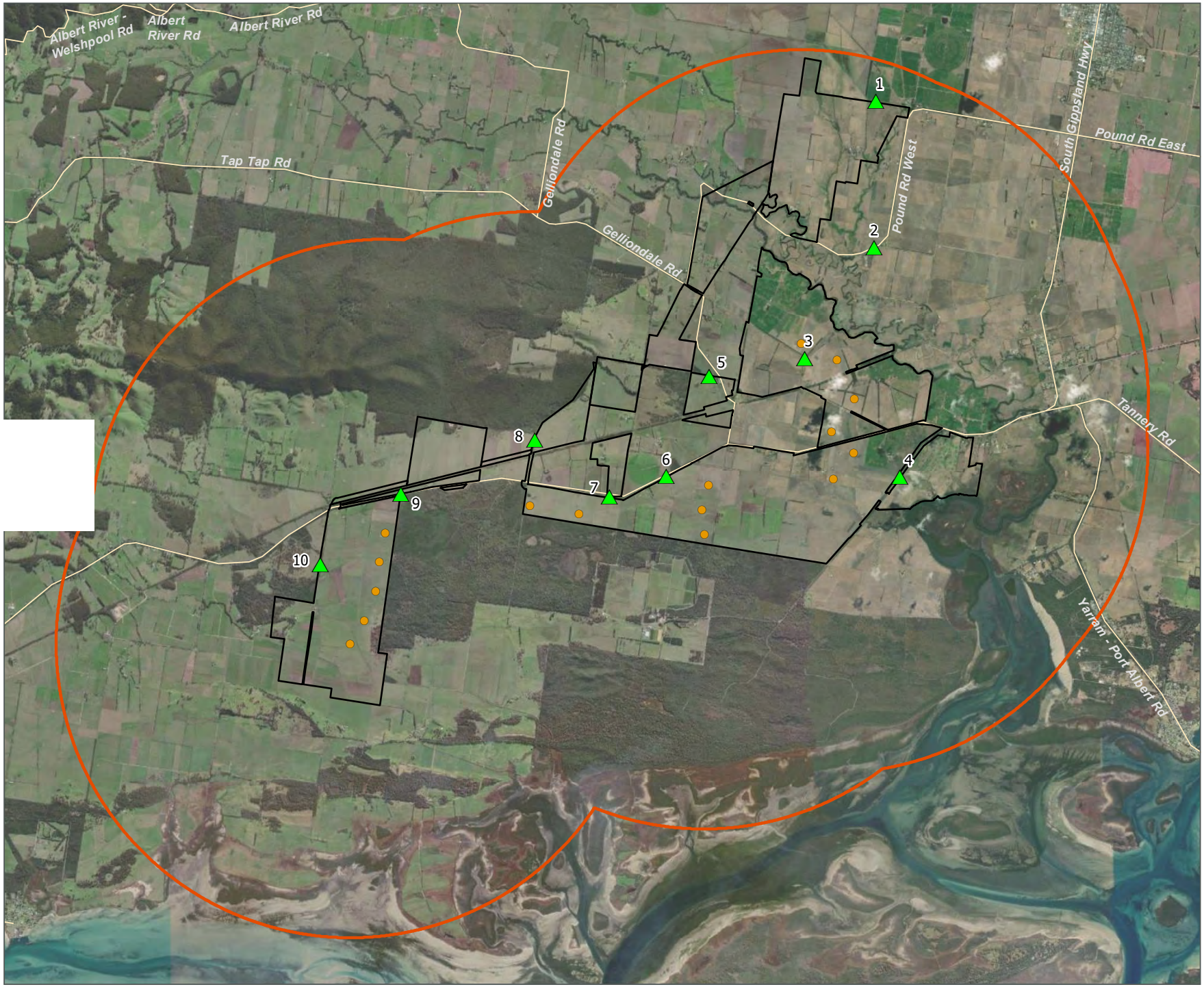

Figure 9: White-throated Needletail targeted survey points, March 2021

Project: Alberton Wind Farm
Client: Synergy Wind Pty Ltd
Date: 06/04/2021

- Property boundary
- Turbines
- Turbine buffer 5km
- White-throated Needletail survey point

N

Metres
0 1,400

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Figure 10: White-throated Needletail flight paths

Project No: 14107_12
Project: Alberton Wind Farm
Date: 13/08/2024

Property boundary

Turbine

White-throated Needletail flight paths

February 2021

March 2021

February 2024

March 2024

April 2024

N

Metres

0 500 1,000 1,500 2,000 2,500

GDA 1994 VICGRID94

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9. Migratory shorebird assessment

9.1. Introduction

Shorebirds spend most of their lifecycle inhabiting intertidal areas of the coast and littoral areas of inland waterbodies. Not all shorebird species in Australia are migratory, but the 37 shorebird species that regularly migrate to Australia are listed as migratory under the EPBC Act and are matters of national environmental significance (DoE 2017). Some species also have EPBC Act listings as threatened.

Many of the migratory shorebird species are listed under additional agreements, including the International Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), the Convention on Wetland of International Important (Ramsar Convention), and bilateral agreements for the conservation of migratory birds between Australia and Japan (JAMBA), China (CAMBA), and the Republic of Korea (ROKAMBA).

This migratory shorebird assessment is based on:

- A field investigation from 2015 to ascertain shorebird's use of the nearest potential shorebird habitat, parts of eastern Corner Inlet within 3 to 5 km of the proposed wind farm; and
- Shorebird count data collected by birders for Birdlife Australia (BLA) from 1980 to 2024.
- Shorebird count data collected by Nature Advisory from December 2024 to February 2025.

The assessment aimed to identify if any important populations of migratory shorebirds occur close enough to the proposed wind farm to be at risk of a significant impact, as defined under the EPBC Act 'Policy Statement 3.21: Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species' (DoE 2017). These guidelines recommend assessing the significance of impacts on important migratory shorebird habitat concerning the following thresholds (Table 18).

Table 18: Thresholds of significant impacts on migratory shorebirds (EPBC Act Policy Statement 3.21).

Ecological element	Significant impact	Comment
Important habitat	**Loss** of habitat	The loss (for example, clearing, infilling or draining) of important habitat areas is likely to have a significant impact when it results in a reduction in the capacity of the habitat to support migratory shorebirds. The magnitude of the impact may increase with the number of shorebirds using the area, the regional significance of the site and/or the extent to which the loss reduces carrying capacity.
	Degradation of habitat leading to a *substantial reduction* in migratory shorebird numbers	Defining *substantial reduction* is made on a case-by-case basis. Factors to consider include: ▪ the number of migratory shorebirds historically using an area (based on surveys and historical data) ▪ likely resultant changes in bird numbers and species diversity ▪ alterations to the value, quality, geographic extent of the area (for example, will the area still be classed as important habitat) ▪ the function and role of the area (roosting, foraging) and likely changes in ecology and hydrology ▪ the regional and local context of the area
	Increased **disturbance** leading to a *substantial reduction* in migratory shorebird numbers	
	Direct mortality of birds leading to a *substantial reduction* in migratory shorebird numbers	

Ecological element	Significant impact	Comment
		▪ the nature, extent, duration and timing of impacts, their likelihood and consequence.

9.2. Methods

Existing data

An analysis of shorebird count data from 1980 to June 2024 was conducted on existing information obtained for the eastern part of Corner Inlet from the BLA Shorebird count database (provided in September 2024). The most relevant data are those from the eastern area including data from 15 survey sites. Data included in the present analysis was collated to avoid confounding data from the same year, season, and site. In total, 714 surveys were included in the present data (394 summer surveys, 320 winter surveys).

Data for the following EPBC Act listed 31 migratory shorebird species were analysed.

- Asian Dowitcher
- Bar-tailed Godwit
- Black-tailed Godwit
- Broad-billed Sandpiper
- Common Greenshank
- Common Redshank
- Common Sandpiper
- Curlew Sandpiper
- Double-banded Plover
- Eastern Curlew
- Great Knot
- Greater Sand Plover
- Grey Plover
- Grey-tailed Tattler
- Latham's Snipe
- Lesser Sand Plover
- Little Curlew
- Long-toed Stint
- Marsh Sandpiper
- Oriental Plover
- Pacific Golden Plover
- Pectoral Sandpiper
- Red Knot
- Red-necked Stint
- Ruddy Turnstone
- Ruff
- Sanderling
- Sharp-tailed Sandpiper
- Terek Sandpiper
- unidentified medium wader
- unidentified small wader
- Whimbrel
- Wood Sandpiper

The 15 sites surveyed by BLA in eastern Corner Inlet and included in this analysis are listed below and shown in Figure 11.

- Box Bank Island - F
- Clonmel Island - D
- Dog Island south - M
- Dream Island - H
- Dream south (shallow inlet) - G
- East Sunday Island / Drum Island - A
- Kate Kearney entrance – E
- McGloughlans entrance - J
- North of St Margaret Island - L
- One Tree Island - G2 - now S
- Port Albert entrance - C
- Port Welshpool foreshore
- Robertsons Beach - K
- Snake Island (east side) - G3 - now B
- Sunday Island west end

Most of the sites were located close to the southern, coastal edge of the Ramsar Wetland such as Dream south (shallow inlet), Kate Kearney entrance and Snake Island (east side), see Figure 11.

The closest regular shorebird monitoring sites to the wind farm are One Tree Island, Robertson's Beach, Sunday Island (west end), and Port Welshpool foreshore, which are approximately 7 to 8 km from the nearest proposed wind turbine.

Field investigations

Field investigations were undertaken to fill in spatial gaps from existing data, where few surveys had been undertaken at nearshore and inner island locations. Initial field investigations were conducted between 25th and 27th February 2015 at low tide to identify areas where shorebirds might be foraging on intertidal sandflats and mudflats. These surveys were undertaken by car, foot, and boat.

Formal shorebird surveys began in December 2024, undertaken by two experienced Nature Advisory ornithologists. These surveys used a combination of foot and boat-based survey techniques to investigate shorebird numbers on nearshore and inner island locations to supplement the existing BLA data from the outer islands (Figure 12). Twenty-three sites were chosen based on their presence of suitable habitat (Table 19). Surveys were conducted at high and low tides for each site to capture variation in usage. Surveys were conducted on:

- 17 – 19 December 2024 (summer spring tide)
- 20 – 22 January 2025 (summer transitioning tide)
- 3 – 5 February 2025 (summer neap tide)
- 19 – 20 February 2025 (summer spring tide)
- 18 – 19 June 2025 (winter spring tide)

Table 19: Survey sites used in Nature Advisory targeted shorebird surveys (2024-2025).

Location and distance to GWF	Survey site	Access	
		Low tide	High tide
McMillan Bay (3 km)	F3	Foot	Boat
	F4	Foot	Boat
East Port Welshpool 3 (4 km)	B18	Boat	Boat
Little Dog Island (4.5 km)	B12	Boat	Boat
	BD13	Foot/boat	Foot/boat
	BD14	Foot/boat	Foot/boat
Bullock Island (5.5 km)	F8	Foot	Foot
	F9	Foot	Foot
	F10	Foot	Foot/boat
	B11N	Foot	Boat
Yarnall Island (6 km)	B15	Boat	Boat
Sunday Island (inner shore) (6 km)	B5	Boat	Boat
	B6	Boat	Boat
	B7	Boat	Boat
Port Albert (east) (6.5 km)	F2	Foot	Boat
Snaggy Island (6.5 km)	B19	Boat	Boat
Possum Island (7 km)	F1	Foot	Foot
One tree Island (7 km)	B22	Foot/boat	Foot/boat
Sunday Island (west end) (7.5 km)	B11S	Boat	Boat
Snake Island (the gulf) (8 km)	B20	Foot/boat	Foot/boat

Location and distance to GWF	Survey site	Access	
		Low tide	High tide
Jephson Island (8.5 km)	B21	Boat	Boat
Dog Island (9 km)	B16	Boat	Boat
	B17	Boat	Boat

9.2.1. Data analysis

Spatial use of Corner Inlet East

Spatial patterns in abundance were analysed by combining the most recent summer counts of data from NA field investigations and BirdLife Australia (2024-2025). Trends in counts were assessed as the distance to the proposed wind farm:

- < 5km
  - McMillan Bay
  - East Port Welshpool 3
  - Little Dog Island
- 5.5 to 7 km
  - Bullock Island
  - Yarnall Island
  - Sunday Island (inshore)
  - Port Albert (east)
  - Snaggy Island
  - Possum Island
  - One Tree Island - G2 - now S
- 7.5 to 10 km
  - Sunday Island west end
  - Snake Island (The Gulf)
  - Jephson Island
  - Dog Island south - M
  - East Sunday Island / Drum Island - A
  - Clonmel Island - D
- 10.5 to 15 km
  - Port Albert entrance - C
  - Kate Kearney entrance - E
- >15 km
  - Dream south (shallow inlet) - G
  - Dream Island - H
  - McGloughlans entrance - J

Only the ten most abundant species were used in this analysis, with the following species representing 99.7 % of all shorebirds observed over the 2024/25 summer period (26,484 of the 26,557 individuals counted). These species included:

- Bar-tailed Godwit
- Common Sandpiper
- Curlew Sandpiper

- Far Eastern Curlew
- Grey Plover
- Pacific Golden Plover
- Red Knot
- Red-necked Stint
- Sanderling
- Whimbrel

Temporal trends

Shorebird data from Birdlife Australia were used to analyse population trends for EPBC Act-listed migratory shorebird species within Corner Inlet east. Average summer and average winter counts for each of these species were calculated separately for each survey decade. The decade averages for each species were then added together to produce a total migratory shorebird average count for 1980-89, 1990-99, 2000-09, 2010-19, and 2020-2024.

9.2.2. Limitations

Limitations in the analysis of existing shorebird count data were the coverage of 15 survey sites, with some not surveyed during each decade, leaving some gaps in the database. As over 81% of sites were surveyed at least once each decade from 1980 to 2024, the data is considered sufficient for this analysis. Of the sites that were not surveyed, 11 were in summer and 17 in winter.

Existing data also did not provide sufficient coverage of the nearshore and inner islands. Field investigations conducted by Nature Advisory in 2024 and 2025 addressed these gaps.

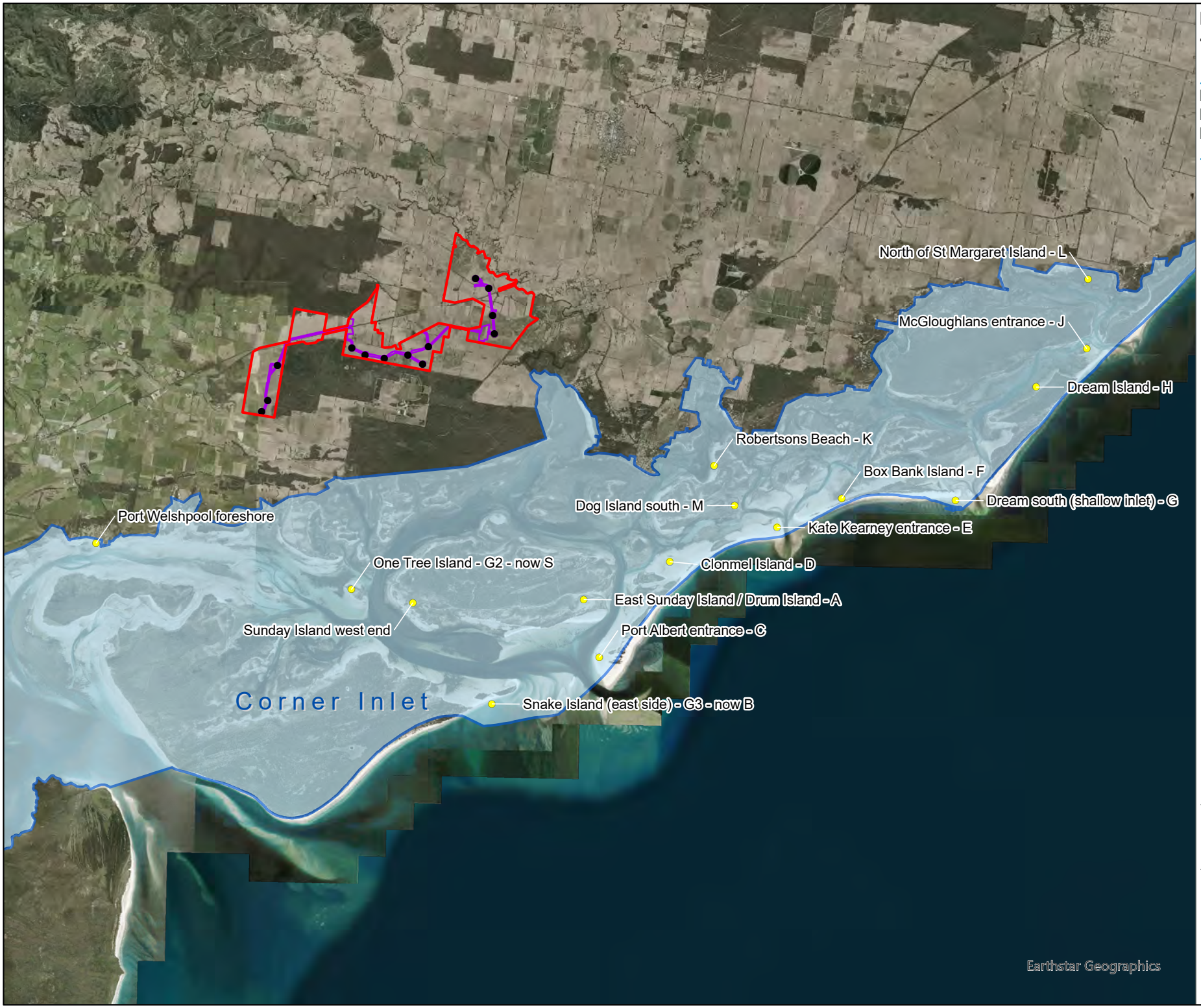

Figure 11: Overview map -Corner Inlet East

Project No: 14107.18
Project: Gelliondale Wind Farm
Date: 12/09/2024

- Site Boundary
- Construction footprint
- Turbine
- Ramsar site
- Survey sites

N

Kilometres

0 2 4 6 8

GDA2020 Vicgrid

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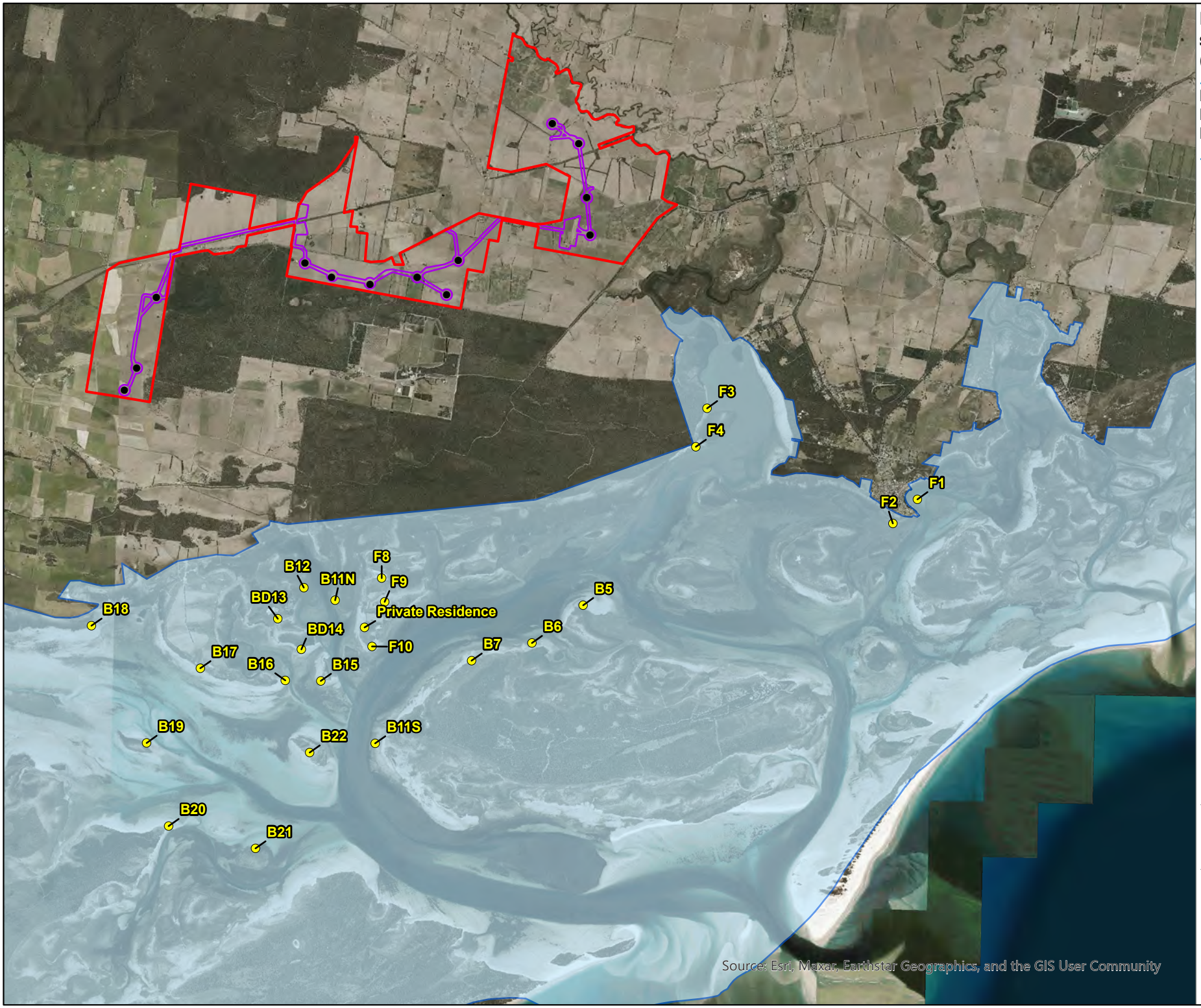

Figure 12: Corner Inlet shorebird survey sites (Nature Advisory)

Project No: 14107.18
Project: Gelliondale Wind Farm
Date: 17/04/2025

- Site Boundary
- Construction footprint
- Turbine
- Ramsar site
- Survey site

N

Kilometres

0 2 4

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9.3. Assessment results

9.3.1. Species abundance and diversity

Thirty-five listed species were recorded within Corner Inlet East (combined field surveys and BirdLife data; Table 20). Twenty-three of these are listed as migratory shorebird species, which represent 72 % of all migratory shorebirds known to visit Australia (DoE 2017). Overall, 1,229,413 individual migratory shorebirds were recorded in the combined BirdLife and Nature Advisory datasets between 1980 and 2025.

Summer captured a higher diversity (23 species) and abundance (1,097,465 birds) of migratory shorebirds compared to winter (17 species, and 131,948 birds). The only exception was the Double-banded Plover, which is a winter migrant from New Zealand (Wiersma et al. 2023). Some species considered to be visitors during the Austral summer were present throughout the winter as well (e.g. Bar-tailed Godwit, Common Greenshank, Far Eastern Curlew).

Several listed non-migratory species were observed during field surveys, most of which are associated almost exclusively with coastal waterbodies (e.g. terns and Hooded Plovers), though others range more widely (e.g. Blue-winged Parrots, Eastern Great Egrets, Little Egrets; Table 20).

Table 20: Listed species recorded during Nature Advisory (NA) field surveys and BirdLife Australia (BLA) shorebird surveys. Bold denotes migratory shorebird species, and 'ns' denotes species not surveyed.

Species	Status		Bilateral migratory species agreements	Summer			Winter	
	FFG	EPBC		NA (2015)	NA (2024/25)	BLA (1980-2024)	BLA (1980-2024)	NA (2025)
Migratory shorebirds								
Bar-tailed Godwit (*baueri* subsp.)	VU	EN, Mig.	1-4	1,259	929	394,481	49,631	5
Black-tailed Godwit	CR	EN, Mig.	1-4	0	0	510	0	0
Common Greenshank	EN	EN, Mig.	2-4	23	13	3,731	29	1
Common Redshank	-	Mig	2-4	0	0	70	0	0
Common Sandpiper	VU	Mig.	2-4	0	2	0	0	0
Curlew Sandpiper	CR	CR, Mig.	1-4	0	28	42,958	558	0
Double-banded Plover	-	Mig.	1	0	0	291	17,741	17
Far Eastern Curlew	CR	CR, Mig.	1-4	35	320	30,078	1,272	6
Great Knot	CR	VU, Mig.	1-4	2	0	7,008	610	0
Greater Sand Plover	VU	VU, Mig.	2-4	0	0	419	41	0
Grey Plover	VU	VU, Mig.	2-4	0	0	17,257	879	0
Grey-tailed Tattler	CR	Mig.	1-4	0	0	321	105	0
Latham's Snipe	-	VU, Mig.	1, 3-4	0	4	0	0	0
Lesser Sand Plover	EN	EN, Mig.	2-4	0	0	1,370	58	0
Marsh Sandpiper	EN	Mig.	2-4	0	0	7	0	0
Pacific Golden Plover	VU	Mig.	2-4	0	48	273	1	7
Red Knot	EN	VU, Mig.	2-4	18	0	83,779	24,108	0
Red-necked Stint	-	Mig.	1-4	324	3,590	491,554	35,569	152
Ruddy Turnstone	EN	VU, Mig.	2-4	0	0	2,348	650	0
Sanderling	-	Mig.	2-4	0	0	10,214	361	0

Species	Status		Bilateral migratory species agreements	Summer			Winter	
	FFG	EPBC		NA (2015)	NA (2024/25)	BLA (1980-2024)	BLA (1980-2024)	NA (2025)
Sharp-tailed Sandpiper	-	VU, Mig.	1-4	0	177	3,049	0	0
Terek Sandpiper	EN	VU, Mig.	2-4	0	0	41	7	0
Whimbrel	EN	Mig.	2-4	58	34	842	140	0
			Summer total	1,097,465		Winter total	131,948	
Other listed bird species								
Blue-winged Parrot	-	VU	-	0	6	ns	ns	0
Caspian Tern	VU	Mig.	3	0	52	ns	ns	3
Eastern Great Egret	VU	-	-	0	15	ns	ns	6
Fairy Tern	CR	VU	-	0	10	ns	ns	0
Great Crested Tern	-	Mig.	3	0	16	ns	ns	0
Gull-billed Tern	EN	Mig.	2	11	2	ns	ns	15
Hooded Plover	VU	VU	-	0	0	ns	ns	2
Little Egret	EN	-	-	0	3	ns	ns	1
Little Tern	CR	VU, Mig.	1-4	0	34	ns	ns	0
Musk Duck	VU	-	-	0	0	7	7	2
White-bellied Sea-eagle	EN	-	-	0	2	ns	ns	0
White-throated Needletail	VU	VU, Mig.	2-4	3	0	ns	ns	0

Notes:

FFG Act: The Flora and Fauna Guarantee Act 1988 (VIC), Cr = Critically endangered, En = Endangered, Vu = Vulnerable

EPBC Act: Environment Protection and Biodiversity Conservation Act 1999 (Cth.), Cr = Critically endangered, En = Endangered, Vu = Vulnerable, Mig. = Migratory

Bilateral Migratory Species Agreements: 1 = Bonn Convention (Bonn), 2 = Australia-China (CAMBA), 3 = Australia-Japan (JAMBA), 4 = Australia-Republic of Korea (ROKAMBA).

9.3.2. Spatial use of Corner Inlet

The spatial use of the site by the ten most common shorebirds showed a consistent trend of higher abundance on the outer islands (10 to 15 km from GWF). These locations contained, on average, 9,190 birds, accounting for 90.9% of records for the most common migratory shorebirds observed over the summers of 2024 and 2025 (Table 21). Notably, there were only two sites within the 10 to 15 km distance, Port Albert and Kate Kearney entrances (see Section 9.2.1). Both appear to be supporting important habitat and numbers of migratory shorebirds.

Only one species, the Whimbrel, did not follow this pattern. The area with the most Whimbrel was Dream Island, 18 km from the proposed wind farm.

Locations that were closest to the proposed wind farm, on average, only accounted for 0.3% of the top 10 species observed over the summer 2024 and 2025 surveys. No major wetland capable of supporting a nationally or internationally important population of migratory shorebirds was located on the wind farm site and its immediate surrounds.

The cause of these patterns is unknown but is thought to be related to disturbance and predation, with nearshore locations likely experiencing more human and animal (e.g. fox) impacts. Note, however, that fox prints were observed on Snake Island during field assessments but are more than likely fewer in number than on the mainland sites.

Table 21: Spatial use of Corner Inlet for the ten most abundant migratory shorebird species, data using average count per summer survey (collated NA and BirdLife data for 2024/25). Bold denotes more than 50% of a species' total.

Distance to GWF	No. Surveys	No. Locations	Average count (% of total for species)										TOTAL
			Bar-tailed Godwit	Common Sandpiper	Curlew Sandpiper	Far Eastern Curlew	Grey Plover	Pac. Golden Plover	Red Knot	Red-necked Stint	Sanderling	Whimbrel	
<5 km	21	3	14 (0.3%)	<1 (0.1%)	1 (0.4%)	5 (8.4%)	-	<1 (3.3%)	-	10 (0.2%)	-	-	30 (0.3%)
5-7 km	49	7	5 (0.1%)	-	<1 (0.2%)	4 (6.7%)	-	1 (12.3%)	-	67 (1.5%)	-	-	80 (0.8%)
7-10 km	30	6	35 (0.8%)	-	-	2 (3.5%)	<1 (0.2%)	-	1 (0.2%)	3 (0.1%)	-	1 (7.2%)	42 (0.4%)
10-15 km	2	2	**3,970 (90.9%)**	**80 (99.9%)**	**132 (99.3%)**	**28 (50.2%)**	**96 (91.5%)**	**6 (84.3%)**	**311 (93.8%)**	**4,177 (90.4%)**	**390 (100%)**	-	**9,190 (90.9%)**
>15 km	3	3	343 (7.9%)	-	-	17 (31.1%)	9 (8.3%)	-	20 (6%)	362 (7.8%)	-	**15 (92.8%)**	765 (7.6%)

9.3.3. Temporal trends

Summer trends

Table 22 shows the average summer count of all migratory shorebirds in Corner Inlet east between 1980 and 2024, sorted by distance of the survey site to the wind farm site and grouped by decade. Figure 13 shows the data trend.

The Corner Inlet east area consistently held over 20,000 individual birds. The general trend in summer abundance was relatively consistent, though data showed somewhat lower abundance from the 1990s to 2010s, the abundance in the 1980s was similar to that recorded over the last four years. However, some outer island sites showed a marked increase over the last two decades (Kate Kearny entrance, Box Bank Island, and Port Albert entrance), and other nearshore and inner island sites showed a decrease in abundance (Dog Island south and One Tree Island). Port Welshpool foreshore appeared to regularly hold fewer shorebirds over summer compared to other sites, with summer numbers ranging from only 15-61 birds.

Table 22: Sum of average counts for all migratory shorebird species over Summer 1980-2024. High counts over 2000 are highlighted in grey. Sites not surveys are denoted with 'ns'.

Survey Site	1980-89	1990-99	2000-09	2010-19	2020-24	Distance from GWF
One Tree Island - G2 - now S	4,266	3,569	3,443	2,161	ns	7 km
Port Welshpool foreshore	ns	61	15	40	ns	7.5 km
Robertsons Beach - K	ns	0	0	509	ns	7.5 km
Sunday Island west end	377	ns	ns	ns	ns	7.5 km
Clonmel Island - D	2,413	2,276	2,329	2,173	874	9 km
Dog Island south - M	ns	1750	102	102	35	9 km
East Sunday Island / Drum Island - A	102	145	18	287	172	9 km
Port Albert entrance - C	946	621	1,049	2,546	7,650	11 km
Box Bank Island - F	8,663	5,509	3,110	2,883	10,015	12 km
Kate Kearney entrance - E	2,081	1,335	12,920	10,569	10,331	12 km
Snake Island (east side) - G3 - now B	2,523	3,783	3,191	30	860	12.5 km
Dream south (shallow inlet) - G	3,086	8,277	516	2,692	1,785	16 km
Dream Island - H	5,095	439	99	262	112	18 km
McGloughlans entrance - J	921	1,119	1,104	1,033	398	19 km
North of St Margaret Island - L	1,951	21	25	144	ns	20 km
Total # birds for all sites	**32,425**	**28,904**	**27,922**	**25,430**	**32,230**	

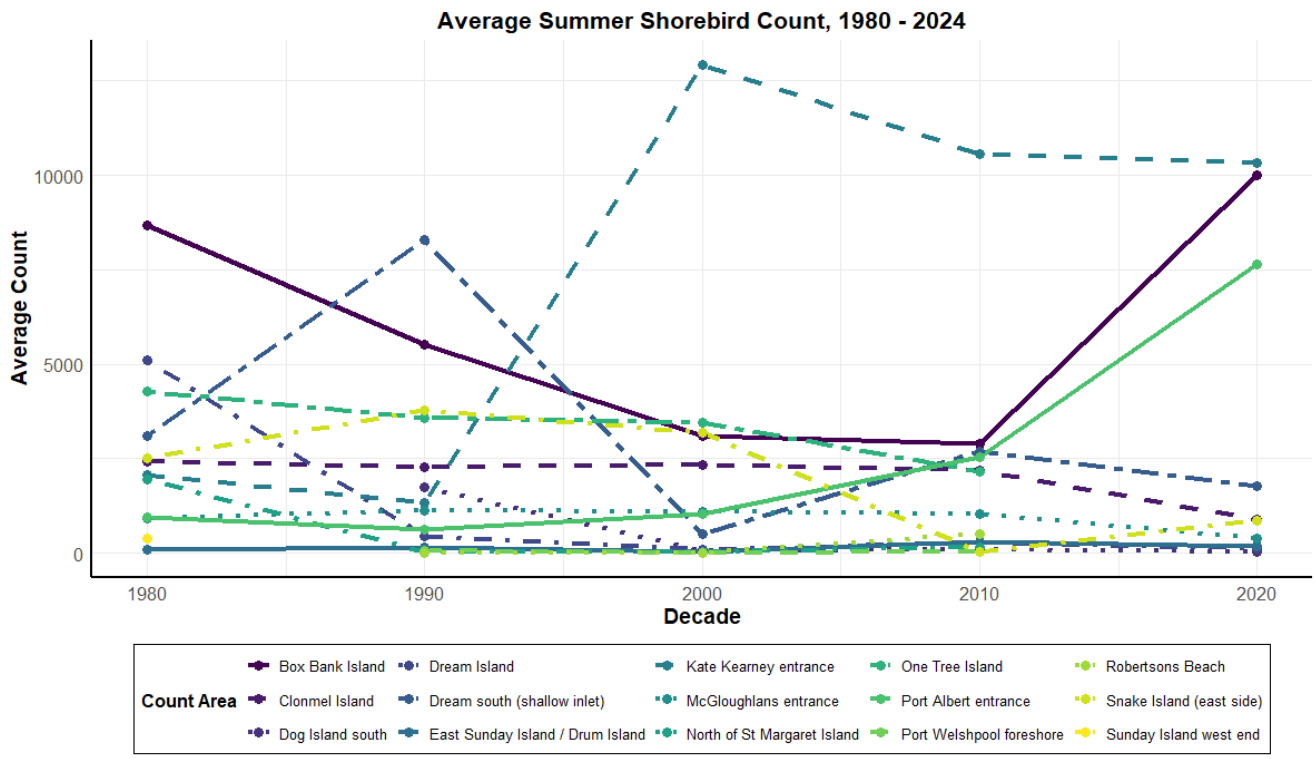

Figure 13: Trends in average summer count for all migratory shorebird species at each site between 1980 and 2024

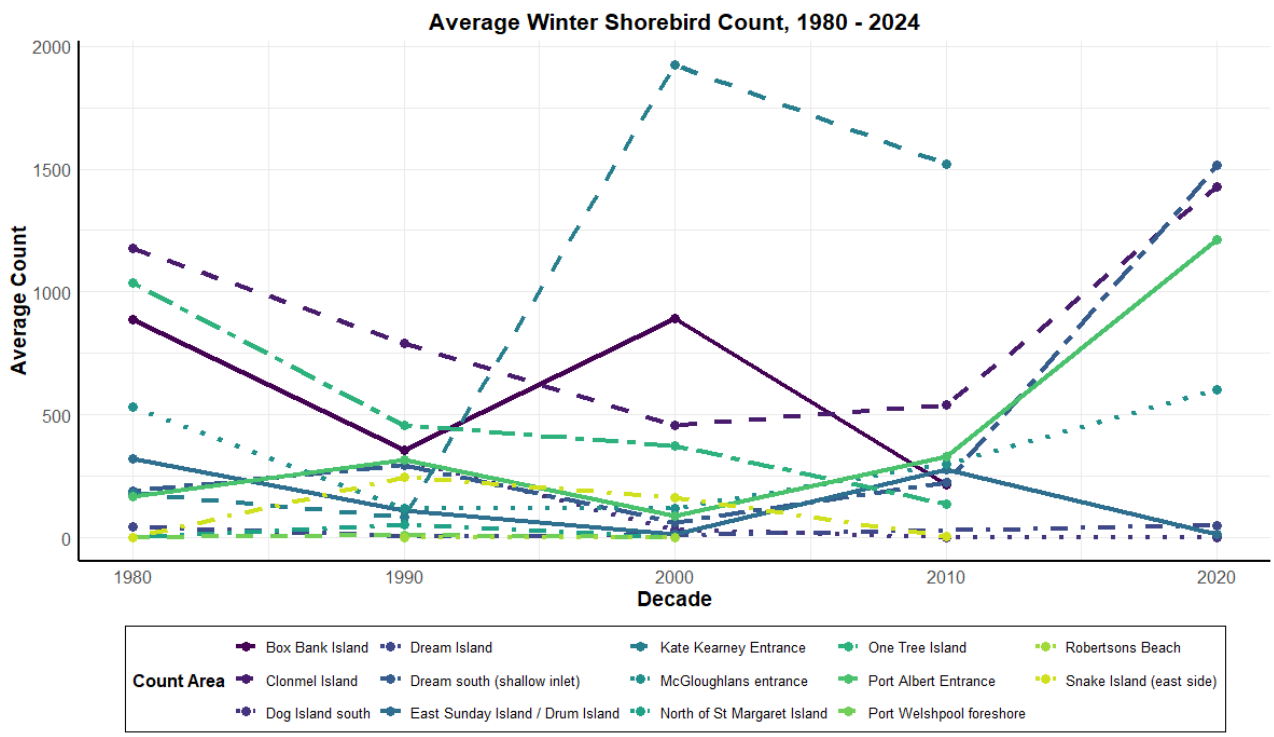

Figure 14: Trends in average winter count for all migratory shorebird species at each site between 1980 and 2024

Winter trends

Table 23 shows the average winter count of all migratory shorebirds in Corner Inlet east between 1980 and 2024, sorted by distance of the survey site to the wind farm site and grouped by decade. Figure 14 shows the data trend.

Corner Inlet east consistently held 3,000 to 4,000 individual birds over winter. The general trend in winter abundance was consistent. Though, some fluctuations over the decades, the abundance in the 1980s was fairly similar to that recorded over the last four years.

Some sites showed a decrease over time (Dog Island south and East Sunday Island/Drum Island). Others showed a sharp increase in wintering shorebird numbers (Kate Kearney entrance, Clonmel Island, Port Albert entrance, and Dream south - shallow inlet).

Three sites appeared to regularly hold fewer shorebirds over winter compared to other sites (all nearshore locations); Port Welshpool foreshore (0-9 birds), Robertsons Beach (0 birds), and North of St Margaret Island (1-51 birds).

Table 23: Sum of average counts for all migratory shorebird species over winter 1980-2024.

Survey Site	1980-89	1990-99	2000-09	2010-19	2020-24	Distance from GWF
One Tree Island - G2 - now S	1,037	458	376	138	ns	7 km
Port Welshpool foreshore	0	9	0	ns	ns	7.5 km
Robertsons Beach - K	ns	0	0	ns	ns	7.5 km
Sunday Island west end	2	245	165	5	ns	7.5 km
Clonmel Island - D	1,178	790	458	540	1,429	9 km
Dog Island south - M	ns	315	33	2	2	9 km
East Sunday Island / Drum Island - A	320	111	13	275	13	9 km
Port Albert entrance - C	166	316	87	328	1,213	11 km
Box Bank Island - F	887	356	892	215	ns	12 km
Kate Kearney entrance - E	180	85	1,924	1,519	ns	12 km
Snake Island (east side) - G3 - now B	ns	0	ns	ns	ns	12.5 km
Dream south (shallow inlet) - G	188	297	62	225	1,517	16 km
Dream Island - H	45	6	ns	10	50	18 km
McGloughlans entrance - J	533	117	121	299	604	19 km
North of St Margaret Island - L	1	51	1	ns	ns	20 km
Total # birds for all sites	**4,536**	**3,155**	**4,129**	**3,556**	**4,827**	

9.3.4. Flight behaviour

A single Latham's Snipe was incidentally recorded once during a BUS (see Section 6), but no other migratory shorebirds were observed during any formal BUS surveys or incidentally around the proposed wind farm site. No wetland habitat considered to have the potential to support a nationally important number of migratory shorebirds was observed onsite. So, the likelihood of shorebirds visiting the site is considered low. However, there is a chance that shorebirds may fly across the proposed wind farm site when migrating to and from the important habitat at Corner Inlet east.

Migratory flights have been described in detail by several authors (Lane & Jessop 1985; Piersma *et al.* 1990; Swennen 1992; Tulp *et al.* 1994). These studies have detailed shorebird migratory flight as remarkably consistent, with characteristics such as:

- Shorebirds depart in flocks of between five and 250 birds, with occasional observations of larger flocks (averages: 52, Lane & Jessop 1985; 10 – 151, depending on species, Piersma *et al.* 1990; 127, Swennen 1992; 13 – 94, depending on species, Tulp *et al.* 1994);
- They fly in an elongated, shallow "V" formation, termed an 'echelon' (Piersma *et al.* 1990);
- Shorebirds are very vocal when they depart on migration, calling unceasingly to one another rather loudly compared with their normal calling during flight;
- They ascend rapidly and steeply and are usually still ascending when lost from sight by the observer. Estimates of climb rate vary from 0.55 to 0.69 m per second, with larger, heavier species of shorebirds climbing at slower rates (Piersma *et al.* 1990, 1997). Rates of ascent for smaller shorebirds in West Africa were between 0.7 and 0.92 m per second. Optimal climb rates of approximately twice this have been predicted for shorebirds by Hedenstrom and Alerstam (1994);
- Observations of flight altitude using weather radar show that during migration, shorebirds fly at between 0.5 and 6 km (Piersma *et al.* 1990; Tulp *et al.* 1994). Altitudes of migration given in the last two studies are of birds still ascending when they disappeared from sight, often at altitudes of greater than one kilometre, and are therefore likely to be at the lower range of altitude estimates for level migratory flight. The first two studies used radar on oceanic islands to study shorebirds on long-distance, level, migratory flights. Altitudes in these circumstances ranged from 2.5 to 6 km
- Ground speeds for migrating shorebirds range between 20 km/h and 91 km/h (Lane & Jessop 1985; Tulp *et al.* 1994), although both studies were of birds climbing with varying strength winds affecting them.

Given these various climb rates and flight speeds, several scenarios may exist (Table 24). Under half of these scenarios there it is very unlikely migratory shorebirds will be at RSA height if passing over the wind farm. Other scenarios put birds above RSA at from 7 to 9 km, with the worst scenario (slowest climb and fastest speed) birds passing above RSA after 11 km.

Notably, the sites that account for the majority of the most abundant migratory shorebirds (98.5 %; Table 21) are over 11 km away from GWF.

Table 24: Scenarios under which birds will reach above RSA height under the various flight speeds and distances in the literature. Reported speed and climb rates from Piersma et al. (1990), Piersma et al. (1997), Land & Jessop (1985) and Tulp et al. (1994).

Scenario	Horizontal speed	Climb rate (m/sec)	Distance needed to reach above RSA
1	5.56 m/s (20 km/h)	0.90	1,544 m
2		0.70	1,986 m
3		0.69	2,015 m
4		0.55	2,526 m
5	25.28 m/s (91 km/h)	0.90	7,026 m
6		0.70	9,027 m
7		0.69	9,166 m
8		0.55	11,479 m

9.4. Conclusions

Investigations found a high abundance and diversity of migratory shorebirds use of Corner Inlet east, consistent with its designated status as an internationally important habitat (EAAFP 2017). Diversity and abundance were higher in summer, which aligns with the migratory status of the species. However, a low number of summer migrants were also reported during winter (e.g. Common Greenshank, Far Eastern Curlew, etc), indicating the potential for the area to support a low number of shorebirds year-round. Winter migrants such as the Double-banded Plover was regularly found in the area, with a lesser number of birds staying over the summer period.

The locations within Corner Inlet east that supported the most migratory shorebirds are those at least 10 or more kilometres from the proposed wind farm. These include the outer islands of Box Bank and Kate Kearny entrance, which have shown to consistently support the highest abundances for the last 40+ years.

There is some possibility that birds migrating northward will pass over the proposed wind farm. Collision with turbine blades is expected to be unlikely, considering the distance to preferred habitats (over 11 km) and modelled flight behaviour scenarios (7 of 8 scenarios show birds reach above RSA at 9 or fewer kilometres). Under the worst scenario (Scenario 8), where birds have the slowest rate of climb and a fastest ground speed, migrating birds will likely be exiting the RSA height at the start of the wind farm(~11.5 km above RSA). It is expected that birds will likely fall within the average climb and speed rates. When combined with the less-than-certainty that flight paths will cross the wind farm, it is considered unlikely that the wind farm will pose a significant impact to collision for migratory shorebird species.

Important habitats for all species of migratory shorebirds studied here are related to intertidal shore or marine habitats. While some may visit inland dams or wetland habitats, it is unlikely that any located within the wind farm site will constitute important habitat. Consequently, no impacts covering loss or degradation of important habitat by the wind farm are expected.

Disturbance thresholds are likely to be species-specific, with some more easily disturbed than others. Some overseas studies indicate some shorebird species are not disturbed by wind farm construction or operation (Lowther 2000), while others found that shorebirds would avoid turbines up to 500m away (Winkelman 1995). Observations in South Australia, of the same species studied here, indicated that a wind farm sited only 300m away from shorebird habitat did not lead to any changes in distribution or abundance of shorebirds (BL&A, unpublished data covering two years either side of wind farm construction and operation). Therefore, with the current wind farm sited at a minimum of 3 km away from intertidal habitats, disturbance by the project on important shorebird habitat is considered unlikely.

This assessment with support from findings in other chapters also concluded:

- No major wetland capable of supporting a nationally or internationally important population of migratory shorebirds is located on the wind farm site and its immediate surrounds
- The nearest potential habitat lies 3 km to the south of the nearest proposed wind turbine and was found to support relatively low numbers of shorebirds
- Most roosting shorebirds in the eastern part of Corner Inlet use the sandy beaches and spits of the outer barrier islands, located 12 km or more from the closest proposed turbine
- The routine tidal movements of birds using these roosts would be to adjacent areas of intertidal sandflats and mudflats, more than 5 km from the nearest proposed wind turbine

Based on these conclusions, the risk of a significant impact on an important population and habitat of migratory shorebirds is considered low.

For the same reasons and given that shorebirds are an important element of the ecological character of the Corner Inlet Ramsar site, the proposed wind farm will not significantly impact the ecological character of this important wetland.

10. Fauna susceptibility and risk assessment

The following analysis identifies how fauna species of concern may be susceptible to impacts as a result of the operation of the proposed wind farm. The risk assessment process was based on the Risk Evaluation Matrix Model used to measure the overall risk of a potential impact event on the local population of the species of concern (identified in the likelihood of occurrence assessment). The assessment requires criteria to be developed for likelihood and consequence. These criteria are provided respectively in Table 25 and Table 26. Table 27 shows the risk levels used and how they are determined from the assessed likelihood and consequence levels.

Table 25: Likelihood criteria

Likelihood	Across a 12-month period:	
	Description	*Approximate probability (%)*
Very low	Very improbable that impact could occur	<5
Low	Less probable than more probable that impact could occur	5 to < 50
Moderate	Equally probable that impact could or could not occur	50
High	More probable than not that impact could occur	>50 to 95
Very high	Very probable that impact could occur	>95

Table 26: Consequence criteria

Predicted to seriously disrupt an ecological significant proportion of the:		Consequence
total population annually	*population in the study area and surrounds for the life of the wind farm*	
No	None	**Negligible**
No	Short-term	**Low**
No	Medium-term	**Moderate**
Yes	Medium-term	**High**
Yes	Long-term	**Severe**

Table 27: Risk ratings

		Consequence				
		Negligible	Low	Moderate	High	Severe
Likelihood	Very low	Very low	Very low	Very low	Low	Low
	Low	Very low	Very low	Low	Medium	High
	Moderate	Very low	Low	Medium	High	High
	High	Very low	Low	Medium	High	Very high
	Very high	Very low	Low	High	Very high	Very high

10.1. Risk pathways

The below analysis considers potential impacts due to the operation of the wind farm that may affect bird and bat species. Key impact pathways during each phase are outlined below.

Operational phase

- Collision with turbine blades
- Deterrence from utilising parts of the wind farm due to disturbance or barrier effects

10.2. Species of concern

The fauna species of concern include those identified from the database review and field assessment as known to, likely to or having the potential to occur in the study area (Table 6). In addition, bird and bat species that are not listed under the EPBC Act or FFG Act, but are known to collide with wind turbines based on turbine strike monitoring from operational wind farms in eastern Australia (Symbolix 2020) or are considered at particular risk of direct and/or indirect impacts from the project have also been assessed including Wedge-tailed Eagle, other raptors and other non-listed birds and bats.

10.3. Results

The following information is included as part of the risk assessment process.

- Fauna species assessed;
- Species status under Commonwealth and state threatened and migratory species lists;
- Impact pathways categorised by phase of the wind farm;
- Likelihood and consequence for each impact pathway;
- Risk rating; and
- Comments.

A summary of the fauna risk assessment is provided in Table 28 with the risk assessment results detailed in Table 29.

Table 28: Fauna initial risk assessment results summary

Risk Rating	Number of species/groups
Very low	45
Low	7
Moderate	4
High	0
Very High	0

The fauna species that were assigned an impact risk rating of moderate are listed below.

- Blue-winged Parrot
- Grey-headed Flying Fox
- White-throated Needletail
- Eastern Bent-wing Bat (low to moderate)

No species are categorised as high or very high risk.

Table 27 provides the detailed results of the initial risk assessment, including evaluation of the impacts of the project on each species against the above likelihood and consequence criteria.

Table 29: Fauna susceptibility and risk assessment

Common Name	Scientific name	Conservation Status			No. of records	Likelihood of occurrence	Flight height group	Likelihood of collision with operating turbines	Comments
		EPBC - T	EPBC - M[5]	FFG					
Birds									
Australasian Bittern	*Botaurus poiciloptilus*	EN		CR	0	Potential wetlands in the wider study area. However no recent records from the broader study area; **unlikely to occur**	Ground dwelling	Very low	Species is unlikely to occur and has not historically been recorded in region. Large wetlands <10 km from the wind farm that are big enough for the species are likely brackish or saline, which is unsuitable. The species primarily dwells and forages in reeds with only very occasional flights between wetlands or parts of the same wetland. Given the unavailability of suitable habitat, the risk of collision is very low.
Australasian Shoveler	*Spatula rhynchotis*			VU	6	Potential wetlands in the wider study area; **potential to occur**	Ground dwelling	Very low	None recorded on the wind farm site, and only few records in the wider study area, therefore collision risk is very low
Australian Gull-billed Tern	*Gelochelidon macrotarsa*			EN	9	Would likely occur in the Corner Inlet Ramsar Site. May fly over in the study area occasionally, although there is no suitable habitat for the species within the study area itself; **potential to occur**	Higher flying	Low	The species on occasions may fly at RSA height however given the low number of recordings, the collision risk is low.
Australian Painted-snipe	*Rostratula australis*	EN	C	CR	0	Although suitable wetland habitat is present in the broader study area, the nearest recent records are in wetland around Melbourne and at Sale and there are no records either in the VBA or in the Atlas of Australian Birds; **unlikely to occur**	Ground dwelling	Very low	Species is unlikely to occur and has not historically been recorded in region. Large wetlands <10 km from the wind farm that are big enough for the species are likely brackish or saline, which is unsuitable. Snipes primarily dwell and forage in wetlands with only very occasional flights between wetlands or parts of the same wetland. Given the unavailability of suitable habitat, the risk of collision is very low.
Australian Masked Owl	*Tyto novaehollandiae*			CR	2	Widespread but elusive; may occur in close by eucalypt forests; rarely in open areas; **unlikely to occur**	Canopy and sub-canopy dwelling	Very low	Unlikely to occur, therefore collision risk is very low.
Barking Owl	*Ninox connivens*			CR	1	Suitable forest and woodland habitat exist, however no recent records from the broader study area; **unlikely to occur**	Canopy and sub-canopy dwelling	Very low	Unlikely to occur, therefore collision risk is very low.
Blue-billed Duck	*Oxyura australis*			VU	4	Potential wetlands in the wider study area; not recorded in the current study; **potential to occur**	Ground dwelling	Very low	None recorded on the wind farm site, and only few records in the wider study area, therefore collision risk is very low

[5] B = Bonn; J = JAMBA; C = CAMBA; R = ROKAMBA

Common Name	Scientific name	Conservation Status			No. of records	Likelihood of occurrence	Flight height group	Likelihood of collision with operating turbines	Comments
		EPBC - T	EPBC - M[5]	FFG					
Blue-winged Parrot	*Neophema chrysostoma*	VU			27	**Recorded** in the study area. Frequently observed at most BUS Points, in flocks of up to 8 in spring-summer. In autumn, flocks are significantly larger (up to 39 individuals). Occasionally seen at RSA height.	Ground and sub-canopy dwelling	Moderate	Species has been recorded in the study area. The proposed wind farm is located within their breeding range, and observations of moderately small numbers (up to 8 individuals) in spring-summer suggest a small breeding population occurs in the region. The larger numbers of individuals present in autumn (up to 39 individuals) may reflect the recruitment of new individuals into the population from breeding, arrivals migrating from Tasmania, or both. Blue-winged Parrot mortalities from turbine collisions have been reported in small numbers (Symbolix 2020). The species forage mostly on the ground with some movements between the ground and nearby low perches. They occasionally rise high into the air and fly some distance and have been observed at RSA height. Given their presence in the study area, and the occasional flights at RSA height, the risk of collision is moderate.
Brown Treecreeper	*Climacteris picumnus*	VU			0	Typically confined to dry woodland areas inland of the Great Dividing Range; **unlikely to occur**	Ground and sub-canopy dwelling	Very low	Species is unlikely to occur, therefore the collision risk is very low.
Chestnut-rumped Heathwren	*Calamanthus pyrrhopygius*			VU	1	Potential habitat may occur within wind farm boundaries; **potential to occur**	Canopy and sub-canopy dwelling	Very low	Unlikely to move out of heath habitat, therefore collision risk is very low.
Diamond Firetail	*Stagonopleura guttata*	VU		VU	0	Typically confined to dry woodland areas inland of the Great Dividing Range; **unlikely to occur.**	Canopy and sub-canopy dwelling	Very low	Species is unlikely to occur, therefore the collision risk is very low.
Fairy Tern	*Sternula nereis*	VU	M	CR	10	Would likely occur in the Corner Inlet Ramsar Site. May fly over in the study area occasionally, although there is no suitable habitat for the species within the study area itself; **potential to occur**	Higher flying	Very low	These species would likely only fly through the wind farm on major movements between the Corner Inlet and Gippsland Lakes or Western Port Ramsar Sites. However, it would most likely follow the coast instead of over the wind farm site. The wind farm boundary is >2 km from the Corner Inlet Ramsar Site at its closest point. For these reasons, the collision risk is very low.
Freckled Duck	*Stictonetta naevosa*			EN	1	May occur in any large freshwater wetland; suitable habitat may occur in study area; **potential to occur**	Ground dwelling	Very low	None recorded on the wind farm site, and only few records in the wider study area, therefore collision risk is very low
Gang-gang Cockatoo	*Callocephalon fimbriatum*	EN		EN	64	Common cockatoo in eucalypt forests surrounding study area; been recorded previously in such forests; recorded in nearby woodlands; **recorded in study area.**	Canopy and sub-canopy dwelling	Low	Gang-gang Cockatoos typically breed in old-growth forests. Most of the forested habitat in the study area is not old-growth and doesn't offer significant suitable nesting habitat. They have previously been documented colliding with turbines (Nature Advisory unpub. data), however due to its foraging behaviour in the canopy and short-distance flights, the collision risk is low.
Grey Falcon	*Falco hypoleucos*	VU		VU	None	No suitable habitat; **unlikely to occur**	Higher flying	Very low	Grey Falcon is indigenous to semi-arid and arid regions. The study area is well outside the species' accepted distribution and therefore the collision risk is very low.
Grey Goshawk	*Accipiter novaehollandiae*			EN	2	Suitable habitat exists, but there are no recent records of the species in this part of South Gippsland in the Atlas of Australian Birds (or in the VBA since 2003, therefore **unlikely to occur**.	Higher flying	Very low	Species is unlikely to occur, therefore the collision risk is very low.

Common Name	Scientific name	Conservation Status			No. of records	Likelihood of occurrence	Flight height group	Likelihood of collision with operating turbines	Comments
		EPBC - T	EPBC - M[5]	FFG					
Ground Parrot	*Pezoporus wallicus*			EN	2	Occurs in coastal heathland and sedgeland with no suitable habitat in the study area. **Unlikely to occur**.	Canopy and sub-canopy dwelling	Very low	Species is unlikely to occur, therefore the collision risk is very low.
Hooded Plover	*Thinornis rubricollis*	VU	M	VU	3	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur**	Ground dwelling	Very low	These species would likely only fly through the wind farm on major movements between the Corner Inlet and Gippsland Lakes or Western Port Ramsar Sites. However, it would most likely follow the coast instead of over the wind farm site. The wind farm boundary is >2 km from the Corner Inlet Ramsar Site at its closest point. For these reasons, the collision risk is very low.
Hooded Robin	*Melanodryas cucullata*	EN		VU	0	Typically confined to dry woodland areas inland of the Great Dividing Range; **unlikely to occur**	Ground and sub-canopy dwelling	Very low	Species is unlikely to occur, therefore the collision risk is very low.
Little Egret	*Egretta garzetta*			EN	25	**Recorded** in study area	Ground dwelling	Low	May occasionally fly at RSA height, therefore the collision risk is low.
Lewin's Rail	*Lewinia pectoralis*			VU	2	In coastal and near coastal wetlands; rather uncommon and no recent records; **unlikely to occur**	Ground dwelling	Very low	Unlikely to occur, therefore collision risk is very low
Magpie Goose	*Anseranas semipalmata*			VU	1	No suitable habitats; uncommon in Gippsland shores; **unlikely to occur**	Ground dwelling	Very low	Unlikely to occur, therefore collision risk is very low
Musk Duck	*Biziura lobata*			VU	12	Suitable habitat found within the study area; not recorded in the current survey; **likely to occur**	Ground dwelling	Very low	None recorded on the wind farm site, and only low records in the wider study area, therefore collision risk is very low
Orange-bellied Parrot	*Neophema chrysogaster*	CR		CR	1	There is limited suitable saltmarsh habitat within the broader study area and this species may on rare occasion pass through the region; **unlikely to occur**	Ground and sub-canopy dwelling	Very low	This species exhibits strong coastal behaviour on mainland Australia and is never > 1 km from the coast. Because the wind farm is >2 km from the coast at the closest point and does not provide a suitable foraging habitat, the collision risk is very low.
Painted Honeyeater	*Grantiella picta*	VU		VU	None	No suitable habitat; **unlikely to occur**	Canopy and sub-canopy dwelling	Very low	Species is unlikely to occur, therefore the collision risk is very low.
Pilotbird	*Pycnoptilus floccosus*	VU		VU	1	May occur in Alberton State Forest, but is a low-flying, sedentary species (DAWE 2022b) unlikely to leave the forest and enter the wind farm area; **unlikely to occur**	Ground dwelling	Very low	One old record (pre-1980) occurs within 10 km of the study area. It could potentially occur in Alberton State Forest. However, it is a low-flying, sedentary species (DAWE 2022b) that is unlikely to leave the forest and enter the study area, which is situated entirely on agricultural land, therefore the collision risk is very low.
Plumed Egret (Intermediate Egret)	*Ardea plumifera*			CR	9	Suitable wetland may exist, but egret uncommon in area; **may occasionally occur**	Ground dwelling	Low	May occasionally fly at RSA height, therefore the collision risk is low.
Powerful Owl	*Ninox strenua*			VU	15	Suitable forest and woodland habitat exist and recent records near the broader study area; **likely to occur**	Canopy and sub-canopy dwelling	Low	The species on occasions may fly at RSA height however given the low number of recordings, the collision risk is low.
Regent Honeyeater	*Anthochaera phrygia*	CR		CR	0	No suitable habitat; **unlikely to occur**	Canopy and sub-canopy dwelling	Very low	Species is unlikely to occur, therefore the collision risk is very low.
Swift Parrot	*Lathamus discolor*	CR		CR	1	**Recorded.** A single individual was recorded from Swift Parrot Survey Area 9 during targeted surveys	Canopy and sub-canopy dwelling	Low	The species on occasions may fly at RSA height however given the low number of recordings, the collision risk is low.

Common Name	Scientific name	Conservation Status			No. of records	Likelihood of occurrence	Flight height group	Likelihood of collision with operating turbines	Comments
		EPBC - T	EPBC - M[5]	FFG					
Wedge-tailed Eagle[6]	*Aquila audux*					**Recorded**. Suitable habitat exists in the study area.	Higher flying		Fly at RSA height but in low numbers, therefore the collision risk is low
White-bellied Sea-Eagle	*Haliaeetus leucogaster*			EN	30	**Recorded**. Suitable habitat exists and recent records in the study area.	Higher flying	Low	Fly at RSA height but in low numbers, therefore the collision risk is low
Bats									
Eastern Bent-wing Bat	*Miniopterus orianae oceanensis*	CR		CR	1	Might fly across during none-breeding season; main known cave in Gippsland is at Bairnsdale; **unlikely to occur**	Canopy and sub-canopy	Low (to moderate)	Species may occur in low numbers, therefore the collision risk is low to moderate. This is considered a precautionary level of risk given the minimal information available about their caves and populations.
Grey-headed Flying Fox	*Pteropus poliocephalus*	VU		VU	15	No recent records in the search area and the Woodside seasonal camp is approximately 25 km from the proposed wind farm site. Approximately 2000 individuals recorded at a newly established camp at Port Welshpool; **likely to occur**	Higher flying	Moderate	The species regularly flies at RSA height and is known to occasionally collide with turbines at operational wind farms in south-eastern Australia (Symbolix 2020). The species is likely to occur at the wind farm and therefore the collision risk is moderate.
Migratory shorebirds									
Bar-tailed Godwit	*Limosa lapponica*		M (B-A2H, J, C, R)	VU	25	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur.**	Ground dwelling	Very low	BirdLife Australia implement a long term and intensive shorebird monitoring program at the Corner Inlet Ramsar Site. The program has not recorded the following in the last eight years: Black-tailed Godwit, Little Curlew, Marsh Sandpiper, Pin-tailed Snipe, Ruff, Swinhoe's Snipe, Wood Sandpiper. No suitable habitat exists for them in the study area, so they are unlikely to forage or roost there. Shorebirds are only likely to fly through the wind farm on migratory flights or when undertaking major movements between the Corner Inlet and Gippsland Lakes or Western Port Ramsar Sites. However, would most likely follow the coast instead of over the wind farm site. The wind farm boundary is >2 km from the Corner Inlet Ramsar Site at its closest point. Shorebirds ascend very rapidly when conducting long-distance flights (AB ESRD 2011). Making a conservative estimate of a flight trajectory of 15-degree incline, shorebirds would be >600 m in altitude, placing them well-above RSA height, by the time they enter the wind farm airspace. For these reasons, the collision risk is very low for shorebirds
Black-tailed Godwit	*Limosa limosa*	EN	M (B-A2H, J, C, R)	CR	1		Ground dwelling	Very low	
Common Greenshank	*Tringa nebularia*	EN	M (B-A2H, J, C, R)	EN	26		Ground dwelling	Very low	
Common Sandpiper	*Actitis hypoleucos*		M (B-A2H, J, C, R)	VU	6		Ground dwelling	Very low	
Curlew Sandpiper	*Calidris ferruginea*	CR	M (B-A2H, J, C, R)	CR	16		Ground dwelling	Very low	
Double-banded Plover	*Charadrius bicinctus*		M (B-A2H)		0	Migratory; usually coastal and near coastal habitats; not recorded in current study, **unlikely to occur**	Ground dwelling	Very low	
Eastern Curlew	*Numenius madagascariensis*	CR	M (B-A1, J, C, R)	CR	61	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur**	Ground dwelling	Very low	
Great Knot	*Calidris tenuirostris*	VU	M (B-A2H, J, C, R)	CR	4	Few records, and the most recent from many decades ago, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**	Ground dwelling	Very low	
Greater Sand Plover	*Charadrius leschenaultii*	VU	M (B-A2H, J, C, R)	VU	5		Ground dwelling	Very low	
Grey Plover	*Pluvialis squatarola*	VU	M (B-A2H, J, C, R)	VU	12	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the	Ground dwelling	Very low	

[6] Not listed as a threatened species under FFG Act or the EPBC Act but included in this table because it is an iconic species and is regularly recorded at the project site.

Common Name	Scientific name	Conservation Status			No. of records	Likelihood of occurrence	Flight height group	Likelihood of collision with operating turbines	Comments
		EPBC - T	EPBC - M[5]	FFG					
Grey-tailed Tattler	*Tringa brevipes*		M (B-A2H, J, C, R)	CR	6	closest point, with no suitable habitat in the study area; **unlikely to occur**	Ground dwelling	Very low	
Lesser Sand Plover	*Charadrius mongolus*	EN	M (B-A2H, J, C, R)	EN	3	Few records, and the most recent from many decades ago, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**.	Ground dwelling	Very low	
Little Curlew	*Numenius minutus*		M (B-A2H, J, C, R)		0		Ground dwelling	Very low	
Marsh Sandpiper	*Tringa stagnatilis*		M (B-A2H, J, C, R)	EN	1		Ground dwelling	Very low	
Pacific Golden Plover	*Pluvialis fulva*		M (B-A2H, J, C, R)	VU	2		Ground dwelling	Very low	
Pectoral Sandpiper	*Calidris melanotos*		M (B-A2H, J, C, R)		0	No records, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**	Ground dwelling	Very low	
Pin-tailed Snipe	*Capella stenura*		M (B-A2H, J, C, R)		0		Ground dwelling	Very low	
Red Knot	*Calidris canutus*	VU	M (B-A2H, J, C, R)	EN	10	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur.**	Ground dwelling	Very low	
Red-necked Stint	*Calidris ruficollis*		M (B-A2H, J, C, R)		0	No records, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**	Ground dwelling	Very low	
Ruddy Turnstone	*Arenaria interpres*	VU	M (B-A2H, J, C, R)	EN	3	Few records, and the most recent from many decades ago, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**	Ground dwelling	Very low	
Ruff	*Calidris pugnax*		M (B-A2H, J, C, R)		0	No records, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**	Ground dwelling	Very low	
Sanderling	*Calidris alba*		M (B-A2H, J, C, R)		0		Ground dwelling	Very low	
Sharp-tailed Sandpiper	*Calidris acuminata*	VU	M (B-A2H, J, C, R)		6	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur.**	Ground dwelling	Very low	
Swinhoe's Snipe	*Capella megala*		M (B-A2H, J, C, R)		0	No records, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**	Ground dwelling	Very low	
Terek Sandpiper	*Xenus cinereus*	VU	M (B-A2H, J, C, R)	EN	1	Few records, and the most recent from 1987, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**	Ground dwelling	Very low	
Whimbrel	*Numenius phaeopus*		M (B-A2H, J, C, R)	EN	14	Likely confined to the Corner Inlet, approx. 2.3 km southeast of the study area at the closest point, with no suitable habitat in the study area; **unlikely to occur**	Ground dwelling	Very low	

Common Name	Scientific name	Conservation Status			No. of records	Likelihood of occurrence	Flight height group	Likelihood of collision with operating turbines	Comments
		EPBC - T	EPBC - M[5]	FFG					
Wood Sandpiper	*Tringa glareola*		M (B-A2H, J, C, R)	EN	0	No records, despite the presence of an intensive shorebird monitoring program in the region; **unlikely to occur**	Ground dwelling	Very low	
Other migratory birds									
Caspian Tern	*Hydroprogne caspi*		M (C, J)	VU	40	Known to occur in the Corner Inlet Ramsar Site, which is one of three significant breeding colonies in Victoria (Minton and Deleyev 2001). May fly over in the study area occasionally, although there is no suitable habitat for the species within the study area itself; **potential to occur**	Higher flying	Low	May occasionally fly at RSA height, therefore the collision risk is low.
Eastern Great Egret	*Ardea alba modesta*		M (J, C)	VU	24	**Recorded** in study area	Ground dwelling	Low	May occasionally fly at RSA height, therefore the collision risk is low.
Glossy Ibis	*Plegadis falcinellus*		M (B-A2S)		1	May occasionally pass through the study area; **potential to occur**	Ground dwelling	Very low	None recorded on the wind farm site, and low records in the wider study area, therefore collision risk is very low
Fork-tailed Swift	*Apus pacificus*		M (C, R, J)		0	**Recorded** in study area	Higher flying	Low	Species has been recorded in study area. It has been documented colliding with turbines, although it is considered a very uncommon occurrence (Moloney et al. 2019), therefore, the collision risk low.
Latham's Snipe	*Gallinago hardwickii*	VU	M (B-A2H, R, J)		13	**Recorded** in study area	Ground dwelling	Very low	Given its migratory nature, low numbers may occur on site at any time during their residency in south-eastern Australia. Given their low numbers and ground-dwelling behaviour, the collision risk is very low.
Little Tern	*Sternula albifrons*		M (B, J, C, R)	CR	8	Would likely occur in the Corner Inlet Ramsar Site. May fly over in the study area occasionally, although there is no suitable habitat for the species within the study area itself; **potential to occur.**	Higher flying	Very low	These species would likely only fly through the wind farm on major movements between the Corner Inlet and Gippsland Lakes or Western Port Ramsar Sites. However, it would most likely follow the coast instead of over the wind farm site. The wind farm boundary is >2 km from the Corner Inlet Ramsar Site at its closest point. For these reasons, the collision risk is very low.
White-throated Needletail	*Hirundapus caudacutus*	VU	M (C, R, J)	VU	53	**Recorded** flying over the broader study area	Higher flying	Moderate (TBC)	The species regularly flies at RSA height and previous mortality monitoring efforts at other wind farms (Moloney et al. 2019, Nature Advisory unpub. data) have recorded this species colliding with turbines. The species uses the airspace at the wind farm and could therefore collide with turbines.
Yellow Wagtail	*Motacilla flava*		M (C, R, J)		0	Rare vagrant to Victoria; **unlikely to occur**	Sub-canopy and ground dwelling	Very low	Species is unlikely to occur, therefore the collision risk is very low

11. Assessment of impacts

11.1. Proposed development

The proposed development will involve the construction of 13 wind turbines (each with an adjacent hardstand required for construction), access tracks, underground cabling, a substation and battery energy storage system, and four construction compounds/operations and maintenance areas.

The extent of the area of impact for the current proposal was considered to include the outer-most boundaries of the following:

- Access tracks – 6 m wide;
- Underground cabling and associated trenching – 3 m wide;
- 13 wind turbines –15 to 18 m radii;
- One hardstand beside each wind turbine – 40 x 80 m;
- One large electrical substation and associated battery energy storage system; and
- Two construction compounds and two operations/maintenance areas.

Predominant land use within the site is for agricultural operations. This land use will continue during and after wind farm construction.

To determine impacts to native vegetation, the proposed construction layout was overlaid with the native vegetation mapped as part of this investigation. Native vegetation occurring in the following locations was considered to be removed based on the proposed development plan:

- Direct removal:
    - Native vegetation within all proposed wind turbine construction hardstands
    - Native vegetation within all proposed access tracks
    - Native vegetation within all proposed laydown and storage areas
    - Native vegetation within all proposed operations and management areas
    - Native vegetation within the proposed substation footprint
- Consequential removal:
    - Native vegetation within 10 m of all wind turbine hardstands (to address potential 'cut and fill' requirements)
    - Trees with the more than 10% of their TPZ encroached.

Impacts to trees

In accordance with the *Assessor's Handbook* (DELWP 2018), a tree is deemed lost when earthworks encroach on more than 10% of its Tree Protection Zone (TPZ). A TPZ is defined as an area around the trunk of the tree which has a radius of 12 × the DBH (to a maximum of 15 m but no less than 2 m). Dead trees are treated in the same manner.

Two trees will be impacted by the proposed layout at an intersection outside the wind farm site.

11.2. Impacts of proposed development

11.2.1. Native vegetation

The current wind farm footprint will result in the loss of a total extent of 1.244 hectares of native vegetation as represented in and documented in the *Native Vegetation Removal* (NVR) report provided by DEECA (Appendix 11).

11.2.2. Modelled species important habitat

The project footprint will not have a significant impact on any habitat for any rare or threatened flora species as determined in Appendix 11.

11.2.3. Listed flora species

The analysis of the likelihood of occurrence of listed flora species presented in Section 4.4 identified that the following species had potential to occur within the study area:

- Coast Grey-box (FFG Act: Endangered)
- Creeping Rush (FFG Act: Endangered)
- Currant-wood (FFG Act: Endangered)
- River Swamp Wallaby-grass (EPBC Act: Vulnerable)
- Southern Blue-gum (FFG Act: Endangered)
- Strzelecki Gum (EPBC Act: Vulnerable; FFG Act: Critically Endangered)

No threatened trees or suitable wetlands will be removed by the proposed wind farm, and targeted flora surveys undertaken within the wider initial layout did not record any threatened flora species (BL&A 2016b).

The following species only have potential to occur in the adjacent state forests, which was part of the initial study area but has been avoided as part of the design response to mitigate impacts:

- Clover Glycine (EPBC Act: Vulnerable; FFG Act: Vulnerable);
- Dense Leek-orchid (EPBC Act: Vulnerable; FFG Act: Critically Endangered);
- Eastern Spider-orchid (EPBC Act: Endangered; FFG Act: Endangered);
- Silver Everlasting (FFG Act: Endangered);
- Fringed Helmet-orchid (FFG Act: Endangered);
- Lizard Orchid (FFG Act: Endangered);
- Metallic Sun-orchid (EPBC Act: Endangered; FFG Act: Endangered);
- Maroon Leek-orchid (EPBC Act: Endangered; FFG Act: Endangered);
- Orange-tip Finger-orchid (FFG Act: Endangered);
- Large White Spider-orchid (FFG Act: Endangered);
- Spurred Helmet-orchid (FFG Act: Endangered);
- Small Wax-lip Orchid (FFG Act: Endangered);
- Lacy Wedge-fern (FFG Act: Endangered);
- Green Leek-orchid (FFG Act: Endangered);
- Slender Leek-orchid (FFG Act: Endangered);
- Slender Bog-sedge (FFG Act: Vulnerable);
- Thick-lip Spider-orchid (EPBC Act: Vulnerable); and

- Parsley Xanthosia (FFG Act: Endangered).

No significant impacts to any of these flora species are expected from the project.

11.2.4. Listed fauna species

The analysis of susceptibility of listed fauna species presented in Section 5.4.2 identified several nationally (EPBC Act) and state (FFG Act) threatened species, are susceptible to impacts from wind farm development in the study area. Of these species, the following were considered more likely to be impacted, as they have the potential to occur, been recorded within the wind farm, or fly at RSA height:

- Swift Parrot
- White-throated Needletail
- Blue-winged Parrot
- Gang–gang Cockatoo
- Powerful Owl
- White-bellied Sea-Eagle
- Eastern Bent-wing Bat
- Grey-headed Flying Fox

Targeted surveys of the first two EPBC-listed species have been carried out; the survey details and possible impacts on these two species are discussed in detail in Section 8. The proposed revised wind farm layout is not expected to significantly impact the Swift Parrot population. A collision risk assessment for the White-throated Needletail is underway and will be considered when assessing potential impacts on this species.

The Gang–gang Cockatoo is a strict woodland species and would only occasionally venture outside the woodland and is not expected to be significantly impacted.

Targeted surveys for Powerful Owl in areas of forest may well confirm their presence (already confirmed for the Alberton West state forest) but would not change conclusions in relation to the likelihood of impact, as discussed earlier in this report (see Section 5.4.2). The owl generally confines itself to forested habitats, none of which will have turbines built in them and dispersal of juvenile owls after breeding is finished would be a rare event most likely confined to the areas where treed habitats are closest. Where this occurs, on either side of the South Gippsland Highway, no turbines are proposed to be constructed. The likelihood of an ongoing impact on this species is therefore considered to be low.

The White-bellied Sea-Eagle is not a likely species to be impacted by the operation of a wind farm; the species is mostly found along the coast and may on occasions venture inland passing over the wind farm site.

Initial Grey-headed Flying fox monitoring has commenced, and a longer-term monitoring regime will improve the overall understanding of camp activity and how they are using the landscape in and around the wind farm site. Because they regularly fly at RSA height and are known to occasionally collide with turbines at operational wind farms in south-eastern Australia, the collision risk is moderate.

A low to moderate risk has been allocated to the Eastern Bent-wing Bat, despite no individuals being recorded during surveys, as a precautionary measure and in the absence of detailed information regarding known caves in the region. Future monitoring and access to confirmed information about the

Eastern Bent-wing Bat, will improve the understanding of their movements in the area and inform the adaptive management approach.

11.2.5. Threatened ecological communities

The proposed development footprint will not result in the loss of any threatened ecological communities.

9.1. Recommendations for further mitigation

Implementation of a Construction Environmental Management Plan (CEMP) for the proposed wind farm will ensure that procedures and strategies exist to respond to any unanticipated impacts on any threatened flora species. This will ensure that the environmental footprint of the project is limited to the defined construction area and protect any native vegetation to be retained beyond this.

Best-practice development and construction recommendations are provided in Appendix 7. These should be considered to ensure impacts are minimised to flora, fauna and/or native vegetation.

12. Implications for the proposed development

12.1. Planning and Environment Act 1987

12.1.1. Local Provisions–Overlays

Environmental Significance Overlay – Schedule 2

A **permit is not required** as no works which will remove, destroy or lop any vegetation are proposed on land under this overlay.

Environmental Significance Overlay – Schedule 3

A **permit is required** under this overlay for the removal of vegetation associated with the development of traffic circle intersections. The responsible authority may consider the following information relevant to biodiversity in their decision to grant a permit:

- The preservation of any existing natural vegetation;
- The conservation of any areas of environmental importance or significance;
- The intensity of human activity which the landscapes and the environment the area can sustain; and
- Whether the development of the land will be detrimental to the natural environment.

Significant Landscape Overlay – Schedule 3

A **permit is required** under this overlay for the removal of vegetation associated with the development of traffic circle intersections. The responsible authority may consider the following information relevant to biodiversity in their decision to grant a permit:

- The conservation and enhancement of the landscape values of the area;
- The contribution of the vegetation to habitat associated with the nearby RAMSAR wetlands; and
- Whether the proposal is sited and designed to maximise retention of existing vegetation throughout the landscape, and whether the proposal provides for the planting of new indigenous coastal vegetation wherever possible.

12.1.2. Clause 52.17of the Planning Scheme

A permit for the proposed removal of native vegetation is required under Cl. 52.17 of the State Planning Provisions for both the Wellington and South Gippsland council areas.

The current proposal would trigger a referral to DEECA as it meets the criteria specified in Section 3.3.

12.2. Implications under the Guidelines

12.2.1. Avoid and minimise statement

In accordance with the Guidelines, all applications to remove native vegetation must provide an avoid and minimise statement that describes any efforts undertaken to avoid the removal of and minimise the impacts to biodiversity and other values of native vegetation, and how these efforts were focused on areas of native vegetation with the highest value.

The proponent committed early in the process to reduce the removal of native vegetation to a minimum based on the results of Nature Advisory's field surveys and subsequent advice. Efforts to avoid and minimise impacts to native vegetation in the current application are presented as follows:

- The number of turbines has been reduced to 13 from the 34 proposed for the Alberton Wind Farm project.

- A proposed turbine between the large forest blocks has been removed. The distance between proposed turbines and forest edges has been increased for most turbines, unless other restrictions were in place (distance to dwellings).
- Where feasible, proposed access tracks follow existing cleared farm tracks.
- The vast majority of the remaining development footprint has been sited within cleared agricultural land.
- The transmission line route has been removed for this proposal (all electrical infrastructure is proposed to be placed underground), avoiding remnant native vegetation and scattered trees within and south of the rail reserve corridor reserve.
- An access track was moved out of Birds Road (a narrow road lined on either side with diverse sedgy, shrubby and grassy vegetation as well as overhanging trees) and into the cleared private land to the east.
- Works compounds and electrical substations have been sited within cleared farm paddocks.
- Access point 1 and associated track were moved west, avoiding impacts on Gelliondale State Forest.

All of the above changes resulted in considerable reductions in overall proposed native vegetation removal.

The proponent has indicated that, where feasible, further micro siting of infrastructure will occur during the construction stage, to further reduce impacts to native vegetation. The impacts presented in this report therefore present a conservative account of proposed impacts.

Further recommendations to mitigate impacts on flora and fauna are presented in Section 7.2.

12.2.2. Assessment pathway

The assessment pathway is determined by the location category and extent of native vegetation as detailed for the study area as follows:

- **Location Category:** Location 2

Extent of native vegetation: A total of 1.244 hectares of native vegetation (including two large trees).

Based on the extent of native vegetation removal being ≥ 0.5 hectares, the Guidelines stipulate that the proposal is to be assessed under the **Detailed** assessment pathway, as determined by the matrix detailed in Table 30.

Table 30: Assessment pathway matrix

Extent of native vegetation	Location Category		
	Location 1	Location 2	Location 3
< 0.5 hectares and not including any large trees	Basic	Intermediate	Detailed
< 0.5 hectares and including one or more large trees	Intermediate	Intermediate	Detailed
≥ 0.5 hectares	Detailed	**Detailed**	Detailed

This proposal **would** trigger a referral to DEECA based on the above criteria.

12.2.3. Offset requirements

Offsets required to compensate for the proposed removal of native vegetation from the study area are as follows:

- 0.4320 general habitat units and must include the following offset attribute requirements:
  - Minimum strategic biodiversity value (SBV) of 0.3056.
  - Occur within the West Gippsland CMA boundary or the Wellington or South Gippsland Shire Council areas.
  - Include the protection of at least two large trees.

Under the Guidelines all offsets must be secured prior to the removal of native vegetation.

12.2.4. Offset statement

The offset target for the current proposal will be achieved via a third-party offset.

An online search of the Native Vegetation Credit Register (NVCR) has shown that the required offset is currently available for purchase from a native vegetation credit owner (DEECA 2023).

Evidence that the required offset is available is provided in Appendix 12. The required offset would be secured following approval of the application to remove native vegetation.

12.3. Implications under the Environment Protection and Biodiversity Conservation Act

The EPBC Act protects several threatened species and ecological communities that are considered to be of national conservation significance. Any significant impacts on these species require the approval of the Australian Minister for the Environment.

Ecological communities

The proposed wind farm will not result in the loss of any threatened EPBC Act-listed ecological communities.

Flora

No EPBC Act-listed flora species have been recorded during targeted flora surveys within the impact area.

Fauna

The following EPBC Act-listed species are susceptible to impacts through turbine collision:

- Swift Parrot
- White-throated Needletail
- Blue-winged Parrot
- Gang–gang Cockatoo
- Powerful Owl
- White-bellied Sea-Eagle
- Grey-headed Flying Fox

These species were considered to be at low to medium risk from collision with turbines and will be addressed in the BAM Plan. Further investigations in the form of Grey-headed Flying Fox roosting surveys and a collision risk model prepared for the EPBC assessment process of the White-throated Needletail will confirm whether a significant impact at population level is expected for these species.

12.4. Implications under the Flora and Fauna Guarantee Act

The following FFG Act-listed communities and species will be impacted by the project.

Listed communities

No FFG Act-listed communities were recorded within the development footprint.

Flora

No FFG act-listed flora species have been recorded within the development footprint during targeted surveys.

Fauna

The Swift Parrot, Powerful Owl, White-bellied Sea-eagle, White-throated Needletail, Grey-headed Flying Fox and Eastern Bent-wing Bat are also FFG Act-listed and need to be considered under this Act.

Although there are no legislative implications for impacts to these species on private land under the FFG Act, these values should be avoided and impacts minimised wherever possible, in recognition of their threatened status at a state level.

Any application for a planning permit may also be assessed by the responsible or referral authority for potential impacts to FFG threatened values as part of broader considerations of impacts to biodiversity, irrespective of land tenure.

A permit would be required from DEECA for impacts to listed flora threatened species and/or communities on public land.

Protected Flora

The following FFG Act values listed as protected are anticipated to be impacted from the proposed development on public land:

- Common Beard-heath

12.5. Implications under the Environmental Effects Act

The Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act 1978 (DSE 2006) identifies criteria that trigger a Referral to the State Minister for Planning.

The project was referred, and it was determined that given the larger Alberton Wind Farm, which includes the project study area, had already been assessed by the Department as not warranting an EES to be prepared.

There are therefore no further implications under the EE Act.

12.6. Implications under the Catchment and Land Protection Act

A Protected Flora Permit would be required from DEECA to remove the above plant taxa. Protected Flora Permits can only be lodged after a planning permit is obtained.

The CaLP Act requires that landowners (or a third party to whom responsibilities have been legally transferred) must eradicate regionally prohibited weeds and prevent the growth and spread of regionally controlled weeds.

Property owners who do not eradicate regionally prohibited weeds or prevent the growth and spread of regionally controlled weeds for which they are responsible may be issued a Land Management Notice or Directions Notice requiring specific control work to be undertaken.

In accordance with the CaLP Act, the noxious weed species listed below, which were recorded in the study area, must be controlled.

- Hawthorn (C)

- African Box-thorn (C)
- Sweet Briar (C)
- Blackberry (C)

Precise control methods that minimise off-target kills (e.g., spot spraying) should be used in environmentally sensitive areas (e.g., within or near native vegetation, waterways, etc.).

13. Recommendations

13.1. Native vegetation and flora species

The layout has been revised to minimise impacts on native vegetation were possible and no threatened flora species or listed communities are proposed to be impacted. Further minimisation of impacts on native vegetation will be considered through micro-siting were feasible during construction.

The following further recommendations for mitigation through micrositing are recommended.

- Where feasible, cables that intersect with high-quality native vegetation, or watercourses should be installed using directional drilling;
- Ancillary site infrastructure (such as site compounds and amenities) should be located outside areas of native vegetation; and
- Construction works should be caried out in a way that does not alter the site's hydrology in areas that support native vegetation or act as tributaries to rivers, creeks and significant drainage lines. This will be detailed within the CEMP.

13.2. Fauna species

To minimise collision risks, monitoring during peak activity periods for species like Blue-winged Parrot and White-throated Needletail should be undertaken and seasonal adjustments to turbine operations should be considered if higher numbers of these species are present. Details will be provided in the Bat and Avifauna Management Plan (BAMP).

Carcass management should be employed to minimise scavenger attraction to areas near turbines, helping to lower the risk for Wedge-tailed Eagles and other raptor species.

Further mitigation measures and monitoring have been addressed in a draft Bat and Avifauna Management Plan (BAMP).

14. Conclusions

The purpose of this report is to assess the potential biodiversity impacts associated with the proposed wind farm to inform the planning permit application for this project. A summary of the key values potentially affected by the project is provided below.

The wind farm site and surrounding land is situated in a region that has been historically cleared of native vegetation for the provision of stock grazing. Other land uses within the study area include a rail reserve and several road reserves, as well as Alberton West State Forest to the north and Gelliondale State Forest to the south.

Vegetation assessments did not identify any threatened flora species or listed communities within the impact area. The layout has been revised to minimise impacts so that only 1.244 ha of native vegetation are proposed to be removed.

The Project has been situated in an appropriate location to avoid impacts to native vegetation where possible. The location is in a landscape that has been significantly altered by clearing for grazing and turbines have been situated in cleared land, avoiding native habitats. Access tracks and other infrastructure require crossovers through native roadside vegetation (swamp scrub) in some areas and this is where the majority of native vegetation removal will occur. Iterations of the project footprint have been undertaken to reduce these impacts wherever possible.

The following listed fauna species were considered to be potentially impacted, as they have the potential to occur, been recorded within the wind farm, or fly at Rotor Swept Area (RSA) height:

- Blue-winged Parrot (EPBC Act: Vulnerable)
- Swift Parrot (EPBC Act: Critically Endangered; FFG Act: Critically Endangered)
- Gang–gang Cockatoo (EPBC Act: Endangered, EPBC Act: Endangered)
- Grey-headed Flying Fox (EPBC Act: Vulnerable, FFG Act: Vulnerable)
- Eastern Bent-wing Bat (FFG Act: Critically Endangered)
- Powerful Owl (FFG Act: Vulnerable)
- White-throated Needletail (EPBC Act: Vulnerable & Migratory; FFG Act: Vulnerable)
- White-bellied Sea-Eagle (FFG Act: Endangered)

Provided that recommended mitigation measures are undertaken, impacts to fauna through habitat removal is considered to be low.

The risk for collision of birds and bats with turbines remains, as is seen for other windfarms, as well as infrastructure including fences, transmission wires and other man-made structures. The potential for impacts on Swift Parrot, White-throated Needletail and Blue-winged Parrot through collision with turbines is considered low and mitigation measures as well as further monitoring has been detailed in a draft BAMP. In summary, these measures include:

- Operational phase monitoring (BUS, bats, carcass monitoring)
- Adaptive management that includes:
    - Impact triggers for listed and non-listed bird and bat species
    - Mitigation - may include, but not be limited to, the following:
        - Habitat modification, vegetation planting/removal;

- Changes in land use practices (including stock management, stock grain-feeding) near turbines, subject to negotiation with landowners;
- Cessation or reduction of cropping/sowing around or near turbines;
- Bird deterrence;
- Increasing turbine and powerline detectability (e.g. visual or audio deterrents);
- Changes to turbine lighting (noting the general requirements below);
- Temporary turbine curtailment for high-risk periods/locations;
- Using ultrasonic deterrents to deter bats at night; and
- Bird protection systems that automatically curtail turbines on approach to reduce raptor fatalities (e.g., Bioseco®, IdentiFlight®).

- Offsetting.

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Appendix 1: Details of the assessment process in accordance with the Guidelines for the removal, destruction or lopping of native vegetation (DELWP 2017)

Purpose and objective

Policies and strategies relating to the protection and management of native vegetation in Victoria are defined in the State Planning Policy Framework (SPPF). The objective of all Victorian Planning Schemes, as identified in Clause 12.01, is 'To ensure that there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation'.

This is to be achieved through the following three-step approach, as described in the Guidelines:

1. Avoid the removal, destruction or lopping of native vegetation.
2. Minimise impacts from the removal, destruction or lopping of native vegetation that cannot be avoided.
3. Provide an offset to compensate for the biodiversity impact from the removal, destruction or lopping of native vegetation.

Note: While a planning permit may still be required, if native vegetation does not meet the definition of either a patch or a scattered tree, an offset under the Guidelines is not required.

Assessment pathways

The first step in determining the type of assessment required for any site in Victoria is to determine the assessment pathway for the proposed native vegetation removal. The three possible assessment pathways for applications to remove native vegetation in Victoria are the following:

- Basic;
- Intermediate; or
- Detailed.

This assessment pathway is determined by the following two factors:

- **Location Category**, as determined using the Location Map of Victoria. The location category indicates the potential risk to biodiversity from removing a small amount of native vegetation. The three location categories are defined as follows:
  - Location 1 – shown in light blue-green on the Location Map; occurring over most of Victoria.
  - Location 2 – shown in dark blue-green on the Location Map; includes areas mapped as endangered EVCs and/or sensitive wetlands and coastal areas.
  - Location 3 – shown in brown on the Location Map; includes areas where the removal of less than 0.5 hectares of native vegetation could have a significant impact on habitat for rare and threatened species.
- **Extent of native vegetation** – The extent of any patches and scattered trees proposed to be removed (and the extent of any past native vegetation removal), with consideration as to whether the proposed removal includes any large trees. Extent of native vegetation is determined as follows:
  - **Patch** – the area of the patch in hectares.
  - **Scattered Tree** – the extent of a scattered tree is dependent on whether the scattered tree is small or large. A tree is considered to be a large tree if the DBH is greater than or equal to the large tree benchmark DBH for the relevant bioregional EVC. Any scattered tree that is not a large

tree is a small scattered tree. The extent of large and small scattered trees is determined as follows:

- **Large scattered tree** – the area of a circle with a 15 m radius, with the trunk of the tree at the centre.
- **Small scattered tree** – the area of a circle with a 10 m radius, with the trunk of the tree at the centre.

The assessment pathway for assessing an application to remove native vegetation is subsequently determined as shown in the following matrix table:

Extent of native vegetation	Location Category		
	Location 1	Location 2	Location 3
< 0.5 hectares and not including any large trees	Basic	Intermediate	Detailed
< 0.5 hectares and including one or more large trees	Intermediate	Intermediate	Detailed
≥ 0.5 hectares	Detailed	Detailed	Detailed

Note: If the native vegetation to be removed includes more than one location category, the higher location category is used to determine the assessment pathway.

Landscape scale information – strategic biodiversity value

The strategic biodiversity value (SBV) is a measure of a location's importance to Victoria's biodiversity, relative to other locations across the state. This is represented as a score between 0 and 1, and determined from the SBV map, available from *NVIM* (DELWP 2022d).

Landscape scale information – habitat for rare or threatened species

Habitat importance for rare or threatened species is a measure of the importance of a location in the landscape as habitat for a particular rare or threatened species, in relation to other habitat available for that species. This is represented as a score between 0 and 1 and determined from the Habitat importance maps, administered by DELWP.

This includes two groups of habitat:

- **Highly localised habitats** – Limited in area and considered to be equally important, therefore having the same habitat importance score.
- **Dispersed habitats** – Less limited in area and based on habitat distribution models.

Habitat for rare or threatened species is used to determine the type of offset required in the detailed assessment pathway.

Biodiversity value

A combination of site-based and landscape scale information is used to calculate the biodiversity value of native vegetation to be removed. Biodiversity value is represented by a general or species habitat score, as determined below.

Firstly, the extent and condition of native vegetation to be removed are combined to determine the habitat hectares as follows:

Habitat hectares = extent of native vegetation × condition score

Secondly, the habitat hectare score is combined with a landscape factor to obtain an overall measure of biodiversity value. Two landscape factors exist as follows:

- **General landscape factor** – determined using an adjusted strategic biodiversity score and relevant when no habitat importance scores are applicable;
- **Species landscape factor** – determined using an adjusted habitat importance score for each rare or threatened species habitat mapped at a site in the Habitat importance map.

These factors are subsequently used as follows to determine the biodiversity value of a site:

General habitat score = habitat hectares × general landscape factor

Species habitat score = habitat hectares × species landscape factor

Offset requirements

A native vegetation offset is required for the approved removal of native vegetation. Offsets conform to one of two types and each type incorporates a multiplier to address the risk of offset:

- A **general offset** is required when the removal of native vegetation does not have a significant impact on any habitat for rare or threatened species (i.e. the proportional impact is below the species offset threshold). In this case a multiplier of 1.5 applies to determine the general offset amount.

General offset (amount of general habitat units) = general habitat score × 1.5

- A **species offset** is required when the removal of native vegetation has a significant impact on habitat for a rare or threatened species (i.e. the proportional impact is above the species offset threshold). In this case a multiplier of 2 applies to determine the species offset amount.

Species offset (amount of species habitat units) = Species habitat score × 2

Note: If native vegetation does not meet the definition of either a patch or scattered tree, an offset is not required.

Offset attributes

Offsets must meet the following attribute requirements, as relevant:

- General offsets
  - **Offset amount** – general offset = general habitat score × 1.5

  - **Strategic biodiversity value (SBV)** – the offset has at least 80% of the SBV of the native vegetation removed
  - **Vicinity** – the offset is in the same CMA boundary or municipal district as the native vegetation removed
  - Habitat for rare and threatened species – N/A
  - **Large trees** – the offset includes the protection of at least one large tree for every large tree to be removed
- Species offsets
  - **Offset amount** – species offset = species habitat score × 2
  - Strategic biodiversity value (SBV): N/A
  - Vicinity: N/A
  - **Habitat for rare and threatened species** – the offset comprises mapped habitat according to the Habitat importance map for the relevant species

Large trees – the offset includes the protection of at least one large tree for every large tree to be removed

Appendix 2: Details of investigated properties

Property No.*	Street address	Town/Suburb	Lot description	Land Designation (DTPLI 2015)	
				Zones	Overlays^
Private Land					
1	150 Todds Road	Hedley	Lot 1 PS51087	FZ	WMO, SLO3
2	169 Birds Road South	Hedley	Allot. 1 Sec. A Parish of Alberton West	FZ	WMO
3	6970 South Gippsland Highway	Hedley	Lot 1 TP110485	FZ	WMO
4	South Gippsland Highway	Hedley	Lot 1 TP578219	FZ	
5	South Gippsland Highway	Hedley	Lot 1 TP578908	FZ	
6	7085 South Gippsland Highway	Hedley	Lot 1 TP754717	FZ, PCRZ	WMO, ESO2
7	Coal Mine Road	Gelliondale	Lot 2 Lp92727	FZ	WMO, ESO2
8	67 Lanes Road	Gelliondale	Lot 2 PS50651	FZ	
9	South Gippsland Highway	Hedley	Allot. 53 Parish of Alberton West	FZ, IN1Z	
10	South Gippsland Highway	Hedley	Lot 2 PS404524	FZ	
11	7438 South Gippsland Highway	Hedley	Lot 1 PS40452	FZ	
12	7618 South Gippsland Highway	Gelliondale	Plan PC36214	FZ	
13	Lanes Road	Alberton West	Lot 1 TP88769	FZ	ESO2
14	115 Gelliondale Road	Gelliondale	Lot 63 LP315	FZ	ESO2
15	Gelliondale Road	Gelliondale	Lot 1 TP814120	FZ, PCRZ	ESO2
16	738 Pound Road West	Alberton West	Lot 1 PS61948	FZ, PCRZ	ESO2
17	47 Nicols Road	Devon North	Allot. 14A Parish of Yarram Yarram	FZ	
18	Nicols Road	Devon North	Allot. 14L Parish of Yarram Yarram	FZ	
19	668 Pound Road West	Yarram	Lot 8 PS31552	FZ	
20	80 Crangs Road	Alberton West	Lot 1 PS61738	FZ	
21	212 Old Alberton West Road	Alberton	Lot 7 LP4703	FZ	
22	174 Old Alberton West Road	Alberton	Lot 1 PS71429	FZ	ESO2

Property No.*	Street address	Town/Suburb	Lot description	Land Designation (DTPLI 2015)	
				Zones	Overlays^
23	Old Alberton West Road	Gelliondale	Lot 5 LP4703	FZ	
24	7913 South Gippsland Highway	Alberton	Lot 3 LP4703	FZ	
25	South Gippsland Highway	Gelliondale	Lot 1 TP864748	FZ	
26	7776 South Gippsland Highway	Gelliondale	Lot 1 TP109933	FZ	
27	7802 South Gippsland Highway	Gelliondale	Plan TP4297	FZ	
28	7890 South Gippsland Highway	Alberton	Lot 1 TP128952	FZ	
29	7996 South Gippsland Highway	Alberton	Lot 1 PS603015	FZ	ESO1
30	8028 South Gippsland Highway	Alberton	Lot 1 PS51087	FZ	
31	Ti Tree Road	Gelliondale	Allot. A Sec. 9 Alberton West	FZ	
32	7666 South Gippsland Highway	Gelliondale	Allot. 8a Parish of Alberton West	FZ	
33	555 Ti Tree Road	Hedley	Allot. 24c Sec. A Parish of Alberton West	PCRZ	ESO2
34	Wests Road	Alberton West	Lot 1 LP9272	FZ	
35	205 Lanes Road	Alberton West	Lot 1 TP83713	FZ	
36	Lanes Road	Alberton West	Lot 1 TP53216	FZ	
37	Lanes Road	Gelliondale	Allot. 44 Parish of Alberton West	FZ	ESO2 (does not cover study area)
38	68 James Road	North Hedley	Allot. 78 Parish of Alberton West	FZ	
39	South Gippsland Highway	Hedley	Allot. 62 Parish of Alberton West	FZ	
40	806 Pound Road West	Alberton West	Lot 4 PS31552	FZ	ESO2 (does not cover study area)
41	Pound Road West	Alberton West	Allot. A11A Parish of Yarram Yarram	PCRZ	ESO2
42	Pound Road West	Alberton West	Allot. 2009 Parish of Yarram Yarram	FZ	
43	Pound Road West	Alberton West	Allot. 2010 Parish of Yarram Yarram	FZ	
44	179 Lower Jack Road	Jack River	Lot 1 LP14081	FZ	

Property No.*	Street address	Town/Suburb	Lot description	Land Designation (DTPLI 2015)	
				Zones	Overlays^
45	Ross Road	Alberton West	Allot. A13A Parish of Yarram Yarram	PCRZ, FZ	
46	Pound Road West	Alberton West	Plan CP16737	PCRZ, FZ	
47	937 Pound Road West	Alberton West	Lot 1 LP143423	FZ	
48	1007 Pound Road West	Alberton West	Lot 1 TP56137	FZ	
49	246 Gelliondale Road	Alberton West	Lot 1 PS438124	FZ	
50	392a Old Alberton West Road	Alberton West	Lot 2 PS438124	FZ	
51	246 Gelliondale Road	Alberton West	Lot 1 PS620983	FZ	
52	1007 Pound Road West	Alberton West	Lot 1 TP561378	FZ	
53	1045 Pound Road West	Alberton West	Lot 1 TP375270	FZ	
54	370 Lanes Road	Alberton West	Lot 2 PS41020	FZ	
55	289 Gelliondale Road	Alberton West	Lot 1 PS41020	FZ	
Public Land					
NA	South Gippsland Highway		Road Reserve	RDZ1	
NA	Great Southern Rail Trail		Rail Reserve (disused)	PCRZ	
NA	Birds Road South		Road Reserve	FZ	
NA	Todds Road		Road Reserve	FZ	
NA	Old Alberton West Road		Road Reserve	FZ	
NA	McPhersons Road		Road Reserve	FZ	
NA	Ti Tree Road		Road Reserve	FZ	
NA	Lanes Road		Road Reserve	FZ	
NA	Wests Road		Road Reserve	FZ	
NA	Great Southern Rail Trail (SOUTH GIPPSLAND HIGHWAY)		Rail Reserve (disused)	PCRZ	
NA	Coal Mine Road		Road Reserve	FZ	

Property No.*	Street address	Town/Suburb	Lot description	Land Designation (DTPLI 2015)	
				Zones	Overlays^
NA	Old Alberton Road		Road Reserve	FZ	
NA	Simmons Street / Crangs Road		Road Reserve (paper road)	FZ	
NA	Pound Road West		Road Reserve	FZ	
NA	Gelliondale Road		Road Reserve	RDZ2	

* = BL&A property reference

^ = Only relevant overlays have been listed

FZ = Farming Zone

RDZ1 = Road Zone – Category 1

RDZ2 = Road Zone – Category 2

PCRZ = Public Conservation and Resource Zone

IN1Z = Industrial 1 Zone

ESO1 = Environmental Significance Overlay – Schedule 1

ESO2 = Environmental Significance Overlay – Schedule 2

SLO3 = Significant Landscapes Overlay – Schedule 3

Appendix 3: Detailed habitat hectare assessment results

Habitat Zone			A	B	C	D	E	F	G	H	I	J	K	L
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			653	53	653	53	53	53	53	53	53	53	53	53
Total area of Habitat Zone (ha)			0.0423	0.023	0.3231	0.0693	0.2816	0.6269	0.7241	1.241	0.071	0.066	0.095	0.375
Site Condition	Large Old Trees	/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	No. large trees in habitat zone		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Tree Canopy Cover	/5	NA	0	NA	0	0	3	0	0	0	3	3	3
	Lack of Weeds	/15	7	0	9	0	0	4	6	6	4	7	4	4
	Understorey	/25	5	5	5	5	5	15	5	5	15	5	5	5
	Recruitment	/10	10	0	0	10	10	6	10	10	10	10	10	10
	Organic Matter	/5	5	2	4	4	3	5	5	5	5	5	4	4
	Logs	/5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Site condition standardising multiplier*		1.36	1.25	1.36	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
	Site Condition subtotal		*37*	*9*	*24*	*24*	*23*	*41*	*33*	*33*	*43*	*38*	*33*	*33*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1	1	1	1	1
	Neighbourhood	/10	0	0	0	0	0	0	0	0	0	0	0	0
	Distance to Core	/5	1	1	1	1	1	1	1	1	1	1	1	1
Total Condition Score		**/100**	**39**	**11**	**26**	**26**	**25**	**43**	**35**	**35**	**45**	**40**	**35**	**35**

Habitat Zone			M	N	O	Q	R	S	T	U	V	W	X1	X2
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			53	53	53	53	53	53	53	53	821	53	821	821
Total area of Habitat Zone (ha)			0.106	0.037	0.010	0.227	0.073	0.023	0.077	0.699	0.063	0.036	0.275	0.036
Site Condition	Large Old Trees	/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	No. large trees in habitat zone		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Tree Canopy Cover	/5	0	0	0	0	3	0	0	3	NA	0	NA	NA
	Lack of Weeds	/15	0	4	7	0	0	4	0	0	7	0	9	9
	Understorey	/25	5	5	5	5	5	5	5	5	15	5	15	15
	Recruitment	/10	10	5	5	10	5	10	10	10	0	5	6	6
	Organic Matter	/5	5	3	3	5	3	5	5	4	5	4	5	5
	Logs	/5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Site condition standardising multiplier*		1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.36	1.25	1.36	1.36
	Site Condition subtotal		*25*	*21*	*25*	*25*	*20*	*30*	*25*	*28*	*37*	*18*	*48*	*48*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1	1	1	1	1
	Neighbourhood	/10	0	0	0	0	0	0	0	0	0	0	0	0
	Distance to Core	/5	1	1	1	1	1	1	1	1	1	1	1	1
Total Condition Score		**/100**	**27**	**23**	**27**	**27**	**22**	**32**	**27**	**30**	**39**	**20**	**50**	**50**

Habitat Zone			Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AK
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			821	821	821	653	53	53	53	53	53	53	53	53
Total area of Habitat Zone (ha)			0.062	0.054	0.192	0.005	0.100	0.110	0.011	0.063	0.023	0.013	0.084	0.240
Site Condition	Large Old Trees	/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	No. large trees in habitat zone		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Tree Canopy Cover	/5	NA	NA	NA	NA	0	0	0	0	0	0	3	0
	Lack of Weeds	/15	9	9	9	4	0	4	4	4	4	4	4	4
	Understorey	/25	15	15	15	5	5	5	5	5	5	5	5	5
	Recruitment	/10	3	6	3	0	6	10	10	6	6	6	5	3
	Organic Matter	/5	5	5	5	5	4	3	3	5	5	5	3	5
	Logs	/5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Site condition standardising multiplier*		1.36	1.36	1.36	1.36	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
	Site Condition subtotal		*44*	*48*	*44*	*19*	*19*	*28*	*28*	*25*	*25*	*25*	*25*	*21*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1	1	1	1	2
	Neighbourhood	/10	0	0	0	0	0	0	0	1	1	1	1	2
	Distance to Core	/5	1	1	1	1	1	1	1	3	3	3	3	3
Total Condition Score		**/100**	**46**	**50**	**46**	**21**	**21**	**30**	**30**	**30**	**30**	**30**	**30**	**28**

Habitat Zone			AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AX
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			53	53	53	53	53	53	53	53	53	53	48	48
Total area of Habitat Zone (ha)			0.190	0.010	0.005	0.066	0.079	0.098	0.150	0.130	0.170	0.063	0.085	0.048
Site Condition	Large Old Trees	/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10	10
	No. large trees in habitat zone		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5	3
	Tree Canopy Cover	/5	0	0	0	0	0	0	0	0	0	0	3	5
	Lack of Weeds	/15	4	0	0	4	4	4	4	4	4	4	0	0
	Understorey	/25	5	5	5	5	5	5	5	5	5	5	5	5
	Recruitment	/10	3	5	5	5	5	5	5	5	5	5	3	3
	Organic Matter	/5	5	4	4	2	2	2	2	2	2	2	3	5
	Logs	/5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2	5
	Site condition standardising multiplier*		1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.00	1.00
	Site Condition subtotal		*21*	*18*	*18*	*20*	*20*	*20*	*20*	*20*	*20*	*20*	*26*	*33*
Landscape Context	Patch Size	/10	2	1	1	1	1	1	1	1	1	1	1	1
	Neighbourhood	/10	2	1	1	1	1	1	1	1	1	1	1	1
	Distance to Core	/5	3	3	3	3	3	3	3	3	3	3	3	3
Total Condition Score		**/100**	**28**	**23**	**23**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**31**	**38**

Habitat Zone			AZ	BA	BB	BC	BD	BE	BF	BG	BI	BK	BM	BM1
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			48	48	48	53	53	48	48	48	48	48	48	48
Total area of Habitat Zone (ha)			0.046	0.019	0.099	0.069	0.128	0.045	0.059	0.018	0.054	0.035	0.012	0.019
Site Condition	Large Old Trees	/10	9	10	10	NA	NA	10	10	10	10	10	0	0
	No. large trees in habitat zone		3	1	3	NA	NA	5	3	2	4	2	0	0
	Tree Canopy Cover	/5	5	3	5	3	0	3	3	5	3	3	3	3
	Lack of Weeds	/15	0	0	0	4	7	4	0	0	0	0	0	0
	Understorey	/25	5	5	5	5	5	5	5	5	5	5	5	5
	Recruitment	/10	3	3	5	6	5	3	0	5	0	5	5	5
	Organic Matter	/5	5	3	5	5	4	5	2	5	5	5	5	5
	Logs	/5	4	5	5	NA	NA	5	0	5	5	5	4	5
	Site condition standardising multiplier*		1.00	1.00	1.00	1.25	1.25	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Site Condition subtotal		*31*	*29*	*35*	*29*	*26*	*35*	*20*	*35*	*28*	*33*	*22*	*23*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1	1	1	1	1
	Neighbourhood	/10	1	1	1	1	1	1	1	1	1	1	1	1
	Distance to Core	/5	3	3	3	3	3	3	3	3	3	3	3	3
Total Condition Score		**/100**	**36**	**34**	**40**	**34**	**31**	**40**	**25**	**40**	**33**	**38**	**27**	**28**

Habitat Zone			BN	BN1	BO	BP	BQ	BR	BS	BT	BU	BW	BX	BY
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			48	48	48	48	48	53	53	48	48	48	53	53
Total area of Habitat Zone (ha)			0.019	0.029	0.130	0.510	0.150	0.005	0.011	0.320	0.151	0.180	0.096	7.400
Site Condition	Large Old Trees	/10	0	10	10	6	6	NA	NA	4	0	4	NA	NA
	No. large trees in habitat zone		0	1	4	4	1	NA	NA	1	0	1	NA	NA
	Tree Canopy Cover	/5	3	3	3	3	3	0	0	3	3	5	0	3
	Lack of Weeds	/15	0	0	0	4	4	0	0	0	0	0	4	9
	Understorey	/25	5	5	5	15	15	5	5	5	5	5	5	15
	Recruitment	/10	5	5	5	10	3	5	5	5	5	5	5	10
	Organic Matter	/5	5	5	5	3	5	4	4	5	5	3	4	5
	Logs	/5	5	5	5	5	2	NA	NA	4	4	4	NA	NA
	Site condition standardising multiplier*		1.00	1.00	1.00	1.00	1.00	1.25	1.25	1.00	1.00	1.00	1.25	1.25
	Site Condition subtotal		*23*	*33*	*33*	*46*	*38*	*18*	*18*	*26*	*22*	*26*	*23*	*53*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1	1	1	1	8
	Neighbourhood	/10	1	1	1	1	1	1	1	1	1	1	1	4
	Distance to Core	/5	3	3	3	3	3	3	3	3	3	3	3	3
Total Condition Score		**/100**	**28**	**38**	**38**	**51**	**43**	**23**	**23**	**31**	**27**	**31**	**28**	**68**

Habitat Zone			BZ	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			48	53	53	8	8	53	53	53	53	653	53	53
Total area of Habitat Zone (ha)			0.810	0.130	0.073	0.260	0.045	0.700	0.034	0.068	0.110	2.000	3.259	0.184
Site Condition	Large Old Trees	/10	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	No. large trees in habitat zone		12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Tree Canopy Cover	/5	5	0	0	NA	NA	0	0	0	0	NA	3	0
	Lack of Weeds	/15	9	4	4	9	9	0	0	0	0	4	4	0
	Understorey	/25	20	15	15	20	20	5	5	5	5	5	15	5
	Recruitment	/10	10	10	10	10	10	10	6	6	6	0	6	10
	Organic Matter	/5	5	5	5	5	5	3	4	4	5	5	5	5
	Logs	/5	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Site condition standardising multiplier*		1.00	1.25	1.25	1.36	1.36	1.25	1.25	1.25	1.25	1.36	1.25	1.25
	Site Condition subtotal		*59*	*43*	*43*	*60*	*60*	*23*	*19*	*19*	*20*	*19*	*41*	*25*
Landscape Context	Patch Size	/10	8	1	1	8	1	1	1	1	1	2	2	1
	Neighbourhood	/10	4	1	1	4	3	0	0	0	0	4	0	0
	Distance to Core	/5	4	3	3	4	3	1	1	1	1	3	1	1
Total Condition Score		**/100**	**75**	**48**	**48**	**76**	**67**	**25**	**21**	**21**	**22**	**28**	**44**	**27**

Habitat Zone			CM	CN	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			53	53	48	53	48	48	16	16	164	53	151	53
Total area of Habitat Zone (ha)			0.040	0.027	0.470	0.026	0.029	0.270	0.043	0.340	0.350	0.128	0.176	0.053
Site Condition	Large Old Trees	/10	NA	NA	6	NA	10	10	0	10	8	NA	6	NA
	No. large trees in habitat zone		NA	NA	3	0	1	11	0	18	3	NA	2	
	Tree Canopy Cover	/5	0	5	5	0	3	3	3	5	5	3	3	0
	Lack of Weeds	/15	0	4	4	4	0	7	0	4	0	4	4	0
	Understorey	/25	5	5	15	5	15	20	5	15	15	5	5	5
	Recruitment	/10	10	6	10	6	3	10	5	10	10	5	10	6
	Organic Matter	/5	5	5	5	5	4	5	5	5	5	3	3	4
	Logs	/5	NA	NA	2	NA	5	5	0	5	5	NA	0	NA
	Site condition standardising multiplier*		1.25	1.25	1.00	1.25	1.00	1.00	1.00	1.00	1.00	1.25	1.00	1.25
	Site Condition subtotal		*25*	*31*	*47*	*25*	*40*	*60*	*18*	*54*	*48*	*25*	*31*	*19*
Landscape Context	Patch Size	/10	1	1	8	1	1	8	1	1	2	2	2	1
	Neighbourhood	/10	0	0	3	1	1	2	0	0	0	0	0	0
	Distance to Core	/5	1	1	4	3	3	4	1	1	1	1	1	1
Total Condition Score		**/100**	**27**	**33**	**62**	**30**	**45**	**74**	**20**	**56**	**51**	**28**	**34**	**21**

Habitat Zone			EA	EB	EC	ED
Bioregion			GipP	GipP	GipP	GipP
EVC Number			53	53	53	821
Total area of Habitat Zone (ha)			0.019	0.030	0.037	0.070
Site Condition	Large Old Trees	/10	NA	NA	NA	NA
	No. large trees in habitat zone		NA	NA	NA	NA
	Tree Canopy Cover	/5	0	0	0	NA
	Lack of Weeds	/15	0	0	0	9
	Understorey	/25	5	5	5	15
	Recruitment	/10	5	5	0	6
	Organic Matter	/5	4	4	4	5
	Logs	/5	NA	NA	NA	NA
	Site condition standardising multiplier*		1.25	1.25	1.25	1.36
	Site Condition subtotal		*18*	*18*	*11*	*48*
Landscape Context	Patch Size	/10	1	1	1	1
	Neighbourhood	/10	1	1	1	0
	Distance to Core	/5	3	3	3	1
Total Condition Score		**/100**	**23**	**23**	**16**	**50**

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004).

Appendix 4: Large trees in patches and scattered trees recorded in the study area

Tree no.	Common Name	Scientific Name	DBH (cm)	Circumference	Habitat Category	Radius of TPZ (m)	Notes	Removed/Retained
1	Swamp Gum	*Eucalyptus ovata*	72	226.08	Large scattered tree	8.64		Retained
2	Swamp Gum	*Eucalyptus ovata*	55	172.7	Large scattered tree	6.6		Retained
3	Swamp Gum	*Eucalyptus ovata*	109	342.26	Large scattered tree	13.08		Retained
4	Swamp Gum	*Eucalyptus ovata*	76	238.64	Large tree in patch	9.12		Retained
5	Swamp Gum	*Eucalyptus ovata*	65	204.1	Large tree in patch	7.8		Retained
6	Swamp Gum	*Eucalyptus ovata*	76	238.64	Large tree in patch	9.12		Retained
7	Swamp Gum	*Eucalyptus ovata*	70	219.8	Large tree in patch	8.4		Retained
8	Swamp Gum	*Eucalyptus ovata*	50	157	Large scattered tree	6		Retained
9	Swamp Gum	*Eucalyptus ovata*	45	141.3	Small scattered tree	5.4		Retained
10	Swamp Gum	*Eucalyptus ovata*	41	128.74	Small scattered tree	4.92		Retained
11	Swamp Gum	*Eucalyptus ovata*	82	257.48	Large tree in patch	9.84		Retained
12	Manna Gum	*Eucalyptus viminalis*	73	229.22	Large tree in patch	8.76		Retained
13	Manna Gum	*Eucalyptus viminalis*	70	219.8	Large tree in patch	8.4		Retained
14	Swamp Gum	*Eucalyptus ovata*	48	150.72	Small scattered tree	5.76		Retained
15	Swamp Gum	*Eucalyptus ovata*	48	150.72	Small scattered tree	5.76		Retained
16	Swamp Gum	*Eucalyptus ovata*	78	244.92	Large tree in patch	9.36		Retained
17	Swamp Gum	*Eucalyptus ovata*	80	251.2	Large tree in patch	9.6		Retained
18	Manna Gum	*Eucalyptus viminalis*	110	345.4	Large tree in patch	13.2		Retained

Tree no.	Common Name	Scientific Name	DBH (cm)	Circumference	Habitat Category	Radius of TPZ (m)	Notes	Removed/Retained
19	Manna Gum	*Eucalyptus viminalis*	72	226.08	Large tree in patch	8.64		Retained
20	Manna Gum	*Eucalyptus viminalis*	45	141.3	Small scattered tree	5.4		Retained
21	Manna Gum	*Eucalyptus viminalis*	34	106.76	Small scattered tree	4.08		Retained
22	Manna Gum	*Eucalyptus viminalis*	41	128.74	Small scattered tree	4.92		Retained
23	Swamp Gum	Eucalyptus ovata	38	119.32	Small scattered tree	4.56		Retained
24	Swamp Gum	Eucalyptus ovata	85	266.9	Large tree in patch	10.2		Retained
25	Swamp Gum	Eucalyptus ovata	77	241.78	Large tree in patch	9.24		Retained
26	Swamp Gum	*Eucalyptus ovata*	116	364.24	Large tree in patch	13.92	Dead	Retained
27	Swamp Gum	Eucalyptus ovata	56	175.84	Large scattered tree	6.72		Retained
28	Swamp Gum	Eucalyptus ovata	110	345.4	Large scattered tree	13.2		Retained
29	Swamp Gum	Eucalyptus ovata	82	257.48	Large scattered tree	9.84		Retained
30	Swamp Gum	Eucalyptus ovata	98	307.72	Large tree in patch	11.76	Dead	Retained
31	Swamp Gum	Eucalyptus ovata	82	257.48	Large tree in patch	9.84		Retained
32	Swamp Gum	Eucalyptus ovata	82	257.48	Large tree in patch	9.84		Retained
33	Swamp Gum	Eucalyptus ovata	98	307.72	Large tree in patch	11.76		Retained
34	Swamp Gum	Eucalyptus ovata	84	263.76	Large tree in patch	10.08		Retained
35	Swamp Gum	Eucalyptus ovata	81	254.34	Large scattered tree	9.72	Dead	Retained
36	Swamp Gum	Eucalyptus ovata	103	323.42	Large scattered tree	12.36	Health 50%	Retained

Tree no.	Common Name	Scientific Name	DBH (cm)	Circumference	Habitat Category	Radius of TPZ (m)	Notes	Removed/Retained
37	Swamp Gum	Eucalyptus ovata	40	125.6	Small scattered tree	4.8		Retained
38	Swamp Gum	Eucalyptus ovata	41	128.74	Small scattered tree	4.92		Retained
39	Swamp Gum	Eucalyptus ovata	51	160.14	Small scattered tree	6.12		Retained
40	Swamp Gum	Eucalyptus ovata	71	222.94	Large scattered tree	8.52		Retained
41	Swamp Gum	Eucalyptus ovata	43	135.02	Small scattered tree	5.16		Retained
42	Swamp Gum	Eucalyptus ovata	93	292.02	Large tree in patch	11.16		Retained
43	Swamp Gum	Eucalyptus ovata	54	169.56	Small scattered tree	6.48		Retained
44	Swamp Gum	Eucalyptus ovata	60	188.4	Small scattered tree	7.2		Retained
45	Swamp Gum	Eucalyptus ovata	38	119.32	Small scattered tree	4.56		Retained
46	Swamp Gum	Eucalyptus ovata	76	238.64	Large tree in patch	9.12		Retained
47	Swamp Gum	Eucalyptus ovata	107	335.98	Large tree in patch	12.84		Retained
48	Swamp Gum	Eucalyptus ovata	116	364.24	Large tree in patch	13.92		Retained
49	Swamp Gum	Eucalyptus ovata	108	339.12	Large tree in patch	12.96		Retained
50	Swamp Gum	Eucalyptus ovata	24	75.36	Small scattered tree	2.88		Retained
51	Swamp Gum	Eucalyptus ovata	44	138.16	Small scattered tree	5.28	20% health	Retained
52	Swamp Gum	Eucalyptus ovata	78	244.92	Large tree in patch	9.36	Hollows	Retained
53	Swamp Gum	Eucalyptus ovata	34	106.76	Small scattered tree	4.08		Retained
54	Eucalyptus	Eucalyptus sp.	53	166.42	Small scattered tree	6.36	Dead	Retained

Tree no.	Common Name	Scientific Name	DBH (cm)	Circumference	Habitat Category	Radius of TPZ (m)	Notes	Removed/Retained
55	Swamp Gum	Eucalyptus ovata	41	128.74	Small scattered tree	4.92		Retained
56	Swamp Gum	Eucalyptus ovata	75	235.5	Large tree in patch	9		Retained
57	Swamp Gum	Eucalyptus ovata	71	222.94	Large tree in patch	8.52		Retained
58	Eucalyptus	Eucalyptus sp.	97	304.58	Large scattered tree	11.64	Dead	Retained
59	Eucalyptus	Eucalyptus sp.	81	254.34	Large scattered tree	9.72	Dead	Retained
60	Manna Gum	Eucalyptus viminalis	98	307.72	Large Tree in Patch	11.76		Retained
61	Manna Gum	Eucalyptus viminalis	127	398.78	Large scattered tree	15.24		Retained
62	Manna Gum	Eucalyptus viminalis	143	449.02	Large scattered tree	17.16		Retained
63	Manna Gum	Eucalyptus viminalis	168	527.52	Large tree in patch	20.16		Retained
64	Manna Gum	Eucalyptus viminalis	102	320.28	Large tree in patch	12.24		Retained
65	Messmate Stringybark	*Eucalyptus obliqua*	101	317.14	Large tree in patch	12.12		Retained
66	Manna Gum	Eucalyptus viminalis	86	270.04	Large tree in patch	10.32		Retained
67	Manna Gum	Eucalyptus viminalis	101	317.14	Large tree in patch	12.12		Retained
68	Messmate Stringybark	*Eucalyptus obliqua*	100	314	Large tree in patch	12		Retained
69	Manna Gum	Eucalyptus viminalis	122	383.08	Large tree in patch	14.64		Retained
70	Messmate Stringybark	*Eucalyptus obliqua*	111	348.54	Large tree in patch	13.32		Retained
71	Messmate Stringybark	*Eucalyptus obliqua*	109	342.26	Large tree in patch	13.08		Retained
72	Manna Gum	Eucalyptus viminalis	88	276.32	Large tree in patch	10.56		Retained
73	Messmate Stringybark	*Eucalyptus obliqua*	77	241.78	Large tree in patch	9.24		Retained

Tree no.	Common Name	Scientific Name	DBH (cm)	Circumference	Habitat Category	Radius of TPZ (m)	Notes	Removed/Retained
74	Swamp Gum	Eucalyptus ovata	87	273.18	Large scattered tree	10.44		Retained
75	Manna Gum	Eucalyptus viminalis	76	238.64	Large scattered tree	9.12		Retained
76	Manna Gum	Eucalyptus viminalis	88	276.32	Large scattered tree	10.56	35% health	Retained
77	Eucalyptus	*Eucalyptus sp.*	90	282.6	Large scattered tree	10.8	Dead	Retained
78	Manna Gum	Eucalyptus viminalis	153	480.42	Large scattered tree	18.36	Health 25%	Retained
79	Eucalyptus	*Eucalyptus sp.*	80	251.2	Large tree in patch	9.6		Retained
80	Saw Banksia	*Banksia serrata*	50	157	Large tree in patch	6		Retained
81	Saw Banksia	*Banksia serrata*	50	157	Large tree in patch	6		Retained
82	Manna Gum	*Eucalyptus viminalis*	62	194.68	Large scattered tree	7.44		Retained
83	Manna Gum	*Eucalyptus viminalis*	81	254.34	Large scattered tree	9.72		Retained
84	Manna Gum	*Eucalyptus viminalis*	68	213.52	Large tree in patch	8.16		Direct removal
85	Manna Gum	*Eucalyptus viminalis*	77	241.78	Large tree in patch	9.24		Retained
86	Saw Banksia	*Banksia serrata*	60	188.4	Large tree in patch	7.2		Retained
87	Saw Banksia	*Banksia serrata*	95	298.3	Large tree in patch	11.4		Retained
88	Saw Banksia	*Banksia serrata*	51	160.14	Large tree in patch	6.12		Retained
89	Manna Gum	*Eucalyptus viminalis*	55	172.7	Large tree in patch	6.6		Retained
90	Saw Banksia	*Banksia serrata*	49	153.86	Large tree in patch	5.88	Dead	Retained
91	Manna Gum	*Eucalyptus viminalis*	67	210.38	Large tree in patch	8.04		Direct removal

Tree no.	Common Name	Scientific Name	DBH (cm)	Circumference	Habitat Category	Radius of TPZ (m)	Notes	Removed/Retained
92	Saw Banksia	*Banksia serrata*	44	138.16	Large tree in patch	5.28		Retained
93	Saw Banksia	*Banksia serrata*	42	131.88	Large tree in patch	5.04		Retained
94	Saw Banksia	*Banksia serrata*	48	150.72	Large tree in patch	5.76		Retained
95	Saw Banksia	*Banksia serrata*	69	216.66	Large tree in patch	8.28		Retained
96	Rough-barked Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	60	188.4	Large scattered tree	7.2		Retained
97	Rough-barked Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	55	172.7	Large scattered tree	6.6		Retained
98	Rough-barked Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	100	314	Large tree in patch	12		Retained
99	Saw Banksia	*Banksia serrata*	75	235.5	Large tree in patch	9		Retained
100	Messmate Stringybark	*Eucalyptus obliqua*	84	263.76	Large tree in patch	10.08		Retained
101	Messmate Stringybark	*Eucalyptus obliqua*	96	301.44	Large tree in patch	11.52		Retained
102	Messmate Stringybark	*Eucalyptus obliqua*	108	339.12	Large tree in patch	12.96	Dead	Retained
103	Messmate Stringybark	*Eucalyptus obliqua*	89	279.46	Large tree in patch	10.68		Retained
104	Messmate Stringybark	*Eucalyptus obliqua*	72	226.08	Large tree in patch	8.64		Retained
105	Messmate Stringybark	*Eucalyptus obliqua*	71	222.94	Large tree in patch	8.52		Retained
106	Messmate Stringybark	*Eucalyptus obliqua*	94	295.16	Large tree in patch	11.28		Retained
107	Messmate Stringybark	*Eucalyptus obliqua*	73	229.22	Large tree in patch	8.76		Retained
108	Messmate Stringybark	*Eucalyptus obliqua*	90	282.6	Large tree in patch	10.8		Retained

Tree no.	Common Name	Scientific Name	DBH (cm)	Circumference	Habitat Category	Radius of TPZ (m)	Notes	Removed/Retained
109	Messmate Stringybark	*Eucalyptus obliqua*	70	219.8	Large tree in patch	8.4		Retained
110	Messmate Stringybark	*Eucalyptus obliqua*	88	276.32	Large tree in patch	10.56		Retained
111	Messmate Stringybark	*Eucalyptus obliqua*	111	348.54	Large tree in patch	13.32		Retained
112	Messmate Stringybark	*Eucalyptus obliqua*	89	279.46	Large tree in patch	10.68		Retained
113	Messmate Stringybark	*Eucalyptus obliqua*	112	351.68	Large tree in patch	13.44		Retained
114	Messmate Stringybark	*Eucalyptus obliqua*	70	219.8	Large tree in patch	8.4	Dead	Retained
115	Messmate Stringybark	*Eucalyptus obliqua*	74	232.36	Large tree in patch	8.88		Retained
116	Messmate Stringybark	*Eucalyptus obliqua*	101	317.14	Large tree in patch	12.12		Retained
117	Messmate Stringybark	*Eucalyptus obliqua*	80	251.2	Large tree in patch	9.6		Retained
118	Rough-barked Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	106	332.84	Large tree in patch	12.72		Retained
119	Swamp Gum	*Eucalyptus ovata*	73	229.22	Large tree in patch	8.76		Retained
120	Messmate Stringybark	*Eucalyptus obliqua*	87	273.18	Large tree in patch	10.44		Retained
121	Coast Grey-box	*Eucalyptus bosistoana*	73	229.22	Large tree in patch	8.76		Retained
122	Swamp Gum	*Eucalyptus ovata*	68	213.52	Large tree in patch	8.16		Retained
123	Swamp Gum	*Eucalyptus ovata*	73	229.22	Large tree in patch	8.76		Retained
124	Manna Gum	*Eucalyptus viminalis*	67	210.38	Large tree in patch	8.04		Retained
125	Swamp Gum	*Eucalyptus ovata*	58	182.12	Large tree in patch	6.96		Retained
126	Swamp Gum	*Eucalyptus ovata*	58	182.12	Large tree in patch	6.96	Dead	Retained

Tree no.	Common Name	Scientific Name	DBH (cm)	Circumference	Habitat Category	Radius of TPZ (m)	Notes	Removed/Retained
127	Swamp Gum	*Eucalyptus ovata*	66	207.24	Large tree in patch	7.92		Retained
128	Manna Gum	*Eucalyptus viminalis*	46	144.44	Large tree in patch	5.52		Retained
129	Swamp Gum	*Eucalyptus ovata*	57	178.98	Large tree in patch	6.84		Retained
130	Swamp Gum	*Eucalyptus ovata*	56	175.84	Large tree in patch	6.72		Retained
131	Swamp Gum	*Eucalyptus ovata*	77	241.78	Large tree in patch	9.24		Retained
132	Swamp Gum	*Eucalyptus ovata*	68	213.52	Large tree in patch	8.16		Retained
133	Swamp Gum	*Eucalyptus ovata*	53	166.42	Large tree in patch	6.36		Retained
134	Swamp Gum	*Eucalyptus ovata*	55	172.7	Large tree in patch	6.6		Retained
135	Swamp Gum	*Eucalyptus ovata*	70	219.8	Large tree in patch	8.4		Retained
136	Swamp Gum	*Eucalyptus ovata*	68	213.52	Large tree in patch	8.16		Retained
137	Swamp Gum	*Eucalyptus ovata*	59	185.26	Large tree in patch	7.08		Retained
138	Swamp Gum	*Eucalyptus ovata*	77	241.78	Large tree in patch	9.24	Dead	Retained
139	Swamp Gum	*Eucalyptus ovata*	79	248.06	Large tree in patch	9.48		Retained
140	Swamp Gum	*Eucalyptus ovata*	73	229.22	Large tree in patch	8.76		Retained
141	Swamp Gum	*Eucalyptus ovata*	69	216.66	Large scattered tree	8.28		Retained
142	Swamp Gum	*Eucalyptus ovata*	59	185.26	Large scattered tree	7.08		Retained
143	Manna Gum	*Eucalyptus viminalis*	55	172.7	Large tree in patch	6.6		Retained

Notes: DBH = Diameter at breast height (130 cm from the ground); **TPZ =** Tree Protection Zone.

Appendix 5: Flora species recorded in the study area

Origin	Common name	Scientific name	EPBC	FFG-T	FFG-P	CaLP Act
	Sallow Wattle	*Acacia longifolia subsp. longifolia*				
	Black Wattle	*Acacia mearnsii*				
	Blackwood	*Acacia melanoxylon*				
	Spike Wattle	*Acacia oxycedrus*				
	Hedge Wattle	*Acacia paradoxa*				
	Prickly Moses	*Acacia verticillata*				
	Sheep's Burr	*Acaena echinata*				
	Bidgee-widgee	*Acaena novae-zelandiae*				
*	Sheep Sorrel	*Acetosella vulgaris*				
*	Agapanthus	*Agapanthus praecox subsp. orientalis*				
	Water Plantain	*Alisma plantago-aquatica*				
	Scrub Sheoak	*Allocasuarina paludosa*				
	Swamp Wallaby-grass	*Amphibromus spp.*				
*	Cape weed	*Arctotheca calendula*				
	Common Woodruff	*Asperula conferta*				
	Spear Grass	*Austrostipa spp.*				
*	Wild Oat	*Avena fatua*				
	Azolla	*Azolla spp.*				
	Creeping Bossiaea	*Bossiaea prostrata*				
	Red-leg Grass	*Bothriochloa macra*				
*	Lesser Quaking-grass	*Briza minor*				
*	Common Water-starwort	*Callitriche stagnalis*				
	Tall Sedge	*Carex appressa*				
	Sedge	*Carex spp.*				

Origin	Common name	Scientific name	EPBC	FFG-T	FFG-P	CaLP Act
	Common Cassinia	*Cassinia aculeata subsp. aculeata*				
*	Common Centaury	*Centaurium erythraea*				
*	Mouse-ear Chickweed	*Cerastium spp.*				
*	Spear Thistle	*Cirsium vulgare*				R
	Mountain Clematis	*Clematis aristata*				
	Prickly Currant-bush	*Coprosma quadrifida*				
*	Mirror Bush	*Coprosma repens*				
#	Spotted Gum	*Corymbia maculata*			P	
*	Water Buttons	*Cotula coronopifolia*				
	Sieber Crassula	*Crassula sieberiana s.l.*				
*	Hawthorn	*Crataegus monogyna*				C
*	Couch	*Cynodon dactylon var. dactylon*				
*	Drain Flat-sedge	*Cyperus eragrostis*				
*	Cocksfoot	*Dactylis glomerata*				
	Black-anther Flax-lily	*Dianella revoluta s.l.*				
	Kidney-weed	*Dichondra repens*				
*	Panic Veldt-grass	*Ehrharta erecta*				
*	Annual Veldt-grass	*Ehrharta longiflora*				
	Nodding Saltbush	*Einadia nutans*				
	Common Spike-sedge	*Eleocharis acuta*				
	Tall Spike-sedge	*Eleocharis sphacelata*				
	Willow Herb	*Epilobium spp.*				
	Love Grass	*Eragrostis spp.*				
	Messmate Stringybark	*Eucalyptus obliqua*				
	Swamp Gum	*Eucalyptus ovata*				

Origin	Common name	Scientific name	EPBC	FFG-T	FFG-P	CaLP Act
	Manna Gum	*Eucalyptus viminalis*				
	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*				
	Cherry Ballart	*Exocarpos cupressiformis*				
	Knobby Club-sedge	*Ficinia nodosa*				
*	Fumitory	*Fumaria spp.*				
	Tall Saw-sedge	*Gahnia clarkei*				
	Thatch Saw-sedge	*Gahnia radula*				
*	Cleavers	*Galium aparine*				
	Crane's Bill	*Geranium spp.*				
	Common Raspwort	*Gonocarpus tetragynus*				
*	Yorkshire Fog	*Holcus lanatus*				
	Pennywort	*Hydrocotyle spp.*				
	Tassel Rope-rush	*Hypolaena fastigiata*				
	Pale Rush	*Juncus pallidus*				
	Common Duckweed	*Lemna disperma*				
*	Common Peppercress	*Lepidium africanum*				
	Pithy Sword-sedge	*Lepidosperma longitudinale*				
	Prickly Tea-tree	*Leptospermum continentale*				
	Common Beard-heath	*Leucopogon virgatus*			P	
	Wattle Mat-rush	*Lomandra filiformis*				
	Spiny-headed Mat-rush	*Lomandra longifolia*				
*	African Box-thorn	*Lycium ferocissimum*				C
	Swamp Paperbark	*Melaleuca ericifolia*				
	Scented Paperbark	*Melaleuca squarrosa*				
	Tree Violet	*Melicytus dentatus s.l.*				

Origin	Common name	Scientific name	EPBC	FFG-T	FFG-P	CaLP Act
	Snowy Daisy-bush	*Olearia lirata*			R	
	Running Marsh-flower	*Ornduffia reniformis*				
*	Soursob	*Oxalis pes-caprae*				R
	Wood Sorrel	*Oxalis spp.*				
	Slender Knotweed	*Persicaria decipiens*				
*	Toowoomba Canary-grass	*Phalaris aquatica*				
	Common Reed	*Phragmites australis*				
*	Radiata Pine	*Pinus radiata*				
*	Karo	*Pittosporum crassifolium*				
#	Sweet Pittosporum	*Pittosporum undulatum*				
*	Buck's-horn Plantain	*Plantago coronopus*				
*	Ribwort	*Plantago lanceolata*				
*	Annual Meadow-grass	*Poa annua s.l.*				
	Common Tussock-grass	*Poa labillardierei*				
*	Prunus	*Prunus spp.*				
	Austral Bracken	*Pteridium esculentum subsp. esculentum*				
	Seaberry Saltbush	*Rhagodia candolleana subsp. candolleana*				
*	Onion Grass	*Romulea rosea*				
*	Sweet Briar	*Rosa rubiginosa*				C
*	Blackberry	*Rubus fruticosus spp. agg.*				C
	Small-leaf Bramble	*Rubus parvifolius*				
*	Curled Dock	*Rumex crispus*				
	Common Wallaby-grass	*Rytidosperma caespitosum*				
	Bristly Wallaby-grass	*Rytidosperma setaceum*				
	Wallaby Grass	*Rytidosperma spp.*				

Origin	Common name	Scientific name	EPBC	FFG-T	FFG-P	CaLP Act
	Bog Sedge	*Schoenus spp.*				
	Annual Fireweed	*Senecio glomeratus*				
	Rough Fireweed	*Senecio hispidulus s.l.*				
	Groundsel	*Senecio spp.*				
*	Black Nightshade	*Solanum nigrum s.l.*				
*	Rough Sow-thistle	*Sonchus asper s.l.*				
	Fennel Pondweed	*Stuckenia pectinata*				
	Kangaroo Grass	*Themeda triandra*				
	Creeping Monkey-flower	*Thyridia repens*				
*	Clover	*Trifolium spp.*				
	Broad-leaf Cumbungi	*Typha orientalis*				
*	Small Nettle	*Urtica urens*				
	Ivy-leaf Violet	*Viola hederacea sensu Entwisle (1996)*				
*	Rat's-tail Fescue	*Vulpia myuros f. myuros*				
*	Fescue	*Vulpia spp.*				
	Tiny Duckweed	*Wolffia australiana*				
	Small Grass-tree	*Xanthorrhoea minor subsp. lutea*			R	

Notes: EPBC = threatened species status under the EPBC Act (EX = presumed extinct in the wild; CR = critically endangered; EN = endangered; VU = vulnerable); **FFG-T** = listed as threatened (L) under the FFG Act; **FFG-P**: listed as protected (P) or restricted use (R) under the FFG Act; **CaLP Act**: declared noxious weeds under the CaLP Act (S = State Prohibited Weeds [any infestations are to be reported to DELWP. DELWP is responsible for control of State Prohibited Weeds]; P = Regionally Prohibited Weeds [Land owners must take all reasonable steps to eradicate regionally prohibited weeds on their land]; C = Regionally Controlled Weeds [Land owners have the responsibility to take all reasonable steps to prevent the growth and spread of Regionally controlled weeds on their land]; R = Restricted Weeds [Trade in these weeds and their propagules, either as plants, seeds or contaminants in other materials is prohibited].

* = introduced to Victoria

= Victorian native taxa occurring outside their natural range

Appendix 6: Vertebrate terrestrial fauna species recorded in the broader study area

Origin	Common name	Scientific name	Conservation status		
			EPBC-T	EPBC-M	FFG-T
	Australasian Pipit	*Anthus novaeseelandiae*			
	Australian Hobby	*Falco longipennis*			
	Australian Magpie	*Gymnorhina tibicen*			
	Australian Pelican	*Pelecanus conspicillatus*			
	Australian Raven	*Corvus coronoides*			
	Australian Shelduck	*Tadorna tadornoides*			
	Australian White Ibis	*Threskiornis molucca*			
	Australian Wood Duck	*Chenonetta jubata*			
	Baillon's Crake	*Zapornia pusilla*			
	Black Swan	*Cygnus atratus*			
	Black-faced Cuckoo-shrike	*Coracina novaehollandiae*			
	Black-fronted Dotterel	*Elseyornis melanops*			
	Black-shouldered Kite	*Elanus axillaris*			
	Blue-winged Parrot	*Neophema chrysostoma*	VU		
	Brown Falcon	*Falco berigora*			
	Brown Goshawk	*Accipiter fasciatus*			
	Brown Songlark	*Cinclorhamphus cruralis*			
	Brown Thornbill	*Acanthiza pusilla*			
	Brown-headed Honeyeater	*Melithreptus brevirostris*			
	Brush Bronzewing	*Phaps elegans*			
	Chestnut Teal	*Anas castanea*			
	Clamorous Reed Warbler	*Acrocephalus stentoreus*			
*	Common Blackbird	*Turdus merula*			
	Common Bronzewing	*Phaps chalcoptera*			
*	Common Myna	*Acridotheres tristis*			

Origin	Common name	Scientific name	Conservation status		
			EPBC-T	EPBC-M	FFG-T
*	Common Starling	*Sturnus vulgaris*			
	Crimson Rosella	*Platycercus elegans*			
	Dusky Moorhen	*Gallinula tenebrosa*			
	Eastern Great Egret	*Ardea alba modesta*		M (JAMBA, CAMBA)	VU
	Eastern Rosella	*Platycercus eximius*			
	Eastern Yellow Robin	*Eopsaltria australis*			
	Eurasian Coot	*Fulica atra*			
	European Goldfinch	*Carduelis carduelis*			
*	European Greenfinch	*Carduelis chloris*			
*	European Skylark	*Alauda arvensis*			
	Fairy Martin	*Hirundo ariel*			
	Forest Raven	*Corvus tasmanicus*			
	Fork-tailed Swift	*Apus pacificus*		M (JAMBA, CAMBA, ROKAMBA)	
	Galah	*Eolophus roseicapilla*			
	Gang-gang Cockatoo	*Callocephalon fimbriatum*	EN		EN
	Golden Whistler	*Pachycephala pectoralis*			
	Golden-headed Cisticola	*Cisticola exilis*			
	Great Cormorant	*Phalacrocorax carbo*			
	Grey Butcherbird	*Cracticus torquatus*			
	Grey Currawong	*Strepera versicolor*			
	Grey Fantail	*Rhipidura albiscarpa*			
	Grey Shrike-thrush	*Colluricincla harmonica*			
	Grey Teal	*Anas gracilis*			
	Hoary-headed Grebe	*Poliocephalus poliocephalus*			
*	House Sparrow	*Passer domesticus*			
	Latham's Snipe	*Gallinago hardwickii*		M (JAMBA, CAMBA, ROKAMBA, Bonn A2H)	

Origin	Common name	Scientific name	Conservation status		
			EPBC-T	EPBC-M	FFG-T
	Laughing Kookaburra	*Dacelo novaeguineae*			
	Lewin's Honeyeater	*Meliphaga lewinii*			
	Little Black Cormorant	*Phalacrocorax sulcirostris*			
	Little Egret	*Egretta garzetta nigripes*			EN
	Little Grassbird	*Megalurus gramineus*			
	Little Pied Cormorant	*Microcarbo melanoleucos*			
	Little Raven	*Corvus mellori*			
	Little Wattlebird	*Anthochaera chrysoptera*			
	Magpie-lark	*Grallina cyanoleuca*			
	Masked Lapwing	*Vanellus miles*			
	Nankeen Kestrel	*Falco cenchroides*			
	New Holland Honeyeater	*Phylidonyris novaehollandiae*			
	Noisy Miner	*Manorina melanocephala*			
	Pacific Black Duck	*Anas superciliosa*			
	Peregrine Falcon	*Falco peregrinus*			
	Purple Swamphen	*Porphyrio porphyrio*			
	Rainbow Lorikeet	*Trichoglossus haematodus*			
	Red Wattlebird	*Anthochaera carunculata*			
	Red-browed Finch	*Neochmia temporalis*			
	Red-rumped Parrot	*Psephotus haematonotus*			
*	Rock Dove	*Columba livia*			
	Royal Spoonbill	*Platalea regia*			
	Rufous Whistler	*Pachycephala rufiventris*			
	Sacred Kingfisher	*Todiramphus sanctus*			
	Silvereye	*Zosterops lateralis*			
	Singing Honeyeater	*Lichenostomus virescens*			
	Spotted Pardalote	*Pardalotus punctatus*			

Origin	Common name	Scientific name	Conservation status		
			EPBC-T	EPBC-M	FFG-T
*	Spotted Turtle-Dove	*Streptopelia chinensis*			
	Straw-necked Ibis	*Threskiornis spinicollis*			
	Striated Fieldwren	*Calamanthus fuliginosus*			
	Striated Pardalote	*Pardalotus striatus*			
	Striated Thornbill	*Acanthiza lineata*			
	Sulphur-crested Cockatoo	*Cacatua galerita*			
	Superb Fairy-wren	*Malurus cyaneus*			
	Swamp Harrier	*Circus approximans*			
	Tree Martin	*Petrochelidon nigricans*			
	Wedge-tailed Eagle	*Aquila audax*			
	Welcome Swallow	*Petrochelidon neoxena*			
	White-browed Scrubwren	*Sericornis frontalis*			
	White-bellied Sea-Eagle	*Haliaeetus leucogaster*		Marine	EN
	White-eared Honeyeater	*Lichenostomus leucotis*			
	White-faced Heron	*Egretta novaehollandiae*			
	White-fronted Chat	*Epthianura albifrons*			
	White-naped Honeyeater	*Melithreptus lunatus*			
	White-necked Heron	*Ardea pacifica*			
	White-plumed Honeyeater	*Lichenostomus penicillatus*			
	White-throated Needletail	*Hirundapus caudacutus*	VU	M (JAMBA, CAMBA, ROKAMBA)	VU
	White-throated Treecreeper	*Cormobates leucophaeus*			
	Willie Wagtail	*Rhipidura leucophrys*			
	Yellow-faced Honeyeater	*Lichenostomus chrysops*			
	Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*			
	Yellow-tailed Black-Cockatoo	*Calyptorhynchus funereus*			
	Black Wallaby	*Wallabia bicolor*			
*	Cat	*Felis catus*			

Origin	Common name	Scientific name	Conservation status		
			EPBC-T	EPBC-M	FFG-T
	Common Wombat	*Vombatus ursinus*			
	Eastern Grey Kangaroo	*Macropus giganteus*			
*	European Hare	*Lepus europeaus*			
*	European Rabbit	*Oryctolagus cuniculus*			
*	Hog Deer	*Cervus porcinus*			
*	Red Fox	*Vulpes vulpes*			
	Red-necked Wallaby	*Macropus rufogriseus*			
	Short-beaked Echidna	*Tachyglossus aculeatus*			
	Eastern Brown Snake	*Pseudonaja textilis*			
	Eastern Three-lined Skink	*Acritoscincus duperreyi*			
	Garden Skink	*Lampropholis guichenoti*			
	Jacky Lizard	*Amphibolurus muricatus*			
	Metallic Skink	*Niveoscincus metallicus*			
	Tiger Snake	*Notechis scutatus*			
	Common Froglet	*Crinia signifera*			
	Pobblebonk Frog	*Limnodynastes dumerilii insularis*			
	Spotted Marsh Frog	*Limnodynastes tasmaniensis*			

Notes:

- X = recorded in the study area
- * = introduced to Victoria
- # = Victorian native taxa occurring outside their natural range

EPBC-T = threatened species status under EPBC Act:

- EX = presumed extinct in the wild
- CE = critically endangered

- EN = endangered
- VU = vulnerable

EPBC-M = migratory status under the EPBC Act – **M** = listed migratory taxa:

- Bonn Convention (A2H) = Convention on the Conservation of Migratory Species of Wild Animals – listed as a member of a family
- Bonn Convention (A2S) = Convention on the Conservation of Migratory Species of Wild Animals - species listed explicitly
- CAMBA = China- Australia Migratory Birds Agreement
- JAMBA = Japan-Australia Migratory Birds Agreement
- ROKAMBA = Republic of Korea Australia Migratory Birds Agreement

FFG-T = threatened species status under the FFG Act:

- EX = presumed extinct in the wild
- CE = critically endangered
- EN = endangered
- VU = vulnerable

Appendix 7: Detailed BUS results

Raw data for the spring 2023 BUS impact points at Gelliondale Wind Farm Project.

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Australasian Pipit	1			1												6						2			**10**	**0**	**0**	**10**
Australian Magpie	105			57			122			51			36			22			102			34			**529**	**0**	**0**	**529**
Australian Pelican				6				3																	**6**	**3**	**0**	**9**
Australian Shelduck							1												10						**11**	**0**	**0**	**11**
Australian White Ibis	32	4		10			1	2															9		**43**	**15**	**0**	**58**
Australian Wood Duck													29												**29**	**0**	**0**	**29**
Black-faced Cuckoo-shrike	1																								**1**	**0**	**0**	**1**
Black-shouldered Kite													1			2									**3**	**0**	**0**	**3**
Blue-winged Parrot	1															2						20			**23**	**0**	**0**	**23**
Brown Falcon							1									2									**3**	**0**	**0**	**3**
Brown Goshawk																						1			**1**	**0**	**0**	**1**
Brown Songlark				2			1			1						3						4			**11**	**0**	**0**	**11**
Cattle Egret	24																								**24**	**0**	**0**	**24**
Common Blackbird										1			7			1			3						**12**	**0**	**0**	**12**
Common Myna	32			1			12			16			3						2			14			**80**	**0**	**0**	**80**
Common Starling	223			21			218			453			46			7			103			174			**1245**	**0**	**0**	**1245**
Crimson Rosella										5			10						6						**21**	**0**	**0**	**21**
Eastern Rosella				1						15			3	3			2		2			6			**27**	**5**	**0**	**32**
Eastern Yellow Robin													3			2									**5**	**0**	**0**	**5**
Eurasian Skylark	46			76			78			27			40			40			38			41			**386**	**0**	**0**	**386**
European Goldfinch													1						2						**3**	**0**	**0**	**3**
Fan-tailed Cuckoo																1			1						**2**	**0**	**0**	**2**
Forest Raven	30			16			23			40			27			9	5		36			26			**207**	**5**	**0**	**212**
Galah	16									2												4			**22**	**0**	**0**	**22**
Golden-headed Cisticola	5			7																					**12**	**0**	**0**	**12**
Grey Butcherbird	1			3						2			2												**8**	**0**	**0**	**8**
Grey Fantail	6									9			9			6			8						**38**	**0**	**0**	**38**
Grey Shrike-thrush	9			2			1			1			3			7			5						**28**	**0**	**0**	**28**
Horsfield's Bronze-cuckoo										1															**1**	**0**	**0**	**1**
House Sparrow							2																		**2**	**0**	**0**	**2**
Laughing Kookaburra										1															**1**	**0**	**0**	**1**
Little Corella	14																		50						**64**	**0**	**0**	**64**
Little Pied Cormorant													1												**1**	**0**	**0**	**1**
Little Raven	16			92						47			55			11	2		3			5			**229**	**2**	**0**	**231**
Little Wattlebird										8			6			11			5						**30**	**0**	**0**	**30**
Magpie-lark	6			6			12			10			6			3			10			10			**63**	**0**	**0**	**63**
Masked Lapwing							1						6												**7**	**0**	**0**	**7**

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Musk Lorikeet										2															2	0	0	2
Noisy Miner										12												2			14	0	0	14
Pacific Black Duck	1	4								6			1												8	4	0	12
Pied Currawong										2			2			2			2						8	0	0	8
Rainbow lorikeet										15			9			2			4	2			2		30	4	0	34
Raven sp.	36			24			31						1			6			4				10		102	10	0	112
Red Wattlebird	11			12			4			25			22			4			6			4			88	0	0	88
Rufous Whistler													6			3									9	0	0	9
Silvereye													15												15	0	0	15
Spotted Dove													2						2						4	0	0	4
Spotted Pardalote										14			5						2						21	0	0	21
Straw-necked Ibis	2	45			25			26																	2	96	0	98
Striated Pardalote										9															9	0	0	9
Stubble Quail	42			41			8			6			16			17			35			11			176	0	0	176
Sulphur-crested Cockatoo	17			4						4			1				1		28	5		30	7		84	13	0	97
Superb Fairy-wren	12						2						11			7			3						35	0	0	35
Swamp Harrier				1												1									2	0	0	2
Wedge-tailed Eagle	1	1			1			4			2			1			2						7		1	18	0	19
Welcome Swallow	29			3			11			25			11			7			4			11			101	0	0	101
White-bellied Sea-Eagle							1																1		1	1	0	2
White-eared Honeyeater										2			5			1			2			1			11	0	0	11
White-faced Heron	3																1		2			1			6	1	0	7
White-necked Heron	10															2	1		3						15	1	0	16
Willie Wagtail	1																								1	0	0	1
Yellow-faced Honeyeater										7			16			16			16						55	0	0	55
Yellow-tailed Black-Cockatoo										4			26			4			2						36	0	0	36
Grand Total	733	54		386	26		530	35		823	2		443	4		207	14		501	7		401	36		4024	178	0	4202

Raw data for the spring 2023 BUS reference points at Gelliondale Wind Farm Project.

Species	REF1			REF2			Total			Grand total
	A	B	C	A	B	C	A	B	C	
Australasian Pipit				1			1	0	0	1
Australian Magpie	49			25			74	0	0	74
Australian Shelduck		12					0	12	0	12
Australian White Ibis	12			1			13	0	0	13
Blue-winged Parrot				1	3		1	3	0	4
Brown Falcon	4						4	0	0	4
Common Blackbird	3			9			12	0	0	12
Common Myna	12			2			14	0	0	14
Common Starling	31			44			75	0	0	75
Corella sp.				15			15	0	0	15
Crimson Rosella				1			1	0	0	1
Eastern Rosella	4			10			14	0	0	14
Eurasian Skylark	29			30			59	0	0	59
European Goldfinch	5						5	0	0	5
Forest Raven	39			35	1		74	1	0	75
Galah	21						21	0	0	21
Grey Butcherbird	2						2	0	0	2
Grey Fantail	9			5			14	0	0	14
Grey Shrike-thrush	9			4			13	0	0	13
Horsfield's Bronze-cuckoo	1						1	0	0	1
Little Corella				4			4	0	0	4
Little Raven	30			19			49	0	0	49
Little Wattlebird				6			6	0	0	6
Magpie-lark	11			7			18	0	0	18
New Holland Honeyeater				1			1	0	0	1
Rainbow lorikeet	3			22	8		25	8	0	33
Raven sp.	14			6			20	0	0	20
Red Wattlebird	14			5			19	0	0	19
Rufous Whistler	9			3			12	0	0	12
Silvereye				5			5	0	0	5
Spotted Dove				5			5	0	0	5
Straw-necked Ibis			120		32	120	0	32	240	272
Stubble Quail	42			35			77	0	0	77
Sulphur-crested Cockatoo	2			37			39	0	0	39
Superb Fairy-wren	6			18			24	0	0	24
Wedge-tailed Eagle		2	2	4	6		4	8	2	14
Welcome Swallow	43			36			79	0	0	79
White-eared Honeyeater				1			1	0	0	1
White-necked Heron	1	1		2			3	1	0	4
Yellow-faced Honeyeater	2			11			13	0	0	13
Yellow-tailed Black-Cockatoo	3			1			4	0	0	4
Grand Total	**410**	**15**	**122**	**411**	**50**	**120**	**821**	**65**	**242**	**1128**

Raw data for the summer 2024 BUS impact points at Gelliondale Wind Farm Project.

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Australasian Pipit							4			1			2						1			2			10	0	0	10
Australian Hobby																						1			1	0	0	1
Australian Magpie	41			27			62			16			55			116			12			192			521	0	0	521
Australian Shelduck													5												5	0	0	5
Australian White Ibis	1												6												7	0	0	7
Australian Wood Duck													14						45						59	0	0	59
Black Swan													32												32	0	0	32
Black-faced Cuckoo-shrike				1																					1	0	0	1
Black-shouldered Kite																			1						1	0	0	1
Blue-winged Parrot																1			5	7					6	7	0	13
Brown Falcon													1												1	0	0	1
Brown Thornbill	4						1			1															6	0	0	6
Common Myna	5			4			7			16			9			9			10			28			88	0	0	88
Common Starling	8			251			34			57			120			65			10			159	3		704	3	0	707
Eastern Rosella				4						6												2			12	0	0	12
Eastern Spinebill							1																		1	0	0	1
Eastern Yellow Robin										2			3						1						6	0	0	6
Eurasian Coot													4												4	0	0	4
Eurasian Skylark	10						4			1			4			2			1			3			25	0	0	25
European Goldfinch	4			1									1												6	0	0	6
Fairy Martin													3												3	0	0	3
Forest Raven										5			3												8	0	0	8
Gang-gang Cockatoo	4																								4	0	0	4
Golden-headed Cisticola							1																		1	0	0	1
Great Cormorant																						1			1	0	0	1
Grey Butcherbird	2			2						3			1			3						2			13	0	0	13
Grey Currawong							1			4			1												6	0	0	6
Grey Fantail	2						5						4												11	0	0	11
Grey Shrike-thrush	2			2			2			1			2			1			1						11	0	0	11
Grey Teal													1						3						4	0	0	4
House Sparrow				2																					2	0	0	2
Laughing Kookaburra																						1			1	0	0	1
Little Pied Cormorant													1												1	0	0	1
Little Raven	20			18			2			4			22			66			3	4		2	2		137	6	0	143
Little Wattlebird							1																		1	0	0	1
Magpie-lark	4			57			3			1			12			1			4						82	0	0	82
Masked Lapwing													11												11	0	0	11
Nankeen Kestrel	2																								2	0	0	2
Noisy Miner										7												1			8	0	0	8

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Olive Whistler							1																		1	0	0	1
Pacific Black Duck													53						6						59	0	0	59
Purple Swamphen													11												11	0	0	11
Rainbow lorikeet				39																					39	0	0	39
Raven sp.	11			5						3			4			4			5			43			75	0	0	75
Red Wattlebird	4						6			13			3			3									29	0	0	29
Spotted Harrier										1															1	0	0	1
Spotted Pardalote							1			1															2	0	0	2
Straw-necked Ibis								3			1		145			3									148	4	0	152
Striated Fieldwren																						1			1	0	0	1
Striated Pardalote							1																		1	0	0	1
Stubble Quail	1			2			1																		4	0	0	4
Sulphur-crested Cockatoo																						3	2		3	2	0	5
Superb Fairy-wren	1						3						5						4			2			15	0	0	15
Swamp Harrier				1			1			1			1												4	0	0	4
Wedge-tailed Eagle		1									3		1										2		1	6	0	7
Whistling Kite										1															1	0	0	1
White-eared Honeyeater	1						2			4			5			1			1						14	0	0	14
White-faced Heron	6												1			5			1						13	0	0	13
White-fronted Chat													1												1	0	0	1
White-necked Heron	4												2						2						8	0	0	8
White-throated Needletail	2																								2	0	0	2
Yellow-faced Honeyeater							4						1												5	0	0	5
Yellow-tailed Black-Cockatoo							2						4				1					2			8	1	0	9
Grand Total	139	1		416			150	3		149	4		554			280	1		116	11		445	9		2249	29	0	2278

Raw data for the summer 2024 BUS reference points at Gelliondale Wind Farm Project.

Species	REF1			REF2			REF3			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	
Australasian Pipit	1									1	0	0	1
Australian Magpie	33			17			3			53	0	0	53
Australian Wood Duck				4						4	0	0	4
Black-shouldered Kite				1						1	0	0	1
Blue-winged Parrot				2	3					2	3	0	5
Brown Thornbill				1			3			4	0	0	4
Collared Sparrowhawk				1						1	0	0	1
Common Myna	82			23						105	0	0	105
Common Starling	39			126						165	0	0	165
Crimson Rosella	9						4			13	0	0	13
Eastern Rosella							2			2	0	0	2
Eastern Spinebill							1			1	0	0	1
Eastern Yellow Robin							5			5	0	0	5
Eurasian Skylark	2			1						3	0	0	3
Forest Raven							2			2	0	0	2
Galah							1			1	0	0	1
Golden Whistler							2			2	0	0	2
Golden-headed Cisticola	1									1	0	0	1
Great Cormorant				1						1	0	0	1
Grey Butcherbird	5						6			11	0	0	11
Grey Currawong							3			3	0	0	3
Grey Fantail							14			14	0	0	14
Grey Shrike-thrush	2			2			11			15	0	0	15
Little Corella				5						5	0	0	5
Little Raven	40			39			2			81	0	0	81
Little Wattlebird							13			13	0	0	13
Magpie-lark	5			5						10	0	0	10
Nankeen Kestrel				1						1	0	0	1
New Holland Honeyeater							4			4	0	0	4
Pacific Black Duck				6						6	0	0	6
Raven sp.	11			3			3			17	0	0	17
Red Wattlebird	3			2			45			50	0	0	50
Red-browed Finch							2			2	0	0	2
Silvereye							1			1	0	0	1
Spotted Dove				1						1	0	0	1
Spotted Pardalote							10			10	0	0	10
Straw-necked Ibis	6									6	0	0	6
Striated Pardalote							1			1	0	0	1
Striated Thornbill							2			2	0	0	2
Stubble Quail	1									1	0	0	1
Sulphur-crested Cockatoo				2						2	0	0	2
Superb Fairy-wren				5			14			19	0	0	19
White-browed Scrubwren				1			1			2	0	0	2
White-eared Honeyeater				1			13			14	0	0	14
White-necked Heron				1						1	0	0	1
Yellow-faced Honeyeater							23			23	0	0	23
Grand Total	**240**			**251**	**3**		**191**			**682**	**3**	**0**	**685**

Raw data for the autumn 2024 BUS impact points at Gelliondale Wind Farm Project.

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Australasian Pipit	1			1						1									1						4	0	0	4
Australian Hobby				1																					1	0	0	1
Australian Magpie	75	25		201			791	4		235	6		176			131	8		606			270	6		2485	49	0	2534
Australian Pelican											3														0	3	0	3
Australian Shelduck							44			3			2	7			5		118	20		2			169	32	0	201
Australian White Ibis		2		34	13		134			7							9								175	24	0	199
Australian Wood Duck																			34						34	0	0	34
Black Swan							44				1														44	1	0	45
Black-faced Cuckoo-shrike	11			2	8		12			1				2											26	10	0	36
Black-shouldered Kite	4			4						2												1			11	0	0	11
Blue-winged Parrot	114	6		21			3									1	2		13	9		35	8		187	25	0	212
Brown Falcon	5				3						1			1		1							1		6	6	0	12
Brown Thornbill	5																								5	0	0	5
Cattle Egret										3						3			1						7	0	0	7
Chestnut Teal																			130						130	0	0	130
Common Blackbird													4												4	0	0	4
Common Myna	5			12			14			132			3	2		21			56			65			308	2	0	310
Common Starling	255			815	100		913	15		369			119			231			351			385			3438	115	0	3553
Corella sp.																						40			40	0	0	40
Crested Pigeon																3			3						6	0	0	6
Crimson Rosella	4			2						21			21			54			12			9			123	0	0	123
Eastern Rosella	11			16			2			23			1			1						1			55	0	0	55
Eastern Yellow Robin										1			4						1						6	0	0	6
Eurasian Skylark	38			14			28			5			18			7			10			55			175	0	0	175
European Goldfinch													2									60			62	0	0	62
Flame Robin	1												7						2			3			13	0	0	13
Forest Raven										1			2												3	0	0	3
Galah																			2			9			11	0	0	11
Golden-headed Cisticola	2																								2	0	0	2
Great Cormorant	1						1																		2	0	0	2
Grey Butcherbird	9			5			5			9			4			6			4			7			49	0	0	49
Grey Currawong										4			1									1			6	0	0	6
Grey Fantail	1									1			2			3			3						10	0	0	10
Grey Shrike-thrush	8			3						9			5			3			1						29	0	0	29
Grey Teal													32						30						62	0	0	62
Laughing Kookaburra				1						2			1			1			2			4			11	0	0	11
Little Pied Cormorant																						1			1	0	0	1
Little Raven	3									5			5			16			15			28			72	0	0	72
Little Wattlebird	3									9			3			30									45	0	0	45

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Magpie-lark	12			103			20			20			40			2			18			12			227	0	0	227
Masked Lapwing													7												7	0	0	7
Nankeen Kestrel				2			2			1									3			1			9	0	0	9
Noisy Miner										19												1			20	0	0	20
Pacific Black Duck	1												5			4			28			2			40	0	0	40
Peregrine Falcon																			1						1	0	0	1
Pied Cormorant																						1			1	0	0	1
Pied Currawong				2						2						14			2			1			21	0	0	21
Rainbow lorikeet		1						4		8	8			80		16	6			17			6		24	122	0	146
Raven sp.	48	10		47	9		75	2		18			39	6		56	2		72	7		43	3		398	39	0	437
Red Wattlebird	6			2			1			35			25			16			18			8			111	0	0	111
Red-browed Finch													54			15									69	0	0	69
Spotted Pardalote	1												2						1						4	0	0	4
Straw-necked Ibis	2			233	59		77	283		1	160					12	6		40						365	508	0	873
Striated Pardalote										6			2						1						9	0	0	9
Sulphur-crested Cockatoo										3									25			4	8		32	8	0	40
Superb Fairy-wren	15												24												39	0	0	39
Swamp Harrier													1												1	0	0	1
Wattlebird sp.																5									5	0	0	5
Wedge-tailed Eagle	1				1			5		1				7		2	2		2	4		4	2		10	21	0	31
Welcome Swallow	6									6			15			5			8			4			44	0	0	44
White-eared Honeyeater	2									2			4												8	0	0	8
White-faced Heron							2			16			3			1			2			1			25	0	0	25
White-throated Needletail										5															5	0	0	5
Willie Wagtail							4						5			1						3			13	0	0	13
Yellow-faced Honeyeater													1												1	0	0	1
Yellow-tailed Black-Cockatoo													2			6									8	0	0	8
Grand Total	650	44		1521	193		2172	313		986	179		641	105		667	40		1616	57		1061	34		9314	965	0	10279

Raw data for the autumn 2024 BUS reference points at Gelliondale Wind Farm Project.

Species	REF1			REF2			Total			Grand total
	A	B	C	A	B	C	A	B	C	
Australasian Pipit	2						2	0	0	2
Australian Magpie	81	52		65	3		146	55	0	201
Australian Pelican		2					0	2	0	2
Australian Shelduck				156			156	0	0	156
Australian White Ibis	11						11	0	0	11
Australian Wood Duck				10			10	0	0	10
Black-shouldered Kite	5			3			8	0	0	8
Blue-winged Parrot	214			7	3		221	3	0	224
Brown Falcon	2						2	0	0	2
Brown Thornbill				4			4	0	0	4
Common Myna	3			67	150		70	150	0	220
Common Starling	116			317			433	0	0	433
Crescent Honeyeater	1						1	0	0	1
Crested Pigeon	1			2			3	0	0	3
Crimson Rosella	9			2			11	0	0	11
Eastern Rosella	5			1			6	0	0	6
Eurasian Skylark	47			5			52	0	0	52
European Goldfinch	10						10	0	0	10
Flame Robin				6			6	0	0	6
Forest Raven				2			2	0	0	2
Galah				4			4	0	0	4
Golden Whistler				1			1	0	0	1
Grey Butcherbird	9			4			13	0	0	13
Grey Fantail	7						7	0	0	7
Grey Shrike-thrush	10			10			20	0	0	20
Laughing Kookaburra	3						3	0	0	3
Little Corella				13			13	0	0	13
Little Raven				1			1	0	0	1
Magpie-lark	39	5		18			57	5	0	62
Pacific Black Duck				19			19	0	0	19
Rainbow lorikeet	2			2	4		4	4	0	8
Raven sp.	46	56		215	7		261	63	0	324
Red Wattlebird				3			3	0	0	3
Rufous Whistler	2						2	0	0	2
Scarlet Robin	2						2	0	0	2
Silvereye	3						3	0	0	3
Spotted Dove				5			5	0	0	5
Spotted Pardalote	1						1	0	0	1
Straw-necked Ibis	147	23					147	23	0	170
Stubble Quail	1						1	0	0	1
Sulphur-crested Cockatoo				38	63		38	63	0	101
Superb Fairy-wren	2			8			10	0	0	10
Wedge-tailed Eagle		2		2	4		2	6	0	8
Welcome Swallow	56	20		2			58	20	0	78
White-browed Scrubwren				3			3	0	0	3
White-eared Honeyeater	1			1			2	0	0	2
White-faced Heron	3			3			6	0	0	6
Willie Wagtail	1			2			3	0	0	3
Yellow-tailed Black-Cockatoo	30				6		30	6	0	36
Grand Total	**872**	**160**		**1001**	**240**		**1873**	**400**	**0**	**2273**

Raw data for the winter 2024 BUS impact points at Gelliondale Wind Farm Project.

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			BUS9			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Australasian Grebe																			2									2	0	0	2
Australasian Pipit				1			1			1			2			7			1			6			3			22	0	0	22
Australian Magpie	48			29			41			36	4		330			75			12			35			32			638	0	0	642
Australian Raven										2																		2	4	0	2
Australian Shelduck	18						2			1			10			12	4		59			4			4	1		110	0	0	115
Australian White Ibis	38																											38	5	0	38
Australian Wood Duck													14			6			20									40	0	0	40
Black Swan	9						4			298						2									54			367	0	0	367
Black-shouldered Kite				1																								1	0	0	1
Blue-winged Parrot	1																		3			25						29	0	0	29
Brown Falcon										1															1			2	0	0	2
Brown Goshawk													1															1	0	0	1
Brown Thornbill	5			1						1									1									8	0	0	8
Cattle Egret																									1			1	0	0	1
Common Blackbird	1															1			1									3	0	0	3
Common Myna	5			1			8																		28			42	0	0	42
Common Starling	26			17			141			38									15			100		12	169			506	0	12	518
Crested Pigeon				1									2												3			6	0	0	6
Crimson Rosella	5									8						2												15	0	0	15
Eastern Rosella										6																		6	0	0	6
Eastern Yellow Robin										1									2									3	0	0	3
Eurasian Skylark	24	3		80			31	3		6	11		18	3		5	1		6	5		57	5		17	4		244	0	0	279
European Goldfinch																						156			3			159	35	0	159
Fairy Martin																						2						2	0	0	2
Flame Robin																						2						2	0	0	2
Forest Raven				1						5						2									1	1		9	0	0	10
Galah	1			6						2									8			2			8			27	1	0	27
Golden Whistler				1																								1	0	0	1
Golden-headed Cisticola																						1						1	0	0	1
Grey Butcherbird	2			1			2			3						1						2						11	0	0	11
Grey Currawong										2			1			1			4						1			9	0	0	9
Grey Shrike-thrush	6			5						5			4			6			6									32	0	0	32
House Sparrow																						50			3			53	0	0	53
Laughing Kookaburra				2						3						1												6	0	0	6
Little Corella																8												8	0	0	8
Little Raven	10			16			12			17			2			11			21			14			21			124	0	0	124
Little Wattlebird										1																		1	0	0	1
Magpie-lark	14			1			5			5									1						9			35	0	0	35
Masked Lapwing										1			6			7			2									16	0	0	16
Nankeen Kestrel							1																					1	0	0	1

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			BUS9			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Noisy Miner										6												6						12	0	0	12
Pacific Black Duck	5						2												39									46	0	0	46
Pied Currawong													1									2			1			4	0	0	4
Rainbow lorikeet																1			1									2	0	0	2
Raven sp.	4			3						1			15	2		5			13	1					9			50	0	0	53
Red Wattlebird	9			5			4			14			7			4			9			1			6			59	3	0	59
Spotted Pardalote	1									7																		8	0	0	8
Straw-necked Ibis	2	22																										2	0	0	24
Striated Pardalote										2									2									4	22	0	4
Sulphur-crested Cockatoo													4			14			2						4			24	0	0	24
Superb Fairy-wren	4															1			5			1						11	0	0	11
Swamp Harrier																1												1	0	0	1
Welcome Swallow	3						4			2			3			6			6			33			4			61	0	0	61
White-bellied Sea-Eagle	1																											1	0	0	1
White-eared Honeyeater	17			1						7			8			13			7									53	0	0	53
White-faced Heron				1										11		4									5			10	0	0	21
Willie Wagtail							4			1															6			11	11	0	11
Yellow-billed Spoonbill													2															2	0	0	2
Yellow-faced Honeyeater	4									1			5			2												12	0	0	12
Grand Total	**263**	**25**		**174**			**262**	**3**		**484**	**15**		**435**	**16**		**198**	**5**		**248**	**6**		**499**	**5**	**12**	**393**	**6**		**2956**	**0**	**12**	**3049**

Raw data for the winter 2024 BUS reference points at Gelliondale Wind Farm Project.

Species	REF 1			REF2			REF 3			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	
Australasian Pipit				1						1	0	0	1
Australian Magpie	26			12						38	0	0	38
Australian Shelduck	2			47						49	0	0	49
Australian Wood Duck	4			4						8	0	0	8
Blue-winged Parrot				1	1					1	1	0	2
Brown Falcon	5									5	0	0	5
Brown Thornbill				4			8			12	0	0	12
Common Blackbird				2						2	0	0	2
Common Myna	3			8						11	0	0	11
Common Starling	5			35						40	0	0	40
Crescent Honeyeater							1			1	0	0	1
Crimson Rosella	1						4			5	0	0	5
Eastern Rosella	4									4	0	0	4
Eastern Yellow Robin				1			3			4	0	0	4
Eurasian Skylark	13	5		6	1			1		19	7	0	26
Flame Robin				1						1	0	0	1
Forest Raven	5									5	0	0	5
Galah				1			3			4	0	0	4
Golden Whistler							5			5	0	0	5
Grey Butcherbird	4						3			7	0	0	7
Grey Currawong	1			4			1			6	0	0	6
Grey Fantail							8			8	0	0	8
Grey Shrike-thrush	5			9			9			23	0	0	23
Laughing Kookaburra				2						2	0	0	2
Little Raven	24			13			3			40	0	0	40
Little Wattlebird							3			3	0	0	3
Magpie-lark	12			2						14	0	0	14
Masked Lapwing				2						2	0	0	2
New Holland Honeyeater							2			2	0	0	2
Pacific Black Duck	1									1	0	0	1
Pied Currawong							1			1	0	0	1
Rainbow lorikeet				1						1	0	0	1
Raven sp.	17	2		25						42	2	0	44
Red Wattlebird	11			7			26			44	0	0	44
Spotted Dove				2						2	0	0	2
Spotted Pardalote	1						17			18	0	0	18
Striated Pardalote	1			5			11			17	0	0	17
Striated Thornbill							12			12	0	0	12
Sulphur-crested Cockatoo				11						11	0	0	11
Superb Fairy-wren				12			10			22	0	0	22
Tree Martin				3						3	0	0	3
Wedge-tailed Eagle	1	1			2					1	3	0	4
Welcome Swallow	7			27						34	0	0	34
White-browed Scrubwren				1			2			3	0	0	3
White-eared Honeyeater	1			3			25			29	0	0	31
White-naped Honeyeater							8			8	0	0	8
Willie Wagtail				1						1	0	0	1
Yellow-faced Honeyeater				2			9			11	0	0	11
Yellow-tailed Black-Cockatoo							1			1	0	0	1
Grand Total	**154**	**8**		**255**	**4**		**175**	**1**		**584**	**13**	**0**	**599**

Raw data for the spring 2024 BUS impact points at Gelliondale Wind Farm Project

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Australian Magpie	22			17			32			18			9			8			7			15			128	0	0	128
Australian Pipit				3			3			3			2			4			5			2			22	0	0	22
Black Swan																							16		0	16	0	16
Black-faced Cuckoo-shrike				2						4						1									7	0	0	7
Blue-winged Parrot																			3						3	0	0	3
Brown Falcon							1													1					1	1	0	2
Brown Honeyeater													2												2	0	0	2
Brown Songlark	1			4															4						9	0	0	9
Brown-headed Honeyeater										2									3			4			9	0	0	9
Common Blackbird	1									1			7						1						10	0	0	10
Common Myna	6			4			23			10			8						9			4			64	0	0	64
Common Starling	17			46			83			42			36			1			77			127			429	0	0	429
Crimson Rosella										2			4												6	0	0	6
Eastern Rosella										4															4	0	0	4
Eastern Yellow Robin													1												1	0	0	1
Eurasian Skylark	76			75			63			43			26			31			65			95			474	0	0	474
Eurasian Tree Sparrow																						4			4	0	0	4
European Goldfinch																									0	0	0	0
Fan-tailed Cuckoo	1															1									2	0	0	2
Forest Raven	4			2																					6	0	0	6
Galah																						12			12	0	0	12
Golden Whistler										1															1	0	0	1
Grey Butcherbird	1						1			4									2			2			10	0	0	10
Grey Currawong											2		6			3									9	2	0	11
Grey Fantail	6									2			10			1			8						27	0	0	27
Grey Shrike-thrush	6						1			5			1			6			15			2			36	0	0	36
Horsfield's Bronze-cuckoo				1						2												1			4	0	0	4
Laughing Kookaburra										2			2												4	0	0	4
Little Corella																						145			145	0	0	145
Little Grassbird	1						1												1			2			5	0	0	5
Little Lorikeet										2															2	0	0	2
Little Raven	10			19			43			35			48			3			28			8			194	0	0	194
Little Wattlebird										1															1	0	0	1
Magpie-lark	7			7			4			10			5						6			3			42	0	0	42
Musk Lorikeet										8									5						13	0	0	13
Noisy Miner										16												8			24	0	0	24
Pacific Black Duck																									0	0	0	0
Peregrine Falcon																			1						1	0	0	1
Pied Currawong																			1						1	0	0	1
Rainbow Lorikeet										3						2			9			5			19	0	0	19
Raven sp.	11	2		14			16			17			20			12			3			7			100	2	0	102
Red Wattlebird	7			3			1			12			9			3			8			2			45	0	0	45
Reed-Warbler	1																		1			2			4	0	0	4

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Rufous Whistler	2									1			3			3			4						13	0	0	13
Shining Bronze-cuckoo													1			1									2	0	0	2
Silvereye	2												8			7									17	0	0	17
Spotted Pardalote										7			8			2			2						19	0	0	19
Striated Pardalote										2			1						1						4	0	0	4
Stubble Quail	7			9			4			7			4			1			8			6			46	0	0	46
Sulphur-crested Cockatoo	1																		4			49			54	0	0	54
Superb Fairy-wren	9									4			7			2			6						28	0	0	28
Swamp Harrier											1		1							1					1	2	0	3
Tree Martin																			2						2	0	0	2
Wedge-tailed Eagle		1												1											0	2	0	2
Welcome Swallow							3			12			3			10			2			3			33	0	0	33
White-browed Scrubwren													1												1	0	0	1
White-eared Honeyeater	4									1			2			3			6						16	0	0	16
White-faced Heron										2						3									5	0	0	5
Willie Wagtail													1									1			2	0	0	2
Yellow-faced Honeyeater	2									12			14			14			25						67	0	0	67
Yellow-rumped Thornbill																2									2	0	0	2
Yellow-tailed Black-cockatoo							8															3			11	0	0	11
Grand Total	**205**	**3**		**206**			**287**			**297**	**3**		**250**	**1**		**124**			**322**	**2**		**512**	**16**		**2203**	**25**	**0**	**2228**

Raw data for the spring 2024 BUS reference points at Gelliondale Wind Farm Project.

Species	REF1			REF2			Total			Grand total
	A	B	C	A	B	C	A	B	C	
Australian Magpie	24			4			28	0	0	28
Australian Pipit	4						4	0	0	4
Black Swan							0	0	0	0
Black-faced Cuckoo-shrike							0	0	0	0
Blue-winged Parrot				6			6	0	0	6
Brown Falcon							0	0	0	0
Brown Honeyeater							0	0	0	0
Brown Songlark							0	0	0	0
Brown-headed Honeyeater							0	0	0	0
Common Blackbird	1			6			7	0	0	7
Common Myna	18			7			25	0	0	25
Common Starling	138			35			173	0	0	173
Crimson Rosella							0	0	0	0
Eastern Rosella	2						2	0	0	2
Eastern Yellow Robin				1			1	0	0	1
Eurasian Skylark	50			17			67	0	0	67
Eurasian Tree Sparrow	5						5	0	0	5
European Goldfinch	1						1	0	0	1
Fan-tailed Cuckoo	1						1	0	0	1
Forest Raven							0	0	0	0
Galah	3			2			5	0	0	5
Golden Whistler							0	0	0	0
Grey Butcherbird							0	0	0	0
Grey Currawong				1			1	0	0	1
Grey Fantail	3			6			9	0	0	9
Grey Shrike-thrush	1			3			4	0	0	4
Horsfield's Bronze-cuckoo							0	0	0	0
Laughing Kookaburra							0	0	0	0
Little Corella							0	0	0	0
Little Grassbird				3			3	0	0	3
Little Lorikeet							0	0	0	0
Little Raven	18	2		25			43	2	0	45
Little Wattlebird							0	0	0	0
Magpie-lark	4						4	0	0	4
Musk Lorikeet				9			9	0	0	9
Noisy Miner							0	0	0	0
Pacific Black Duck	8						8	0	0	8
Peregrine Falcon				1			1	0	0	1
Pied Currawong							0	0	0	0
Rainbow Lorikeet				29			29	0	0	29
Raven sp.	13			8			21	0	0	21
Red Wattlebird	3			8			11	0	0	11
Reed-Warbler	2			1			3	0	0	3
Rufous Whistler	3			10			13	0	0	13
Shining Bronze-cuckoo							0	0	0	0
Silvereye	3			10			13	0	0	13
Spotted Pardalote				1			1	0	0	1
Striated Pardalote				1			1	0	0	1
Stubble Quail	11			3			14	0	0	14
Sulphur-crested Cockatoo	45			30			75	0	0	75
Superb Fairy-wren				17			17	0	0	17
Swamp Harrier							0	0	0	0
Tree Martin	5						5	0	0	5
Wedge-tailed Eagle		1					0	1	0	1
Welcome Swallow	6			1			7	0	0	7
White-browed Scrubwren				1			1	0	0	1
White-eared Honeyeater							0	0	0	0
White-faced Heron							0	0	0	0
Willie Wagtail	1			2			3	0	0	3
Yellow-faced Honeyeater	2			9			11	0	0	11
Yellow-rumped Thornbill							0	0	0	0
Yellow-tailed Black-cockatoo	8						8	0	0	8
Grand Total	**383**	**3**		**257**			**640**	**3**	**0**	**643**

Raw data for the summer 2025 BUS impact points at Gelliondale Wind Farm Project

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Australian Hobby							1			1															2	0	0	2
Australian Magpie	20	4		37			18			14			14			22			127			76	2		328	6	0	334
Australian Pipit	1			1			26									5						1			34	0	0	34
Australian Raven													1												1	0	0	1
Australian Shelduck																			6						6	0	0	6
Australian White Ibis					12		4																		4	12	0	16
Australian Wood Duck																			3						3	0	0	3
Black-faced Cuckoo-shrike	5			2																					7	0	0	7
Black-shouldered Kite	1	1			1		1																		2	2	0	4
Blue-winged Parrot																				5			2		0	7	0	7
Brown Falcon				1												1			1			2			5	0	0	5
Brown Songlark																						1			1	0	0	1
Brown Thornbill	3			2									4												9	0	0	9
Collared Sparrowhawk				1																					1	0	0	1
Common Blackbird													2												2	0	0	2
Common Myna	3						5			11						3			16			5			43	0	0	43
Common Starling	48			12	31		61			91				8		20				11		578			810	50	0	860
Crescent Honeyeater																			1						1	0	0	1
Crimson Rosella	1			1						6			1	2		2									11	2	0	13
Eastern Rosella				9						7						4									20	0	0	20
Eurasian Coot																4									4	0	0	4
Eurasian Skylark	1			1			9						2			2			2			16			33	0	0	33
European Goldfinch	1												8									1			10	0	0	10
Fairy Martin																						2			2	0	0	2
Golden Whistler																			1						1	0	0	1
Great Crested Grebe																			1						1	0	0	1
Grey Butcherbird										2															2	0	0	2
Grey Currawong										2															2	0	0	2
Grey Fantail	10									8									8			1			27	0	0	27
Grey Shrike-thrush	1																		1						2	0	0	2
Grey Teal																			2						2	0	0	2
Hoary-headed Grebe																3									3	0	0	3
Laughing Kookaburra										1															1	0	0	1
Little Grassbird													3												3	0	0	3
Little Raven	5			2			4			2			16												29	0	0	29
Little Wattlebird										4															4	0	0	4
Magpie-lark	4			1			3			2			3						2			1			16	0	0	16
Musk Lorikeet										9						2									11	0	0	11
New Holland Honeyeater	1												2						4						7	0	0	7
Noisy Miner										2									3						5	0	0	5
Pacific Black Duck							1									4			6						11	0	0	11
Peregrine Falcon							1						1												2	0	0	2
Rainbow Lorikeet										10				13			2						4		10	19	0	29

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Raven sp.	15	1		13			16			25			4			16	2		21	9		45	2		155	14	0	169
Red Wattlebird										25			3												28	0	0	28
Red-browed Finch													4												4	0	0	4
Rufous Whistler	2																								2	0	0	2
Sacred Kingfisher																			1						1	0	0	1
Silvereye	5												1						2						8	0	0	8
Spotted Dove													2						1						3	0	0	3
Spotted Pardalote										2						1			2						5	0	0	5
Straw-necked Ibis	15			1			4	19																	20	19	0	39
Stubble Quail	3			1						1			1			1						8			15	0	0	15
Sulphur-crested Cockatoo										3									6				3		9	3	0	12
Superb Fairy-wren	4			5						7			26			3			12						57	0	0	57
Swamp Harrier							1												1						2	0	0	2
Tree Martin																						18			18	0	0	18
Wedge-tailed Eagle	3	1	1											1			1		3						6	3	1	10
Welcome Swallow							4			3						6			1			22			36	0	0	36
White-browed Scrubwren													5						2						7	0	0	7
White-eared Honeyeater										3									1						4	0	0	4
White-faced Heron																5						1			6	0	0	6
Willie Wagtail							2									1									3	0	0	3
Yellow-faced Honeyeater										2									2						4	0	0	4
Yellow-tailed Black-cockatoo													7	1											7	1	0	8
Grand Total	**152**	**7**	**1**	**90**	**44**		**161**	**19**		**243**			**110**	**25**		**105**	**5**		**239**	**25**		**778**	**13**		**1878**	**138**	**1**	**2017**

Raw data for the summer 2025 BUS reference points at Gelliondale Wind Farm Project.

Species	REF1			REF2			Total			Grand total
	A	B	C	A	B	C	A	B	C	
Australian Magpie	19			9			28	0	0	28
Australian Pipit	4			21			25	0	0	25
Australian White Ibis	7						7	0	0	7
Black-shouldered Kite	1						1	0	0	1
Blue-winged Parrot		1		7			7	1	0	8
Brown Thornbill				5			5	0	0	5
Common Bronzewing				1			1	0	0	1
Common Myna	41						41	0	0	41
Common Starling	28	7		18			46	7	0	53
Eurasian Skylark	4			1			5	0	0	5
European Goldfinch				8			8	0	0	8
Fairy Martin				13			13	0	0	13
Forest Raven	1						1	0	0	1
Grey Fantail	2			4			6	0	0	6
Grey Shrike-thrush				1			1	0	0	1
Little Raven	8			9			17	0	0	17
Magpie-lark	3						3	0	0	3
Nankeen Kestrel				1			1	0	0	1
New Holland Honeyeater				1			1	0	0	1
Peregrine Falcon	1						1	0	0	1
Rainbow Lorikeet					4		0	4	0	4
Raven sp.	27	1		41	4		68	5	0	73
Red Wattlebird	2						2	0	0	2
Rufous Whistler				1			1	0	0	1
Stubble Quail	2			2			4	0	0	4
Sulphur-crested Cockatoo				1			1	0	0	1
Superb Fairy-wren				27			27	0	0	27
Tree Martin	12						12	0	0	12
Wedge-tailed Eagle		2					0	2	0	2
Welcome Swallow				80			80	0	0	80
Willie Wagtail				1			1	0	0	1
Yellow-faced Honeyeater				1			1	0	0	1
Yellow-tailed Black-cockatoo	2						2	0	0	2
Grand Total	164	11		253	8		417	19	0	436

Raw data for the autumn 2025 BUS impact points at Gelliondale Wind Farm Project

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			BUS9			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Australian Hobby							2									1												3	0	0	3
Australian Magpie	33			54	2		29			39			36			62			253			121	2		56			683	4	0	687
Australian Pelican		1																										0	1	0	1
Australian Pipit	4						13						4						2			2			7			32	0	0	32
Australian Shelduck																3			14									17	0	0	17
Australian White Ibis		2		76			12	130		4															9			101	132	0	233
Australian Wood Duck																												0	0	0	0
Black-faced Cuckoo-shrike	10												1															11	0	0	11
Black-shouldered Kite				4			1																					5	0	0	5
Black Swan																			2									2	0	0	2
Blue-winged Parrot																2			2	6		21	7					25	13	0	38
Brown Falcon																1												1	0	0	1
Brown Goshawk					1																							0	1	0	1
Brown Thornbill	1												3						1									5	0	0	5
Chestnut Teal																2												2	0	0	2
Common Blackbird													9															9	0	0	9
Common Bronzewing										1																		1	0	0	1
Common Myna	6			1			4			18												4			55	16		88	16	0	104
Common Starling	42			810	150		920			84			14			95			10			45			204	300		2224	450	0	2674
Crested Pigeon							3																		3			6	0	0	6
Crimson Rosella	1			3						17			4			11			4			15			1			56	0	0	56
Eastern Rosella				19						10			5			10						13			2			59	0	0	59
Eastern Spinebill										1			2															3	0	0	3
Eastern Yellow Robin										2			2			1			5			2						12	0	0	12
Eurasian Skylark	2			3			2			2									1						3			13	0	0	13
Fan-tailed Cuckoo																												0	0	0	0
Forest Raven	1									2			1			1						3			1			9	0	0	9
Galah								10								3			13			2						18	10	0	28
Gang-gang Cockatoo																												0	0	0	0
Golden-headed Cisticola																									11			11	0	0	11
Golden Whistler																						1						1	0	0	1
Great Cormorant							2																					2	0	0	2
Grey Butcherbird	6			3			3			1			6			6			1			5			5			36	0	0	36
Grey Currawong	3						1			2			1	2		2			2									11	2	0	13
Grey Fantail	6									2			1						3			1			1			14	0	0	14
Grey Shrike-thrush	7			1						1			2			3			7			2			1			24	0	0	24
Laughing Kookaburra	2						1			3			1			3			1									11	0	0	11
Lewin's Honeyeater																1												1	0	0	1
Little Corella		3																										0	3	0	3
Little Raven	38			158			54	1		30			21	4		64	7		338	6		38			107	3		848	21	0	869
Little Wattlebird	3																											3	0	0	3
Magpie-lark	5			6			5			5			1			1			5			5			16			49	0	0	49
Martin sp.																						2						2	0	0	2

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			BUS9			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Masked Lapwing																												0	0	0	0
Musk Lorikeet																						1						1	0	0	1
Nankeen Kestrel																			1									1	0	0	1
New Holland Honeyeater																												0	0	0	0
Noisy Miner	2									7						2			1									12	0	0	12
Pacific Black Duck																			2									2	0	0	2
Pied Currawong	2			1						1						5						2			1			12	0	0	12
Rainbow Lorikeet	3									2			1	2					2			2			8	6		18	8	0	26
Raven sp.	4			13			9												5			8	5		3	3		42	8	0	50
Red Wattlebird	12			3			2			10			4			6			2			7			1			47	0	0	47
Red-browed Finch													6															6	0	0	6
Rufous Whistler	2			1															1									4	0	0	4
Silvereye	1																											1	0	0	1
Spotted Dove							2																					2	0	0	2
Spotted Pardalote										3																		3	0	0	3
Straw-necked Ibis	4	60		153	8		5	150		30				32	220										93	140		285	390	220	895
Striated Pardalote																												0	0	0	0
Striated Thornbill	5																											5	0	0	5
Sulphur-crested Cockatoo																						3			2	3		5	3	0	8
Superb Fairy-wren										4			27						8						1			40	0	0	40
Swamp Harrier																												0	0	0	0
Wedge-tailed Eagle					2			1												6			1		1	2		1	12	0	13
Welcome Swallow	2						2									2									3	17		9	17	0	26
White-eared Honeyeater	2			1						9			6			4			5			3			1			31	0	0	31
White-faced Heron																2												2	0	0	2
White-naped Honeyeater																												0	0	0	0
White-necked Heron		1																										0	1	0	1
White-throated Treecreeper																												0	0	0	0
Willie Wagtail	1												1												6			8	0	0	8
Yellow-faced Honeyeater	1												4			3			11									19	0	0	19
Yellow-rumped Thornbill																									11			11	0	0	11
Yellow-tailed Black-Cockatoo	4						7						7						2									20	0	0	20
Grand Total	**215**	**67**		**1310**	**163**		**1079**	**292**		**290**			**170**	**40**	**220**	**296**	**7**		**704**	**18**		**308**	**15**		**613**	**490**		**4985**	**1092**	**220**	**6297**

Raw data for the autumn 2025 BUS reference points at Gelliondale Wind Farm Project.

Species	REF1			REF2			REF3			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	
Australian Hobby										0	0	0	0
Australian Magpie	38			17			7			62	0	0	62
Australian Pelican										0	0	0	0
Australian Pipit	5			1						6	0	0	6
Australian Shelduck				29						29	0	0	29
Australian White Ibis		1	2							0	1	2	3
Australian Wood Duck	27									27	0	0	27
Black Swan										0	0	0	0
Black-faced Cuckoo-shrike										0	0	0	0
Black-shouldered Kite	2									2	0	0	2
Blue-winged Parrot				20	27					20	27	0	47
Brown Falcon	3			2						5	0	0	5
Brown Goshawk										0	0	0	0
Brown Thornbill				5			10			15	0	0	15
Chestnut Teal										0	0	0	0
Common Blackbird				3						3	0	0	3
Common Bronzewing										0	0	0	0
Common Myna				1						1	0	0	1
Common Starling	20	60		43						63	60	0	123
Crested Pigeon										0	0	0	0
Crimson Rosella	6			1			4			11	0	0	11
Eastern Rosella	8						1			9	0	0	9
Eastern Spinebill							4			4	0	0	4
Eastern Yellow Robin				1			10			11	0	0	11
Eurasian Skylark				2						2	0	0	2
Fan-tailed Cuckoo							1			1	0	0	1
Forest Raven	1						2			3	0	0	3
Galah	18			2						20	0	0	20
Gang-gang Cockatoo	31									31	0	0	31
Golden Whistler							1			1	0	0	1
Golden-headed Cisticola										0	0	0	0
Great Cormorant										0	0	0	0
Grey Butcherbird	8			4			6			18	0	0	18
Grey Currawong				1						1	0	0	1
Grey Fantail	4			2			17			23	0	0	23
Grey Shrike-thrush	3			5			3			11	0	0	11
Laughing Kookaburra	5			2						7	0	0	7
Lewin's Honeyeater										0	0	0	0
Little Corella										0	0	0	0
Little Raven	33			69	2		1	2		103	4	0	107
Little Wattlebird							2			2	0	0	2
Magpie-lark	18									18	0	0	18
Martin sp.										0	0	0	0
Masked Lapwing	1									1	0	0	1
Musk Lorikeet										0	0	0	0
Nankeen Kestrel										0	0	0	0
New Holland Honeyeater							3			3	0	0	3
Noisy Miner	2			1						3	0	0	3
Pacific Black Duck										0	0	0	0
Pied Currawong	2									2	0	0	2
Rainbow Lorikeet				6				7		6	7	0	13
Raven sp.	6			17		3	1			24	0	3	27
Red Wattlebird	10						16			26	0	0	26
Red-browed Finch				6						6	0	0	6
Rufous Whistler							2			2	0	0	2
Silvereye										0	0	0	0
Spotted Dove										0	0	0	0
Spotted Pardalote							10			10	0	0	10
Straw-necked Ibis	135	37	70							135	37	70	242
Striated Pardalote							8			8	0	0	8
Striated Thornbill							17			17	0	0	17
Sulphur-crested Cockatoo										0	0	0	0
Superb Fairy-wren	7			26			4			37	0	0	37
Swamp Harrier	1									1	0	0	1
Wedge-tailed Eagle				2						2	0	0	2
Welcome Swallow	1									1	0	0	1

Species	REF1			REF2			REF3			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	
White-eared Honeyeater	3			1			33			37	0	0	37
White-faced Heron										0	0	0	0
White-naped Honeyeater							7			7	0	0	7
White-necked Heron										0	0	0	0
White-throated Treecreeper							3			3	0	0	3
Willie Wagtail	1			2						3	0	0	3
Yellow-faced Honeyeater				2			24			26	0	0	26
Yellow-rumped Thornbill	2									2	0	0	2
Yellow-tailed Black-Cockatoo							1	3		1	3	0	4
Grand total	**401**	**98**	**72**	**273**	**29**	**3**	**198**	**12**	**0**	**872**	**139**	**75**	**1086**

Raw data for the winter 2025 BUS impact points at Gelliondale Wind Farm Project

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			BUS9			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Australian Magpie	93			57			25			50			28			37			237			55			27			**609**	**0**	**0**	**609**
Australian Pipit				6			8			1			5									2			140			**162**	**0**	**0**	**162**
Australian Raven																			1									**1**	**0**	**0**	**1**
Australian Shelduck	5			2			18												52			2	8		45			**124**	**8**	**0**	**132**
Australian White Ibis	1						1			1																		**3**	**0**	**0**	**3**
Australian Wood Duck																			50									**50**	**0**	**0**	**50**
Black Swan	541																											**541**	**0**	**0**	**541**
Black-shouldered Kite				2																								**2**	**0**	**0**	**2**
Blue-winged Parrot				8			6	1									2			1								**14**	**4**	**0**	**18**
Brown Falcon							1						1												3			**5**	**0**	**0**	**5**
Brown Thornbill																2												**2**	**0**	**0**	**2**
Brush Bronzewing													2															**2**	**0**	**0**	**2**
Common Blackbird										3			2															**5**	**0**	**0**	**5**
Common Myna																									2			**2**	**0**	**0**	**2**
Common Starling	24			210			181			100			13			95			23			14			30			**690**	**0**	**0**	**690**
Crested Pigeon							8																					**8**	**0**	**0**	**8**
Crimson Rosella	2			6						9			19			5												**41**	**0**	**0**	**41**
Eastern Rosella	2			5						12												2						**21**	**0**	**0**	**21**
Eastern Yellow Robin													1			1												**2**	**0**	**0**	**2**
Eurasian Skylark							7									8						3			48			**66**	**0**	**0**	**66**
Flame Robin	10																					2						**12**	**0**	**0**	**12**
Forest Raven										1			1															**2**	**0**	**0**	**2**
Galah	2																											**2**	**0**	**0**	**2**
Grey Butcherbird				2						4												2						**8**	**0**	**0**	**8**
Grey Currawong	2												1			1												**4**	**0**	**0**	**4**
Grey Shrike-thrush	2			1																								**3**	**0**	**0**	**3**
Laughing Kookaburra										2			1															**3**	**0**	**0**	**3**
Little Raven	16			90			16			10			9			16			89			16			37			**299**	**0**	**0**	**299**
Magpie-lark	7			21			1						6						6						5			**46**	**0**	**0**	**46**
Masked Lapwing							1																					**1**	**0**	**0**	**1**
New Holland Honeyeater													1															**1**	**0**	**0**	**1**
Noisy Miner										12																		**12**	**0**	**0**	**12**
Pacific Black Duck																			13									**13**	**0**	**0**	**13**
Peregrine Falcon																									1			**1**	**0**	**0**	**1**
Rainbow Lorikeet																						1						**1**	**0**	**0**	**1**
Raven sp.				1			1						1															**3**	**0**	**0**	**3**
Red Wattlebird	5			1			1			2												1						**10**	**0**	**0**	**10**
Red-browed Finch													5															**5**	**0**	**0**	**5**
Spotted Pardalote										2			5			1												**8**	**0**	**0**	**8**
Straw-necked Ibis				1							48														25	70		**26**	**118**	**0**	**144**
Striated Thornbill	4																											**4**	**0**	**0**	**4**
Sulphur-crested Cockatoo																			6									**6**	**0**	**0**	**6**
Superb Fairy-wren													18			29												**47**	**0**	**0**	**47**

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			BUS9			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Wedge-tailed Eagle							1																		1			2	0	0	2
Welcome Swallow	2									1																		3	0	0	3
Whistling Kite				1																			1					1	1	0	2
White-eared Honeyeater													4			4												8	0	0	8
White-faced Heron	2		2										1															3	0	2	5
White-fronted Chat																									2			2	0	0	2
Willie Wagtail	1			1			3															2			11			18	0	0	18
Yellow-rumped Thornbill	8																											8	0	0	8
Grand Total	729		2	415			279	1		210	48		124			199	2		477	1		102	9		377	70		2912	131	2	3045

Raw data for the winter 2025 BUS reference points at Gelliondale Wind Farm Project.

Species	REF1			REF2			REF3			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	
Australian Magpie	25			44			3			72	0	0	72
Australian Pipit	19			2						21	0	0	21
Australian Raven	2			1						3	0	0	3
Australian Shelduck				23						23	0	0	23
Australian Wood Duck	51									51	0	0	51
Blue-winged Parrot	1				1					1	1	0	2
Brown Goshawk				1						1	0	0	1
Brown Thornbill							15			15	0	0	15
Common Blackbird				1						1	0	0	1
Common Myna				36						36	0	0	36
Common Starling				61						61	0	0	61
Crimson Rosella	2			12			3			17	0	0	17
Eastern Rosella	2									2	0	0	2
Eastern Yellow Robin							1			1	0	0	1
Eurasian Skylark	5									5	0	0	5
Forest Raven	1									1	0	0	1
Grey Butcherbird	1						1			2	0	0	2
Grey Currawong	1						2			3	0	0	3
Grey Fantail							1			1	0	0	1
Grey Shrike-thrush				3			4			7	0	0	7
Little Raven	17			134			3			154	0	0	154
Little Wattlebird				3						3	0	0	3
Magpie-lark	5			7						12	0	0	12
Pacific Black Duck				8						8	0	0	8
Red Wattlebird	2			2						4	0	0	4
Spotted Pardalote							5			5	0	0	5
Striated Thornbill							10			10	0	0	10
Sulphur-crested Cockatoo				65						65	0	0	65
Superb Fairy-wren	2			25			16			43	0	0	43
Wedge-tailed Eagle		2								0	2	0	2
White-eared Honeyeater				2			14			16	0	0	16
White-faced Heron	1									1	0	0	1
Yellow-faced Honeyeater							2			2	0	0	2
Grand Total	137	2		430	1		80			647	3	0	650
Australian Magpie	25			44			3			72	0	0	72
Australian Pipit	19			2						21	0	0	21
Australian Raven	2			1						3	0	0	3
Australian Shelduck				23						23	0	0	23
Australian Wood Duck	51									51	0	0	51
Blue-winged Parrot	1				1					1	1	0	2
Brown Goshawk				1						1	0	0	1
Brown Thornbill							15			15	0	0	15
Common Blackbird				1						1	0	0	1
Common Myna				36						36	0	0	36
Common Starling				61						61	0	0	61
Crimson Rosella	2			12			3			17	0	0	17
Eastern Rosella	2									2	0	0	2
Eastern Yellow Robin							1			1	0	0	1
Eurasian Skylark	5									5	0	0	5
Forest Raven	1									1	0	0	1
Grey Butcherbird	1						1			2	0	0	2
Grey Currawong	1						2			3	0	0	3
Grey Fantail							1			1	0	0	1
Grey Shrike-thrush				3			4			7	0	0	7
Little Raven	17			134			3			154	0	0	154
Little Wattlebird				3						3	0	0	3
Magpie-lark	5			7						12	0	0	12
Pacific Black Duck				8						8	0	0	8
Red Wattlebird	2			2						4	0	0	4
Spotted Pardalote							5			5	0	0	5
Striated Thornbill							10			10	0	0	10
Sulphur-crested Cockatoo				65						65	0	0	65
Superb Fairy-wren	2			25			16			43	0	0	43
Wedge-tailed Eagle		2								0	2	0	2
White-eared Honeyeater				2			14			16	0	0	16
White-faced Heron	1									1	0	0	1

Species	REF1			REF2			REF3			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	
Yellow-faced Honeyeater							2			2	0	0	2
Grand Total	137	2		430	1		80			647	3	0	650

Appendix 8: General development recommendations

Consideration should be given to including the measures described below in a construction and operational environmental management plan for the project.

Pre-construction phase:

- Where feasible, development and associated works should be sited at least 30 m away from rivers, creeks and significant drainage lines.
- The proposed development should be designed in a way that does not alter the site's hydrology in areas that support native vegetation or act as tributaries to rivers, creeks and significant drainage lines.
- Construction contractors should be inducted into an environmental management program for construction works.
- All environmental controls should be checked for compliance on a regular basis.

Construction phase:

- Environmentally sensitive areas including retained native vegetation within 50 m of works (including access points and routes) should be securely fenced at 2 m from the perimeter and appropriately signed. All machinery, vehicles, equipment, personnel, waste materials/spoil and earthworks are to be excluded from these areas.
- Tree Retention Zones (TRZs) are to be established and maintained around all retained scattered trees within 50 m of works (including access points and routes) for the duration of construction activities. Construction and construction-related activities are to be excluded from the TRZ. Encroachment into the TRZ (including earthworks such as trenching for pipelines or cabling, etc. that disturb the root zone) must not affect more than 10% of the total area of the TRZ. Directional drilling must not be undertaken within TRZs, unless:
    - The directional drilling bore is at least 600 mm deep; AND
    - A qualified arborist has confirmed in writing that the radius of the bore will not significantly damage the tree causing it to be lost in the future; AND
    - A qualified arborist has confirmed in writing that the use of directional drilling is appropriate for the specific project/works.
- Any pruning of native trees should be undertaken using a suitably qualified arborist and be carried out in accordance with *Australian Standard 4373 – 2007 Pruning of Amenity Trees* to the satisfaction of the Responsible Authority. An excavator, backhoe, bulldozer blade or loader should not be used to trim branches.
- A suitably qualified arborist (Level 5) should be on-site during all works within Tree Protection Zones of any native canopy tree located within 5 m of the works to ensure all efforts are taken to avoid impacts on the root zones, to monitor root damage and carry out any amelioration to disturbed roots.
- Any stockpiling should occur outside of environmentally sensitive areas.
- All machinery should enter and exit works sites along defined routes that do not impact on native vegetation or cause soil disturbance and weed spread.
- All machinery brought on site should be clean and free of weeds and pathogens (including seeds and other propagules).
- All machinery wash down, lay down and personnel rest areas should be defined (fenced) and located in disturbed areas.
- All works must be undertaken in a manner that will minimise soil erosion and adhere to Construction Techniques for Sediment Pollution Control (EPAV 1991).

Post-construction phase:

- Weed control, by an experienced bush regenerator, is to be carried out along disturbed areas after construction to control any weed outbreaks in farmland or native vegetation as well as along watercourses.
- The use of local indigenous plant species, of local genetic provenance, should be considered in the landscaping of any development on the site. Locally indigenous species generally have low water-use requirements, high survival rates and provide habitat to local fauna species.

Decommissioning phase:

- As per construction phase.

Appendix 9: Photographs of native vegetation proposed for removal

Representative photo of habitat zones A, C, AB: Aquatic Herbland (EVC 653)

Representative photo of habitat zone B: Swamp Scrub (EVC 53)

Representative photo of habitat zones D, E, K, I, L, N, O, Q - U, W, AD - AI, CM, DH: Swamp Scrub (EVC 53)

Representative photo of habitat zones F, H, CK: Swamp Scrub (EVC 53)

Representative photo of habitat zones CB, CC, CG, CH, CI: Swamp Scrub (EVC 53)

Representative photo of habitat zones V - Z, AA: Tall Marsh (EVC 821)

Representative photo of habitat zones AK, AL: Swamp Scrub (EVC 53)

Representative photo of habitat zones AN - AU, BR, BS, BV, BX: Swamp Scrub (EVC 53)

Representative photo of zones AV - AZ, BA - BD, BF, BG, BI, BJ - BO, BW: Heathy Woodland (EVC 48)

Representative photo of habitat zones BE, BH, BP, BQ, BT, BU: Heathy Woodland (EVC 48)

Habitat zone BY: Swamp Scrub (EVC 53)

Habitat zone BZ: Heathy Woodland (EVC 48)

Habitat zone DA: Heathy Woodland (EVC 48)

Habitat zone DC: Heathy Woodland (EVC 48)

Habitat zone DD: Heathy Woodland (EVC 48)

Appendix 10: EVC benchmarks

Gippsland Plain:

- Wet Heathland (EVC 8)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Creekline Herb-rich Woodland (EVC 164)
- Aquatic Herbland (EVC 653)
- Tall Marsh (EVC 821)

EVC/Bioregion Benchmark for Vegetation Quality Assessment

Gippsland Plain bioregion

EVC 8: Wet Heathland

Description:
A low, generally treeless heathland although sometimes emergent eucalypts may be present. Occurs on lower slopes, flats or depressions, which are infertile and subjected to prolonged water logging. Understorey is often dominated by a range of sedges, grasses and shrubs.

Life Forms:

Life form	#Spp	%Cover	LF code
Medium Shrub	6	40%	MS
Small Shrub	3	5%	SS
Prostrate Shrub	1	1%	PS
Medium Herb	3	5%	MH
Small or Prostrate Herb	2	5%	SH
Large Tufted Graminoid	1	5%	LTG
Large Non-tufted Graminoid	2	10%	LNG
Medium to Small Tufted Graminoid	2	5%	MTG
Medium to Tiny Non-tufted Graminoid	5	20%	MNG
Ground Fern	1	1%	GF
Bryophytes/Lichens	na	20%	BL

LF Code	Species typical of at least part of EVC range	Common Name
MS	*Melaleuca squarrosa*	Scented Paperbark
MS	*Leptospermum continentale*	Prickly Tea-tree
MS	*Allocasuarina paludosa*	Scrub Sheoak
MS	*Sprengelia incarnata*	Pink Swamp-heath
SS	*Platylobium obtusangulum*	Common Flat-pea
SS	*Epacris obtusifolia*	Blunt-leaf Heath
SS	*Epacris gunnii*	Ace of Spades
MH	*Gonocarpus humilis*	Shade Raspwort
MH	*Gonocarpus tetragynus*	Common Raspwort
LNG	*Gahnia radula*	Thatch Saw-sedge
MTG	*Patersonia occidentalis*	Long Purple-flag
MNG	*Schoenus brevifolius*	Zig-zag Bog-sedge
MNG	*Schoenus lepidosperma*	Slender Bog-sedge
MNG	*Baumea juncea*	Bare Twig-sedge
MNG	*Leptocarpus tenax*	Slender Twine-rush
SC	*Cassytha glabella*	Slender Dodder-laurel
GF	*Lindsaea linearis*	Screw Fern

Recruitment:
Episodic/Fire. Desirable period between disturbances is 30 years.

Organic Litter:
20% cover

Weediness:
There are no consistent weeds in this EVC.

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EVC/Bioregion Benchmark for Vegetation Quality Assessment

Gippsland Plain bioregion

EVC 16: Lowland Forest

Description:
Eucalypt forest to 20 m tall on relatively fertile, moderately well-drained soils in areas of relatively high rainfall. Characterised by the diversity of life forms and species in the understorey including a range of shrubs, grasses and herbs.

Large trees:

Species	DBH(cm)	#/ha
Eucalyptus spp.	70 cm	20 / ha

Tree Canopy Cover:

%cover	Character Species	Common Name
30%	*Eucalyptus obliqua*	Messmate Stringybark
	Eucalyptus radiata s.l.	Narrow-leaf Peppermint
	Eucalyptus consideniana	Yertchuk

Understorey:

Life form	#Spp	%Cover	LF code
Immature Canopy Tree		5%	IT
Understorey Tree or Large Shrub	2	10%	T
Medium Shrub	7	30%	MS
Small Shrub	5	10%	SS
Prostrate Shrub	2	5%	PS
Large Herb	1	1%	LH
Medium Herb	7	10%	MH
Small or Prostrate Herb	7	5%	SH
Large Tufted Graminoid	2	15%	LTG
Large Non-tufted Graminoid	1	5%	LNG
Medium to Small Tufted Graminoid	7	15%	MTG
Medium to Tiny Non-tufted Graminoid	1	1%	MNG
Ground Fern	2	15%	GF
Scrambler or Climber	3	1%	SC
Bryophytes/Lichens	na	10%	BL

LF Code	Species typical of at least part of EVC range	Common Name
T	*Acacia melanoxylon*	Blackwood
MS	*Epacris impressa*	Common Heath
MS	*Leptospermum continentale*	Prickly Tea-tree
MS	*Banksia marginata*	Silver Banksia
MS	*Leptospermum myrsinoides*	Heath Tea-tree
SS	*Amperea xiphoclada var. xiphoclada*	Broom Spurge
PS	*Acrotriche serrulata*	Honey-pots
MH	*Gonocarpus tetragynus*	Common Raspwort
MH	*Drosera peltata ssp. auriculata*	Tall Sundew
MH	*Viola hederacea sensu Willis (1972)*	Ivy-leaf Violet
SH	*Opercularia varia*	Variable Stinkweed
LTG	*Xanthorrhoea minor ssp. lutea*	Small Grass-tree
LTG	*Lomandra longifolia*	Spiny-headed Mat-rush
LNG	*Gahnia radula*	Thatch Saw-sedge
MTG	*Lomandra filiformis*	Wattle Mat-rush
MTG	*Poa australis spp. agg.*	Tussock Grass
MNG	*Microlaena stipoides var. stipoides*	Weeping Grass
GF	*Pteridium esculentum*	Austral Bracken
SC	*Billardiera scandens*	Common Apple-berry

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The Place To Be

Recruitment:
Continuous

Organic Litter:
40 % cover

Logs:
20 m/0.1 ha.

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
MH	*Hypochoeris radicata*	Cat's Ear	high	low

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Department of Sustainability and Environment

EVC/Bioregion Benchmark for Vegetation Quality Assessment

Gippsland Plain bioregion

EVC 48: Heathy Woodland

Description:
Spans a variety of geologies but is generally associated with nutrient-poor soils including deep uniform sands (aeolian or outwash) and Tertiary sand/clay which has been altered to form quartzite gravel. Eucalypt-dominated low woodland to 10 m tall lacking a secondary tree layer and generally supporting a diverse array of narrow or ericoid-leaved shrubs except where frequent fire has reduced this to a dense cover of bracken. Geophytes and annuals can be quite common but the ground cover is normally fairly sparse.

Large trees:

Species	DBH(cm)	#/ha
Eucalyptus spp.	50 cm	15 / ha
Banksia serrata	40 cm	

Tree Canopy Cover:

%cover	Character Species	Common Name
10%	*Eucalyptus willisii*	Jimmy's Shining Peppermint
	Eucalyptus obliqua	Messmate Stringybark
	Eucalyptus radiata s.l.	Narrow-leaf Peppermint
	Eucalyptus viminalis ssp. *pryoriana*	Rough-barked Manna Gum
	Banksia serrata	Saw Banksia

Understorey:

Life form	#Spp	%Cover	LF code
Immature Canopy Tree		5%	IT
Medium Shrub	5	30%	MS
Small Shrub	5	20%	SS
Medium Herb	2	5%	MH
Small or Prostrate Herb	2	5%	SH
Large Tufted Graminoid	1	5%	LTG
Large Non-tufted Graminoid	1	1%	LNG
Medium to Small Tufted Graminoid	1	5%	MTG
Medium to Tiny Non-tufted Graminoid	2	5%	MNG
Ground Fern	1	5%	GF
Bryophytes/Lichens	na	10%	BL
Soil Crust	na	10%	S/C

LF Code	Species typical of at least part of EVC range	Common Name
MS	*Epacris impressa*	Common Heath
MS	*Leptospermum myrsinoides*	Heath Tea-tree
MS	*Leptospermum continentale*	Prickly Tea-tree
MS	*Monotoca scoparia*	Prickly Broom-heath
SS	*Amperea xiphoclada* var. *xiphoclada*	Broom Spurge
SS	*Leucopogon virgatus*	Common Beard-heath
SS	*Dillwynia glaberrima*	Smooth Parrot-pea
LTG	*Gahnia sieberiana*	Red-fruit Saw-sedge
MTG	*Xanthorrhoea minor* ssp. *lutea*	Small Grass-tree
MNG	*Hypolaena fastigiata*	Tassel Rope-rush
SC	*Cassytha glabella*	Slender Dodder-laurel

Victoria The Place To Be

Recruitment:
Episodic/Fire. Desirable period between disturbances is 20 years.

Organic Litter:
40 % cover

Logs:
15 m/0.1 ha.

Weediness:
There are no consistent weeds in this EVC.

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EVC/Bioregion Benchmark for Vegetation Quality Assessment

Gippsland Plain bioregion

EVC 53_61: Swamp Scrub

Description:

Closed scrub to 8 m tall at low elevations on alluvial deposits along streams or on poorly drained sites with higher nutrient availability. The EVC is dominated by Swamp Paperbark *Melaleuca ericifolia* (or sometimes Woolly Tea-tree *Leptospermum lanigerum*) which often forms a dense thicket, out-competing other species. Occasional emergent eucalypts may be present. Where light penetrates to ground level, a moss/lichen/liverwort or herbaceous ground cover is often present. Dry variants have a grassy/herbaceous ground layer.

Canopy Cover:

% cover	Character Species	Common Name
50%	*Leptospermum lanigerum*	Woolly Tea-tree
	Melaleuca ericifolia	Swamp Paperbark

Understorey:

Life form	# Spp	% Cover	LF code
Medium Shrub	2	10%	MS
Small Shrub	2	1%	SS
Large Herb	2	5%	LH
Medium Herb	3	15%	MH
Small or Prostrate Herb	2	5%	SH
Large Tufted Graminoid	2	10%	LTG
Large Non-tufted Graminoid	3	10%	LNG
Medium to Small Tufted Graminoid	2	5%	MTG
Medium to Tiny Non-tufted Graminoid	2	15%	MNG
Ground Fern	1	5%	GF
Scrambler or Climber	1	1%	SC
Bryophytes/Lichens	na	20%	BL

LF Code	Species typical of at least part of EVC range	Common Name
MS	*Coprosma quadrifida*	Prickly Currant-bush
MS	*Leptospermum continentale*	Prickly Tea-tree
LH	*Lycopus australis*	Australian Gipsywort
LH	*Lythrum salicaria*	Purple Loosestrife
LH	*Persicaria praetermissa*	Spotted Knotweed
MH	*Hydrocotyle pterocarpa*	Wing Pennywort
MH	*Stellaria angustifolia*	Swamp Starwort
MH	*Lobelia anceps*	Angled Lobelia
SH	*Crassula helmsii*	Swamp Crassula
LTG	*Juncus procerus*	Tall Rush
LTG	*Poa labillardierei*	Common Tussock-grass
LNG	*Gahnia radula*	Thatch Saw-sedge
LNG	*Phragmites australis*	Common Reed
LNG	*Baumea rubiginosa* s.l.	Soft Twig-rush
MTG	*Triglochin procerum* s.l.	Water Ribbons
MTG	*Juncus gregiflorus*	Green Rush
MNG	*Eleocharis acuta*	Common Spike-sedge
GF	*Blechnum cartilagineum*	Gristle Fern
SC	*Calystegia sepium*	Large Bindweed

Victoria The Place To Be

Recruitment:
Continuous

Organic Litter:
40 % cover

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
MH	*Hypochoeris radicata*	Cat's Ear	high	low
LNG	*Holcus lanatus*	Yorkshire Fog	high	high

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EVC/Bioregion Benchmark for Vegetation Quality Assessment

Gippsland Plain bioregion

EVC 151: Plains Grassy Forest

Description:
Open forest to 20 m tall often above a heathy shrub layer and a diverse grassy, sedgy and herbaceous ground layer. Occurs on lowland plains and old river terraces made up of gravelly sandy clays.

Large trees:

Species	DBH(cm)	#/ha
Eucalyptus spp.	70 cm	20 / ha

Tree Canopy Cover:

%cover	Character Species	Common Name
30%	*Eucalyptus muelleriana*	Yellow Stringybark
	Eucalyptus bridgesiana s.l.	But But
	Eucalyptus polyanthemos	Red Box
	Eucalyptus macrorhyncha	Red Stringybark

Understorey:

Life form	#Spp	%Cover	LF code
Immature Canopy Tree		5%	IT
Understorey Tree or Large Shrub	3	15%	T
Medium Shrub	6	20%	MS
Small Shrub	3	5%	SS
Prostrate Shrub	2	5%	PS
Large Herb	3	5%	LH
Medium Herb	6	10%	MH
Small or Prostrate Herb	2	5%	SH
Large Tufted Graminoid	2	10%	LTG
Large Non-tufted Graminoid	1	5%	LNG
Medium to Small Tufted Graminoid	4	15%	MTG
Medium to Tiny Non-tufted Graminoid	2	1%	MNG
Ground Fern	2	10%	GF
Bryophytes/Lichens	na	10%	BL

Victoria The Place To Be

EVC 151: Plains Grassy Forest - Gippsland Plain bioregion

LF Code	Species typical of at least part of EVC range	Common Name
T	*Allocasuarina littoralis*	Black Sheoak
T	*Acacia mearnsii*	Black Wattle
T	*Acacia implexa*	Lightwood
T	*Exocarpos cupressiformis*	Cherry Ballart
MS	*Leptospermum continentale*	Prickly Tea-tree
MS	*Banksia marginata*	Silver Banksia
MS	*Kunzea ericoides*	Burgan
MS	*Melaleuca parvistaminea*	Rough-barked Honey-myrtle
SS	*Pimelea humilis*	Common Rice-flower
SS	*Hibbertia riparia*	Erect Guinea-flower
SS	*Platylobium obtusangulum*	Common Flat-pea
SS	*Phyllanthus hirtellus*	Thyme Spurge
PS	*Acrotriche serrulata*	Honey-pots
PS	*Bossiaea prostrata*	Creeping Bossiaea
PS	*Astroloma humifusum*	Cranberry Heath
LH	*Tricoryne elatior*	Yellow Rush-lily
LH	*Wahlenbergia gracilis s.l.*	Sprawling Bluebell
MH	*Poranthera microphylla*	Small Poranthera
MH	*Hypericum gramineum*	Small St John's Wort
MH	*Hydrocotyle hirta*	Hairy Pennywort
MH	*Gonocarpus tetragynus*	Common Raspwort
SH	*Dichondra repens*	Kidney-weed
SH	*Oxalis corniculata s.l.*	Yellow Wood-sorrel
SH	*Opercularia varia*	Variable Stinkweed
LTG	*Xanthorrhoea minor ssp. lutea*	Small Grass-tree
LTG	*Lomandra longifolia*	Spiny-headed Mat-rush
LNG	*Gahnia radula*	Thatch Saw-sedge
MTG	*Themeda triandra*	Kangaroo Grass
MTG	*Poa australis spp. agg.*	Tussock Grass
MTG	*Lomandra filiformis*	Wattle Mat-rush
MTG	*Lepidosperma laterale*	Variable Sword-sedge
MNG	*Microlaena stipoides var. stipoides*	Weeping Grass
MNG	*Entolasia marginata*	Bordered Panic
GF	*Pteridium esculentum*	Austral Bracken

Recruitment:
Continuous

Organic Litter:
20 % cover

Logs:
20 m/0.1 ha.

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
LH	*Centaurium tenuiflorum*	Slender Centaury	high	low
MH	*Hypochoeris radicata*	Cat's Ear	high	low
MH	*Centaurium erythraea*	Common Centaury	high	low

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Department of Sustainability and Environment

EVC/Bioregion Benchmark for Vegetation Quality Assessment

Gippsland Plain bioregion

EVC 164: Creekline Herb-rich Woodland

Description:
Woodland or open forest to 15 m tall occurring on creek terraces and along shallow drainage lines with ephemeral flows. Soils are mostly alluvial deposits of seasonally wet sands and silts. Characterised by a sparse shrub layer above a grassy/sedgy understorey, often rich in herbs within the inter-tussock spaces.

Large trees:

Species	DBH(cm)	#/ha
Eucalyptus spp.	70 cm	10 / ha

Tree Canopy Cover:

%cover	Character Species	Common Name
20%	*Eucalyptus viminalis*	Manna Gum
	Eucalyptus ovata	Swamp Gum

Understorey:

Life form	#Spp	%Cover	LF code
Immature Canopy Tree		5%	IT
Understorey Tree or Large Shrub	2	10%	T
Medium Shrub	5	15%	MS
Large Herb	2	1%	LH
Medium Herb	5	5%	MH
Small or Prostrate Herb	1	1%	SH
Large Tufted Graminoid	3	15%	LTG
Large Non-tufted Graminoid	1	5%	LNG
Medium to Small Tufted Graminoid	2	5%	MTG
Medium to Tiny Non-tufted Graminoid	2	10%	MNG
Ground Fern	2	20%	GF
Bryophytes/Lichens	na	20%	BL

LF Code	Species typical of at least part of EVC range	Common Name
T	*Acacia melanoxylon*	Blackwood
MS	*Leptospermum continentale*	Prickly Tea-tree
MS	*Ozothamnus ferrugineus*	Tree Everlasting
MS	*Cassinia aculeata*	Common Cassinia
LH	*Senecio minimus*	Shrubby Fireweed
LH	*Senecio linearifolius*	Fireweed Groundsel
MH	*Lobelia anceps*	Angled Lobelia
MH	*Senecio sp. aff. tenuiflorus*	Beaked Fireweed
SH	*Oxalis exilis*	Shady Wood-sorrel
LTG	*Lomandra longifolia*	Spiny-headed Mat-rush
LTG	*Lepidosperma laterale var. majus*	Variable Sword-sedge
LTG	*Poa labillardierei*	Common Tussock-grass
LNG	*Gahnia radula*	Thatch Saw-sedge
MTG	*Poa clelandii*	Noah's Ark
MNG	*Microlaena stipoides var. stipoides*	Weeping Grass
MNG	*Poa tenera*	Slender Tussock-grass
MNG	*Imperata cylindrica*	Blady Grass
GF	*Pteridium esculentum*	Austral Bracken
GF	*Adiantum aethiopicum*	Common Maidenhair
SC	*Glycine clandestina*	Twining Glycine

Recruitment:
Continuous

Organic Litter:
20 % cover

Logs:
10 m/0.1 ha.

Victoria The Place To Be

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
MS	*Chrysanthemoides monilifera*	Boneseed	high	high
MS	*Rubus sp. aff. armeniacus*	Blackberry	high	high
LH	*Plantago lanceolata*	Ribwort	high	low
LH	*Crepis capillaris*	Smooth Hawksbeard	high	low
LH	*Sonchus oleraceus*	Common Sow-thistle	high	low
LH	*Cirsium vulgare*	Spear Thistle	high	high
MH	*Hypochoeris radicata*	Cat's Ear	high	low
MH	*Oxalis pes-caprae*	Soursob	high	high
MH	*Cerastium glomeratum s.l.*	Common Mouse-ear Chickweed	high	low
MH	*Trifolium dubium*	Suckling Clover	high	low
MH	*Centaurium erythraea*	Common Centaury	high	low
SH	*Trifolium repens var. repens*	White Clover	high	low
LTG	*Watsonia meriana var. bulbillifera*	Bulbil Watsonia	high	high
LNG	*Holcus lanatus*	Yorkshire Fog	high	high
MTG	*Anthoxanthum odoratum*	Sweet Vernal-grass	high	high
MTG	*Romulea rosea*	Onion Grass	high	low
MTG	*Gladiolus undulatus*	Wild Gladiolus	high	low
MTG	*Agrostis capillaris s.l.*	Brown-top Bent	high	high
MTG	*Poa annua*	Annual Meadow-grass	high	low
MTG	*Paspalum dilatatum*	Paspalum	high	high
MTG	*Ehrharta longiflora*	Annual Veldt-grass	high	low
MTG	*Ehrharta erecta var. erecta*	Panic Veldt-grass	high	high
MTG	*Briza maxima*	Large Quaking-grass	high	low
MNG	*Dactylis glomerata*	Cocksfoot	high	high
MNG	*Aira caryophyllea*	Silvery Hair-grass	high	low
SC	*Vicia sativa*	Common Vetch	high	low

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EVC/Bioregion Benchmark for Vegetation Quality Assessment

Gippsland Plain bioregion

EVC 653: Aquatic Herbland

Description:
Herbland of permanent to semi-permanent wetlands, dominated by sedges (especially on shallower verges) and/or aquatic herbs. Occurs on fertile paludal soils, typically heavy clays beneath organic accumulations.

Life Forms:

Life form	#Spp	%Cover	LF code
Large Herb	2	10%	LH
Medium Herb	3	20%	MH
Small or Prostrate Herb	3	15%	SH
Large Non-tufted Graminoid	2	20%	LTG
Medium to Small Tufted Graminoid	2	10%	MTG
Medium to Tiny Non-tufted Graminoid	1	5%	MNG
Total understorey projective foliage cover		**80%**	

LF Code	Species typical of at least part of EVC range	Common Name
LH	*Persicaria decipiens*	Slender Knotweed
MH	*Myriophyllum verrucosum*	Red Water-milfoil
MH	*Potamogeton pectinatus*	Fennel Pondweed
SH	*Lemna disperma*	Common Duckweed
SH	*Azolla filiculoides*	Pacific Azolla
SH	*Mimulus repens*	Creeping Monkey-flower
SH	*Wolffia australiana*	Tiny Duckweed
LNG	*Typha orientalis*	Broad-leaf Cumbungi
LNG	*Phragmites australis*	Common Reed
MTG	*Triglochin procerum s.l.*	Water Ribbons
MNG	*Bolboschoenus caldwellii*	Salt Club-sedge

Recruitment:
Episodic/Flood. Desirable period between disturbances is 5 years.

Organic Litter:
10% Cover

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
LH	*Aster subulatus*	Aster-weed	high	low
MH	*Cotula coronopifolia*	Water Buttons	high	high

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Department of Sustainability and Environment

EVC/Bioregion Benchmark for Vegetation Quality Assessment

Gippsland Plain bioregion

EVC 821: Tall Marsh

Description:
Occurs on Quaternary sedimentary geology of mainly estuarine sands, soils are peaty, silty clays, and average annual rainfall is approximately 600 mm. It requires shallow water (to 1 m deep) and low current-scour, and can only tolerate very low levels of salinity. Closed to open grassland/sedgeland to 2-3 m tall, dominated by Common Reed and Cumbungi. Small aquatic and semi-aquatic species occur amongst the reeds.

Life Forms:

Life form	#Spp	%Cover	LF code
Large Herb	3	10%	LH
Medium Herb	2	5%	MH
Small or Prostrate Herb	6	10%	SH
Large Tufted Graminoid	1	5%	LTG
Large Non-tufted Graminoid	2	40%	LNG
Medium to Tiny Non-tufted Graminoid	1	1%	MNG
Total understorey projective foliage cover		**70%**	

LF Code	Species typical of at least part of EVC range	Common Name
LH	*Myriophyllum verrucosum*	Red Water-milfoil
LH	*Myriophyllum salsugineum*	Lake Water-milfoil
LH	*Villarsia reniformis*	Running Marsh-flower
MH	*Rumex bidens*	Mud Dock
MH	*Lilaeopsis polyantha*	Australian Lilaeopsis
MH	*Lepilaena bilocularis*	Small-fruit Water-mat
SH	*Lemna disperma*	Common Duckweed
SH	*Azolla filiculoides*	Pacific Azolla
SH	*Wolffia australiana*	Tiny Duckweed
SH	*Mimulus repens*	Creeping Monkey-flower
LTG	*Triglochin procerum s.l.*	Water Ribbons
LTG	*Juncus ingens*	Giant Rush
LNG	*Schoenoplectus tabernaemontani*	River Club-sedge
LNG	*Phragmites australis*	Common Reed
LNG	*Typha domingensis*	Cumbungi
LNG	*Typha orientalis*	Broad-leaf Cumbungi
MNG	*Lepilaena cylindrocarpa*	Long-fruit Water-mat
MNG	*Eleocharis acuta*	Common Spike-sedge

Recruitment:
Episodic/Flood: desirable period of disturbance is every five years

Organic Litter:
10% cover

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
MH	*Cotula coronopifolia*	Water Buttons	high	high
MNG	*Paspalum distichum*	Water Couch	high	high

Victoria The Place To Be

Appendix 11: Native Vegetation Removal report – (NVR)

Native Vegetation Removal Report

NVRR ID: 370_20241010_HLO

This report provides information to support an application to remove, destroy or lop native vegetation in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation* (the Guidelines). This report is **not an assessment by DEECA** of the proposed native vegetation removal. Native vegetation information and offset requirements have been determined using spatial data provided by the applicant or their consultant.

Report details

Date created: 10/10/2024

Local Government Area:
SOUTH GIPPSLAND SHIRE
WELLINGTON SHIRE

Shapefile name: Edited.shp

Site assessor name:
Arend Kwak
Dean Karopoulos

Registered Aboriginal Party: Gunaikurnai

Coordinates: 146.61491, -38.62815

Address:
7618 SOUTH GIPPSLAND HIGHWAY GELLIONDALE 3971
SOUTH GIPPSLAND HIGHWAY HEDLEY 3967
7167 SOUTH GIPPSLAND HIGHWAY HEDLEY 3967
174 OLD ALBERTON WEST ROAD ALBERTON 3971
614 BARRY ROAD AGNES 3962
OLD ALBERTON WEST ROAD ALBERTON 3971
7913 SOUTH GIPPSLAND HIGHWAY ALBERTON 3971
6950 SOUTH GIPPSLAND HIGHWAY HEDLEY 3967
212 OLD ALBERTON WEST ROAD ALBERTON 3971
7890 SOUTH GIPPSLAND HIGHWAY ALBERTON 3971
(3 additional addresses not listed)

Regulator Notes

Removal polygons are located:

- On Crown Land

Summary of native vegetation to be removed

Assessment pathway	**Detailed Assessment Pathway**		
Location category	Location 2 The native vegetation extent map indicates that this area is typically characterised as supporting native vegetation. Additionally, it is modelled as encompassing an endangered Ecological Vegetation Class, sensitive wetland or sensitive coastal area. The removal of less than 0.5 hectares of native vegetation in this area will not require a Species Offset.		
Total extent including past and proposed removal (ha) *Includes endangered EVCs (ha): 1.081*	**1.244**	*Extent of past removal (ha)*	*0*
		Extent of proposed removal - Patches (ha)	*1.244*
		Extent of proposed removal - Scattered Trees (ha)	*0.000*
No. Large Trees proposed to be removed	**2**	*No. Large Patch Trees*	*2*
		No. Large Scattered Trees	*0*
No. Small Scattered Trees	0		

Offset requirements if approval is granted

Any approval granted will include a condition to obtain an offset, before the removal of native vegetation, that meets the following requirements:

General Offset amount [1]	**0.4320 General Habitat Units**
Vicinity	West Gippsland CMA or SOUTH GIPPSLAND SHIRE LGA, WELLINGTON SHIRE LGA
Minimum strategic biodiversity value score [2]	0.3056
Large Trees*	2
***The total number of Large Trees that the offset must protect**	**2** Large Trees to be protected in either the General, Species or combination across all habitat units protected

NB: values within tables in this document may not add to the totals shown above due to rounding
Appendix 1 includes information about the native vegetation to be removed
Appendix 2 includes information about the rare or threatened species with mapped habitat at the site
Appendix 3 includes the following figures

- Location map
- Strategic Biodiversity Value map
- Condition map
- Endangered EVCs map
- Aerial photograph showing mapped native vegetation
- Property in context
- Habitat Importance maps

1. The General Offset amount required is the sum of all General Habitat Units in Appendix 1.
2. Minimum strategic biodiversity value score is 80 per cent of the weighted average score across habitat zones where a General Offset is required.
3. The Species Offset amount(s) required is the sum of all Species Habitat Units in Appendix 1.

Next steps

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

If you wish to remove the mapped native vegetation you are required to apply for approval from the responsible authority. The responsible authority will refer your application to DEECA for assessment, as required. **This report is not a referral assessment by DEECA.**

This *Native vegetation removal report* must be submitted with your application for approval to remove, destroy or lop native vegetation.

Refer to the Guidelines for a full list of application requirements This report provides information that meets the following application requirements:

- The assessment pathway and reason for the assessment pathway.
- A description of the native vegetation to be removed (partly met).
- Maps showing the native vegetation and property (partly met).
- Information about the impacts on rare or threatened species.
- The offset requirements determined in accordance with Section 5 of the Guidelines that apply if approval is granted to remove native vegetation.

Additional application requirements must be met including:

- Topographical and land information
- Recent dated photographs.
- Details of past native vegetation removal.
- An avoid and minimise statement.
- A copy of any Property Vegetation Plan as applicable.
- A defendable space statement as applicable.
- A statement about the Native Vegetation Precinct Plan (NVPP) as applicable.
- A site assessment report including a habitat hectare assessment of any patches of native vegetation and details of trees.
- An offset statement that explains that an offset has been identified and how it will be secured.

Appendix 1: Description of native vegetation to be removed

The Species-General Offset Test was applied to your proposal. This test determines if the proposed removal of native vegetation has a proportional impact on any rare or threatened species habitats above the Species Offset threshold. The threshold is set at 0.005 per cent of the mapped habitat value for a species. When the proportional impact meets or exceeds the Species Offset threshold, a Species Offset is required. This test is completed for all species with mapped habitat at the site. Multiple Species Offsets will be required if the Species Offset threshold is exceeded for multiple species.

Where a zone requires Species Offset(s), the Species Habitat Units for each species in that zone are calculated by the following equation in accordance with the Guidelines: ***Species Habitat Units = extent without overlap x condition score x species landscape factor x 2, where the species landscape factor = 0.5 + (habitat importance score/2)***

The Species Offset amount(s) required is the sum of all Species Habitat Units per zone.

Where a zone does not require a Species Offset, the General Habitat Units in that zone are calculated by the following equation in accordance with the Guidelines: ***General Habitat Units = extent without overlap x condition score x general landscape factor x 1.5, where the general landscape factor = 0.5 + (strategic biodiversity value score/2)***

The General Offset amount required is the sum of all General Habitat Units per zone.

Native vegetation to be removed

Information provided by or on behalf of the applicant							Information calculated by NVR Map						
Zone	**Type**	**DBH (cm)**	**EVC code**	**Bioregional conservation status**	**Partial Removal**	**Condition score**	**Large Tree(s)**	**Polygon extent (ha)**	**Extent without overlap (ha)**	**SBV score**	**HI Score**	**Habitat Units**	**Offset Type**
1-AA	Patch	-	GipP0821	Endangered	no	0.460	-	0.003	0.003	0.450	-	0.001	General
1-AB	Patch	-	GipP0653	Endangered	no	0.210	-	0.001	0.001	0.440	-	0.000	General
1-AEone	Patch	-	GipP0053	Endangered	no	0.300	-	0.013	0.013	0.260	-	0.004	General

Information provided by or on behalf of the applicant							Information calculated by NVR Map						
Zone	**Type**	**DBH (cm)**	**EVC code**	**Bioregional conservation status**	**Partial Removal**	**Condition score**	**Large Tree(s)**	**Polygon extent (ha)**	**Extent without overlap (ha)**	**SBV score**	**HI Score**	**Habitat Units**	**Offset Type**
1-AEtwo	Patch	-	GipP0053	Endangered	no	0.300	-	0.018	0.018	0.285	-	0.005	General
1-AF	Patch	-	GipP0053	Endangered	no	0.300	-	0.025	0.025	0.241	-	0.007	General
1-AG	Patch	-	GipP0053	Endangered	no	0.300	-	0.023	0.023	0.193	-	0.006	General
1-AH	Patch	-	GipP0053	Endangered	no	0.300	-	0.170	0.170	0.197	-	0.046	General
1-AIone	Patch	-	GipP0053	Endangered	no	0.300	-	0.032	0.032	0.190	-	0.008	General
1-AItwo	Patch	-	GipP0053	Endangered	no	0.300	-	0.067	0.067	0.200	-	0.018	General
1-AM	Patch	-	GipP0053	Endangered	no	0.230	-	0.010	0.010	0.190	-	0.002	General
1-AN	Patch	-	GipP0053	Endangered	no	0.230	-	0.006	0.006	0.190	-	0.001	General
1-Aone	Patch	-	GipP0653	Endangered	no	0.390	-	0.003	0.003	0.370	-	0.001	General
1-Atwo	Patch	-	GipP0653	Endangered	no	0.390	-	0.002	0.002	0.380	-	0.001	General
1-BUone	Patch	-	GipP0053	Endangered	no	0.270	-	0.008	0.008	0.230	-	0.002	General
1-BUtwo	Patch	-	GipP0053	Endangered	no	0.270	-	0.010	0.010	0.230	-	0.003	General

Information provided by or on behalf of the applicant							Information calculated by NVR Map						
Zone	**Type**	**DBH (cm)**	**EVC code**	**Bioregional conservation status**	**Partial Removal**	**Condition score**	**Large Tree(s)**	**Polygon extent (ha)**	**Extent without overlap (ha)**	**SBV score**	**HI Score**	**Habitat Units**	**Offset Type**
1-CB	Patch	-	GipP0053	Endangered	no	0.480	-	0.007	0.007	0.220	-	0.003	General
1-CCone	Patch	-	GipP0053	Endangered	no	0.480	-	0.002	0.002	0.220	-	0.001	General
1-CCtwo	Patch	-	GipP0053	Endangered	no	0.480	-	0.002	0.002	0.220	-	0.001	General
1-CFone	Patch	-	GipP0053	Endangered	no	0.250	-	0.003	0.003	0.380	-	0.001	General
1-CFtwo	Patch	-	GipP0053	Endangered	no	0.250	-	0.046	0.046	0.380	-	0.012	General
1-CH	Patch	-	GipP0053	Endangered	no	0.210	-	0.030	0.030	0.380	-	0.007	General
1-CI	Patch	-	GipP0053	Endangered	no	0.220	-	0.060	0.060	0.380	-	0.014	General
1-CJone	Patch	-	GipP0053	Endangered	no	0.280	-	0.013	0.013	0.390	-	0.004	General
1-CJtwo	Patch	-	GipP0053	Endangered	no	0.280	-	0.015	0.015	0.390	-	0.004	General
1-CL	Patch	-	GipP0053	Endangered	no	0.270	-	0.005	0.005	0.210	-	0.001	General
1-CM	Patch	-	GipP0053	Endangered	no	0.270	-	0.010	0.010	0.890	-	0.004	General
1-CN	Patch	-	GipP0053	Endangered	no	0.330	-	0.011	0.011	0.450	-	0.004	General

Information provided by or on behalf of the applicant							Information calculated by NVR Map						
Zone	**Type**	**DBH (cm)**	**EVC code**	**Bioregional conservation status**	**Partial Removal**	**Condition score**	**Large Tree(s)**	**Polygon extent (ha)**	**Extent without overlap (ha)**	**SBV score**	**HI Score**	**Habitat Units**	**Offset Type**
1-Cone	Patch	-	GipP0653	Endangered	no	0.260	-	0.002	0.002	0.380	-	0.001	General
1-Ctwo	Patch	-	GipP0653	Endangered	no	0.260	-	0.036	0.036	0.380	-	0.010	General
1-D	Patch	-	GipP0053	Endangered	no	0.260	-	0.010	0.010	0.380	-	0.003	General
1-DA	Patch	-	GipP0048	Least Concern	no	0.620	-	0.059	0.059	0.754	-	0.048	General
1-DC	Patch	-	GipP0048	Least Concern	no	0.450	1	0.019	0.019	0.640	-	0.011	General
1-DD	Patch	-	GipP0048	Least Concern	no	0.740	1	0.056	0.056	0.640	-	0.051	General
1-DH	Patch	-	GipP0053	Endangered	no	0.280	-	0.017	0.017	0.260	-	0.004	General
1-DI	Patch	-	GipP0151	Vulnerable	no	0.340	-	0.030	0.030	0.430	-	0.011	General
1-Fone	Patch	-	GipP0053	Endangered	no	0.430	-	0.012	0.012	0.370	-	0.005	General
1-Fthree	Patch	-	GipP0053	Endangered	no	0.430	-	0.014	0.014	0.391	-	0.006	General
1-Ftwo	Patch	-	GipP0053	Endangered	no	0.430	-	0.018	0.018	0.370	-	0.008	General
1-I	Patch	-	GipP0053	Endangered	no	0.450	-	0.011	0.011	0.458	-	0.005	General
1-J	Patch	-	GipP0053	Endangered	no	0.400	-	0.010	0.010	0.450	-	0.004	General

Information provided by or on behalf of the applicant							Information calculated by NVR Map						
Zone	**Type**	**DBH (cm)**	**EVC code**	**Bioregional conservation status**	**Partial Removal**	**Condition score**	**Large Tree(s)**	**Polygon extent (ha)**	**Extent without overlap (ha)**	**SBV score**	**HI Score**	**Habitat Units**	**Offset Type**
1-K	Patch	-	GipP0053	Endangered	no	0.350	-	0.006	0.006	0.450	-	0.002	General
1-Lone	Patch	-	GipP0053	Endangered	no	0.350	-	0.035	0.035	0.459	-	0.013	General
1-Ltwo	Patch	-	GipP0053	Endangered	no	0.350	-	0.018	0.018	0.460	-	0.007	General
1-Mone	Patch	-	GipP0053	Endangered	no	0.270	-	0.001	0.001	0.440	-	0.000	General
1-Mtwo	Patch	-	GipP0053	Endangered	no	0.270	-	0.012	0.012	0.445	-	0.003	General
1-Q	Patch	-	GipP0053	Endangered	no	0.270	-	0.211	0.211	0.432	-	0.061	General
1-R	Patch	-	GipP0053	Endangered	no	0.220	-	0.073	0.073	0.460	-	0.018	General

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

This table identifies all rare or threatened species with mapped habitat at the site and the proportional impact associated with the proposed native vegetation removal.

Species common name	Species scientific name	Taxon ID	Conservation status	Group	Habitat impacted	Proportional impact (%)
King Quail	Coturnix chinensis victoriae	10012	Endangered	Dispersed	Habitat importance map	0.0003
Eastern Spider-orchid	Caladenia orientalis	503660	Endangered	Dispersed	Habitat importance map	0.0002
Pacific Golden Plover	Pluvialis fulva	10137	Vulnerable	Dispersed	Habitat importance map	0.0001
Grey-tailed Tattler	Tringa brevipes	10155	Critically endangered	Dispersed	Habitat importance map	0.0001
Terek Sandpiper	Xenus cinereus	10160	Endangered	Dispersed	Habitat importance map	0.0001
Orange-bellied Parrot	Neophema chrysogaster	10305	Critically endangered	Dispersed	Habitat importance map	0.0001
Glossy Grass Skink	Pseudemoia rawlinsoni	12683	Vulnerable	Dispersed	Habitat importance map	0.0001
Strzelecki Gum	Eucalyptus strzeleckii	504558	Vulnerable	Dispersed	Habitat importance map	0.0001
Annual Fireweed	Senecio glomeratus subsp. longifructus	507144	Rare	Dispersed	Habitat importance map	0.0001
Lewin's Rail	Lewinia pectoralis pectoralis	10045	Vulnerable	Dispersed	Habitat importance map	0.0000
Ruddy Turnstone	Arenaria interpres	10129	Vulnerable	Dispersed	Habitat importance map	0.0000
Lesser Sand Plover	Charadrius mongolus	10139	Critically endangered	Dispersed	Habitat importance map	0.0000
Grey Goshawk	Accipiter novaehollandiae novaehollandiae	10220	Vulnerable	Dispersed	Habitat importance map	0.0000
Elegant Parrot	Neophema elegans	10307	Vulnerable	Dispersed	Habitat importance map	0.0000

Species common name	Species scientific name	Taxon ID	Conservation status	Group	Habitat impacted	Proportional impact (%)
Ground Parrot	Pezoporus wallicus wallicus	10311	Endangered	Dispersed	Habitat importance map	0.0000
White-throated Needletail	Hirundapus caudacutus	10334	Vulnerable	Dispersed	Habitat importance map	0.0000
Chestnut-rumped Heathwren	Calamanthus pyrrhopygius	10498	vulnerable	Dispersed	Habitat importance map	0.0000
Swamp Skink	Lissolepis coventryi	12407	Vulnerable	Dispersed	Habitat importance map	0.0000
Southern Toadlet	Pseudophryne semimarmorata	13125	Vulnerable	Dispersed	Habitat importance map	0.0000
Sticky Wattle	Acacia howittii	500044	Rare	Dispersed	Habitat importance map	0.0000
Grey Mangrove	Avicennia marina subsp. australasica	500345	Rare	Dispersed	Habitat importance map	0.0000
Variable Bossiaea	Bossiaea heterophylla	500438	Rare	Dispersed	Habitat importance map	0.0000
Bog Gum	Eucalyptus kitsoniana	501290	Rare	Dispersed	Habitat importance map	0.0000
Salt Lawrencia	Lawrencia spicata	501888	Rare	Dispersed	Habitat importance map	0.0000
Maroon Leek-orchid	Prasophyllum frenchii	502709	Endangered	Dispersed	Habitat importance map	0.0000
Fisch's Greenhood	Pterostylis fischii	502795	Rare	Dispersed	Habitat importance map	0.0000
Shingle Fireweed	Senecio diaschides	503103	Rare	Dispersed	Habitat importance map	0.0000
Naked Sun-orchid	Thelymitra circumsepta	503383	Vulnerable	Dispersed	Habitat importance map	0.0000
Swamp Everlasting	Xerochrysum palustre	503763	Vulnerable	Dispersed	Habitat importance map	0.0000
Gippsland Lakes Peppermint	Eucalyptus arenicola	504479	Rare	Dispersed	Habitat importance map	0.0000
Parsley Xanthosia	Xanthosia leiophylla	504562	Rare	Dispersed	Habitat importance map	0.0000
Green-striped Greenhood	Pterostylis chlorogramma	504728	Vulnerable	Dispersed	Habitat importance map	0.0000

Species common name	Species scientific name	Taxon ID	Conservation status	Group	Habitat impacted	Proportional impact (%)
Silky Kidney-weed	Dichondra sp. 1	505786	Rare	Dispersed	Habitat importance map	0.0000

Habitat Group

- Highly localised habitat means there is 2,000 hectares or less mapped habitat for the species.
- Dispersed habitat means there is more than 2,000 hectares of mapped habitat for the species.

Habitat Impacted

The Species General Offset test, as described in Section 5.3.1 of the Guidelines, is used to determine if proposed native vegetation removal will result in a proportionally significant impact on the habitat value of rare or threatened species. The test is applied where the native vegetation proposed for removal:

- Intersects the Habitat Importance Map for a rare or threatened species; or
- Intersects the 'top ranking' modelled habitat for a rare or threatened species with dispersed habitat, as identified in its Top Ranking Habitat Importance Map.

Top Ranking Maps consist of the 2,000 hectares of habitat with the highest Habitat Importance Scores for each dispersed species.

The 'Habitat impacted' column identifies whether the Habitat Importance Map or its Top Ranking Map was used to determine the proportional impact for a species with dispersed habitat.

Appendix 3: Images of mapped native vegetation

1. Property in context

Proposed Removal
Past Removal
Partial Removal
Property Boundaries

N

3500 m

2. Aerial photograph showing mapped native vegetation

Proposed Removal

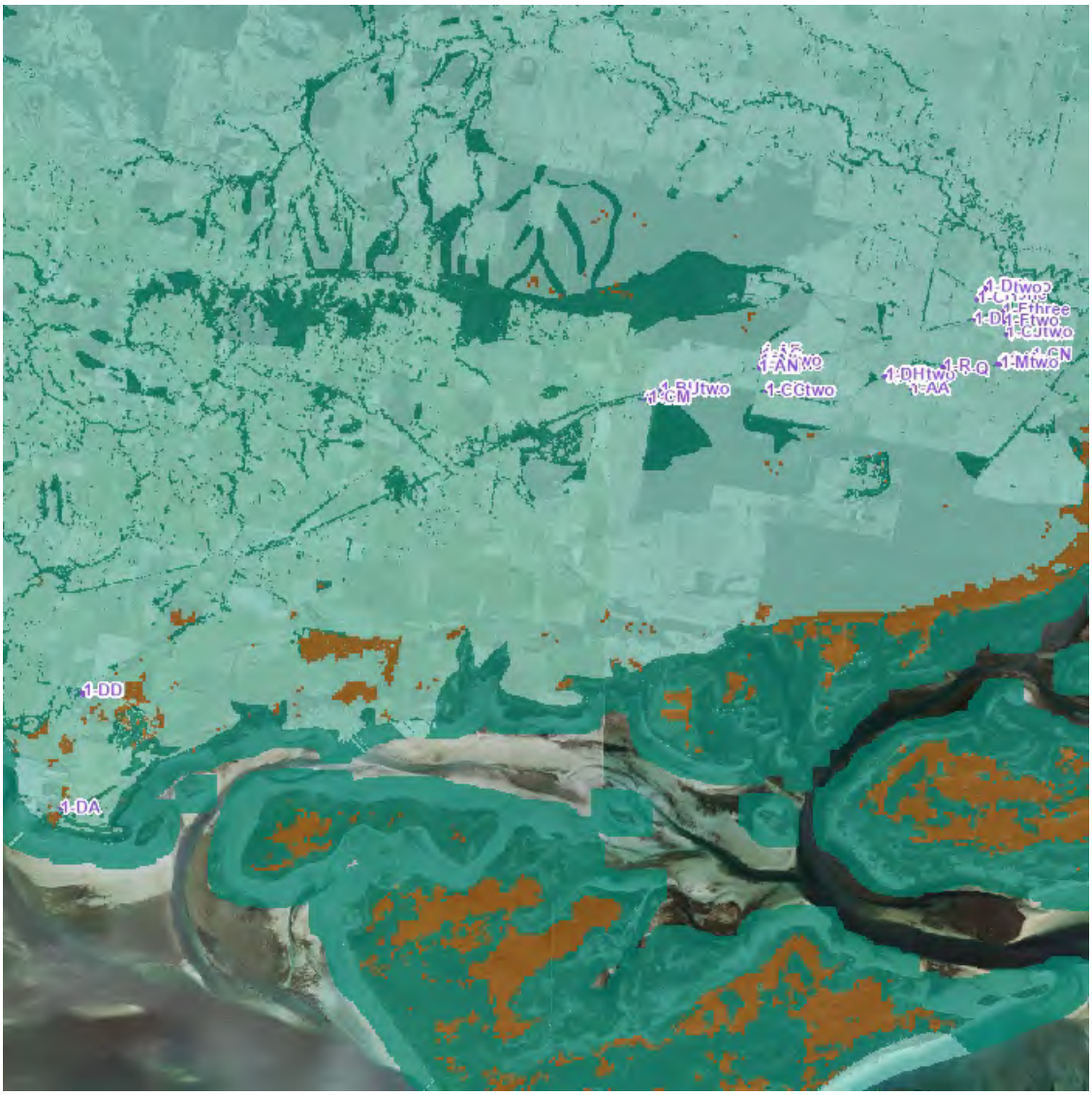
Past Removal

Partial Removal

N

3500 m

3. Location Risk Map



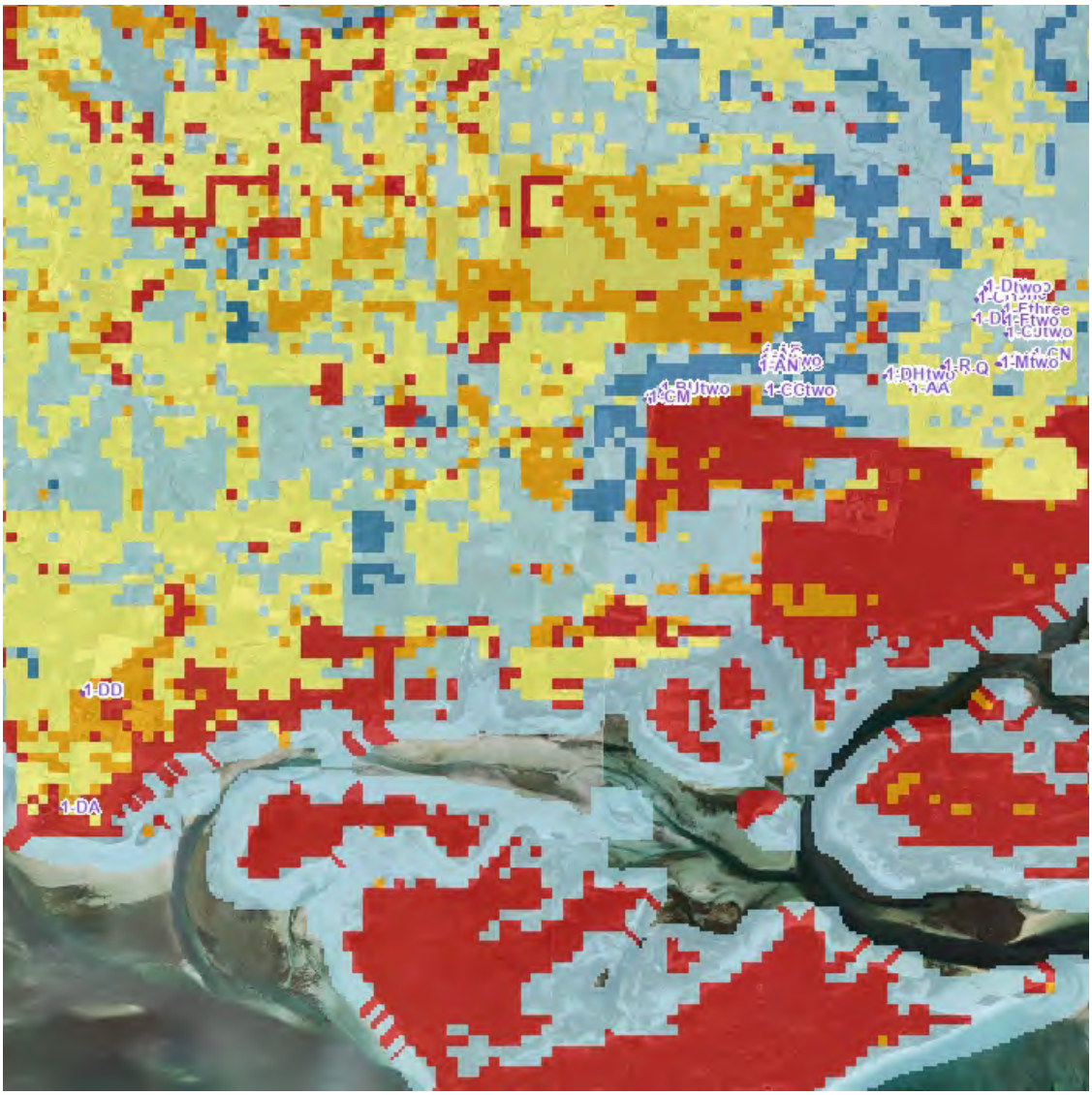
Proposed Removal
Past Removal
Partial Removal

Location 1
Location 2
Location 3

N

3500 m

4. Strategic Biodiversity Value Score Map



Proposed Removal
Past Removal
Partial Removal

0.81 - 1.00
0.61 - 0.80
0.41 - 0.60
0.21 - 0.40
0.00 - 0.20

N

3500 m

5. Modelled Condition Score Map

Proposed Removal
Past Removal
Partial Removal

0.81 - 1.00
0.61 - 0.80
0.41 - 0.60
0.21 - 0.40
0.00 - 0.20

N

3500 m

6. Modelled Endangered EVCs

Proposed Removal

Past Removal

Partial Removal

Endangered 1750 Ecological Vegetation Classes

N

3500 m

7. Habitat Importance maps

Not Applicable

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Appendix 12: Availability of required Offsets (DEECA search results)

Report of available native vegetation credits

This report lists native vegetation credits available to purchase through the Native Vegetation Credit Register.

This report is **not evidence** that an offset has been secured. An offset is only secured when the units have been purchased and allocated to a permit or other approval and an allocated credit extract is provided by the Native Vegetation Credit Register.

Date and time: 23/10/2024 10:34 **Report ID: 26950**

What was searched for?

General offset

General habitat units	Strategic biodiversity value	Large trees	Vicinity (Catchment Management Authority or Municipal district)	
0.432	0.3056	2	LGA	Wellington Shire

Details of available native vegetation credits on 23 October 2024 10:34

These sites meet your requirements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
BBA-0138	11.887	1186	West Gippsland	Wellington Shire	Yes	Yes	No	Ecocentric
BBA-0138	12.119	419	West Gippsland	Wellington Shire	Yes	Yes	No	Ecocentric
BBA-0759	18.868	659	West Gippsland	Wellington Shire	Yes	Yes	No	Contact NVOR
BBA-2833	5.401	20	West Gippsland	Wellington Shire	Yes	Yes	No	Ethos
BBA-2875	32.836	1037	West Gippsland	Wellington Shire	Yes	Yes	No	Abezco
VC_CFL-3797_01	16.033	941	West Gippsland	Wellington Shire	Yes	Yes	No	Bio Offsets, Ecocentric, VegLink

These sites meet your requirements using alternative arrangements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)

There are no sites listed in the Native Vegetation Credit Register that meet your offset requirements when applying the alternative arrangements as listed in section 11.2 of the Guidelines for the removal, destruction or lopping of native vegetation.

These potential sites are not yet available, land owners may finalise them once a buyer is confirmed.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)

There are no potential sites listed in the Native Vegetation Credit Register that meet your offset requirements.

Next steps

If applying for approval to remove native vegetation
Attach this report to an application to remove native vegetation as evidence that your offset requirement is currently available.

If you have approval to remove native vegetation
Below are the contact details for all brokers. Contact the broker(s) listed for the credit site(s) that meet your offset requirements. These are shown in the above tables. If more than one broker or site is listed, you should get more than one quote before deciding which offset to secure.

Broker contact details

Broker Abbreviation	Broker Name	Phone	Email	Website
Abezco	Abzeco Pty. Ltd.	(03) 9431 5444	offsets@abzeco.com.au	www.abzeco.com.au
Baw Baw SC	Baw Baw Shire Council	(03) 5624 2411	bawbaw@bawbawshire.vic.gov.au	www.bawbawshire.vic.gov.au
Bio Offsets	Biodiversity Offsets Victoria	0452 161 013	info@offsetsvictoria.com.au	www.offsetsvictoria.com.au
Contact NVOR	Native Vegetation Offset Register	136 186	nativevegetation.offsetregister@deeca.vic.gov.au	www.environment.vic.gov.au/native-vegetation
Ecocentric	Ecocentric Environmental Consulting	0410 564 139	ecocentric@me.com	Not avaliable
Ethos	Ethos NRM Pty Ltd	(03) 5153 0037	offsets@ethosnrm.com.au	www.ethosnrm.com.au
Nillumbik SC	Nillumbik Shire Council	(03) 9433 3316	offsets@nillumbik.vic.gov.au	www.nillumbik.vic.gov.au
TFN	Trust for Nature	8631 5888	offsets@tfn.org.au	www.trustfornature.org.au
VegLink	Vegetation Link Pty Ltd	(03) 8578 4250 or 1300 834 546	offsets@vegetationlink.com.au	www.vegetationlink.com.au
Yarra Ranges SC	Yarra Ranges Shire Council	1300 368 333	biodiversityoffsets@yarraranges.vic.gov.au	www.yarraranges.vic.gov.au

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For more information contact the DEECA Customer Service Centre 136 186 or the Native Vegetation Credit Register at nativevegetation.offsetregister@delwp.vic.gov.au

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Obtaining this publication does not guarantee that the credits shown will be available in the Native Vegetation Credit Register either now or at a later time when a purchase of native vegetation credits is planned.

Notwithstanding anything else contained in this publication, you must ensure that you comply with all relevant laws, legislation, awards or orders and that you obtain and comply with all permits, approvals and the like that affect, are applicable or are necessary to undertake any action to remove, lop or destroy or otherwise deal with any native vegetation or that apply to matters within the scope of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes

Appendix 9: Waterbird species recorded in Corner Inlet Ramsar Site (BMT WBM 2011)

The following list of waterbird species recorded at the Corner Inlet Ramsar site was compiled by BMT WBM (2011). Cr = Critically Endangered, En = Endangered, Vu = Vulnerable.

Common Name	Species Name	EPBC Act	FFG Act
Australasian Darter	*Anhinga novaehollandiae*	–	–
Australasian Gannet	*Morus serrator*	–	–
Australasian Grebe	*Tachybaptus novaehollandiae*	–	–
Australian Gull-billed Tern	*Gelochelidon nilotica*	Migratory	En
Australasian Shoveler	*Anas rhynchotis*	–	Vu
Australian Pelican	*Pelecanus conspicillatus*	–	–
Australian Pied Oystercatcher	*Haematopus longirostris*	–	–
Australian Shelduck	*Tadorna tadornoides*	–	–
Australian Spotted Crake	*Porzana fluminea*	–	–
Australian White Ibis	*Threskiornis molucca*	–	–
Australian Wood Duck	*Chenonetta jubata*	–	–
Banded Lapwing	*Vanellus tricolor*	–	–
Banded Stilt	*Cladorhynchus leucocephalus*	–	–
Bar-tailed Godwit	*Limosa lapponica*	Migratory	Vu
Black Swan	*Cygnus atratus*	–	–
Black-faced Cormorant	*Phalacrocorax fuscescens*	–	–
Black-fronted Dotterel	*Elseyornis melanops*	–	–
Black-tailed Godwit	*Limosa limosa*	Migratory	Cr
Black-tailed Native-Hen	*Tribonyx ventralis*	–	–
Black-Winged Stilt	*Himantopus himantopus*	–	–
Blue-billed Duck	*Oxyura australis*	–	Vu
Buff-banded Rail	*Gallirallus philippensis*	–	–
Cape Barren Goose	*Cereopsis novaehollandiae*	–	–
Caspian Tern	*Hydroprogne caspia*	Migratory	–
Cattle Egret	*Ardea ibis*	–	–
Chestnut Teal	*Anas castanea*	–	–
Common Greenshank	*Tringa nebularia*	En, Migratory	En
Common Sandpiper	*Actitis hypoleucos*	Migratory	Vu
Common Tern	*Sterna hirundo*	Migratory	–
Curlew Sandpiper	*Calidris ferruginea*	Cr, Migratory	Cr
Double-banded Plover	*Charadrius bicinctus*	Migratory	–
Dusky Moorhen	*Gallinula tenebrosa*	–	–

Eastern Curlew	*Numenius madagascariensis*	Cr, Migratory	Cr
Eastern Great Egret	*Ardea modesta*	Migratory	Vu
Eurasian Coot	*Fulica atra*	–	–
Fairy Tern	*Sternula nereis*	Vu	Cr
Glossy Ibis	*Plegadis falcinellus*	Migratory	–
Great Cormorant	*Phalacrocorax carbo*	–	–
Great Crested Grebe	*Podiceps cristatus*	–	–
Greater Crested Tern	*Thalasseus bergii*	Migratory	–
Great Knot	*Calidris tenuirostris*	Vu, Migratory	Cr
Greater Sand Plover	*Charadrius leschenaultii*	Vu	Vu
Grey Plover	*Pluvialis squatarola*	Vu	Vu
Grey Teal	*Anas gracilis*	–	–
Grey-tailed Tattler	*Heteroscelus brevipes*	Migratory	Cr
Hardhead	*Aythya australis*	–	–
Hoary-headed Grebe	*Poliocephalus poliocephalus*	–	–
Hooded Plover	*Thinornis rubricollis*	Vu	Vu
Kelp Gull	*Larus dominicanus*	–	–
Latham's Snipe	*Gallinago hardwickii*	Vu, Migratory	Vu
Lesser Sand Plover	*Charadrius mongolus*	En, Migratory	En
Lewin's Rail	*Lewinia pectoralis*	–	Vu
Little Black Cormorant	*Phalacrocorax sulcirostris*	–	–
Little Egret	*Egretta garzetta*	–	En
Little Penguin	*Eudyptula minor*	–	–
Little Pied Cormorant	*Microcarbo melanoleucos*	–	–
Little Tern	*Sternula albifrons*	Vu, Migratory	Cr
Marsh Sandpiper	*Tringa stagnatilis*	Migratory	En
Masked Lapwing	*Vanellus miles*	–	–
Musk Duck	*Biziura lobata*	–	Vu
Nankeen Night Heron	*Nycticorax caledonicus*	–	–
Oriental Pratincole	*Glareola maldivarum*	Migratory	–
Pacific Black Duck	*Anas superciliosa*	–	–
Pacific Golden Plover	*Pluvialis fulva*	Migratory	Vu
Pacific Gull	*Larus pacificus*	–	Listed
Pectoral Sandpiper	*Calidris melanotos*	Migraotry	–
Pied Cormorant	*Phalacrocorax varius*	–	–
Pink-Eared Duck	*Malacorhynchus membranaceus*	–	–
Plumed Egret	*Ardea intermedia*	–	Cr
Purple Swamphen	*Porphyrio porphyrio*	–	–
Red Knot	*Calidris canutus*	Vu, Migratory	En
Red-capped Plover	*Charadrius ruficapillus*	–	–

Red-kneed Dotterel	*Erythrogonys cinctus*	–	–
Red-necked Avocet	*Recurvirostra novaehollandiae*	–	–
Red-necked Stint	*Calidris ruficollis*	Migratory	–
Royal Spoonbill	*Platalea regia*	–	–
Ruddy Turnstone	*Arenaria interpres*	Vu, Migratory	Vu
Sanderling	*Calidris alba*	–	–
Sharp-tailed Sandpiper	*Calidris acuminata*	Vu, Migratory	–
Short-Tailed Shearwater	*Ardenna tenuirostris*	Migratory	–
Silver Gull	*Chroicocephalus novaehollandiae*	–	–
Sooty Oystercatcher	*Haematopus fuliginosus*	–	–
Spotless Crake	*Porzana tabuensis*	–	–
Straw-necked Ibis	*Threskiornis spinicollis*	–	–
Terek Sandpiper	*Xenus cinereus*	Vu, Migratory	En
Whimbrel	*Numenius phaeopus*	Migratory	En
Whiskered Tern	*Chlidonias hybrida*	–	–
White-faced Heron	*Egretta novaehollandiae*	–	–
White-fronted Tern	*Sterna striata*	–	–
White-necked Heron	*Ardea pacifica*	–	–
White-winged Black Tern	*Chlidonias leucopterus*	Migratory	–
Wood Sandpiper	*Tringa glareola*	Migratory	En
Yellow-billed Spoonbill	*Platalea flavipes*	–	–

Appendix 10: Detailed habitat hectare assessment results

Habitat Zone			A	B	C	D	E	F	G	H	I	J	K	L
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			653	53	653	53	53	53	53	53	53	53	53	53
Total area of Habitat Zone (ha)			0.0423	0.023	0.3231	0.0693	0.2816	0.6269	0.7241	1.241	0.071	0.066	0.095	0.375
Site Condition	Large Old Trees	/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	No. large trees in habitat zone		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Tree Canopy Cover	/5	NA	0	NA	0	0	3	0	0	0	3	3	3
	Lack of Weeds	/15	7	0	9	0	0	4	6	6	4	7	4	4
	Understorey	/25	5	5	5	5	5	15	5	5	15	5	5	5
	Recruitment	/10	10	0	0	10	10	6	10	10	10	10	10	10
	Organic Matter	/5	5	2	4	4	3	5	5	5	5	5	4	4
	Logs	/5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Site condition standardising multiplier*		1.36	1.25	1.36	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
	Site Condition subtotal		*37*	*9*	*24*	*24*	*23*	*41*	*33*	*33*	*43*	*38*	*33*	*33*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1	1	1	1	1
	Neighbourhood	/10	0	0	0	0	0	0	0	0	0	0	0	0
	Distance to Core	/5	1	1	1	1	1	1	1	1	1	1	1	1
Total Condition Score		**/100**	**39**	**11**	**26**	**26**	**25**	**43**	**35**	**35**	**45**	**40**	**35**	**35**

Habitat Zone			M	N	O	Q	R	S	T	U	V	W	X1	X2
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			53	53	53	53	53	53	53	53	821	53	821	821
Total area of Habitat Zone (ha)			0.106	0.037	0.010	0.227	0.073	0.023	0.077	0.699	0.063	0.036	0.275	0.036
Site Condition	Large Old Trees	/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	No. large trees in habitat zone		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Tree Canopy Cover	/5	0	0	0	0	3	0	0	3	NA	0	NA	NA
	Lack of Weeds	/15	0	4	7	0	0	4	0	0	7	0	9	9
	Understorey	/25	5	5	5	5	5	5	5	5	15	5	15	15
	Recruitment	/10	10	5	5	10	5	10	10	10	0	5	6	6
	Organic Matter	/5	5	3	3	5	3	5	5	4	5	4	5	5
	Logs	/5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Site condition standardising multiplier*		1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.36	1.25	1.36	1.36
	Site Condition subtotal		*25*	*21*	*25*	*25*	*20*	*30*	*25*	*28*	*37*	*18*	*48*	*48*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1	1	1	1	1
	Neighbourhood	/10	0	0	0	0	0	0	0	0	0	0	0	0
	Distance to Core	/5	1	1	1	1	1	1	1	1	1	1	1	1
Total Condition Score		**/100**	**27**	**23**	**27**	**27**	**22**	**32**	**27**	**30**	**39**	**20**	**50**	**50**

Habitat Zone			Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AK
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			821	821	821	653	53	53	53	53	53	53	53	53
Total area of Habitat Zone (ha)			0.062	0.054	0.192	0.005	0.100	0.110	0.011	0.063	0.023	0.013	0.084	0.240
Site Condition	Large Old Trees	/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	No. large trees in habitat zone		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Tree Canopy Cover	/5	NA	NA	NA	NA	0	0	0	0	0	0	3	0
	Lack of Weeds	/15	9	9	9	4	0	4	4	4	4	4	4	4
	Understorey	/25	15	15	15	5	5	5	5	5	5	5	5	5
	Recruitment	/10	3	6	3	0	6	10	10	6	6	6	5	3
	Organic Matter	/5	5	5	5	5	4	3	3	5	5	5	3	5
	Logs	/5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Site condition standardising multiplier*		1.36	1.36	1.36	1.36	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
	Site Condition subtotal		*44*	*48*	*44*	*19*	*19*	*28*	*28*	*25*	*25*	*25*	*25*	*21*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1	1	1	1	2
	Neighbourhood	/10	0	0	0	0	0	0	0	1	1	1	1	2
	Distance to Core	/5	1	1	1	1	1	1	1	3	3	3	3	3
Total Condition Score		**/100**	**46**	**50**	**46**	**21**	**21**	**30**	**30**	**30**	**30**	**30**	**30**	**28**

Habitat Zone			AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AX
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			53	53	53	53	53	53	53	53	53	53	48	48
Total area of Habitat Zone (ha)			0.190	0.010	0.005	0.066	0.079	0.098	0.150	0.130	0.170	0.063	0.085	0.048
Site Condition	Large Old Trees	/10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10	10
	No. large trees in habitat zone		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5	3
	Tree Canopy Cover	/5	0	0	0	0	0	0	0	0	0	0	3	5
	Lack of Weeds	/15	4	0	0	4	4	4	4	4	4	4	0	0
	Understorey	/25	5	5	5	5	5	5	5	5	5	5	5	5
	Recruitment	/10	3	5	5	5	5	5	5	5	5	5	3	3
	Organic Matter	/5	5	4	4	2	2	2	2	2	2	2	3	5
	Logs	/5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2	5
	Site condition standardising multiplier*		1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.00	1.00
	Site Condition subtotal		*21*	*18*	*18*	*20*	*20*	*20*	*20*	*20*	*20*	*20*	*26*	*33*
Landscape Context	Patch Size	/10	2	1	1	1	1	1	1	1	1	1	1	1
	Neighbourhood	/10	2	1	1	1	1	1	1	1	1	1	1	1
	Distance to Core	/5	3	3	3	3	3	3	3	3	3	3	3	3
Total Condition Score		**/100**	**28**	**23**	**23**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**31**	**38**

Habitat Zone			AZ	BA	BB	BC	BD	BE	BF	BG	BI	BK	BM	BM1
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			48	48	48	53	53	48	48	48	48	48	48	48
Total area of Habitat Zone (ha)			0.046	0.019	0.099	0.069	0.128	0.045	0.059	0.018	0.054	0.035	0.012	0.019
Site Condition	Large Old Trees	/10	9	10	10	NA	NA	10	10	10	10	10	0	0
	No. large trees in habitat zone		3	1	3	NA	NA	5	3	2	4	2	0	0
	Tree Canopy Cover	/5	5	3	5	3	0	3	3	5	3	3	3	3
	Lack of Weeds	/15	0	0	0	4	7	4	0	0	0	0	0	0
	Understorey	/25	5	5	5	5	5	5	5	5	5	5	5	5
	Recruitment	/10	3	3	5	6	5	3	0	5	0	5	5	5
	Organic Matter	/5	5	3	5	5	4	5	2	5	5	5	5	5
	Logs	/5	4	5	5	NA	NA	5	0	5	5	5	4	5
	Site condition standardising multiplier*		1.00	1.00	1.00	1.25	1.25	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Site Condition subtotal		*31*	*29*	*35*	*29*	*26*	*35*	*20*	*35*	*28*	*33*	*22*	*23*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1	1	1	1	1
	Neighbourhood	/10	1	1	1	1	1	1	1	1	1	1	1	1
	Distance to Core	/5	3	3	3	3	3	3	3	3	3	3	3	3
Total Condition Score		**/100**	**36**	**34**	**40**	**34**	**31**	**40**	**25**	**40**	**33**	**38**	**27**	**28**

Habitat Zone			BN	BN1	BO	BP	BQ	BR	BS	BT	BU	BW	BX	BY
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			48	48	48	48	48	53	53	48	48	48	53	53
Total area of Habitat Zone (ha)			0.019	0.029	0.130	0.510	0.150	0.005	0.011	0.320	0.151	0.180	0.096	7.400
Site Condition	Large Old Trees	/10	0	10	10	6	6	NA	NA	4	0	4	NA	NA
	No. large trees in habitat zone		0	1	4	4	1	NA	NA	1	0	1	NA	NA
	Tree Canopy Cover	/5	3	3	3	3	3	0	0	3	3	5	0	3
	Lack of Weeds	/15	0	0	0	4	4	0	0	0	0	0	4	9
	Understorey	/25	5	5	5	15	15	5	5	5	5	5	5	15
	Recruitment	/10	5	5	5	10	3	5	5	5	5	5	5	10
	Organic Matter	/5	5	5	5	3	5	4	4	5	5	3	4	5
	Logs	/5	5	5	5	5	2	NA	NA	4	4	4	NA	NA
	Site condition standardising multiplier*		1.00	1.00	1.00	1.00	1.00	1.25	1.25	1.00	1.00	1.00	1.25	1.25
	Site Condition subtotal		*23*	*33*	*33*	*46*	*38*	*18*	*18*	*26*	*22*	*26*	*23*	*53*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1	1	1	1	8
	Neighbourhood	/10	1	1	1	1	1	1	1	1	1	1	1	4
	Distance to Core	/5	3	3	3	3	3	3	3	3	3	3	3	3
Total Condition Score		**/100**	**28**	**38**	**38**	**51**	**43**	**23**	**23**	**31**	**27**	**31**	**28**	**68**

Habitat Zone			BZ	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			48	53	53	8	8	53	53	53	53	653	53	53
Total area of Habitat Zone (ha)			0.810	0.130	0.073	0.260	0.045	0.700	0.034	0.068	0.110	2.000	3.259	0.184
Site Condition	Large Old Trees	/10	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	No. large trees in habitat zone		12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Tree Canopy Cover	/5	5	0	0	NA	NA	0	0	0	0	NA	3	0
	Lack of Weeds	/15	9	4	4	9	9	0	0	0	0	4	4	0
	Understorey	/25	20	15	15	20	20	5	5	5	5	5	15	5
	Recruitment	/10	10	10	10	10	10	10	6	6	6	0	6	10
	Organic Matter	/5	5	5	5	5	5	3	4	4	5	5	5	5
	Logs	/5	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Site condition standardising multiplier*		1.00	1.25	1.25	1.36	1.36	1.25	1.25	1.25	1.25	1.36	1.25	1.25
	Site Condition subtotal		*59*	*43*	*43*	*60*	*60*	*23*	*19*	*19*	*20*	*19*	*41*	*25*
Landscape Context	Patch Size	/10	8	1	1	8	1	1	1	1	1	2	2	1
	Neighbourhood	/10	4	1	1	4	3	0	0	0	0	4	0	0
	Distance to Core	/5	4	3	3	4	3	1	1	1	1	3	1	1
Total Condition Score		**/100**	**75**	**48**	**48**	**76**	**67**	**25**	**21**	**21**	**22**	**28**	**44**	**27**

Habitat Zone			CM	CN	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			53	53	48	53	48	48	16	16	164	53	151	53
Total area of Habitat Zone (ha)			0.040	0.027	0.470	0.026	0.029	0.270	0.043	0.340	0.350	0.128	0.176	0.053
Site Condition	Large Old Trees	/10	NA	NA	6	NA	10	10	0	10	8	NA	6	NA
	No. large trees in habitat zone		NA	NA	3	0	1	11	0	18	3	NA	2	
	Tree Canopy Cover	/5	0	5	5	0	3	3	3	5	5	3	3	0
	Lack of Weeds	/15	0	4	4	4	0	7	0	4	0	4	4	0
	Understorey	/25	5	5	15	5	15	20	5	15	15	5	5	5
	Recruitment	/10	10	6	10	6	3	10	5	10	10	5	10	6
	Organic Matter	/5	5	5	5	5	4	5	5	5	5	3	3	4
	Logs	/5	NA	NA	2	NA	5	5	0	5	5	NA	0	NA
	Site condition standardising multiplier*		1.25	1.25	1.00	1.25	1.00	1.00	1.00	1.00	1.00	1.25	1.00	1.25
	Site Condition subtotal		*25*	*31*	*47*	*25*	*40*	*60*	*18*	*54*	*48*	*25*	*31*	*19*
Landscape Context	Patch Size	/10	1	1	8	1	1	8	1	1	2	2	2	1
	Neighbourhood	/10	0	0	3	1	1	2	0	0	0	0	0	0
	Distance to Core	/5	1	1	4	3	3	4	1	1	1	1	1	1
Total Condition Score		**/100**	**27**	**33**	**62**	**30**	**45**	**74**	**20**	**56**	**51**	**28**	**34**	**21**

Habitat Zone			EA	EB	EC	ED
Bioregion			GipP	GipP	GipP	GipP
EVC Number			53	53	53	821
Total area of Habitat Zone (ha)			0.019	0.030	0.037	0.070
Site Condition	Large Old Trees	/10	NA	NA	NA	NA
	No. large trees in habitat zone		NA	NA	NA	NA
	Tree Canopy Cover	/5	0	0	0	NA
	Lack of Weeds	/15	0	0	0	9
	Understorey	/25	5	5	5	15
	Recruitment	/10	5	5	0	6
	Organic Matter	/5	4	4	4	5
	Logs	/5	NA	NA	NA	NA
	Site condition standardising multiplier*		1.25	1.25	1.25	1.36
	Site Condition subtotal		*18*	*18*	*11*	*48*
Landscape Context	Patch Size	/10	1	1	1	1
	Neighbourhood	/10	1	1	1	0
	Distance to Core	/5	3	3	3	1
Total Condition Score		**/100**	**23**	**23**	**16**	**50**

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004).

Appendix 11: Details of large trees in patches and scattered trees recorded in the Project area and transport route

Tree no.	Common Name	Scientific Name	DBH (cm)	Habitat Category	Radius of TPZ (m)	Notes
1	Swamp Gum	*Eucalyptus ovata*	72	Large scattered tree	8.64	
2	Swamp Gum	*Eucalyptus ovata*	55	Large scattered tree	6.6	
3	Swamp Gum	*Eucalyptus ovata*	109	Large scattered tree	13.08	
4	Swamp Gum	*Eucalyptus ovata*	76	Large tree in patch	9.12	
5	Swamp Gum	*Eucalyptus ovata*	65	Large tree in patch	7.8	
6	Swamp Gum	*Eucalyptus ovata*	76	Large tree in patch	9.12	
7	Swamp Gum	*Eucalyptus ovata*	70	Large tree in patch	8.4	
8	Swamp Gum	*Eucalyptus ovata*	50	Large scattered tree	6	
9	Swamp Gum	*Eucalyptus ovata*	45	Small scattered tree	5.4	
10	Swamp Gum	*Eucalyptus ovata*	41	Small scattered tree	4.92	
11	Swamp Gum	*Eucalyptus ovata*	82	Large tree in patch	9.84	
12	Manna Gum	*Eucalyptus viminalis*	73	Large tree in patch	8.76	
13	Manna Gum	*Eucalyptus viminalis*	70	Large tree in patch	8.4	
14	Swamp Gum	*Eucalyptus ovata*	48	Small scattered tree	5.76	
15	Swamp Gum	*Eucalyptus ovata*	48	Small scattered tree	5.76	
16	Swamp Gum	*Eucalyptus ovata*	78	Large tree in patch	9.36	
17	Swamp Gum	*Eucalyptus ovata*	80	Large tree in patch	9.6	
18	Manna Gum	*Eucalyptus viminalis*	110	Large tree in patch	13.2	
19	Manna Gum	*Eucalyptus viminalis*	72	Large tree in patch	8.64	
20	Manna Gum	*Eucalyptus viminalis*	45	Small scattered tree	5.4	
21	Manna Gum	*Eucalyptus viminalis*	34	Small scattered tree	4.08	
22	Manna Gum	*Eucalyptus viminalis*	41	Small scattered tree	4.92	
23	Swamp Gum	Eucalyptus ovata	38	Small scattered tree	4.56	

Tree no.	Common Name	Scientific Name	DBH (cm)	Habitat Category	Radius of TPZ (m)	Notes
24	Swamp Gum	Eucalyptus ovata	85	Large tree in patch	10.2	
25	Swamp Gum	Eucalyptus ovata	77	Large tree in patch	9.24	
26	Swamp Gum	*Eucalyptus ovata*	116	Large tree in patch	13.92	Dead
27	Swamp Gum	Eucalyptus ovata	56	Large scattered tree	6.72	
28	Swamp Gum	Eucalyptus ovata	110	Large scattered tree	13.2	
29	Swamp Gum	Eucalyptus ovata	82	Large scattered tree	9.84	
30	Swamp Gum	Eucalyptus ovata	98	Large tree in patch	11.76	Dead
31	Swamp Gum	Eucalyptus ovata	82	Large tree in patch	9.84	
32	Swamp Gum	Eucalyptus ovata	82	Large tree in patch	9.84	
33	Swamp Gum	Eucalyptus ovata	98	Large tree in patch	11.76	
34	Swamp Gum	Eucalyptus ovata	84	Large tree in patch	10.08	
35	Swamp Gum	Eucalyptus ovata	81	Large scattered tree	9.72	Dead
36	Swamp Gum	Eucalyptus ovata	103	Large scattered tree	12.36	Health 50%
37	Swamp Gum	Eucalyptus ovata	40	Small scattered tree	4.8	
38	Swamp Gum	Eucalyptus ovata	41	Small scattered tree	4.92	
39	Swamp Gum	Eucalyptus ovata	51	Small scattered tree	6.12	
40	Swamp Gum	Eucalyptus ovata	71	Large scattered tree	8.52	
41	Swamp Gum	Eucalyptus ovata	43	Small scattered tree	5.16	
42	Swamp Gum	Eucalyptus ovata	93	Large tree in patch	11.16	
43	Swamp Gum	Eucalyptus ovata	54	Small scattered tree	6.48	
44	Swamp Gum	Eucalyptus ovata	60	Small scattered tree	7.2	
45	Swamp Gum	Eucalyptus ovata	38	Small scattered tree	4.56	
46	Swamp Gum	Eucalyptus ovata	76	Large tree in patch	9.12	
47	Swamp Gum	Eucalyptus ovata	107	Large tree in patch	12.84	

Tree no.	Common Name	Scientific Name	DBH (cm)	Habitat Category	Radius of TPZ (m)	Notes
48	Swamp Gum	Eucalyptus ovata	116	Large tree in patch	13.92	
49	Swamp Gum	Eucalyptus ovata	108	Large tree in patch	12.96	
50	Swamp Gum	Eucalyptus ovata	24	Small scattered tree	2.88	
51	Swamp Gum	Eucalyptus ovata	44	Small scattered tree	5.28	20% health
52	Swamp Gum	Eucalyptus ovata	78	Large tree in patch	9.36	Hollows
53	Swamp Gum	Eucalyptus ovata	34	Small scattered tree	4.08	
54	Eucalyptus	Eucalyptus sp.	53	Small scattered tree	6.36	Dead
55	Swamp Gum	Eucalyptus ovata	41	Small Scattered Tree	4.92	
56	Swamp Gum	Eucalyptus ovata	75	Large tree in patch	9	
57	Swamp Gum	Eucalyptus ovata	71	Large tree in patch	8.52	
58	Eucalyptus	Eucalyptus sp.	97	Large scattered tree	11.64	Dead
59	Eucalyptus	Eucalyptus sp.	81	Large scattered tree	9.72	Dead
60	Manna Gum	Eucalyptus viminalis	98	Large Tree in Patch	11.76	
61	Manna Gum	Eucalyptus viminalis	127	Large scattered tree	15.24	
62	Manna Gum	Eucalyptus viminalis	143	Large scattered tree	17.16	
63	Manna Gum	Eucalyptus viminalis	168	Large tree in patch	20.16	
64	Manna Gum	Eucalyptus viminalis	102	Large tree in patch	12.24	
65	Messmate Stringybark	*Eucalyptus obliqua*	101	Large tree in patch	12.12	
66	Manna Gum	Eucalyptus viminalis	86	Large tree in patch	10.32	
67	Manna Gum	Eucalyptus viminalis	101	Large tree in patch	12.12	
68	Messmate Stringybark	*Eucalyptus obliqua*	100	Large tree in patch	12	
69	Manna Gum	Eucalyptus viminalis	122	Large tree in patch	14.64	
70	Messmate Stringybark	*Eucalyptus obliqua*	111	Large tree in patch	13.32	

Tree no.	Common Name	Scientific Name	DBH (cm)	Habitat Category	Radius of TPZ (m)	Notes
71	Messmate Stringybark	*Eucalyptus obliqua*	109	Large tree in patch	13.08	
72	Manna Gum	Eucalyptus viminalis	88	Large tree in patch	10.56	
73	Messmate Stringybark	*Eucalyptus obliqua*	77	Large tree in patch	9.24	
74	Swamp Gum	Eucalyptus ovata	87	Large scattered tree	10.44	
75	Manna Gum	Eucalyptus viminalis	76	Large scattered tree	9.12	
76	Manna Gum	Eucalyptus viminalis	88	Large scattered tree	10.56	35% health
77	Eucalyptus	*Eucalyptus sp.*	90	Large scattered tree	10.8	Dead
78	Manna Gum	Eucalyptus viminalis	153	Large scattered tree	18.36	Health 25%
79	Eucalyptus	*Eucalyptus sp.*	80	Large tree in patch	9.6	
80	Saw Banksia	*Banksia serrata*	50	Large tree in patch	6	
81	Saw Banksia	*Banksia serrata*	50	Large tree in patch	6	
82	Manna Gum	*Eucalyptus viminalis*	62	Large scattered tree	7.44	
83	Manna Gum	*Eucalyptus viminalis*	81	Large scattered tree	9.72	
84	Manna Gum	*Eucalyptus viminalis*	68	Large tree in patch	8.16	
85	Manna Gum	*Eucalyptus viminalis*	77	Large tree in patch	9.24	
86	Saw Banksia	*Banksia serrata*	60	Large tree in patch	7.2	
87	Saw Banksia	*Banksia serrata*	95	Large tree in patch	11.4	
88	Saw Banksia	*Banksia serrata*	51	Large tree in patch	6.12	
89	Manna Gum	*Eucalyptus viminalis*	55	Large tree in patch	6.6	
90	Saw Banksia	*Banksia serrata*	49	Large tree in patch	5.88	Dead
91	Manna Gum	*Eucalyptus viminalis*	67	Large tree in patch	8.04	
92	Saw Banksia	*Banksia serrata*	44	Large tree in patch	5.28	

Tree no.	Common Name	Scientific Name	DBH (cm)	Habitat Category	Radius of TPZ (m)	Notes
93	Saw Banksia	*Banksia serrata*	42	Large tree in patch	5.04	
94	Saw Banksia	*Banksia serrata*	48	Large tree in patch	5.76	
95	Saw Banksia	*Banksia serrata*	69	Large tree in patch	8.28	
96	Rough-barked Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	60	Large scattered tree	7.2	
97	Rough-barked Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	55	Large scattered tree	6.6	
98	Rough-barked Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	100	Large tree in patch	12	
99	Saw Banksia	*Banksia serrata*	75	Large tree in patch	9	
100	Messmate Stringybark	*Eucalyptus obliqua*	84	Large tree in patch	10.08	
101	Messmate Stringybark	*Eucalyptus obliqua*	96	Large tree in patch	11.52	
102	Messmate Stringybark	*Eucalyptus obliqua*	108	Large tree in patch	12.96	Dead
103	Messmate Stringybark	*Eucalyptus obliqua*	89	Large tree in patch	10.68	
104	Messmate Stringybark	*Eucalyptus obliqua*	72	Large tree in patch	8.64	
105	Messmate Stringybark	*Eucalyptus obliqua*	71	Large tree in patch	8.52	
106	Messmate Stringybark	*Eucalyptus obliqua*	94	Large tree in patch	11.28	
107	Messmate Stringybark	*Eucalyptus obliqua*	73	Large tree in patch	8.76	
108	Messmate Stringybark	*Eucalyptus obliqua*	90	Large tree in patch	10.8	
109	Messmate Stringybark	*Eucalyptus obliqua*	70	Large tree in patch	8.4	
110	Messmate Stringybark	*Eucalyptus obliqua*	88	Large tree in patch	10.56	

Tree no.	Common Name	Scientific Name	DBH (cm)	Habitat Category	Radius of TPZ (m)	Notes
111	Messmate Stringybark	*Eucalyptus obliqua*	111	Large tree in patch	13.32	
112	Messmate Stringybark	*Eucalyptus obliqua*	89	Large tree in patch	10.68	
113	Messmate Stringybark	*Eucalyptus obliqua*	112	Large tree in patch	13.44	
114	Messmate Stringybark	*Eucalyptus obliqua*	70	Large tree in patch	8.4	Dead
115	Messmate Stringybark	*Eucalyptus obliqua*	74	Large tree in patch	8.88	
116	Messmate Stringybark	*Eucalyptus obliqua*	101	Large tree in patch	12.12	
117	Messmate Stringybark	*Eucalyptus obliqua*	80	Large tree in patch	9.6	
118	Rough-barked Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	106	Large tree in patch	12.72	
119	Swamp Gum	*Eucalyptus ovata*	73	Large tree in patch	8.76	
120	Messmate Stringybark	*Eucalyptus obliqua*	87	Large tree in patch	10.44	
121	Coast Grey-box	*Eucalyptus bosistoana*	73	Large tree in patch	8.76	
122	Swamp Gum	*Eucalyptus ovata*	68	Large tree in patch	8.16	
123	Swamp Gum	*Eucalyptus ovata*	73	Large tree in patch	8.76	
124	Manna Gum	*Eucalyptus viminalis*	67	Large tree in patch	8.04	
125	Swamp Gum	*Eucalyptus ovata*	58	Large tree in patch	6.96	
126	Swamp Gum	*Eucalyptus ovata*	58	Large tree in patch	6.96	Dead
127	Swamp Gum	*Eucalyptus ovata*	66	Large tree in patch	7.92	
128	Manna Gum	*Eucalyptus viminalis*	46	Large tree in patch	5.52	
129	Swamp Gum	*Eucalyptus ovata*	57	Large tree in patch	6.84	
130	Swamp Gum	*Eucalyptus ovata*	56	Large tree in patch	6.72	

Tree no.	Common Name	Scientific Name	DBH (cm)	Habitat Category	Radius of TPZ (m)	Notes
131	Swamp Gum	*Eucalyptus ovata*	77	Large tree in patch	9.24	
132	Swamp Gum	*Eucalyptus ovata*	68	Large tree in patch	8.16	
133	Swamp Gum	*Eucalyptus ovata*	53	Large tree in patch	6.36	
134	Swamp Gum	*Eucalyptus ovata*	55	Large tree in patch	6.6	
135	Swamp Gum	*Eucalyptus ovata*	70	Large tree in patch	8.4	
136	Swamp Gum	*Eucalyptus ovata*	68	Large tree in patch	8.16	
137	Swamp Gum	*Eucalyptus ovata*	59	Large tree in patch	7.08	
138	Swamp Gum	*Eucalyptus ovata*	77	Large tree in patch	9.24	Dead
139	Swamp Gum	*Eucalyptus ovata*	79	Large tree in patch	9.48	
140	Swamp Gum	*Eucalyptus ovata*	73	Large tree in patch	8.76	
141	Swamp Gum	*Eucalyptus ovata*	69	Large scattered tree	8.28	
142	Swamp Gum	*Eucalyptus ovata*	59	Large scattered tree	7.08	
143	Manna Gum	*Eucalyptus viminalis*	55	Large tree in patch	6.6	

Notes: DBH = Diameter at breast height (130 cm from the ground); **TPZ =** Tree Protection Zone.

Appendix 12: Detailed Bird Utilisation Survey results

Raw data for the spring 2023 BUS impact points at Gelliondale Wind Farm Project.

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Australasian Pipit	1			1												6						2			**10**	**0**	**0**	**10**
Australian Magpie	105			57			122			51			36			22			102			34			**529**	**0**	**0**	**529**
Australian Pelican				6				3																	**6**	**3**	**0**	**9**
Australian Shelduck							1												10						**11**	**0**	**0**	**11**
Australian White Ibis	32	4		10			1	2															9		**43**	**15**	**0**	**58**
Australian Wood Duck													29												**29**	**0**	**0**	**29**
Black-faced Cuckoo-shrike	1																								**1**	**0**	**0**	**1**
Black-shouldered Kite													1			2									**3**	**0**	**0**	**3**
Blue-winged Parrot	1															2						20			**23**	**0**	**0**	**23**
Brown Falcon							1									2									**3**	**0**	**0**	**3**
Brown Goshawk																						1			**1**	**0**	**0**	**1**
Brown Songlark				2			1			1						3						4			**11**	**0**	**0**	**11**
Cattle Egret	24																								**24**	**0**	**0**	**24**
Common Blackbird										1			7			1			3						**12**	**0**	**0**	**12**
Common Myna	32			1			12			16			3						2			14			**80**	**0**	**0**	**80**
Common Starling	223			21			218			453			46			7			103			174			**1245**	**0**	**0**	**1245**
Crimson Rosella										5			10						6						**21**	**0**	**0**	**21**
Eastern Rosella				1						15			3	3			2		2			6			**27**	**5**	**0**	**32**
Eastern Yellow Robin													3			2									**5**	**0**	**0**	**5**
Eurasian Skylark	46			76			78			27			40			40			38			41			**386**	**0**	**0**	**386**
European Goldfinch													1						2						**3**	**0**	**0**	**3**
Fan-tailed Cuckoo																1			1						**2**	**0**	**0**	**2**
Forest Raven	30			16			23			40			27			9	5		36			26			**207**	**5**	**0**	**212**
Galah	16									2												4			**22**	**0**	**0**	**22**
Golden-headed Cisticola	5			7																					**12**	**0**	**0**	**12**
Grey Butcherbird	1			3						2			2												**8**	**0**	**0**	**8**
Grey Fantail	6									9			9			6			8						**38**	**0**	**0**	**38**
Grey Shrike-thrush	9			2			1			1			3			7			5						**28**	**0**	**0**	**28**
Horsfield's Bronze-cuckoo										1															**1**	**0**	**0**	**1**
House Sparrow							2																		**2**	**0**	**0**	**2**
Laughing Kookaburra										1															**1**	**0**	**0**	**1**
Little Corella	14																		50						**64**	**0**	**0**	**64**
Little Pied Cormorant													1												**1**	**0**	**0**	**1**
Little Raven	16			92						47			55			11	2		3			5			**229**	**2**	**0**	**231**
Little Wattlebird										8			6			11			5						**30**	**0**	**0**	**30**
Magpie-lark	6			6			12			10			6			3			10			10			**63**	**0**	**0**	**63**
Masked Lapwing							1						6												**7**	**0**	**0**	**7**
Musk Lorikeet										2															**2**	**0**	**0**	**2**

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Noisy Miner										12												2			14	0	0	14
Pacific Black Duck	1	4								6			1												8	4	0	12
Pied Currawong										2			2			2			2						8	0	0	8
Rainbow lorikeet										15			9			2			4	2			2		30	4	0	34
Raven sp.	36			24			31						1			6			4				10		102	10	0	112
Red Wattlebird	11			12			4			25			22			4			6			4			88	0	0	88
Rufous Whistler													6			3									9	0	0	9
Silvereye													15												15	0	0	15
Spotted Dove													2						2						4	0	0	4
Spotted Pardalote										14			5						2						21	0	0	21
Straw-necked Ibis	2	45			25			26																	2	96	0	98
Striated Pardalote										9															9	0	0	9
Stubble Quail	42			41			8			6			16			17			35			11			176	0	0	176
Sulphur-crested Cockatoo	17			4						4			1				1		28	5		30	7		84	13	0	97
Superb Fairy-wren	12						2						11			7			3						35	0	0	35
Swamp Harrier				1												1									2	0	0	2
Wedge-tailed Eagle	1	1			1			4			2			1			2						7		1	18	0	19
Welcome Swallow	29			3			11			25			11			7			4			11			101	0	0	101
White-bellied Sea-Eagle							1																1		1	1	0	2
White-eared Honeyeater										2			5			1			2			1			11	0	0	11
White-faced Heron	3																1		2			1			6	1	0	7
White-necked Heron	10															2	1		3						15	1	0	16
Willie Wagtail	1																								1	0	0	1
Yellow-faced Honeyeater										7			16			16			16						55	0	0	55
Yellow-tailed Black-Cockatoo										4			26			4			2						36	0	0	36
Grand Total	**733**	**54**		**386**	**26**		**530**	**35**		**823**	**2**		**443**	**4**		**207**	**14**		**501**	**7**		**401**	**36**		**4024**	**178**	**0**	**4202**

Raw data for the spring 2023 BUS reference points at Gelliondale Wind Farm Project.

Species	REF1			REF2			Total			Grand total
	A	B	C	A	B	C	A	B	C	
Australasian Pipit				1			1	0	0	1
Australian Magpie	49			25			74	0	0	74
Australian Shelduck		12					0	12	0	12
Australian White Ibis	12			1			13	0	0	13
Blue-winged Parrot				1	3		1	3	0	4
Brown Falcon	4						4	0	0	4
Common Blackbird	3			9			12	0	0	12
Common Myna	12			2			14	0	0	14
Common Starling	31			44			75	0	0	75
Corella sp.				15			15	0	0	15
Crimson Rosella				1			1	0	0	1
Eastern Rosella	4			10			14	0	0	14
Eurasian Skylark	29			30			59	0	0	59
European Goldfinch	5						5	0	0	5
Forest Raven	39			35	1		74	1	0	75
Galah	21						21	0	0	21
Grey Butcherbird	2						2	0	0	2
Grey Fantail	9			5			14	0	0	14
Grey Shrike-thrush	9			4			13	0	0	13
Horsfield's Bronze-cuckoo	1						1	0	0	1
Little Corella				4			4	0	0	4
Little Raven	30			19			49	0	0	49
Little Wattlebird				6			6	0	0	6
Magpie-lark	11			7			18	0	0	18
New Holland Honeyeater				1			1	0	0	1
Rainbow lorikeet	3			22	8		25	8	0	33
Raven sp.	14			6			20	0	0	20
Red Wattlebird	14			5			19	0	0	19
Rufous Whistler	9			3			12	0	0	12
Silvereye				5			5	0	0	5
Spotted Dove				5			5	0	0	5
Straw-necked Ibis			120		32	120	0	32	240	272
Stubble Quail	42			35			77	0	0	77
Sulphur-crested Cockatoo	2			37			39	0	0	39
Superb Fairy-wren	6			18			24	0	0	24
Wedge-tailed Eagle		2	2	4	6		4	8	2	14
Welcome Swallow	43			36			79	0	0	79
White-eared Honeyeater				1			1	0	0	1
White-necked Heron	1	1		2			3	1	0	4
Yellow-faced Honeyeater	2			11			13	0	0	13
Yellow-tailed Black-Cockatoo	3			1			4	0	0	4
Grand Total	**410**	**15**	**122**	**411**	**50**	**120**	**821**	**65**	**242**	**1128**

Raw data for the summer 2024 BUS impact points at Gelliondale Wind Farm Project.

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Australasian Pipit							4			1			2						1			2			**10**	**0**	**0**	**10**
Australian Hobby																						1			**1**	**0**	**0**	**1**
Australian Magpie	41			27			62			16			55			116			12			192			**521**	**0**	**0**	**521**
Australian Shelduck													5												**5**	**0**	**0**	**5**
Australian White Ibis	1												6												**7**	**0**	**0**	**7**
Australian Wood Duck													14						45						**59**	**0**	**0**	**59**
Black Swan													32												**32**	**0**	**0**	**32**
Black-faced Cuckoo-shrike				1																					**1**	**0**	**0**	**1**
Black-shouldered Kite																			1						**1**	**0**	**0**	**1**
Blue-winged Parrot																1			5	7					**6**	**7**	**0**	**13**
Brown Falcon													1												**1**	**0**	**0**	**1**
Brown Thornbill	4						1			1															**6**	**0**	**0**	**6**
Common Myna	5			4			7			16			9			9			10			28			**88**	**0**	**0**	**88**
Common Starling	8			251			34			57			120			65			10			159	3		**704**	**3**	**0**	**707**
Eastern Rosella				4						6												2			**12**	**0**	**0**	**12**
Eastern Spinebill							1																		**1**	**0**	**0**	**1**
Eastern Yellow Robin										2			3						1						**6**	**0**	**0**	**6**
Eurasian Coot													4												**4**	**0**	**0**	**4**
Eurasian Skylark	10						4			1			4			2			1			3			**25**	**0**	**0**	**25**
European Goldfinch	4			1									1												**6**	**0**	**0**	**6**
Fairy Martin													3												**3**	**0**	**0**	**3**
Forest Raven										5			3												**8**	**0**	**0**	**8**
Gang-gang Cockatoo	4																								**4**	**0**	**0**	**4**
Golden-headed Cisticola							1																		**1**	**0**	**0**	**1**
Great Cormorant																						1			**1**	**0**	**0**	**1**
Grey Butcherbird	2			2						3			1			3						2			**13**	**0**	**0**	**13**
Grey Currawong							1			4			1												**6**	**0**	**0**	**6**
Grey Fantail	2						5						4												**11**	**0**	**0**	**11**
Grey Shrike-thrush	2			2			2			1			2			1			1						**11**	**0**	**0**	**11**
Grey Teal													1						3						**4**	**0**	**0**	**4**
House Sparrow				2																					**2**	**0**	**0**	**2**
Laughing Kookaburra																						1			**1**	**0**	**0**	**1**
Little Pied Cormorant													1												**1**	**0**	**0**	**1**
Little Raven	20			18			2			4			22			66			3	4		2	2		**137**	**6**	**0**	**143**
Little Wattlebird							1																		**1**	**0**	**0**	**1**
Magpie-lark	4			57			3			1			12			1			4						**82**	**0**	**0**	**82**
Masked Lapwing													11												**11**	**0**	**0**	**11**
Nankeen Kestrel	2																								**2**	**0**	**0**	**2**
Noisy Miner										7												1			**8**	**0**	**0**	**8**

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Olive Whistler							1																		1	0	0	1
Pacific Black Duck													53						6						59	0	0	59
Purple Swamphen													11												11	0	0	11
Rainbow lorikeet				39																					39	0	0	39
Raven sp.	11			5						3			4			4			5			43			75	0	0	75
Red Wattlebird	4						6			13			3			3									29	0	0	29
Spotted Harrier										1															1	0	0	1
Spotted Pardalote							1			1															2	0	0	2
Straw-necked Ibis								3			1		145			3									148	4	0	152
Striated Fieldwren																						1			1	0	0	1
Striated Pardalote							1																		1	0	0	1
Stubble Quail	1			2			1																		4	0	0	4
Sulphur-crested Cockatoo																						3	2		3	2	0	5
Superb Fairy-wren	1						3						5						4			2			15	0	0	15
Swamp Harrier				1			1			1			1												4	0	0	4
Wedge-tailed Eagle		1									3		1										2		1	6	0	7
Whistling Kite										1															1	0	0	1
White-eared Honeyeater	1						2			4			5			1			1						14	0	0	14
White-faced Heron	6												1			5			1						13	0	0	13
White-fronted Chat													1												1	0	0	1
White-necked Heron	4												2						2						8	0	0	8
White-throated Needletail	2																								2	0	0	2
Yellow-faced Honeyeater							4						1												5	0	0	5
Yellow-tailed Black-Cockatoo							2						4				1					2			8	1	0	9
Grand Total	139	1		416			150	3		149	4		554			280	1		116	11		445	9		2249	29	0	2278

Raw data for the summer 2024 BUS reference points at Gelliondale Wind Farm Project.

Species	REF1			REF2			REF3			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	
Australasian Pipit	1									1	0	0	1
Australian Magpie	33			17			3			53	0	0	53
Australian Wood Duck				4						4	0	0	4
Black-shouldered Kite				1						1	0	0	1
Blue-winged Parrot				2	3					2	3	0	5
Brown Thornbill				1			3			4	0	0	4
Collared Sparrowhawk				1						1	0	0	1
Common Myna	82			23						105	0	0	105
Common Starling	39			126						165	0	0	165
Crimson Rosella	9						4			13	0	0	13
Eastern Rosella							2			2	0	0	2
Eastern Spinebill							1			1	0	0	1
Eastern Yellow Robin							5			5	0	0	5
Eurasian Skylark	2			1						3	0	0	3
Forest Raven							2			2	0	0	2
Galah							1			1	0	0	1
Golden Whistler							2			2	0	0	2
Golden-headed Cisticola	1									1	0	0	1
Great Cormorant				1						1	0	0	1
Grey Butcherbird	5						6			11	0	0	11
Grey Currawong							3			3	0	0	3
Grey Fantail							14			14	0	0	14
Grey Shrike-thrush	2			2			11			15	0	0	15
Little Corella				5						5	0	0	5
Little Raven	40			39			2			81	0	0	81
Little Wattlebird							13			13	0	0	13
Magpie-lark	5			5						10	0	0	10
Nankeen Kestrel				1						1	0	0	1
New Holland Honeyeater							4			4	0	0	4
Pacific Black Duck				6						6	0	0	6
Raven sp.	11			3			3			17	0	0	17
Red Wattlebird	3			2			45			50	0	0	50
Red-browed Finch							2			2	0	0	2
Silvereye							1			1	0	0	1
Spotted Dove				1						1	0	0	1
Spotted Pardalote							10			10	0	0	10
Straw-necked Ibis	6									6	0	0	6
Striated Pardalote							1			1	0	0	1
Striated Thornbill							2			2	0	0	2
Stubble Quail	1									1	0	0	1
Sulphur-crested Cockatoo				2						2	0	0	2
Superb Fairy-wren				5			14			19	0	0	19
White-browed Scrubwren				1			1			2	0	0	2
White-eared Honeyeater				1			13			14	0	0	14
White-necked Heron				1						1	0	0	1
Yellow-faced Honeyeater							23			23	0	0	23
Grand Total	**240**			**251**	**3**		**191**			**682**	**3**	**0**	**685**

Raw data for the autumn 2024 BUS impact points at Gelliondale Wind Farm Project.

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Australasian Pipit	1			1						1									1						**4**	**0**	**0**	**4**
Australian Hobby				1																					**1**	**0**	**0**	**1**
Australian Magpie	75	25		201			791	4		235	6		176			131	8		606			270	6		**2485**	**49**	**0**	**2534**
Australian Pelican											3														**0**	**3**	**0**	**3**
Australian Shelduck							44			3			2	7			5		118	20		2			**169**	**32**	**0**	**201**
Australian White Ibis		2		34	13		134			7							9								**175**	**24**	**0**	**199**
Australian Wood Duck																			34						**34**	**0**	**0**	**34**
Black Swan							44				1														**44**	**1**	**0**	**45**
Black-faced Cuckoo-shrike	11			2	8		12			1				2											**26**	**10**	**0**	**36**
Black-shouldered Kite	4			4						2												1			**11**	**0**	**0**	**11**
Blue-winged Parrot	114	6		21			3									1	2		13	9		35	8		**187**	**25**	**0**	**212**
Brown Falcon	5				3						1			1		1							1		**6**	**6**	**0**	**12**
Brown Thornbill	5																								**5**	**0**	**0**	**5**
Cattle Egret										3						3			1						**7**	**0**	**0**	**7**
Chestnut Teal																			130						**130**	**0**	**0**	**130**
Common Blackbird													4												**4**	**0**	**0**	**4**
Common Myna	5			12			14			132			3	2		21			56			65			**308**	**2**	**0**	**310**
Common Starling	255			815	100		913	15		369			119			231			351			385			**3438**	**115**	**0**	**3553**
Corella sp.																						40			**40**	**0**	**0**	**40**
Crested Pigeon																3			3						**6**	**0**	**0**	**6**
Crimson Rosella	4			2						21			21			54			12			9			**123**	**0**	**0**	**123**
Eastern Rosella	11			16			2			23			1			1						1			**55**	**0**	**0**	**55**
Eastern Yellow Robin										1			4						1						**6**	**0**	**0**	**6**
Eurasian Skylark	38			14			28			5			18			7			10			55			**175**	**0**	**0**	**175**
European Goldfinch													2									60			**62**	**0**	**0**	**62**
Flame Robin	1												7						2			3			**13**	**0**	**0**	**13**
Forest Raven										1			2												**3**	**0**	**0**	**3**
Galah																			2			9			**11**	**0**	**0**	**11**
Golden-headed Cisticola	2																								**2**	**0**	**0**	**2**
Great Cormorant	1						1																		**2**	**0**	**0**	**2**
Grey Butcherbird	9			5			5			9			4			6			4			7			**49**	**0**	**0**	**49**
Grey Currawong										4			1									1			**6**	**0**	**0**	**6**
Grey Fantail	1									1			2			3			3						**10**	**0**	**0**	**10**
Grey Shrike-thrush	8			3						9			5			3			1						**29**	**0**	**0**	**29**
Grey Teal													32						30						**62**	**0**	**0**	**62**
Laughing Kookaburra				1						2			1			1			2			4			**11**	**0**	**0**	**11**
Little Pied Cormorant																						1			**1**	**0**	**0**	**1**
Little Raven	3									5			5			16			15			28			**72**	**0**	**0**	**72**
Little Wattlebird	3									9			3			30									**45**	**0**	**0**	**45**

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Magpie-lark	12			103			20			20			40			2			18			12			227	0	0	227
Masked Lapwing													7												7	0	0	7
Nankeen Kestrel				2			2			1									3			1			9	0	0	9
Noisy Miner										19												1			20	0	0	20
Pacific Black Duck	1												5			4			28			2			40	0	0	40
Peregrine Falcon																			1						1	0	0	1
Pied Cormorant																						1			1	0	0	1
Pied Currawong				2						2						14			2			1			21	0	0	21
Rainbow lorikeet		1						4		8	8			80		16	6			17			6		24	122	0	146
Raven sp.	48	10		47	9		75	2		18			39	6		56	2		72	7		43	3		398	39	0	437
Red Wattlebird	6			2			1			35			25			16			18			8			111	0	0	111
Red-browed Finch													54			15									69	0	0	69
Spotted Pardalote	1												2						1						4	0	0	4
Straw-necked Ibis	2			233	59		77	283		1	160					12	6		40						365	508	0	873
Striated Pardalote										6			2						1						9	0	0	9
Sulphur-crested Cockatoo										3									25			4	8		32	8	0	40
Superb Fairy-wren	15												24												39	0	0	39
Swamp Harrier													1												1	0	0	1
Wattlebird sp.																5									5	0	0	5
Wedge-tailed Eagle	1				1			5		1				7		2	2		2	4		4	2		10	21	0	31
Welcome Swallow	6									6			15			5			8			4			44	0	0	44
White-eared Honeyeater	2									2			4												8	0	0	8
White-faced Heron							2			16			3			1			2			1			25	0	0	25
White-throated Needletail										5															5	0	0	5
Willie Wagtail							4						5			1						3			13	0	0	13
Yellow-faced Honeyeater													1												1	0	0	1
Yellow-tailed Black-Cockatoo													2			6									8	0	0	8
Grand Total	650	44		1521	193		2172	313		986	179		641	105		667	40		1616	57		1061	34		9314	965	0	10279

Raw data for the autumn 2024 BUS reference points at Gelliondale Wind Farm Project.

Species	REF1			REF2			Total			Grand total
	A	B	C	A	B	C	A	B	C	
Australasian Pipit	2						2	0	0	2
Australian Magpie	81	52		65	3		146	55	0	201
Australian Pelican		2					0	2	0	2
Australian Shelduck				156			156	0	0	156
Australian White Ibis	11						11	0	0	11
Australian Wood Duck				10			10	0	0	10
Black-shouldered Kite	5			3			8	0	0	8
Blue-winged Parrot	214			7	3		221	3	0	224
Brown Falcon	2						2	0	0	2
Brown Thornbill				4			4	0	0	4
Common Myna	3			67	150		70	150	0	220
Common Starling	116			317			433	0	0	433
Crescent Honeyeater	1						1	0	0	1
Crested Pigeon	1			2			3	0	0	3
Crimson Rosella	9			2			11	0	0	11
Eastern Rosella	5			1			6	0	0	6
Eurasian Skylark	47			5			52	0	0	52
European Goldfinch	10						10	0	0	10
Flame Robin				6			6	0	0	6
Forest Raven				2			2	0	0	2
Galah				4			4	0	0	4
Golden Whistler				1			1	0	0	1
Grey Butcherbird	9			4			13	0	0	13
Grey Fantail	7						7	0	0	7
Grey Shrike-thrush	10			10			20	0	0	20
Laughing Kookaburra	3						3	0	0	3
Little Corella				13			13	0	0	13
Little Raven				1			1	0	0	1
Magpie-lark	39	5		18			57	5	0	62
Pacific Black Duck				19			19	0	0	19
Rainbow lorikeet	2			2	4		4	4	0	8
Raven sp.	46	56		215	7		261	63	0	324
Red Wattlebird				3			3	0	0	3
Rufous Whistler	2						2	0	0	2
Scarlet Robin	2						2	0	0	2
Silvereye	3						3	0	0	3
Spotted Dove				5			5	0	0	5
Spotted Pardalote	1						1	0	0	1
Straw-necked Ibis	147	23					147	23	0	170
Stubble Quail	1						1	0	0	1
Sulphur-crested Cockatoo				38	63		38	63	0	101
Superb Fairy-wren	2			8			10	0	0	10
Wedge-tailed Eagle		2		2	4		2	6	0	8
Welcome Swallow	56	20		2			58	20	0	78
White-browed Scrubwren				3			3	0	0	3
White-eared Honeyeater	1			1			2	0	0	2
White-faced Heron	3			3			6	0	0	6
Willie Wagtail	1			2			3	0	0	3
Yellow-tailed Black-Cockatoo	30				6		30	6	0	36
Grand Total	**872**	**160**		**1001**	**240**		**1873**	**400**	**0**	**2273**

Raw data for the winter 2024 BUS impact points at Gelliondale Wind Farm Project.

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			BUS9			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Australasian Grebe																			2									2	0	0	2
Australasian Pipit				1			1			1			2			7			1			6			3			22	0	0	22
Australian Magpie	48			29			41			36	4		330			75			12			35			32			638	0	0	642
Australian Raven										2																		2	4	0	2
Australian Shelduck	18						2			1			10			12	4		59			4			4	1		110	0	0	115
Australian White Ibis	38																											38	5	0	38
Australian Wood Duck													14			6			20									40	0	0	40
Black Swan	9						4			298						2									54			367	0	0	367
Black-shouldered Kite				1																								1	0	0	1
Blue-winged Parrot	1																		3			25						29	0	0	29
Brown Falcon										1															1			2	0	0	2
Brown Goshawk													1															1	0	0	1
Brown Thornbill	5			1						1									1									8	0	0	8
Cattle Egret																									1			1	0	0	1
Common Blackbird	1															1			1									3	0	0	3
Common Myna	5			1			8																		28			42	0	0	42
Common Starling	26			17			141			38									15			100		12	169			506	0	12	518
Crested Pigeon				1									2												3			6	0	0	6
Crimson Rosella	5									8						2												15	0	0	15
Eastern Rosella										6																		6	0	0	6
Eastern Yellow Robin										1									2									3	0	0	3
Eurasian Skylark	24	3		80			31	3		6	11		18	3		5	1		6	5		57	5		17	4		244	0	0	279
European Goldfinch																						156			3			159	35	0	159
Fairy Martin																						2						2	0	0	2
Flame Robin																						2						2	0	0	2
Forest Raven				1						5						2									1	1		9	0	0	10
Galah	1			6						2									8			2			8			27	1	0	27
Golden Whistler				1																								1	0	0	1
Golden-headed Cisticola																						1						1	0	0	1
Grey Butcherbird	2			1			2			3						1						2						11	0	0	11
Grey Currawong										2			1			1			4						1			9	0	0	9
Grey Shrike-thrush	6			5						5			4			6			6									32	0	0	32
House Sparrow																						50			3			53	0	0	53
Laughing Kookaburra				2						3						1												6	0	0	6
Little Corella																8												8	0	0	8
Little Raven	10			16			12			17			2			11			21			14			21			124	0	0	124
Little Wattlebird										1																		1	0	0	1
Magpie-lark	14			1			5			5									1						9			35	0	0	35
Masked Lapwing										1			6			7			2									16	0	0	16
Nankeen Kestrel							1																					1	0	0	1

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			BUS9			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Noisy Miner										6												6						12	0	0	12
Pacific Black Duck	5						2												39									46	0	0	46
Pied Currawong													1									2			1			4	0	0	4
Rainbow lorikeet																1			1									2	0	0	2
Raven sp.	4			3						1			15	2		5			13	1					9			50	0	0	53
Red Wattlebird	9			5			4			14			7			4			9			1			6			59	3	0	59
Spotted Pardalote	1									7																		8	0	0	8
Straw-necked Ibis	2	22																										2	0	0	24
Striated Pardalote										2									2									4	22	0	4
Sulphur-crested Cockatoo													4			14			2						4			24	0	0	24
Superb Fairy-wren	4															1			5			1						11	0	0	11
Swamp Harrier																1												1	0	0	1
Welcome Swallow	3						4			2			3			6			6			33			4			61	0	0	61
White-bellied Sea-Eagle	1																											1	0	0	1
White-eared Honeyeater	17			1						7			8			13			7									53	0	0	53
White-faced Heron				1										11		4									5			10	0	0	21
Willie Wagtail							4			1															6			11	11	0	11
Yellow-billed Spoonbill													2															2	0	0	2
Yellow-faced Honeyeater	4									1			5			2												12	0	0	12
Grand Total	**263**	**25**		**174**			**262**	**3**		**484**	**15**		**435**	**16**		**198**	**5**		**248**	**6**		**499**	**5**	**12**	**393**	**6**		**2956**	**0**	**12**	**3049**

Raw data for the winter 2024 BUS reference points at Gelliondale Wind Farm Project.

Species	REF 1			REF2			REF 3			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	
Australasian Pipit				1						1	0	0	1
Australian Magpie	26			12						38	0	0	38
Australian Shelduck	2			47						49	0	0	49
Australian Wood Duck	4			4						8	0	0	8
Blue-winged Parrot				1	1					1	1	0	2
Brown Falcon	5									5	0	0	5
Brown Thornbill				4			8			12	0	0	12
Common Blackbird				2						2	0	0	2
Common Myna	3			8						11	0	0	11
Common Starling	5			35						40	0	0	40
Crescent Honeyeater							1			1	0	0	1
Crimson Rosella	1						4			5	0	0	5
Eastern Rosella	4									4	0	0	4
Eastern Yellow Robin				1			3			4	0	0	4
Eurasian Skylark	13	5		6	1			1		19	7	0	26
Flame Robin				1						1	0	0	1
Forest Raven	5									5	0	0	5
Galah				1			3			4	0	0	4
Golden Whistler							5			5	0	0	5
Grey Butcherbird	4						3			7	0	0	7
Grey Currawong	1			4			1			6	0	0	6
Grey Fantail							8			8	0	0	8
Grey Shrike-thrush	5			9			9			23	0	0	23
Laughing Kookaburra				2						2	0	0	2
Little Raven	24			13			3			40	0	0	40
Little Wattlebird							3			3	0	0	3
Magpie-lark	12			2						14	0	0	14
Masked Lapwing				2						2	0	0	2
New Holland Honeyeater							2			2	0	0	2
Pacific Black Duck	1									1	0	0	1
Pied Currawong							1			1	0	0	1
Rainbow lorikeet				1						1	0	0	1
Raven sp.	17	2		25						42	2	0	44
Red Wattlebird	11			7			26			44	0	0	44
Spotted Dove				2						2	0	0	2
Spotted Pardalote	1						17			18	0	0	18
Striated Pardalote	1			5			11			17	0	0	17
Striated Thornbill							12			12	0	0	12
Sulphur-crested Cockatoo				11						11	0	0	11
Superb Fairy-wren				12			10			22	0	0	22
Tree Martin				3						3	0	0	3
Wedge-tailed Eagle	1	1			2					1	3	0	4
Welcome Swallow	7			27						34	0	0	34
White-browed Scrubwren				1			2			3	0	0	3
White-eared Honeyeater	1			3			25			29	0	0	31
White-naped Honeyeater							8			8	0	0	8
Willie Wagtail				1						1	0	0	1
Yellow-faced Honeyeater				2			9			11	0	0	11
Yellow-tailed Black-Cockatoo							1			1	0	0	1
Grand Total	**154**	**8**		**255**	**4**		**175**	**1**		**584**	**13**	**0**	**599**

Raw data for the spring 2024 BUS impact points at Gelliondale Wind Farm Project

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Australian Magpie	22			17			32			18			9			8			7			15			128	0	0	128
Australian Pipit				3			3			3			2			4			5			2			22	0	0	22
Black Swan																							16		0	16	0	16
Black-faced Cuckoo-shrike				2						4						1									7	0	0	7
Blue-winged Parrot																			3						3	0	0	3
Brown Falcon							1													1					1	1	0	2
Brown Honeyeater													2												2	0	0	2
Brown Songlark	1			4															4						9	0	0	9
Brown-headed Honeyeater										2									3			4			9	0	0	9
Common Blackbird	1									1			7						1						10	0	0	10
Common Myna	6			4			23			10			8						9			4			64	0	0	64
Common Starling	17			46			83			42			36			1			77			127			429	0	0	429
Crimson Rosella										2			4												6	0	0	6
Eastern Rosella										4															4	0	0	4
Eastern Yellow Robin													1												1	0	0	1
Eurasian Skylark	76			75			63			43			26			31			65			95			474	0	0	474
Eurasian Tree Sparrow																						4			4	0	0	4
European Goldfinch																									0	0	0	0
Fan-tailed Cuckoo	1															1									2	0	0	2
Forest Raven	4			2																					6	0	0	6
Galah																						12			12	0	0	12
Golden Whistler										1															1	0	0	1
Grey Butcherbird	1						1			4									2			2			10	0	0	10
Grey Currawong											2		6			3									9	2	0	11
Grey Fantail	6									2			10			1			8						27	0	0	27
Grey Shrike-thrush	6						1			5			1			6			15			2			36	0	0	36
Horsfield's Bronze-cuckoo				1						2												1			4	0	0	4
Laughing Kookaburra										2			2												4	0	0	4
Little Corella																						145			145	0	0	145
Little Grassbird	1						1												1			2			5	0	0	5
Little Lorikeet										2															2	0	0	2
Little Raven	10			19			43			35			48			3			28			8			194	0	0	194
Little Wattlebird										1															1	0	0	1
Magpie-lark	7			7			4			10			5						6			3			42	0	0	42
Musk Lorikeet										8									5						13	0	0	13
Noisy Miner										16												8			24	0	0	24
Pacific Black Duck																									0	0	0	0
Peregrine Falcon																			1						1	0	0	1
Pied Currawong																			1						1	0	0	1
Rainbow Lorikeet										3						2			9			5			19	0	0	19
Raven sp.	11	2		14			16			17			20			12			3			7			100	2	0	102
Red Wattlebird	7			3			1			12			9			3			8			2			45	0	0	45
Reed-Warbler	1																		1			2			4	0	0	4

Rufous Whistler	2									1			3			3			4						13	0	0	13
Shining Bronze-cuckoo													1			1									2	0	0	2
Silvereye	2												8			7									17	0	0	17
Spotted Pardalote										7			8			2			2						19	0	0	19
Striated Pardalote										2			1						1						4	0	0	4
Stubble Quail	7			9			4			7			4			1			8			6			46	0	0	46
Sulphur-crested Cockatoo	1																		4			49			54	0	0	54
Superb Fairy-wren	9									4			7			2			6						28	0	0	28
Swamp Harrier											1		1							1					1	2	0	3
Tree Martin																			2						2	0	0	2
Wedge-tailed Eagle		1												1											0	2	0	2
Welcome Swallow							3			12			3			10			2			3			33	0	0	33
White-browed Scrubwren													1												1	0	0	1
White-eared Honeyeater	4									1			2			3			6						16	0	0	16
White-faced Heron										2						3									5	0	0	5
Willie Wagtail													1									1			2	0	0	2
Yellow-faced Honeyeater	2									12			14			14			25						67	0	0	67
Yellow-rumped Thornbill																2									2	0	0	2
Yellow-tailed Black-cockatoo							8															3			11	0	0	11
Grand Total	**205**	**3**		**206**			**287**			**297**	**3**		**250**	**1**		**124**			**322**	**2**		**512**	**16**		**2203**	**25**	**0**	**2228**

Raw data for the spring 2024 BUS reference points at Gelliondale Wind Farm Project.

Species	REF1			REF2			Total			Grand total
	A	B	C	A	B	C	A	B	C	
Australian Magpie	24			4			28	0	0	28
Australian Pipit	4						4	0	0	4
Black Swan							0	0	0	0
Black-faced Cuckoo-shrike							0	0	0	0
Blue-winged Parrot				6			6	0	0	6
Brown Falcon							0	0	0	0
Brown Honeyeater							0	0	0	0
Brown Songlark							0	0	0	0
Brown-headed Honeyeater							0	0	0	0
Common Blackbird	1			6			7	0	0	7
Common Myna	18			7			25	0	0	25
Common Starling	138			35			173	0	0	173
Crimson Rosella							0	0	0	0
Eastern Rosella	2						2	0	0	2
Eastern Yellow Robin				1			1	0	0	1
Eurasian Skylark	50			17			67	0	0	67
Eurasian Tree Sparrow	5						5	0	0	5
European Goldfinch	1						1	0	0	1
Fan-tailed Cuckoo	1						1	0	0	1
Forest Raven							0	0	0	0
Galah	3			2			5	0	0	5
Golden Whistler							0	0	0	0
Grey Butcherbird							0	0	0	0
Grey Currawong				1			1	0	0	1
Grey Fantail	3			6			9	0	0	9
Grey Shrike-thrush	1			3			4	0	0	4
Horsfield's Bronze-cuckoo							0	0	0	0
Laughing Kookaburra							0	0	0	0
Little Corella							0	0	0	0
Little Grassbird				3			3	0	0	3
Little Lorikeet							0	0	0	0
Little Raven	18	2		25			43	2	0	45
Little Wattlebird							0	0	0	0
Magpie-lark	4						4	0	0	4
Musk Lorikeet				9			9	0	0	9
Noisy Miner							0	0	0	0
Pacific Black Duck	8						8	0	0	8
Peregrine Falcon				1			1	0	0	1
Pied Currawong							0	0	0	0
Rainbow Lorikeet				29			29	0	0	29
Raven sp.	13			8			21	0	0	21
Red Wattlebird	3			8			11	0	0	11
Reed-Warbler	2			1			3	0	0	3
Rufous Whistler	3			10			13	0	0	13
Shining Bronze-cuckoo							0	0	0	0
Silvereye	3			10			13	0	0	13
Spotted Pardalote				1			1	0	0	1
Striated Pardalote				1			1	0	0	1
Stubble Quail	11			3			14	0	0	14
Sulphur-crested Cockatoo	45			30			75	0	0	75
Superb Fairy-wren				17			17	0	0	17
Swamp Harrier							0	0	0	0
Tree Martin	5						5	0	0	5
Wedge-tailed Eagle		1					0	1	0	1
Welcome Swallow	6			1			7	0	0	7
White-browed Scrubwren				1			1	0	0	1
White-eared Honeyeater							0	0	0	0
White-faced Heron							0	0	0	0
Willie Wagtail	1			2			3	0	0	3
Yellow-faced Honeyeater	2			9			11	0	0	11
Yellow-rumped Thornbill							0	0	0	0
Yellow-tailed Black-cockatoo	8						8	0	0	8
Grand Total	**383**	**3**		**257**			**640**	**3**	**0**	**643**

Raw data for the summer 2025 BUS impact points at Gelliondale Wind Farm Project

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Australian Hobby							1			1															**2**	**0**	**0**	**2**
Australian Magpie	20	4		37			18			14			14			22			127			76	2		**328**	**6**	**0**	**334**
Australian Pipit	1			1			26									5						1			**34**	**0**	**0**	**34**
Australian Raven													1												**1**	**0**	**0**	**1**
Australian Shelduck																			6						**6**	**0**	**0**	**6**
Australian White Ibis					12		4																		**4**	**12**	**0**	**16**
Australian Wood Duck																			3						**3**	**0**	**0**	**3**
Black-faced Cuckoo-shrike	5			2																					**7**	**0**	**0**	**7**
Black-shouldered Kite	1	1			1		1																		**2**	**2**	**0**	**4**
Blue-winged Parrot																				5			2		**0**	**7**	**0**	**7**
Brown Falcon				1												1			1			2			**5**	**0**	**0**	**5**
Brown Songlark																						1			**1**	**0**	**0**	**1**
Brown Thornbill	3			2									4												**9**	**0**	**0**	**9**
Collared Sparrowhawk				1																					**1**	**0**	**0**	**1**
Common Blackbird													2												**2**	**0**	**0**	**2**
Common Myna	3						5			11						3			16			5			**43**	**0**	**0**	**43**
Common Starling	48			12	31		61			91				8		20				11		578			**810**	**50**	**0**	**860**
Crescent Honeyeater																			1						**1**	**0**	**0**	**1**
Crimson Rosella	1			1						6			1	2		2									**11**	**2**	**0**	**13**
Eastern Rosella				9						7						4									**20**	**0**	**0**	**20**
Eurasian Coot																4									**4**	**0**	**0**	**4**
Eurasian Skylark	1			1			9						2			2			2			16			**33**	**0**	**0**	**33**
European Goldfinch	1												8									1			**10**	**0**	**0**	**10**
Fairy Martin																						2			**2**	**0**	**0**	**2**
Golden Whistler																			1						**1**	**0**	**0**	**1**
Great Crested Grebe																			1						**1**	**0**	**0**	**1**
Grey Butcherbird										2															**2**	**0**	**0**	**2**
Grey Currawong										2															**2**	**0**	**0**	**2**
Grey Fantail	10									8									8			1			**27**	**0**	**0**	**27**
Grey Shrike-thrush	1																		1						**2**	**0**	**0**	**2**
Grey Teal																			2						**2**	**0**	**0**	**2**
Hoary-headed Grebe																3									**3**	**0**	**0**	**3**
Laughing Kookaburra										1															**1**	**0**	**0**	**1**
Little Grassbird													3												**3**	**0**	**0**	**3**
Little Raven	5			2			4			2			16												**29**	**0**	**0**	**29**
Little Wattlebird										4															**4**	**0**	**0**	**4**
Magpie-lark	4			1			3			2			3						2			1			**16**	**0**	**0**	**16**
Musk Lorikeet										9						2									**11**	**0**	**0**	**11**
New Holland Honeyeater	1												2						4						**7**	**0**	**0**	**7**
Noisy Miner										2									3						**5**	**0**	**0**	**5**
Pacific Black Duck							1									4			6						**11**	**0**	**0**	**11**
Peregrine Falcon							1						1												**2**	**0**	**0**	**2**
Rainbow Lorikeet										10				13			2						4		**10**	**19**	**0**	**29**

Raven sp.	15	1		13			16			25			4			16	2		21	9		45	2		155	14	0	169
Red Wattlebird										25			3												28	0	0	28
Red-browed Finch													4												4	0	0	4
Rufous Whistler	2																								2	0	0	2
Sacred Kingfisher																			1						1	0	0	1
Silvereye	5												1						2						8	0	0	8
Spotted Dove													2						1						3	0	0	3
Spotted Pardalote										2						1			2						5	0	0	5
Straw-necked Ibis	15			1			4	19																	20	19	0	39
Stubble Quail	3			1						1			1			1						8			15	0	0	15
Sulphur-crested Cockatoo										3									6				3		9	3	0	12
Superb Fairy-wren	4			5						7			26			3			12						57	0	0	57
Swamp Harrier							1												1						2	0	0	2
Tree Martin																						18			18	0	0	18
Wedge-tailed Eagle	3	1	1											1			1		3						6	3	1	10
Welcome Swallow							4			3						6			1			22			36	0	0	36
White-browed Scrubwren													5						2						7	0	0	7
White-eared Honeyeater										3									1						4	0	0	4
White-faced Heron																5						1			6	0	0	6
Willie Wagtail							2									1									3	0	0	3
Yellow-faced Honeyeater										2									2						4	0	0	4
Yellow-tailed Black-cockatoo													7	1											7	1	0	8
Grand Total	**152**	**7**	**1**	**90**	**44**		**161**	**19**		**243**			**110**	**25**		**105**	**5**		**239**	**25**		**778**	**13**		**1878**	**138**	**1**	**2017**

Raw data for the summer 2025 BUS reference points at Gelliondale Wind Farm Project.

Species	REF1			REF2			Total			Grand total
	A	B	C	A	B	C	A	B	C	
Australian Magpie	19			9			28	0	0	28
Australian Pipit	4			21			25	0	0	25
Australian White Ibis	7						7	0	0	7
Black-shouldered Kite	1						1	0	0	1
Blue-winged Parrot		1		7			7	1	0	8
Brown Thornbill				5			5	0	0	5
Common Bronzewing				1			1	0	0	1
Common Myna	41						41	0	0	41
Common Starling	28	7		18			46	7	0	53
Eurasian Skylark	4			1			5	0	0	5
European Goldfinch				8			8	0	0	8
Fairy Martin				13			13	0	0	13
Forest Raven	1						1	0	0	1
Grey Fantail	2			4			6	0	0	6
Grey Shrike-thrush				1			1	0	0	1
Little Raven	8			9			17	0	0	17
Magpie-lark	3						3	0	0	3
Nankeen Kestrel				1			1	0	0	1
New Holland Honeyeater				1			1	0	0	1
Peregrine Falcon	1						1	0	0	1
Rainbow Lorikeet					4		0	4	0	4
Raven sp.	27	1		41	4		68	5	0	73
Red Wattlebird	2						2	0	0	2
Rufous Whistler				1			1	0	0	1
Stubble Quail	2			2			4	0	0	4
Sulphur-crested Cockatoo				1			1	0	0	1
Superb Fairy-wren				27			27	0	0	27
Tree Martin	12						12	0	0	12
Wedge-tailed Eagle		2					0	2	0	2
Welcome Swallow				80			80	0	0	80
Willie Wagtail				1			1	0	0	1
Yellow-faced Honeyeater				1			1	0	0	1
Yellow-tailed Black-cockatoo	2						2	0	0	2
Grand Total	**164**	**11**		**253**	**8**		**417**	**19**	**0**	**436**

Raw data for the autumn 2025 BUS impact points at Gelliondale Wind Farm Project

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			BUS9			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Australian Hobby							2									1												3	0	0	3
Australian Magpie	33			54	2		29			39			36			62			253			121	2		56			683	4	0	687
Australian Pelican		1																										0	1	0	1
Australian Pipit	4						13						4						2			2			7			32	0	0	32
Australian Shelduck																3			14									17	0	0	17
Australian White Ibis		2		76			12	130		4															9			101	132	0	233
Australian Wood Duck																												0	0	0	0
Black-faced Cuckoo-shrike	10												1															11	0	0	11
Black-shouldered Kite				4			1																					5	0	0	5
Black Swan																			2									2	0	0	2
Blue-winged Parrot																2			2	6		21	7					25	13	0	38
Brown Falcon																1												1	0	0	1
Brown Goshawk					1																							0	1	0	1
Brown Thornbill	1												3						1									5	0	0	5
Chestnut Teal																2												2	0	0	2
Common Blackbird													9															9	0	0	9
Common Bronzewing										1																		1	0	0	1
Common Myna	6			1			4			18												4			55	16		88	16	0	104
Common Starling	42			810	150		920			84			14			95			10			45			204	300		2224	450	0	2674
Crested Pigeon							3																		3			6	0	0	6
Crimson Rosella	1			3						17			4			11			4			15			1			56	0	0	56
Eastern Rosella				19						10			5			10						13			2			59	0	0	59
Eastern Spinebill										1			2															3	0	0	3
Eastern Yellow Robin										2			2			1			5			2						12	0	0	12
Eurasian Skylark	2			3			2			2									1						3			13	0	0	13
Fan-tailed Cuckoo																												0	0	0	0
Forest Raven	1									2			1			1						3			1			9	0	0	9
Galah								10								3			13			2						18	10	0	28
Gang-gang Cockatoo																												0	0	0	0
Golden-headed Cisticola																									11			11	0	0	11
Golden Whistler																						1						1	0	0	1
Great Cormorant							2																					2	0	0	2
Grey Butcherbird	6			3			3			1			6			6			1			5			5			36	0	0	36
Grey Currawong	3						1			2			1	2		2			2									11	2	0	13
Grey Fantail	6									2			1						3			1			1			14	0	0	14
Grey Shrike-thrush	7			1						1			2			3			7			2			1			24	0	0	24
Laughing Kookaburra	2						1			3			1			3			1									11	0	0	11
Lewin's Honeyeater																1												1	0	0	1
Little Corella		3																										0	3	0	3
Little Raven	38			158			54	1		30			21	4		64	7		338	6		38			107	3		848	21	0	869
Little Wattlebird	3																											3	0	0	3
Magpie-lark	5			6			5			5			1			1			5			5			16			49	0	0	49
Martin sp.																						2						2	0	0	2

Masked Lapwing																											**0**	**0**	**0**	**0**
Musk Lorikeet																					1						**1**	**0**	**0**	**1**
Nankeen Kestrel																		1									**1**	**0**	**0**	**1**
New Holland Honeyeater																											**0**	**0**	**0**	**0**
Noisy Miner	2									7						2			1								**12**	**0**	**0**	**12**
Pacific Black Duck																			2								**2**	**0**	**0**	**2**
Pied Currawong	2			1						1						5					2			1			**12**	**0**	**0**	**12**
Rainbow Lorikeet	3									2			1	2					2			2			8	6	**18**	**8**	**0**	**26**
Raven sp.	4			13			9												5			8	5		3	3	**42**	**8**	**0**	**50**
Red Wattlebird	12			3			2			10			4			6			2			7			1		**47**	**0**	**0**	**47**
Red-browed Finch													6														**6**	**0**	**0**	**6**
Rufous Whistler	2			1															1								**4**	**0**	**0**	**4**
Silvereye	1																										**1**	**0**	**0**	**1**
Spotted Dove							2																				**2**	**0**	**0**	**2**
Spotted Pardalote										3																	**3**	**0**	**0**	**3**
Straw-necked Ibis	4	60		153	8		5	150		30				32	220									93	140		**285**	**390**	**220**	**895**
Striated Pardalote																											**0**	**0**	**0**	**0**
Striated Thornbill	5																										**5**	**0**	**0**	**5**
Sulphur-crested Cockatoo																					3			2	3		**5**	**3**	**0**	**8**
Superb Fairy-wren										4			27						8						1		**40**	**0**	**0**	**40**
Swamp Harrier																											**0**	**0**	**0**	**0**
Wedge-tailed Eagle					2			1												6			1		1	2	**1**	**12**	**0**	**13**
Welcome Swallow	2						2									2									3	17	**9**	**17**	**0**	**26**
White-eared Honeyeater	2			1						9			6			4			5			3			1		**31**	**0**	**0**	**31**
White-faced Heron																2											**2**	**0**	**0**	**2**
White-naped Honeyeater																											**0**	**0**	**0**	**0**
White-necked Heron		1																									**0**	**1**	**0**	**1**
White-throated Treecreeper																											**0**	**0**	**0**	**0**
Willie Wagtail	1												1											6			**8**	**0**	**0**	**8**
Yellow-faced Honeyeater	1												4			3			11								**19**	**0**	**0**	**19**
Yellow-rumped Thornbill																								11			**11**	**0**	**0**	**11**
Yellow-tailed Black-Cockatoo	4						7						7						2								**20**	**0**	**0**	**20**
Grand Total	**215**	**67**		**1310**	**163**		**1079**	**292**		**290**			**170**	**40**	**220**	**296**	**7**		**704**	**18**		**308**	**15**		**613**	**490**		**4985**	**1092**	**220**	**6297**

Raw data for the autumn 2025 BUS reference points at Gelliondale Wind Farm Project.

Species	REF1			REF2			REF3			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	
Australian Hobby										0	0	0	0
Australian Magpie	38			17			7			62	0	0	62
Australian Pelican										0	0	0	0
Australian Pipit	5			1						6	0	0	6
Australian Shelduck				29						29	0	0	29
Australian White Ibis		1	2							0	1	2	3
Australian Wood Duck	27									27	0	0	27
Black Swan										0	0	0	0
Black-faced Cuckoo-shrike										0	0	0	0
Black-shouldered Kite	2									2	0	0	2
Blue-winged Parrot				20	27					20	27	0	47
Brown Falcon	3			2						5	0	0	5
Brown Goshawk										0	0	0	0
Brown Thornbill				5			10			15	0	0	15
Chestnut Teal										0	0	0	0
Common Blackbird				3						3	0	0	3
Common Bronzewing										0	0	0	0
Common Myna				1						1	0	0	1
Common Starling	20	60		43						63	60	0	123
Crested Pigeon										0	0	0	0
Crimson Rosella	6			1			4			11	0	0	11
Eastern Rosella	8						1			9	0	0	9
Eastern Spinebill							4			4	0	0	4
Eastern Yellow Robin				1			10			11	0	0	11
Eurasian Skylark				2						2	0	0	2
Fan-tailed Cuckoo							1			1	0	0	1
Forest Raven	1						2			3	0	0	3
Galah	18			2						20	0	0	20
Gang-gang Cockatoo	31									31	0	0	31
Golden Whistler							1			1	0	0	1
Golden-headed Cisticola										0	0	0	0
Great Cormorant										0	0	0	0
Grey Butcherbird	8			4			6			18	0	0	18
Grey Currawong				1						1	0	0	1
Grey Fantail	4			2			17			23	0	0	23
Grey Shrike-thrush	3			5			3			11	0	0	11
Laughing Kookaburra	5			2						7	0	0	7
Lewin's Honeyeater										0	0	0	0
Little Corella										0	0	0	0
Little Raven	33			69	2		1	2		103	4	0	107
Little Wattlebird							2			2	0	0	2
Magpie-lark	18									18	0	0	18
Martin sp.										0	0	0	0
Masked Lapwing	1									1	0	0	1
Musk Lorikeet										0	0	0	0
Nankeen Kestrel										0	0	0	0
New Holland Honeyeater							3			3	0	0	3
Noisy Miner	2			1						3	0	0	3
Pacific Black Duck										0	0	0	0
Pied Currawong	2									2	0	0	2
Rainbow Lorikeet				6				7		6	7	0	13
Raven sp.	6			17		3	1			24	0	3	27
Red Wattlebird	10						16			26	0	0	26
Red-browed Finch				6						6	0	0	6
Rufous Whistler							2			2	0	0	2
Silvereye										0	0	0	0
Spotted Dove										0	0	0	0
Spotted Pardalote							10			10	0	0	10
Straw-necked Ibis	135	37	70							135	37	70	242
Striated Pardalote							8			8	0	0	8
Striated Thornbill							17			17	0	0	17
Sulphur-crested Cockatoo										0	0	0	0
Superb Fairy-wren	7			26			4			37	0	0	37
Swamp Harrier	1									1	0	0	1
Wedge-tailed Eagle				2						2	0	0	2
Welcome Swallow	1									1	0	0	1

White-eared Honeyeater	3			1			33			37	0	0	37
White-faced Heron										0	0	0	0
White-naped Honeyeater							7			7	0	0	7
White-necked Heron										0	0	0	0
White-throated Treecreeper							3			3	0	0	3
Willie Wagtail	1			2						3	0	0	3
Yellow-faced Honeyeater				2			24			26	0	0	26
Yellow-rumped Thornbill	2									2	0	0	2
Yellow-tailed Black-Cockatoo							1	3		1	3	0	4
Grand total	**401**	**98**	**72**	**273**	**29**	**3**	**198**	**12**	**0**	**872**	**139**	**75**	**1086**

Raw data for the winter 2025 BUS impact points at Gelliondale Wind Farm Project

Species	BUS1			BUS2			BUS3			BUS4			BUS5			BUS6			BUS7			BUS8			BUS9			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Australian Magpie	93			57			25			50			28			37			237			55			27			609	0	0	609
Australian Pipit				6			8			1			5									2			140			162	0	0	162
Australian Raven																			1									1	0	0	1
Australian Shelduck	5			2			18												52			2	8		45			124	8	0	132
Australian White Ibis	1						1			1																		3	0	0	3
Australian Wood Duck																			50									50	0	0	50
Black Swan	541																											541	0	0	541
Black-shouldered Kite				2																								2	0	0	2
Blue-winged Parrot				8			6	1									2			1								14	4	0	18
Brown Falcon							1						1												3			5	0	0	5
Brown Thornbill																2												2	0	0	2
Brush Bronzewing													2															2	0	0	2
Common Blackbird										3			2															5	0	0	5
Common Myna																									2			2	0	0	2
Common Starling	24			210			181			100			13			95			23			14			30			690	0	0	690
Crested Pigeon							8																					8	0	0	8
Crimson Rosella	2			6						9			19			5												41	0	0	41
Eastern Rosella	2			5						12												2						21	0	0	21
Eastern Yellow Robin													1			1												2	0	0	2
Eurasian Skylark							7									8						3			48			66	0	0	66
Flame Robin	10																					2						12	0	0	12
Forest Raven										1			1															2	0	0	2
Galah	2																											2	0	0	2
Grey Butcherbird				2						4												2						8	0	0	8
Grey Currawong	2												1			1												4	0	0	4
Grey Shrike-thrush	2			1																								3	0	0	3
Laughing Kookaburra										2			1															3	0	0	3
Little Raven	16			90			16			10			9			16			89			16			37			299	0	0	299
Magpie-lark	7			21			1						6						6						5			46	0	0	46
Masked Lapwing							1																					1	0	0	1
New Holland Honeyeater													1															1	0	0	1
Noisy Miner										12																		12	0	0	12
Pacific Black Duck																			13									13	0	0	13
Peregrine Falcon																									1			1	0	0	1
Rainbow Lorikeet																						1						1	0	0	1
Raven sp.				1			1						1															3	0	0	3
Red Wattlebird	5			1			1			2												1						10	0	0	10
Red-browed Finch													5															5	0	0	5
Spotted Pardalote										2			5			1												8	0	0	8
Straw-necked Ibis				1							48														25	70		26	118	0	144
Striated Thornbill	4																											4	0	0	4
Sulphur-crested Cockatoo																			6									6	0	0	6
Superb Fairy-wren													18			29												47	0	0	47

Wedge-tailed Eagle							1																	1			2	0	0	2
Welcome Swallow	2									1																	3	0	0	3
Whistling Kite				1																		1					1	1	0	2
White-eared Honeyeater													4			4											8	0	0	8
White-faced Heron	2		2										1														3	0	2	5
White-fronted Chat																								2			2	0	0	2
Willie Wagtail	1			1			3														2			11			18	0	0	18
Yellow-rumped Thornbill	8																										8	0	0	8
Grand Total	**729**		**2**	**415**			**279**	**1**		**210**	**48**		**124**			**199**	**2**		**477**	**1**		**102**	**9**		**377**	**70**		**2912**	**131**	**2**	**3045**

Raw data for the winter 2025 BUS reference points at Gelliondale Wind Farm Project.

Species	REF1			REF2			REF3			Total			Grand total
	A	B	C	A	B	C	A	B	C	A	B	C	
Australian Magpie	25			44			3			72	0	0	72
Australian Pipit	19			2						21	0	0	21
Australian Raven	2			1						3	0	0	3
Australian Shelduck				23						23	0	0	23
Australian Wood Duck	51									51	0	0	51
Blue-winged Parrot	1				1					1	1	0	2
Brown Goshawk				1						1	0	0	1
Brown Thornbill							15			15	0	0	15
Common Blackbird				1						1	0	0	1
Common Myna				36						36	0	0	36
Common Starling				61						61	0	0	61
Crimson Rosella	2			12			3			17	0	0	17
Eastern Rosella	2									2	0	0	2
Eastern Yellow Robin							1			1	0	0	1
Eurasian Skylark	5									5	0	0	5
Forest Raven	1									1	0	0	1
Grey Butcherbird	1						1			2	0	0	2
Grey Currawong	1						2			3	0	0	3
Grey Fantail							1			1	0	0	1
Grey Shrike-thrush				3			4			7	0	0	7
Little Raven	17			134			3			154	0	0	154
Little Wattlebird				3						3	0	0	3
Magpie-lark	5			7						12	0	0	12
Pacific Black Duck				8						8	0	0	8
Red Wattlebird	2			2						4	0	0	4
Spotted Pardalote							5			5	0	0	5
Striated Thornbill							10			10	0	0	10
Sulphur-crested Cockatoo				65						65	0	0	65
Superb Fairy-wren	2			25			16			43	0	0	43
Wedge-tailed Eagle		2								0	2	0	2
White-eared Honeyeater				2			14			16	0	0	16
White-faced Heron	1									1	0	0	1
Yellow-faced Honeyeater							2			2	0	0	2
Grand Total	137	2		430	1		80			647	3	0	650
Australian Magpie	25			44			3			72	0	0	72
Australian Pipit	19			2						21	0	0	21
Australian Raven	2			1						3	0	0	3
Australian Shelduck				23						23	0	0	23
Australian Wood Duck	51									51	0	0	51
Blue-winged Parrot	1				1					1	1	0	2
Brown Goshawk				1						1	0	0	1
Brown Thornbill							15			15	0	0	15
Common Blackbird				1						1	0	0	1
Common Myna				36						36	0	0	36
Common Starling				61						61	0	0	61
Crimson Rosella	2			12			3			17	0	0	17
Eastern Rosella	2									2	0	0	2
Eastern Yellow Robin							1			1	0	0	1
Eurasian Skylark	5									5	0	0	5
Forest Raven	1									1	0	0	1
Grey Butcherbird	1						1			2	0	0	2
Grey Currawong	1						2			3	0	0	3
Grey Fantail							1			1	0	0	1
Grey Shrike-thrush				3			4			7	0	0	7
Little Raven	17			134			3			154	0	0	154
Little Wattlebird				3						3	0	0	3
Magpie-lark	5			7						12	0	0	12
Pacific Black Duck				8						8	0	0	8
Red Wattlebird	2			2						4	0	0	4
Spotted Pardalote							5			5	0	0	5
Striated Thornbill							10			10	0	0	10
Sulphur-crested Cockatoo				65						65	0	0	65
Superb Fairy-wren	2			25			16			43	0	0	43
Wedge-tailed Eagle		2								0	2	0	2
White-eared Honeyeater				2			14			16	0	0	16
White-faced Heron	1									1	0	0	1

Yellow-faced Honeyeater							2			2	0	0	2
Grand Total	**137**	**2**		**430**	**1**		**80**			**647**	**3**	**0**	**650**

Appendix 13: Overview assessment (BL&A 2016)

ALBERTON WIND FARM

FLORA AND FAUNA ASSESSMENT

Synergy Wind Pty Ltd

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December 2016

Report No. 14107 (3.3)

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1. EXECUTIVE SUMMARY

Brett Lane and Associates Pty Ltd undertook a flora and fauna assessment of a number of private properties as well as public road and rail reserves around the township of Alberton West in South Gippsland, Victoria. A wind farm and associated infrastructure are proposed for this land.

The study area supported mostly extensive areas of cleared pasture with small, fenced patches of native scrub. Large, extensive remnant forests, woodlands, heathlands, sedgelands and scrubs abutted some edges of the study areas and also occurred across a number of road and rail reserves. The Albert River crossed the study area.

Much of the study area was being used for dairy farming. As such, most of its remnant native vegetation and original fauna habitats had been removed through historical clearing for agricultural development. In this respect, the biodiversity value of the site is no different from most cleared agricultural landscapes in south eastern Australia.

Six fauna habitat types were identified:

- Eucalypt Forest;
- Agricultural pastures/Grazing paddocks;
- Rows of native and introduced trees;
- Heathy woodland;
- Saltmarsh and mangroves; and
- Aquatic habitats (drainage lines, creeks, rivers).

Native vegetation was categorised during the overview assessment into 62 Vegetation Sites (each comprising one or more areas of a distinct vegetation type or grouping), and as 116 habitat zones and 40 scattered trees (within areas impacted by past or current development layouts). A total of 20 Ecological Vegetation Classes were determined to occur or potentially occur on site.

Two listed threatened ecological communities were considered to potentially occur in the study area: Natural Damp Grassland of the Victorian Coastal Plains (within the proposed development footprint) and Subtropical and Temperate Coastal Saltmarsh (outside the proposed development footprint). Targeted surveys have been undertaken in November 2016 to determine whether Natural Dam Grassland occurs within the proposed development footprint and it has not been found.

A total of 267 flora species (mostly indigenous) and 120 fauna species (mostly indigenous) were recorded during the current investigations. Seven EPBC and FFG Act listed flora species and 27 listed fauna species (state and Commonwealth, including migratory species) were considered to potentially occur. Of these, all flora species and three fauna species were considered to be susceptible to proposed impacts. These species are listed below:

Flora

- Clover Glycine
- Eastern Spider-orchid
- Maroon Leek-orchid
- Metallic Sun-orchid

- River Swamp Wallaby-grass
- Strzelecki Gum
- Thick-lip Spider-orchid

Targeted surveys for the above listed flora species have been undertaken in November 2016 and none of these species have been found within the proposed impact areas (see BL&A 2016b).

Fauna

- Powerful Owl

The Powerful Owl may utilise some wooded areas of the study area and move occasionally into the southern forest at Hedley, where there are large hollow-bearing trees. The primary risk to this species is during nocturnal dispersive and foraging movements when they may potentially fly at RSA heights. Movements by the Powerful Owl are generally confined within forests habitats, which would therefore not involve any part of the proposed wind farm. Juvenile Owl dispersal from a breeding territory may result in a one-off flight across a gap between forest patches, such as north and south of the South Gippsland Highway between large nearby forest blocks, such as Alberton and Hedley. As no turbines are proposed between treed habitats at Hedley and the Alberton West State Forest at the narrowed gap between them, the likelihood of Powerful Owl being affected by nearby wind turbines is considered very low.

- Fork-tailed Swift
- White-throated Needletail

Both of these species could be susceptible to collisions with turbines and other structures as the species fly mostly at and above RSA height and it is likely the occasional individual will be affected by the proposed project. The population of these species numbers 10,000 or more and the loss of the occasional individual is expected to have negligible consequences for these species' populations.

A total of ***1.195 hectares*** of remnant patch native vegetation and ***sixteen scattered trees*** are ***proposed to be removed*** from the study area with a Strategic Biodiversity Score of 0.358.

Proposed vegetation removal would result in an estimated ***offset requirement of 0.386 General Biodiversity Equivalence Units (BEUs)*** with a minimum Strategic Biodiversity Score of 0.286. Offsets would need to be achieved within the West Gippsland CMA or Wellington Shire Council and would need to be secured prior to the removal of native vegetation.

A permit is required under Environmental Significance Overlay and Schedules 1 and 2 to that overlay within the Wellington Planning Scheme to remove, destroy or lop any vegetation, including dead vegetation. A planning permit under Clause 52.17 of the Wellington Planning Scheme is also required for the removal of native vegetation. The current proposal will be assessed under the high-risk assessment pathway and will be referred to the state Department of Environment land water and Planning (DELWP).

A Referral under the EPBC Act has been submitted in December 2016..

A Protected Flora Permit would be required from DELWP to remove the plant taxa comprising a listed threatened community, listed threatened flora species or otherwise protected values from public land.

A Referral to the state Minister for Planning is not required under the EE Act as the effects of the project on the environment are below the biodiversity impact criteria of the Ministerial Guidelines on Referral under this Act.

2. INTRODUCTION

Synergy Wind Pty Ltd engaged Brett Lane & Associates Pty. Ltd. (BL&A) to conduct a flora and fauna assessment of a number of private properties as well as public road and rail reserves around the township of Alberton West in South Gippsland, Victoria. The specific area investigated included the private properties listed in Appendix 1. A wind farm and associated infrastructure are proposed for this land (see Figure 1).

This investigation was commissioned to provide information on the extent and condition of native vegetation in the study areas according to Victoria's *Biodiversity assessment guidelines* (DEPI 2013b), as well as any potential impacts on flora and fauna matters listed under the state *Flora and Fauna Guarantee Act 1988* (FFG Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This report outlines any implications under relevant national, state and local legislation and planning policies that control development impacts on biodiversity.

This investigation was divided into two stages: an initial overview assessment of the broader wind farm site (referred to herein as the 'broader study area') followed by a detailed assessment of various proposed development footprints (referred to herein as the 'detailed study area').

The scopes of the two assessments are listed below.

1) Vegetation overview assessment of the broader wind farm site

- An initial site survey involved characterisation and moderate-scale mapping of remnant native vegetation across the broader wind farm site in order to identify potential constraints for wind farm design.
- Discussions were held with the proponent to provide advice on micrositing options for an initial layout option, based on the findings of the overview assessment to minimise impacts on native vegetation and other biodiversity.

2) Flora and fauna assessment of the proposed development footprint

Once a preferred wind farm layout had been developed, the development footprint was assessed in detail for its flora and fauna. This investigation included:

- A review of existing information on the flora, fauna and native vegetation of the area, including:
  - Victorian Biodiversity Atlas administered by the Department of Environment, Land, Water and Planning (DELWP);
  - The Commonwealth EPBC Act Protected Matters Search Tool; and
  - DELWP Native Vegetation Information Management system (using the EnSym Tool).
- A detailed flora and fauna field assessment of the development footprint, involving:
  - Detailed mapping and habitat hectare assessment of remnant native vegetation affected by the development footprint;
  - Compilation of flora and fauna species lists for the footprint and its surrounds;
  - Assessment of the nature and quality of native fauna habitat; and
  - Assessment of the likelihood of occurrence on and adjacent to the development footprint of EPBC Act and the FFG Act listed flora and fauna.

A number of layout iterations were surveyed.

Note that off-site native vegetation impacts of road upgrades for heavy vehicles and the external power grid connector were not included in the current scope of work.

This report is divided into the sections described below.

Section 3 provides legislative background, including details of all relevant Commonwealth, state and local legislation and planning policies and provisions.

Section 4 describes the sources of information, including the methods used for the field survey.

Section 5 presents the assessment results, including details of the native vegetation, flora and fauna of the study areas.

Section 6 discusses the proposed impacts of the project and details the implications of the findings under the relevant legislation and policies.

This investigation was undertaken by a team from BL&A, comprising Davide Coppolino (Senior Ecologist), Jeremy Ward (Senior Zoologist), Inga Kulik (Senior Ecologist & Project Manager) and Brett Lane (Principal Consultant).

Figure 1: Overview map

Project: Alberton Wind Farm
Client: Synergy Wind Pty Ltd

Legend

- Turbines
- Development footprint
- Ramsar site

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Kilometers

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3. LEGISLATIVE BACKGROUND

This section of the report reviews the legislation and planning provisions that relate to biodiversity considered relevant to the control of the proposed development's impacts on biodiversity. The implications of these controls for the project are addressed in Section 6 of this report.

3.1. Local laws and regulations

Section 111, Part 5 of the *Local Government Act 1989* gives authority to local governments to make local laws for or with respect to any act, matter or thing that it has jurisdiction over under any Act.

There are no local laws relevant to biodiversity that relate to the current proposal.

3.2. Planning and Environment Act 1987

The Victorian *Planning and Environment Act 1987* (P&E Act) establishes a framework for planning the use, development and protection (or conservation) of land in Victoria.

Section 4A (1-2) of the Act allows the Minister for Planning to prepare and approve standard planning provisions (i.e. Victorian Planning Provisions, or VPPs). VPPs are implemented through Victoria's planning schemes which are constituted and approved under the Act.

VPPs within each planning scheme are divided into State Planning Provisions, which apply across Victoria; and Local Planning Provisions, which apply specifically to the applicable local planning scheme in the relevant municipality.

This section discusses planning provisions in the Welshpool planning scheme applicable to flora, fauna and native vegetation.

3.2.1. Land designation

Zoning of land within the broader study area is detailed in Appendix 1. Zones in the broader study area comprise the following:

- Farming Zone
- Road Zone – Category 1
- Road Zone – Category 2
- Public Conservation and Resource Zone
- Industrial 1 Zone

The entire study area is located within a Bushfire-prone Area.

3.2.2. Local provisions

Local Planning Policy Framework

There are no local planning policies relevant to the current investigation.

Overlays

The study area is subject to the overlays outlined below that are relevant to this assessment. The purposes of these overlays in the Wellington Planning Scheme are also discussed below.

Environmental Significance Overlay – Schedule 1

Purpose: The purpose of ESO1 is to ensure the long-term protection and enhancement of the environmental quality, natural beauty and visual amenity of coastal and Gippsland Lakes environs.

Environmental Significance Overlay – Schedule 2

Purpose: The purpose of ESO1 is to protect and enhance the ecological, habitat, aesthetic, scientific, floristic, faunal, cultural, educational, and recreation values of wetlands.

Significant Landscapes Overlay – Schedule 3

Purpose: The purpose of ESO3 is to ensure that any use and development of the Gippsland Coalfields preserves opportunities for coal exploration and mining in the future.

An eight-year retention licence for coal exploration, covering much of the study area, was granted to Ignite Resources in 2015 (Licence RL2013).

3.2.3. State provisions

Under Clause 52.17 of all Victorian Planning Schemes a planning permit is required for the destruction, lopping or removal of native vegetation on land which has an area of 0.4 hectares or more (together with all contiguous land in single ownership). This includes the removal of dead trees with a DBH (diameter at breast height or 1.3 metres) of 40 centimetres or more and any individual scattered native plants.

On 20th December 2013 a planning scheme amendment was gazetted to implement a number of reforms to Victoria's native vegetation permitted clearing regulations, particularly Clauses 12.01 (Biodiversity), 52.16 (Native vegetation precinct plan) and 52.17 (Native vegetation). As part of these reforms the previously incorporated document *Victoria's Native Vegetation – a Framework for Action* was replaced by a new incorporated document, *Permitted clearing of native vegetation – Biodiversity assessment guidelines* (DEPI 2013b).

Before issuing a planning permit, Responsible Authorities are obligated to refer to Clause 12.01 (Biodiversity) in the Planning Scheme. This refers in turn to the following online tool and document:

- The Native Vegetation Information Management system (NVIM) (DEPI 2014b) — a database administered by DELWP; and
- *Permitted clearing of native vegetation – Biodiversity assessment guidelines* (DEPI 2013b).

These are discussed below.

Native Vegetation Information Management system (NVIM)

The online Native Vegetation Information Management system (NVIM) is an interactive mapping tool, which provides some of the information required to accompany a permit to remove native vegetation. It does not replace the application process.

The information provided by NVIM can include the following (described in more detail below):

- The *location risk* of the native vegetation;

- The *condition* of the native vegetation – used for the low-risk assessment pathway only;
- The *strategic biodiversity score* of the native vegetation proposed to be removed; and
- The *native vegetation offset* requirement – used for the low risk assessment pathway only.

Preliminary proposals are analysed using DELWP's EnSym Tool, which uses the same data and processes as NVIM.

Biodiversity assessment guidelines

Guidelines objective

As set out in *Permitted clearing of native vegetation – Biodiversity assessment guidelines* ('the Guidelines') the objective for permitted clearing of native vegetation in Victoria is 'No net loss in the contribution made by native vegetation to Victoria's biodiversity'. The key strategies for ensuring this outcome when considering an application to remove native vegetation are:

- Avoiding the removal of native vegetation that makes a significant contribution to Victoria's biodiversity;
- Minimising impacts on Victoria's biodiversity from the removal of native vegetation; and
- Where native vegetation is permitted to be removed, ensuring it is offset in a manner that makes an equivalent contribution to Victoria's biodiversity made by the native vegetation to be removed.

Note: if native vegetation does not meet the definition of either a remnant patch or scattered trees, the Guidelines are not required to be applied.

Risk-based assessment pathways

The first step in determining the type of assessment required for any site in Victoria is to determine the risk to biodiversity associated with the proposed native vegetation removal and therefore the risk-based assessment pathway for the proposed native vegetation removal. There are three risk-based pathways for assessing an application to remove native vegetation, below.

- Low risk
- Moderate risk
- High risk

This risk-based assessment pathway is determined by two factors, outlined below.

Extent risk – the area in hectares proposed to be removed *or* the number of scattered trees. *Note:* extent risk also includes any native vegetation clearing for which permission has been granted in the last five years.

Location risk – the likelihood that removing native vegetation in a location will have an impact on the persistence of a rare or threatened species classified into three categories: Location A, Location B and Location C.

The risk-based pathway for assessing an application to remove native vegetation is determined by the following matrices for remnant patches and scattered trees:

Extent (remnant patches)	Location A	Location B	Location C
< 0.5 hectares	Low	Low	High
≥ 0.5 hectares and < 1 hectare	Low	Moderate	High
≥ 1 hectare	Moderate	High	High
Extent (scattered trees)	**Location A**	**Location B**	**Location C**
< 15 scattered trees	Low	Moderate	High
≥ 15 scattered trees	Moderate	High	High

Notes: All native vegetation within any subdivision plot of less than 0.4 hectares is deemed to be lost; For applications with combined removal of both remnant patch and scattered trees, the extent of the scattered trees is converted to an area by assigning a standard area of 0.071 hectares per tree – the total extent is then used to determine the risk-based pathway.

The presence of any Location B or Location C risk categories within an area of proposed native vegetation removal means this whole area of removal is considered to belong to that category for the purpose of determining the risk-based assessment pathway.

Strategic biodiversity score

The strategic biodiversity score generated by NVIM acts as a measure of the site's importance for Victoria's biodiversity relative to other locations across the landscape. It is calculated based on a weighted average of scores across an area of native vegetation proposed for removal on a site.

Habitat importance

Habitat importance mapping produced by DELWP is based on one or a combination of habitat importance models, habitat distribution models or site record data. It identifies the following:

- *Habitat importance for dispersed species* – based on habitat distribution models and assigned a habitat importance score ranging from 0 to 1; and
- *Highly localised habitats* – considered to be equally important for a particular species and assigned a habitat importance score of 1.

Habitat importance mapping is used to determine the type of offset required under the moderate and high risk assessment pathways.

Biodiversity equivalence

Biodiversity equivalence scores are used to quantify losses in the contribution to Victoria's biodiversity from removing native vegetation and gains in this contribution from a native vegetation offset.

There are two types of biodiversity equivalence scores depending on whether or not the site makes a contribution to the habitat of a Victorian rare or threatened species.

- A *general* biodiversity equivalence score is a measure of the contribution native vegetation on a site makes to Victoria's biodiversity overall and applies when no habitat importance scores are applicable according to the equation:

General biodiversity equivalence score =
habitat hectares x strategic biodiversity score

- A *specific* biodiversity equivalence score is a measure of the contribution that native vegetation on a site makes to the habitat of a particular rare or threatened species – calculated for each such species for which the site provides important habitat (using habitat importance scores provided by DELWP) according to the equation:

Specific biodiversity equivalence score =
habitat hectares x habitat importance score

Offset requirements

A native vegetation offset is required for the approved removal of native vegetation. Offsets conform to one of two types and each type incorporates a risk factor to address the risk of offset failing:

- A *general* offset applies if the removal of native vegetation impacts Victoria's overall biodiversity and has an offset risk factor of 1.5 applied according to the equation:

General risk-adjusted offset requirement =
general biodiversity equivalence score (clearing site) x 1.5

- A *specific* offset applies if the native vegetation makes a significant impact to habitat for a rare or threatened species determined by a *specific-general offset test*. It applies to each species impacted and has an offset risk factor of 2 applied according to the equation:

Specific risk-adjusted offset requirement =
specific biodiversity equivalence score (clearing site) x 2

Note: if native vegetation does not meet the definition of either a remnant patch or scattered trees an offset is not required.

DELWP referral criteria

Clause 66.02 of the planning scheme determines the role of DELWP in the assessment of native vegetation removal permit applications. If an application is referred, DELWP may make certain recommendations to the responsible authority in relation to the permit application. An application to remove native vegetation must be referred to DELWP in the following circumstances:

- Applications where the native vegetation to be removed is 0.5 hectares or more (this does not apply to removal of scattered trees only);
- All applications in the high risk-based pathway;
- Applications where a property vegetation plan applies to the site; and
- Applications on Crown land which is occupied or managed by the responsible authority.

Summary of the assessment process

The assessment process, decision guidelines and offset requirements for approved native vegetation removal are outlined in Table 1.

Table 1: Summary of the assessment process and offset requirements

Risk-based pathway	Assessment quantum inputs	Decision guidelines	Offset requirements
Low	▪ Habitat hectares* (NVIM) ▪ Strategic biodiversity score (NVIM) ▪ General biodiversity equivalence score	An application for removal cannot be refused on biodiversity grounds (unless it is not in accordance with any property vegetation plan that applies to the site). *Note: this guideline also applies to native vegetation that does not meet the definition of either a remnant patch or scattered trees.*	General offset applies: ▪ General offset = general biodiversity equivalence score (clearing site) x 1.5 ▪ Offset must be located in the same CMA^ or Local Government Area as the removal ▪ Offset must have a strategic biodiversity score at least 80% of the native vegetation removed ▪ Offset must be secured before the removal of native vegetation
Moderate	▪ Habitat hectares* (site assessment) ▪ Strategic biodiversity score (NVIM) ▪ Habitat importance scores for each Victorian rare and threatened species ▪ Specific biodiversity equivalence score for each rare and threatened species *OR* ▪ *General* biodiversity equivalence score if no habitat importance scores apply	The responsible authority will consider: ▪ The strategic biodiversity score and habitat importance score of the native vegetation proposed to be removed ▪ Any property vegetation plan that applies to the site ▪ Whether reasonable steps have been taken to ensure that impacts of the proposed removal of native vegetation on biodiversity have been minimised with regard to the contribution to biodiversity made by the native vegetation to be removed and the native vegetation to be retained ▪ Whether an offset has been identified that meets the requirements ▪ The need to remove native vegetation to create defendable space to reduce the risk of bushfire	If the specific biodiversity equivalence scores for any rare and threatened species fails the specific-general offset test, then a general offset applies (as above) Otherwise, a specific offset applies for <u>each</u> rare and threatened species: ▪ Specific offset = specific biodiversity equivalence score (clearing site) x 2 ▪ Offset must be located in the same species habitat anywhere in Victoria as determined by DELWP habitat importance mapping ▪ When a specific offset is required for multiple species, the offset site must satisfy the specific offset requirements for all of these species or multiple offset sites may be used ▪ Offset must be secured before the removal of native vegetation
High		In addition to the considerations for the moderate pathway (above) the responsible authority will determine whether the native vegetation to be removed makes a significant contribution to Victoria's biodiversity. This includes considering: ▪ Impacts on important habitat for rare or threatened species, particularly highly localised habitat ▪ Proportional impacts on remaining habitat for rare or threatened species ▪ If the removal of the native vegetation will contribute to a cumulative impact that is a significant threat to the persistence of a rare or threatened species ▪ The availability of, and potential for, gain from offsets	

*** Habitat hectares = condition score (out of 1) x extent (hectares)**

^ Catchment Management Authority

Note: All applications must provide information about the vegetation to be removed such as location and address of the property, description of the vegetation, maps and recent dated photographs.

3.3. EPBC Act

The *Environment Protection and Biodiversity Conservation Act 1999* protects a number of threatened species and ecological communities that are considered to be of national conservation significance. Any significant impacts on these species require the approval of the Australian Minister for the Environment.

If there is a possibility of a significant impact on nationally threatened species or communities or listed migratory species, a Referral under the EPBC Act should be considered. The Minister will decide after 20 business days whether the project will be a 'controlled action' under the EPBC Act, in which case it cannot be undertaken without the approval of the Minister. This approval depends on a further assessment and approval process (lasting between three and nine months, depending on the level of assessment).

3.4. FFG Act

The Victorian *Flora and Fauna Guarantee Act 1988* lists threatened and protected species and ecological communities (DEPI 2013a, DELWP 2015a). Any removal of threatened flora species or communities (or protected flora) listed under the FFG Act from public land requires a Protected Flora Permit under the Act, obtained from DELWP.

The FFG Act only applies to private land in relation to the commercial collection of grasstrees, tree-ferns and sphagnum moss.

3.5. EE Act

The "Ministerial Guidelines for Assessment of Environmental Effects under the *Environment Effects Act 1978"* (DSE 2006), identifies criteria which trigger a Referral to the State Minister for Planning. The criteria related to flora, fauna and native vegetation are outlined below.

<u>One or more</u> of the following would trigger a Referral:

- Potential clearing of 10 ha or more of native vegetation from an area that:
  - Is of an Ecological Vegetation Class identified as endangered by the Department of Sustainability and Environment (in accordance with Appendix 2 of Victoria's Native Vegetation Management Framework); or
  - Is, or is likely to be, of very high conservation significance (as defined in accordance with Appendix 3 of Victoria's Native Vegetation Management Framework); and
  - Is not authorised under an approved Forest Management Plan or Fire Protection Plan
- Potential long-term loss of a significant proportion (e.g. 1 to 5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria
- 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'
- Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term

Two or more of the following would also trigger a Referral:

- Potential clearing of 10 ha or more of native vegetation, unless authorised under an approved Forest Management Plan or Fire Protection Plan
- Matters listed under the Flora and Fauna Guarantee Act 1988:
    - Potential loss of a significant area of a listed ecological community; or
    - Potential loss of a genetically important population of an endangered or threatened species (listed or nominated for listing), including as a result of loss or fragmentation of habitats; or
    - Potential loss of critical habitat; or
    - Potential significant effects on habitat values of a wetland supporting migratory bird species.

3.6. CaLP Act

The *Catchment ad Land Protection Act 1994* (CaLP Act) requires that land owners (or a third party to whom responsibilities have been legally transferred) must take all reasonable steps on their land to:

- Avoid causing or contributing to land degradation which causes or may cause damage to land of another land owner;
- Conserve soil;
- Protect water resources;
- Eradicate regionally prohibited weeds;
- Prevent the growth and spread of regionally controlled weeds;
- Prevent the spread of, and as far as possible eradicate, established pest animals; and
- Prevent the spread of regionally controlled weeds and established pest animals on a roadside that adjoins the land owner's land.

4. SOURCES OF INFORMATION

4.1. Existing information

Existing information used for this investigation is described below.

4.1.1. Existing reporting and documentation

The reports, planning schemes and/or development plans below, relating to the study area were reviewed.

- Wellington Planning Scheme (DTPLI 2015)
- Proposed wind farm layouts received between 14th December 2015 and 11th May 2016.

4.1.2. Location and extent risk

The likely risk-based pathway for assessment of any proposed vegetation removal relies on the 'location risk' and 'extent risk' determined with the assistance of the online Native Vegetation Information Management system (NVIM) administered by the Department of Environment, Land, Water and Planning (DEPI 2014b).

NVIM online mapping was viewed to determine the mapped location risk of the study area and to gain a preliminary indication of the extent risk, described in Section 3.2.3.

4.1.3. Native vegetation

Pre-1750 (pre-European settlement) vegetation mapping administered by DELWP was reviewed to determine the type of native vegetation likely to occur in the study area and surrounds. Information on Ecological Vegetation Classes was obtained from published EVC benchmarks. These sources included:

- Relevant EVC benchmarks for the Gippsland Plain bioregion[1] (DELWP 2015b); and
- Biodiversity Interactive Maps (DELWP 2015c).

4.1.4. Listed matters

Existing flora and fauna species records and information about the potential occurrence of listed matters was obtained from an area termed the 'search region', defined here as an area with a radius of ten kilometres from the approximate centre point of the study area (coordinates: latitude 38˚ 37' 22" S and longitude 146˚ 35' 42" E).

A list of the flora and fauna species recorded in the search region was obtained from the Victorian Biodiversity Atlas (VBA), a database administered by DELWP.

The 'Vegetation/ Modelled FFG Communities' layer in DELWP's Biodiversity Interactive Map (DELWP 2015c) was consulted to determine which ecological communities listed as threatened under the FFG Act were modelled to potentially occur in or near the broader study area.

[1] A bioregion is defined as "a geographic region that captures the patterns of ecological characteristics in the landscape, providing a natural framework for recognising and responding to biodiversity values". In general bioregions reflect underlying environmental features of the landscape (DNRE 1997).

The online *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (Department of the Environment 2015) was consulted to determine whether nationally listed species or communities potentially occurred in the search region based on habitat modelling.

4.2. Field methodology

An initial overview assessment was carried out from 23rd to 27th March 2015. During this assessment, the broader study area (comprising most of the properties participating in the wind farm project) was inspected from a vehicle. This overview assessment was supplemented by a later overview assessment on 6th June 2016 and a detailed habitat hectare assessment between the 21st and 23rd September 2016, a targeted flora survey for EPBC Act listed species between the 2nd and 4th November 2016. The second,third and fourth assessment focused on parts of additional properties within which over-head transmission lines were proposed.

During the overview assessments, each distinct site found to support native vegetation (in the form of patches and/or scattered trees – see Section 4.2.1) was mapped at a course-scale using aerial photograph interpretation. The following information was recorded for each site:

- Ecological Vegetation Classes identified or likely to occur;
- General weediness;
- Indication of indigenous flora diversity;
- Basic notes of vegetation such as dominant species; and
- General quality of vegetation.

During the targeted surveys the following listed values were assessed.

- Natural Damp Grassland of the Victorian Coastal Plains
- Clover Glycine
- Eastern Spider-orchid
- Maroon Leek-orchid
- Metallic Sun-orchid
- River Swamp Wallaby-grass
- Strzelecki Gum and
- Thick-lip Spider-orchid

The subsequent flora and fauna assessments were conducted from 7th to 11th December 2015,from 7th to 10th June 2016 as well as 2nd to 4th November 2016 (flora survey only, during the latter two). During the fauna assessments, the wind farm site was surveyed by sampling the various distinct landscapes and habitat types recorded during the overview assessment. These areas were initially surveyed from a vehicle and areas supporting notable fauna habitat were inspected in more detail on foot.

Native vegetation sites intersecting with, or in close proximity to development footprint options were mapped and assessed in detail. Mapping was undertaken through a combination of aerial photograph interpretation and ground-truthing using a hand held GPS (accurate to approximately five metres). Species and ecological communities listed

as threatened under the EPBC Act or FFG Act (where the latter occurred on public land) were also mapped using the same method, then later assessed in detail during the relevant flowering periods (November 2016). Vegetation was initially assessed as outlined in Section 4.2.1 below, then in a more targeted manner in the latter survey.

4.2.1. Native vegetation assessment

Native vegetation is currently defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses'. The *Biodiversity assessment guidelines* apply to native vegetation belonging to two categories (DEPI 2013b):

- Remnant patch; or
- Scattered trees.

The definitions of these categories are provided below, along with the prescribed DELWP methods to assess them.

Remnant patch

A remnant patch of native vegetation is either:

- An area of native vegetation where at least 25 per cent of the total perennial understorey plant cover is native; and/or
- Any area with three or more native canopy trees[2] where the canopy foliage cover[3] is at least 20 per cent of the area.

Remnant patch condition is assessed using the habitat hectare method (Parkes *et al*. 2003; DSE 2004) whereby components of native vegetation (e.g. tree canopy, understorey and ground cover) are assessed against an EVC benchmark. The score effectively measures the percentage resemblance of the vegetation to its original condition.

The NVIM system (DEPI 2014b) provides modelled condition scores for native vegetation to be used in certain circumstances (Section 3.2.3). All wetlands mapped on DELWP's native vegetation layer are treated as a remnant patch.

The condition score assists in defining the biodiversity equivalence score (described in Section 3.2.3) of the native vegetation and the offset targets if removal of native vegetation is approved.

Scattered trees

The *Biodiversity assessment guidelines* define scattered trees as a native canopy tree[2] that does not form part of a remnant patch of native vegetation.

Scattered trees are counted, the species identified and their DBH (diameter at breast height or 1.3 metres above ground) measured or estimated.

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[2] A canopy tree is a reproductively mature tree that is greater than 3 metres in height and is normally found in the upper layer of the relevant vegetation type.
[3] Foliage cover is the proportion of the ground that is shaded by vegetation foliage when lit from directly above.

4.2.2. Flora species and habitats

Records of flora species were made in conjunction with sampling methods used to undertake habitat hectare assessments of native vegetation, described above. Specimens requiring identification using laboratory techniques were collected.

Species protected under the FFG Act were determined by crosschecking against the FFG Act Protected Flora List (DEPI 2013a).

The potential for habitats to support listed flora species was assessed based on the criteria outlined below:

- The presence of suitable habitat for flora species such as soil type, floristic associations and landscape context; and
- The level of disturbance of suitable habitats by anthropogenic disturbances and invasions by pest plants and animals.

Wherever appropriate, a precautionary approach was adopted in determining the likelihood of occurrence or flora listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and Victorian *Flora and Fauna Guarantee Act 1988*. That is, where insufficient evidence was available on the potential occurrence of a listed species, it is assumed that it could be in an area of suitable habitat.

4.2.3. Fauna species and habitats

The techniques below were used to detect fauna species utilising the study area:

- Incidental searches for mammal scats, tracks and signs (e.g. diggings, signs of feeding and nests/burrows);
- Turning over logs/rocks and other ground debris for reptiles, frogs and mammals;
- Bird observation during the day in addition to transect surveys in relevant habitats in association with the proposed wind farm;
- General searches for reptiles and frogs; including identification of frog calls in seasonally wet areas; and
- General searches for bat habitat including waterbodies, potential commuting corridors, foraging sites and potential roosting sites such as caves, trees with hollows and lifted bark for crevice dwelling species.

The broader study area's habitat connectivity (i.e. degree of isolation/fragmentation), including linkages to other habitats in the region, was determined using field observations, recent aerial photography and DELWP's Biodiversity Interactive Maps (DELWP 2015c).

In addition to the fauna assessment in this report, detailed avifauna and bat investigations have been undertaken in the broader study area and its environs, in particular:

- Bird Utilisation Studies;
- Bat Utilisation Studies; and
- Migratory and resident shorebird surveys of the intertidal and shallow marine habitats in the nearby parts of the Nooramunga Marine and Coastal Parks.

These studies were undertaken in 2014 and have been reported in a separate document (BL&A 2015).

Wherever appropriate, a precautionary approach was adopted in determining the likelihood of occurrence or fauna listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and Victorian *Flora and Fauna Guarantee Act 1988*. That is, where insufficient evidence was available on the potential occurrence of a listed species, it is assumed that it could be in an area of suitable habitat.

4.2.4. Threatened ecological communities

During the overview assessment, the likelihood of listed threatened ecological communities occurring in the study area was determined. This involved checking areas of native vegetation within the proposed development footprint and assessing them in more detail against published descriptions of relevant listed ecological communities modelled to potentially occur in the study area.

Reviewed ecological community descriptions comprised identification criteria and condition thresholds from listing advice for EPBC Act communities as well as FFG Act listed community descriptions (SAC 2015).

4.3. Limitations of field assessment

The short duration of field assessments can result in a failure to record all species and life-forms because of the seasonal absence of some species. However, this limitation was not considered to undermine the current investigation, which was designed to provide an indicative, rather than exhaustive inventory of flora and fauna species in the study area.

The site assessments were carried out in early autumn (overview assessment), early summer (detailed flora and fauna assessment),early spring (habitat hectare assessment of powerline layout) and spring (targeted EPBC Act species surveys).

Some paddocks had been heavily grazed during the assessments, leaving little vegetation available to determine the presence, extent and/or composition of native vegetation. The timing of the survey and condition of vegetation was otherwise considered suitable to ascertain the extent and condition of native vegetation and fauna habitats.

Identification of EVCs considers vegetation types which would have naturally occupied the landscape prior to European impacts. Significant past alteration of parts of the study area's land form, hydrology and soil composition as well as past vegetation clearance has resulted in the emergence of an artificial site ecology and the reestablishment of vegetation that is likely to be notably different to what would have naturally occupied the study area. Identification of EVCs in altered areas was therefore based upon consideration of:

- Modelled EVC mapping (DELWP 2015c);
- Observations of adjacent landforms that had not been significantly altered;
- Observations of nearby natural vegetation remnants;
- Any observed indigenous flora species that are useful for determining EVCs; and
- Relevant published EVC benchmark descriptions.

EVC identification was based upon the structure and floristic composition of current observed vegetation if the above information was not sufficient to allow for a reasonable conclusion to be made on which EVC would have naturally occurred and the observed vegetation resembled an EVC, which is likely to have naturally occurred in the region.

No information was available on whether planted vegetation had been planted and maintained with public or private funding. Therefore, for the purposes of the current investigation, vegetation planted on private land was assumed to have been planted and maintained with private funding while that on public land was assumed to have been planted and maintained with public funding.

A small patch of vegetation on the banks of the Jack River was not able to be adequately assessed due to site access constraints. However this is not expected to be affected by the development due to the fact it is so close to the river and construction guidelines state that no infrastructure is to be erected that close to river/creek-lines.

4.4. Determination of impact extent

The detailed study area (comprising the proposed disturbance footprint described in Section 6.1) and mapped biodiversity values were overlaid using GIS to determine the extent of proposed impacts on biodiversity values in the study area. DELWP guidelines to determine whether a scattered tree or canopy tree in a remnant patch is lost or retained when it occurs near proposed development works (Appendix 6) were applied to determine impacts to scattered/canopy trees.

GIS shapefiles of the native vegetation (including location, extent, EVC number and habitat hectare score) that would be impacted by the proposed project were analysed using DELWP's EnSym Tool. The EnSym report is attached as Appendix 9.

5. ASSESSMENT RESULTS

5.1. Site description

The broader study area (Figure 1) was approximately 3200 hectares of private land and public infrastructure reserves in South Gippsland within the townships of Alberton, Alberton West, Devon North, Gelliondale, Hedley and Yarram.

The study area comprised four distinct landscapes, described below.

The central north-western part of the broader study area comprised lower slopes of the foothills of the Strzelecki Ranges. Much of this land had been cleared. However, some notable blocks of remnant Yellow Stringybark forest had been retained within areas abutting the more extensive forests of the Strzelecki Ranges.

The southern part of the broader study area supported a gently undulating coast barrier dune complex with light-loamy to sandy soils. This area would have once supported a complex of heathy vegetation types with Sedgy Wetland and Swamp Scrub in larger wet depressions and along drainage lines. Almost all this area (except for mainly roadside vegetation and scattered paddock trees) had been cleared of native vegetation and was being used for stock grazing. Adjacent state forests (to the south) supported extensive expanses of Heathy Woodland, Swamp Scrub, Sedge Swamp and Damp Heathland.

Land between the coastal dune complex and higher, hilly country further inland comprised relatively flat swampy ground with loamy to clayey soils. This land would have once supported Swamp Scrub and grassland vegetation but had been extensively cleared, drained and converted to intensively managed dairy farms. Groundwater had also been significantly drained. Much of the extant woody vegetation in this area comprised planted shelterbelts of non-indigenous trees.

The Albert River was the largest watercourse crossing the broader study area. Its reaches in the northern sections meandered through the landscape and held shallow to moderately deep, flowing fresh water. Although the river banks and channel were vegetated (with a mixture of indigenous reeds, rushes, herbs, climbers, trees and shrubs as well as introduced vegetation), surrounding land was mostly cleared dairy farms. Closer to the mouth of the river, water became brackish, shallower and slower-flowing. These areas, including a number of tributaries (possibly spring-fed) supported mostly degraded brackish wetland vegetation (e.g. Sea Rush and Australian Salt-grass). These areas were being used to graze dairy cattle. The tidal reaches of the river were wider and were lined with Mangrove Shrubland, with Saltmarsh and associated vegetation types further from the river.

The Jack River was another significant, meandering permanent waterway that crossed the north-eastern part of the broader study area. This river ran almost parallel to the Albert River, within a kilometre or so of the latter, and joined with the Albert River at a number of locations. A number of wet and dry ox-bows occurred between and along the two rivers. Stony Creek, which had been channelized for part of its length, was a notable tributary to the Jack River. This creek dissected the far north-eastern corner of the broader study area.

In addition to the aforementioned waterways, the broader study area had many small to large farm dams, divided by numerous minor to prominent man-made drainage channels. Many of these water bodies were inundated during the current investigations

and supported a mixture of indigenous and introduced aquatic and wetland vegetation (e.g. reeds, rushes, herbs and shrubs).

The following DELWP BioSites occurred within the broader study area:

- Albert River (Site No. 1903) – national significance;
- Gelliondale Railway (Site No. 1955) – regional significance; and
- Hedley (Site No. 1914) – regional significance.

The rivers and creeks crossing the broader study area, particularly the Albert and Jack Rivers, provided important aquatic and terrestrial habitat linkages and migratory routes for aquatic fauna through cleared farmland from the Strzelecki Ranges (in the north-west) to Corner Inlet (in the south-east). The disused Gelliondale Railway which crosses the broader study area provided the only narrow, densely vegetated east to west wildlife corridor through the otherwise cleared landscape.

The key habitat areas listed below occurred within the region.

- Alberton West State Forest

  This area comprised an extensive forest remnant on the foothills of the Strzelecki Ranges, immediately north-west and contiguous with remnant forest blocks in the central north-western part of the broader study area.

- Strzelecki Ranges

  The main expanse of remaining remnant native forest covering the Strzelecki Ranges occurred less than 10 kilometres to the north-west. This habitat was somewhat linked to the broader study area via a patchwork of cleared farmland and small to large patches of remnant native forest.

- Unnamed State Forest

  This area supported extensive heathy woodlands and other near-coastal vegetation types. It extended southwards from the southern edge of the broader study area.

- Nooramunga Marine and Coastal Parks

  This area supported extensive coastal banksia woodlands, saltmarshes and other coastal vegetation types, as well as areas of intertidal sand and mud flats and shallow marine waters. It extended southwards from the southern edge of the abovementioned unnamed state forest, to Corner Inlet. Nooramunga Marine Coastal Park occurs approximately 3.5 kilometres south of the broader study area.

- Corner Inlet (Ramsar and listed Important Wetland)

  This area extended westward from the southern end of Nooramunga Marine Coastal Park. Corner Inlet lies approximately seven kilometres southwest of the broader study area.

- Wilsons Promontory National Park

  This area extended southward from Corner Inlet, approximately 15 kilometres south-west of the study area.

The study area lies within the Gippsland Plain bioregion and falls within the West Gippsland catchment.

Figure 2-20: Study areas and native vegetation – overview and detailed

5.2. Ecological Vegetation Classes

Pre–European EVC mapping (DELWP 2015c) indicated that the study area and surrounds would have supported the EVCs listed below, prior to European settlement, based on modelling of factors including rainfall, aspect, soils and remaining vegetation:

- Damp Sands Herb-rich Woodland (EVC 3)
- Wet Heathland (EVC 8)
- Coastal Saltmarsh (EVC 9)
- Lowland Forest (EVC 16)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Plains Grassy Forest (EVC 151)
- Wet Heathland/Damp Heathland Mosaic (EVC 686)
- Swamp Scrub/Plains Grassland Mosaic (EVC 687)

Evidence on site, including floristic composition and soil characteristics, suggested that the EVCs listed below were present or potentially occurred within the study area (Figure 2 to Figure 20).

- Damp Sands Herb-rich Woodland (EVC 3)
- Wet Heathland (EVC 8)
- Coastal Saltmarsh (EVC 9)
- Riparian Forest (EVC 18)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Floodplain Riparian Woodland (EVC 56)
- Swampy Riparian Woodland (EVC 83)
- South Gippsland Plains Grassland (EVC 132_62)
- Sedge Wetland (EVC 136)
- Mangrove Shrubland (EVC 140)
- Plains Grassy Forest (EVC 151)
- Riparian Scrub (EVC 191)
- Aquatic Herbland (EVC 653)
- Brackish Wetland (EVC 656)
- Damp Heathland (EVC 710)
- Tall Marsh (EVC 821)
- Floodplain Reedbed (EVC 863)
- Estuarine Flats Grassland (EVC 914)
- Brackish Grassland (EVC 934)

Descriptions of these EVCs are provided within the EVC benchmarks in Appendix 8.

5.3. Native vegetation assessment

Sites found to support native vegetation during the overview and detailed assessment are shown in Figure 2 to Figure 20 and described in Table 2.

During the targeted surveys, no EPBC Act listed species/communities were recorded in any of the patches assessed.

Table 2: Sites found to support native vegetation during the overview assessment

Site No.	EVC/s	Weediness	Indigenous flora diversity	Flora notes	Quality
1	53/132	High	Very Low	One or more patches dominated by Common Spike-sedge	Very Low
2	53/132	High	Very Low	One or more patches of Rushes	Very Low
3	53/132	High	Very Low	One or more patches of Rushes	Very Low
4	53/132	High	Very Low	Bulrush dominated vegetation in man-made dam and drainage channel	Very Low
5	53/132	High	Very Low	Common Reed dominated vegetation in man-made dam and drainage channel	Very Low
6	53/132	High	Low	Some very small patches of aquatic reeds, grasses and herbs dominated by Bulrush and Common Spike-sedge occupying man-made dam	Very Low
7	53/83	Moderate to High	Moderate	One or more patches and possibly scattered trees dominated by Swamp Paperbark and Swamp Gum	Moderate
8	53/83	High	Low	One or more patches and possibly scattered trees dominated by Swamp Paperbark and Swamp Gum	Low
9	53	Moderate	Moderate	Dominated by Swamp Paperbark with some Coast Manna-gum	Moderate
10	53	High	Low	Dominated by Swamp Paperbark	Low
11	9	Low to Moderate	Low to Moderate	Dominated by Sea Rush	Moderate
12	53	High	Low	Dominated by Swamp Paperbark	Low
13	9/140/914	Low	High	Variety of herbaceous salt-adapted species	High
14	53/83/132/48	High	Very Low	Small patches of indigenous species imported by birds (e.g. Seaberry Saltbush) under planted trees; possibly some scattered trees also	Very Low
15	53	High	Low	Patches and scattered trees; co-dominated by Swamp Paperbark and Swamp Gum	Low
16	53/9/132_62	Moderate	Low	Co-dominated by Sea Rush and Australian Salt-grass	Low
17	53/132_62/656/934	Very High	Very Low	Dominated by Rushes	Very Low

Site No.	EVC/s	Weediness	Indigenous flora diversity	Flora notes	Quality
18	53/9/132_62	High	High	Dominated by Australian Salt-grass	Very Low
19	53	Low	Low	Dominated by Swamp Paperbark with some Blackwoods on an island within a dam (inaccessible)	Low
20	53	Low	Moderate	Co-dominated by Sea Rush and Beaded Glasswort with some Swamp Paperbark on slightly elevated ground	Moderate
21	53	High	Very Low	Scattered Swamp Paperbarks (possibly scattered trees) amongst weeds and planted trees	Very Low
22	8/53/136/710	High	High	Small indigenous herbs amongst weedy grasses	Low
23	53	High	Low	Dominated by Swamp Paperbark	Low
24	53	Moderate	Low	Dominated by Swamp Paperbark with Common Reed and Water Ribbons	Low
25	53/83	Low to Moderate	Moderate	Dam filled with Bulrush and surrounded by Swamp Gums and Swamp Paperbarks as well as planted trees and shrubs	Low
26	151	High	Moderate	Tall Spike-sedge in dam, surrounded by Swamp Gums and Swamp Paperbarks	Low
27	48	Low	Moderate to High	Dominated by Messmate Stringybark and Coast Manna-gum	Moderate to High
28	53/136	High	Very Low	One or more small patches of Rushes amongst weedy pasture grasses	Very Low
29	48	High	Low to Moderate	Dominated by Messmate Stringybark and Coast Manna-gum	Low
30	3/53/8/710	Very High	Very Low	Small patches and scattered trees; dominated by Swamp Gum and Swamp Paperbark	Very Low
31	53	High	Low	Dominated by Swamp Paperbark and Swamp Gum	Low
32	53	Very High	Very Low	Very small patches of Swamp Paperbark amongst weeds	Very Low
33	53	High	High	Multiple patches dominated by Swamp Paperbark with Common Reed and Bulrush	Very Low
34	48	Moderate to High	Low to Moderate	Multiple patches and scattered trees; dominated by Coast Manna-gum with Austral Bracken	Low

Site No.	EVC/s	Weediness	Indigenous flora diversity	Flora notes	Quality
35	48	Very High	Very Low	Multiple patches and scattered trees; dominated by Coast Manna-gum with Austral Bracken	Very Low
36	9/710/136	Very High	Very Low	Potentially one or more small patches dominated by Rushes	Very Low
37	53	Moderate to High	Moderate to High	Dominated by Swamp Paperbark and Swamp Gum	Moderate
38	151	Moderate to High	Moderate	Dominated by Yellow Stringybark and Southern Blue-gum with a variety of grasses, forbs, trees and shrubs in the understorey	Moderate to High
39	53	High	Low	Dam dominated by Bulrush with Swamp Paperbark surrounding the dam	Low
40	53	Moderate	Moderate	Dominated by Swamp Paperbark	Moderate
41	53	Moderate	Low to Moderate	Dominated by Swamp Paperbark and Swamp Gum	Moderate
42	53	High	Very Low	Multiple small patches; Swamp Paperbark within Blue Gum plantation	Very Low
43	53	Moderate to High	Low to Moderate	Multiple patches dominated by Swamp Paperbark	Low to Moderate
44	53/18/56/191	High	Moderate	Variety of planted indigenous trees and shrubs	Low to Moderate
45	53	Low to Moderate	Low to Moderate	Dominated by Swamp Gum with a variety of trees and shrubs such as Swamp Paperbark and Black Wattle	Low to Moderate
46	53/863	Moderate	Low	Co-dominated by Common Reed and Bulrush	Moderate
47	53/863	Very High	Very Low	Multiple patched including Common Reed amongst planted River Red-gums and Blackberry with some Swamp Gums	Very Low
48	53	Moderate	Low	Variety of indigenous shrubs	Low
49	53	Moderate	Low	Dense growth of Large Bindweed over some shrubs such as Swamp Paperbark	Low
50	48	Moderate	Moderate	Dominated by Coast Manna-gum	Low to Moderate
51	151	Low to	Moderate	Dominated by Yellow Stringybark	Moderate

Site No.	EVC/s	Weediness	Indigenous flora diversity	Flora notes	Quality
		Moderate			
52	151	Very High	Very Low	Scattered patches dominated by eucalypts amongst introduced pasture grasses	Very Low
53	151	Moderate	Moderate	Dominated by Yellow Stringybark with a variety of grasses, forbs, trees and shrubs in the understorey	High
54	53/863	Low	Low to Moderate	Dominated by Bulrush	Moderate
55	3, 8, 53, 136, 710	Low to Moderate	Moderate to High	Roadside vegetation; multiple patches dominated by various Eucalypts; array of indigenous grasses, forbs and shrubs in the understorey	Moderate
56	53	High	Very Low	Scattered Swamp Paperbark, rushes and Common Reed amongst weedy grasses and forbs; within inundated drainage line	Very Low
57	151	Moderate to High	Moderate	Grazed paddock with at least partially indigenous grassy ground cover	Low to Moderate
58	151	Moderate	High	Dominated by Blue Gum and Yellow Stringybark; heavily eroded drainage line; high structural diversity	Moderate to high
59	53	High	Moderate	Swamp Paperbark over Seaberry Saltbush, Cocksfoot, Blackberry and some small logs	Low to Moderate
60	53	Moderate to High	Low	Revegetation along teh Albert River; mostly planted trees and shrubs (e.g. Blue Gum, Swamp Gum and Wattles) over a mostly introduced ground layer	Low
61	53/863	Moderate to High	Moderate	Dense stands of Common Reed with other indigenous aquatic flora within the Jack River	Moderate
62	53	Low	Very Low	Fenced-off stands of Swamp Paperbark with few other indigenous species as well as weedy grasses and forbs	Low

5.4. Remnant patches

A total of 116 remnant patches (referred to herein as habitat zones) comprising the abovementioned EVCs were identified and assessed within or in close proximity to past and current development footprints.

The habitat hectare assessment results for these habitat zones are provided in Table 3 More detailed habitat scoring results are presented in Appendix 2. Habitat zones are briefly described in Table 4.

Table 3: Summary of habitat hectare assessment results

Habitat Zone	EVC no.	Area (ha)	Condition score (out of 100)
A	53	0.064	37
B	53	0.101	25
C	53	0.072	28
D	863	0.064	55
E	863	0.039	41
F	132_62	0.027	16
G	132_62	0.004	16
H1	53	0.009	25
H2	53	0.440	25
H3	53	0.113	25
H4	53	0.094	25
H5	53	0.118	25
H6	53	0.272	25
H7	53	0.010	25
H8	53	0.037	25
H9	53	0.011	25
H10	53	0.041	25
H11	53	0.014	25
H12	53	0.029	25
H13	53	0.194	25
H14	53	0.028	25
H15	53	0.163	25
H16	53	0.041	25
H17	53	0.158	25
H18	53	0.037	25
H19	53	0.103	28
H20	53	0.085	28
I	53	0.086	37
J	53	0.222	16
K	132_62	0.007	16

Habitat Zone	EVC no.	Area (ha)	Condition score (out of 100)
L	132_62	0.019	22
M	132_62	0.014	22
N	132_62	0.014	22
O	132_62	0.038	22
P1	653	0.056	49
P2	653	0.185	49
Q	653	3.756	49
R	653	0.005	49
S	653	0.007	49
T	132_62	0.050	22
U	132_62	0.015	20
V	53	0.041	22
W	53	0.036	24
X	132_62	0.047	16
Y	653	1.147	15
Z	53	0.404	21
AA	53	0.066	8
BB	53	1.474	37
CC	48	0.114	9
DD1	48	0.051	9
DD2	48	1.035	9
EE	48	0.017	45
FF1	53	0.149	30
FF2	53	0.031	30
FF3	53	0.016	30
FF4	53	0.025	30
FF5	53	0.007	30
FF6	53	0.004	30
GG1	8	0.011	15
GG2	8	0.017	15
GG3	8	0.039	15
HH1	53	0.172	17
HH2	53	0.037	17
HH3	53	0.260	17
II1	53	0.102	40
II2	53	0.158	40
II3	53	0.209	40
JJ	53	0.128	23

Habitat Zone	EVC no.	Area (ha)	Condition score (out of 100)
KK	53	0.104	23
1A	53	0.085	18
1B	53	0.078	27
1C	53	0.566	28
1D	53	0.595	28
1E	53	1.597	28
1F	53	0.864	28
1G	53	0.314	42
1H	53	0.033	35
1I	53	0.060	10
1J	53	0.035	25
1K	53	0.010	15
1L	53	0.119	35
1M	53	0.015	40
1N	132_62	0.177	20
1O	53	0.070	30
1P	53	0.097	30
1Q	3	0.110	41
1R	3	0.054	25
1S	3	0.128	26
1T	3	0.272	44
1U	3	0.074	23
1V	8	0.171	56
1W	8	0.601	52
1X	8	0.172	47
1Y	53	0.077	43
1Z	53	0.195	24
2A	53	1.173	20
2B	151	0.240	40
2C	151	0.046	42
2D	53	0.087	37
2E	53	0.052	37
2F	53	0.047	47
2G	53	0.087	47
2H	53	0.617	62
2I	53	0.230	25
2J	53	0.341	23
2K	53	0.072	23

Habitat Zone	EVC no.	Area (ha)	Condition score (out of 100)
2L	53	0.102	32
2M	53	0.053	20
2N	821	0.225	35
20	53	0.092	27
57	53	0.045	16
62	53	0.003	17
60a	53	0.093	25
46a	653	0.019	40
58a	53	0.104	41
60g	53	0.020	16
Total		23.062	

Table 4: Description of habitat zones in the study area

HZs	EVC no.	General quality	Description	Example photo
1U, 1R, 1S	3	Low	Damp Sands Herb-rich Woodland Structure simplified, diversity much depleted	
1Q, 1T	3	High	Damp Sands Herb-rich Woodland Some structural elements degraded or missing but otherwise intact	

HZs	EVC no.	General quality	Description	Example photo
GG1, GG2, GG3	8	Very low	Wet Heathland Structure and diversity much depleted; high weed cover	
1X, 1W, 1V	8	High	Wet Heathland Structure and diversity relatively intact; low weed cover	

HZs	EVC no.	General quality	Description	Example photo
CC, DD1, DD2	48	Very low	Heathy Woodland Fenced-off tree plantings (partly indigenous), understorey mostly of non-indigenous native, likely brought in by birds; very low native diversity, high weed cover	
EE	48	High	Heathy Woodland Vegetation overhanging study area; fire break along the edge of high-quality bushland; structure simplified from fire-reduction activity; high indigenous diversity	

HZs	EVC no.	General quality	Description	Example photo
AA, 1A, 1I, 1K, J, HH1, HH2, HH3, 62, 60a, 60g	53	Very low	Swamp Scrub Structure simplified, diversity much depleted, high weed cover	
B, C, V, W, Z, JJ, KK, H1, H2, H3, H4, H5, H6, H7, H8, H9, H10, H11, H12, H13, H14, H15, H16, H17, H18, H19, H20, 1B, 1C, 1D, 1E, 1F, 1J, 1Z, 2A, 2I, 2J, 2K, 2M, 2O	53	Low	Swamp Scrub Structure simplified, diversity much depleted	

HZs	EVC no.	General quality	Description	Example photo
A, BB, FF1, FF2, FF3, FF4, FF5, FF6, I, II1, II2, II3, 1H, 1L, 1M, 1O, 1P, 2D, 2E, 2L, 57, 58	53	Moderate	Swamp Scrub Moderate structural intactness and indigenous diversity;, low to high weed cover	
1G, 1Y, 2F, 2G, 2H	53	High	Swamp Scrub Structure relatively intact or high connectivity, high indigenous diversity, low weed cover	

HZs	EVC no.	General quality	Description	Example photo
2B, 2C	151	Moderate to high	Plains Grassy Forest Moderate to high structural intactness, high indigenous diversity, low to moderate weed cover	
Y	653	Low	Aquatic Herbland Structure simplified, diversity much depleted	

HZs	EVC no.	General quality	Description	Example photo
P1, P2, Q, R, S, 46a	653	High	Aquatic Herbland Structure and diversity relatively intact; low weed cover	
2N	821	Moderate	Tall Marsh Moderate structural intactness and indigenous diversity, low to high weed cover	

HZs	EVC no.	General quality	Description	Example photo
D, E	863	High	Floodplain Reedbed Moderate structural intactness and indigenous diversity, low to high weed cover	
F, G, K, X	132_62	Very low	South Gippsland Plains Grassland Stands of indigenous Rush amongst common pasture weeds	

HZs	EVC no.	General quality	Description	Example photo
L, M, N, O, T, U, 1N,	132_62	Low	South Gippsland Plains Grassland Structural diversity and indigenous diversity much depleted; high weed cover	

5.5. Scattered trees

Scattered trees recorded within, or in close proximity to past and current proposed development layouts would have once comprised the canopy component of Damp Sands Herb-rich Woodland (EVC 3), Heathy Woodland (EVC 48) and Swamp Scrub (EVC 53). A total of 40 scattered trees occurred in the study area (Figure 2 to Figure 20), ranging in DBH (diameter at breast height) between six and 97 centimetres. Details of the scattered trees recorded are listed in Appendix 3.

5.6. Flora species

5.6.1. Flora species recorded

During the assessments 267 plant species were recorded. Of these, 178 (67%) were indigenous and 89 (33%) were introduced or non-indigenous native in origin (Appendix 4).

5.6.2. Listed species

VBA records (VBA 2015) and the EPBC Protected Matters Search Tool (Department of the Environment 2015) indicated that within the search region there were records of, or there occurred potential suitable habitat for, nine species listed under the Commonwealth EPBC Act and seven listed under the state FFG Act, including seven listed under both Acts. No flora species listed under the EPBC Act or FFG Act were recorded during the field survey. Grey Mangrove, listed as rare on DELWP's Advisory List, was recorded

The likelihood of occurrence in the study area of species listed under the EPBC Act and FFG Act is addressed in Table 5. Species considered 'likely to occur' are those that have a very high chance of being in the study area based on numerous records in the search region and suitable habitat in the study area. Species considered to have the 'potential to occur' are those where suitable habitat exists, but recent records are scarce.

These likelihoods of occurrence were tested through the targeted flora surveys and none of the species/communities outlined below were recorded in the study area.

- Natural Damp Grassland of the Victorian Coastal Plains
- Clover Glycine
- Eastern Spider-orchid
- Maroon Leek-orchid
- Metallic Sun-orchid
- River Swamp Wallaby-grass
- Strzelecki Gum and
- Thick-lip Spider-orchid

Table 5: FFG Act and EPBC Act listed flora species and likelihood of occurrence

Common Name	Scientific name	EPBC	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Clover Glycine	Glycine latrobeana	VU	L	In Victoria, occurs mainly in grasslands and grassy woodlands on basalt soils dominated by Kangaroo Grass or within intermittently flooded streamlines co-dominated by Yellow Gum and Scentbark over mixed grasses and shrubs (in the Grampians/Black Range area). The species also occurs at the Nunniong Plateau in eastern Victoria within sub-alpine woodlands around 12oo metres above sea level on red-brown clays dominated by Snow Gum over an understorey of Small-fruit Hakea, various grasses (e.g. Kangaroo Grass, tussock grasses, Bent Grass and Common Wheat-grass) and forbs. At Reef Hills State Park in north-eastern Victoria plants occur in herb-rich woodland. At Yarra Valley Parklands and Meruka Park near Melbourne, vegetation is described as Valley Grassy Forest, dominated by Eucalyptus melliodora (Yellow Box), with scattered Acacia paradoxa (Hedge Wattle). Field layer comprises Austrodanthonia spp. (wallaby grasses) and various forbs. Other former sites in this area occurred in Grassy Dry Forest with Red Box. (Carter & Sutter 2010; D. Coppolino pers. Obs.). It is also found rarely in heathland (Carter & Sutter 2010).	None	N/A	Habitat present within remnant native plains grassland to woodland vegetation on drier fertile ground – **Potential to occur, but not recorded in impact areas during targeted surveys.**
Eastern Spider-orchid	Caladenia orientalis	EN	L	Heathland and Heathy Woodland in coastal areas between the Mornington Peninsula and Wilsons Promontory (Jeanes & Backhouse 2006).	None	N/A	Habitat present within Heathland and heathy woodland patches with an intact ground layer - **Potential to occur, but not recorded in impact areas during targeted surveys.**

Common Name	Scientific name	EPBC	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Maroon Leek-orchid	Prasophyllum frenchii	EN	L	Favouring heathland and Grassland on black clays (Bates 1994).	2	1/09/2003	Habitat present within roadsides supporting a fertile, damp grassy and herbaceous ground layer in plains country – **Potential to occur, but not recorded in impact areas during targeted surveys.**
Matted Flax-lily	Dianella amoena	EN	L	Lowland grassland and grassy woodlands on well-drained to seasonally waterlogged fertile sandy loams to heavy cracking soils derived from sedimentary or volcanic Geology. It is widely distributed from eastern to south-western Victoria (Carter 2010).	None	N/A	Much degraded habitat present - **Unlikely to occur**
Metallic Sun-orchid	Thelymitra epipactoides	EN	L	Primarily in mesic coastal heathlands, grasslands and woodlands, but also in drier inland heathlands, open forests and woodlands. (Backhouse & Jeanes 1995 in DSEWPC 2003).	1	9/12/1978	Habitat present within areas with a relatively intact and diverse grassy or heathy understory - **Potential to occur, but not recorded in impact areas during targeted surveys.**
River Swamp Wallaby-grass	Amphibromus fluitans	VU		Inhabits both natural and man-made water-bodies, including swamps, lagoons, billabongs and dams, and in roadside ditches predominantly in the north-central area along the Murray River between Wodonga and Echuca (Walsh 1994).	2	18/04/2007	Habitat present within drainage channels, vegetated dams and waterways – **Potential to occur, but not recorded in impact areas during targeted surveys.**
Strzelecki Gum	Eucalyptus strzeleckii	VU	L	Apparently endemic, confined to across the western section of the Strzelecki Range, from Neerim South in the north, south to Foster. Favours ridges, slopes and streambanks and deep fertile soils.	2	24/02/2012	Habitat present within Plains Grassy Forest – **Potential to occur, but not recorded in impact areas during targeted surveys.**

Common Name	Scientific name	EPBC	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Swamp Everlasting	Xerochrysum palustre	VU	L	Sedge-rich swamps and wetlands, usually on black cracking clay soils (Walsh and Entwisle 1999). Scattered occurrences in Victoria range from the South Australian border in the west to the Cobberas, near Benambra, in the East (DSE 2008).	8	11/12/2007	No habitat present – **Unlikely to occur**
Thick-lip Spider-orchid	Caladenia tessellata	VU		Coastal open woodlands, Lowland forest, heathy woodland (Entwisle 1994).	2	15/04/1992	Habitat present within forest and heathy woodland with intact ground layer – **Potential to occur, but not recorded in impact areas during targeted surveys.**

Notes: **EPBC** = threatened species status under EPBC Act: EX = presumed extinct in the wild; CR = critically endangered; EN = endangered; VU = vulnerable; **FFG** = threatened species status under the FFG Act: **L** = listed as threatened

5.7. Fauna habitats

The broader study area supported the six fauna habitat types listed below.

- Eucalypt Forest;
- Agricultural pastures;
- Native and introduced treed vegetation-rows;
- Heathy woodland;
- Saltmarsh and mangroves; and
- Aquatic habitats (drainage lines, creeks, rivers).

Eucalypt forest

This habitat type was predominately present in the outlying area in the north-west section of the broader study area (Alberton West State Forest). Species primarily comprised Yellow Stringy-bark, Mountain Grey Gum, Messmate, and Tasmanian Blue Gum, with an open understory of grasses and shrubs. Hollows that provide habitat for tree-dwelling fauna were present in some large trees. The ground layer comprised a mixture of weeds and native species. Leaf-litter and fallen timber were present throughout the forest, which provided suitable habitat for reptiles. As the forest sits just outside the broader study area, it has been included due to its direct proximity and its influence on the fauna of the broader study area.

Agricultural land

Grazing pastures were the dominant habitat type across most of the broader study area and primarily comprised introduced grass species. This habitat is largely devoid of native vegetation due to historic clearing for agriculture and the introduction of pasture grasses for dairy farms. Habitat components for ground dwelling fauna, such as leaf litter, rocks and woody debris, were scarce across the broader study area, however some artificial refuges was being utilised by some common reptile and frog species.

Native and introduced treed vegetation-rows

Linear patches of treed vegetation (tree-rows, wind breaks etc) along roadsides and rail-reserves in the broader study area, supported native and introduced plant species. Various eucalyptus species and swamp paperbark with the occasional she-oak species dominated this habitat. It provided foraging opportunities for a number of common and generalist fauna species.

Importantly, connectivity to similar habitats within the landscape, provided by linear strips of vegetated habitat, increased the value of habitats to fauna. The broader study area was connected to Alberton West State Forest to the north-west and the Hedley State Forest in the south. These large remnant forest blocks flanked the north-west and southern wind farm boundaries and formed a network of wider, regional value that provides dispersal, commuting routes, as well as foraging habitat for species that may move between forest blocks.

Heathy woodland

This habitat was located along the southern boundaries of the broader study area, in association with the Hedley State Forest. This habitat was dominated by Coast Manna

Gum, Messmate and Saw Banksia. Hedley State Forest is an intact remnant forest with a ground layer consisting of native grasses and a shrub layer dominated by grasstree species. As the woodland sits just outside the broader study area, it has been included due to its influence on the fauna of the broader study area. Additionally, due to the quality of habitat, it is likely to act as an attraction for fauna species as a place to feed and roost.

Saltmarsh and Mangroves

Some areas of saltmarsh and outlying pockets of mangroves occurred in the far south-east of the broader study area along the Albert River. These habitats were predominately made up of Beaded Glasswort, Salt Grass, sedges and rushes. The mangroves were dominated by Grey Mangrove. These areas were largely inaccessible to livestock due to exclusion fences, therefore disturbance has been somewhat controlled.

Due to this highly specific habitat, it is likely to act as an attraction for specific fauna species, particularly migratory species, as a place to feed and roost.

Aquatic habitats (drainage lines, creeks, rivers)

Aquatic habitats scattered across the broader study area consisted of the Albert River and its tributaries, drainage lines, ephemeral wetlands and farm dams.

The majority of farm dams were accessible to stock and supported little or no vegetation. Ephemeral drainage lines were common throughout the broader study area as a method of draining water from low-lying agricultural land. These were often in poor condition and dominated by native and weed species such as sedges and rushes. Although in poor condition, they provide habitat for several frog species and also migratory species such as Latham's Snipe and Eastern Great Egret.

Where more permanent water-bodies were allowed to flow naturally and excluded from grazing pressure, low and high marshes occurred, particularly in the north-east of the site in association with the Albert River. These marshes were dominated by reeds, rushes and sedges, providing good intact and connected vegetation cover. Consequently, they provided dispersal and foraging opportunities as well as critical refuges for a number of fauna species.

5.8. Fauna species

5.8.1. Fauna species recorded

During the field assessment 120 fauna species were recorded. This included 101 bird (10 introduced), 10 mammal (5 introduced), six reptile, three frog and an array of invertebrate species (Appendix 5).

5.8.2. Listed fauna species

The review of existing information indicated that 61 fauna species listed under the Commonwealth EPBC Act and the state FFG Act have previously been recorded within the search region in the last 35 years or for which potential habitat occurs according to the EPBC Act Protected Matters Search Tool (see also Figure 21). The likelihood of occurrence of these species in the study area was assessed and the results are presented in Table 6.

Species considered 'likely to occur' are those that have a very high chance of being in the study area given the existence of numerous records in the search region and suitable habitat in the study area. Using the precautionary approach, species considered to have the 'potential to occur' (at least occasionally) are those where suitable habitat exists or is situated close to the wind farm boundaries, but recent records are scarce.

This assessment of potential occurrence of listed fauna species excludes:

- Marine fauna (such as whales, dolphins and sea-lions etc) given that the study area is inland with no significant marine linkages; and
- Migratory oceanic bird species (such as albatrosses and petrels) given that the study area is inland.

The susceptibility of these species to impacts from development is discussed in Section 5.7.3.

Table 6: Listed fauna species from the search region and likelihood of occurrence in the study area.

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Birds								
Australasian Bittern	*Botaurus poiciloptilus*	EN		L	Terrestrial wetlands, including a range of wetland types but prefers permanent water bodies with tall dense vegetation, particularly those dominated by sedges, rush, reeds or cutting grass (Marchant and Higgins 1990).	None	N/A	Although there was some potential habitat in the broader study area this species is an uncommon visitor to the region and is considered **unlikely to occur**
Australian Painted Snipe	*Rostratula australis*	EN	M (CAMBA)	L	Lowlands on shallow freshwater swamps with emergent vegetation and flooded saltmarshes (Marchant and Higgins 1993).	None	N/A	Although suitable wetland habitat is present in the broader study area, sAs the nearest recent records are in wetland around Melbourne and at Sale and there are no records either in the VBA or in the Atlas of Australian Birds (http://birdata.com.au/homecontent., viewed 01/07/16), this species is **unlikely to occur.**
Baillon's Crake	*Porzana pusilla palustris*			L	Vegetated freshwater wetlands, swamps with emergent vegetation	None	N/A	**Recorded** in study area
Bar-tailed Godwit	*Limosa lapponica*	CR	M (JAMBA, CAMBA, ROKAMBA, Bonn Convention (A2H))		Mainly coastal species, usually in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats (Higgins and Davies 1996).	1	27/2/2015	No suitable habitat. **Unlikely to occur.**
Black-faced Monarch	*Monarcha melanopsis*		M (Bonn Convention (A2H))		Rainforests, eucalypt woodlands, coastal scrub and damp gullies (Higgins et al. 2006)	None	N/A	Suitable forest and woodland habitat though lack of records, **potential to occur**
Black-tailed Godwit	*Limosa limosa*		M (JAMBA, CAMBA, Bonn Convention (A2H))		Mainly coastal species, usually in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats (Higgins and Davies 1996).	None	N/A	No suitable habitat and lack of records. **Unlikely to occur.**
Caspian Tern	*Hydroprogne caspia*		M (JAMBA, CAMBA)	L	Sheltered coastal embayment, including harbours, lagoons, inlets, estuaries and river deltas, usually with sandy or muddy margins (Higgins and Davies 1996).	6	21/12/2009	No suitable habitat. **Unlikely to occur.**
Cattle Egret	*Ardea ibis*		M (JAMBA, CAMBA)		Wooded lands and terrestrial freshwater wetlands and pasture, in association with cattle (Marchant and Higgins 1990).	4	25/05/2001	Suitable habitat exists and recent records in the study area. **Likely to occur.**
Common Greenshank	*Tringa nebularia*		M (JAMBA, CAMBA, ROKAMBA, Bonn Convention (A2H))		Inhabits wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands (Higgins and Davies 1996).	4	27/02/2015	No suitable habitat. **Unlikely to occur.**
Common Sandpiper	*Actitis hypoleucos*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H)		Inhabits a wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands (Higgins and Davies 1996).	2	4/03/1977	No suitable habitat. **Unlikely to occur.**

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Common Tern	*Sterna hirundo*		M (JAMBA, CAMBA, ROKAMBA)		Inhabit shallow fresh to saline wetlands, usually coastal to near-coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins and Davies 1996).	1	1/01/1977	No suitable habitat. **Unlikely to occur.**
Curlew Sandpiper	*Calidris ferruginea*	CR	M (JAMBA, CAMBA, ROKAMBA, Bonn Convention (A2H))		Inhabits wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands (Higgins and Davies 1996).	4	3/03/1999	No suitable habitat. **Unlikely to occur.**
Double-banded Plover	*Charadrius bicinctus*		M (Bonn Convention (A2H))		Inhabits wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands (Marchant and Higgins 1993).	1	1/01/1977	No suitable habitat. **Unlikely to occur.**
Eastern Curlew	*Numenius madagascariensis*	CR	M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H)		Inhabits sheltered coasts, especially estuaries, embayment, harbours, inlets and coastal lagoons with large intertidal mudflats or sandflats, often with beds of sea grass (Higgins and Davies 1996).	7	27/02/2015	No suitable habitat. **Unlikely to occur.**
Eastern Great Egret	*Ardea modesta*		M (JAMBA, CAMBA)	L	Occurs in a variety of wetlands including: permanent water bodies on flood plains; shallows of deep permanent lakes, either open or vegetated with shrubs or trees; semi-permanent swamps with tall emergent vegetation (e.g. bulrush) and herb dominated seasonal swamps with abundant aquatic flora (Marchant and Higgins 1990).	14	25/04/2004	**Recorded** in study area
Fairy Prion	*Pachyptila turtur*	VU			Marine bird; in subtropical and subantarctic seas (Marchant and Higgins 1990).	None	N/A	No suitable habitat and lack of records. **Unlikely to occur.**
Fairy Tern	*Sternula nereis nereis*	VU		L	Sheltered coasts, on mainland and inshore and offshore islands. Occurs in embayment, such as harbours, inlets, bays, estuaries and lagoons and on ocean beaches. Also on lakes and salt ponds (Higgins and Davies 1996).	None	N/A	No suitable habitat and lack of records. **Unlikely to occur.**
Fork-tailed Swift	*Apus pacificus*		M (JAMBA, CAMBA, ROKAMBA		Aerial over predominately open country.	None	N/A	**Recorded** in study area
Glossy Ibis	*Plegadis falcinellus*		M (CAMBA, Bonn (A2S))		Prefer freshwater inland wetlands, in particular, permanent or ephemeral water bodies and swamps with abundant vegetation (Marchant and Higgins 1990).	1	7/03/2001	May occasionally pass through the study area - **potential to occur**
Great Knot	*Calidris tenuirostris*		M (JAMBA, CAMBA, ROKAMBA, Bonn Convention (A2H))	L	Inhabit sheltered coastal habitats with large intertidal mudflats or sandflats. Including inlets, bays, harbours, estuaries and lagoons; also ocean beaches (Higgins and Davies 1996).	None	N/A	No suitable habitat and lack of records. **Unlikely to occur.**

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Greater Sand Plover	*Charadrius leschenaultii*		M (JAMBA, CAMBA, ROKAMBA, Bonn Convention (A2H))		Entirely coastal; mainly on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks (Marchant and Higgins 1993).	None	N/A	No suitable habitat and lack of records. **Unlikely to occur.**
Grey Goshawk	*Accipiter novae-hollandiae novae-hollandiae*			L	Inhabit rainforests, open forests, swamp forests, woodlands and plantations; most abundant where forest or woodland provide cover for hunting from perches (Marchant and Higgins 1993).	1	1/02/1922	Suitable habitat exists, but there are no recent records of the species in this part of South Gippsland in the Atlas of Australian Birds (http://birdata.com.au/homecontent., viewed 01/07/16) or in the VBA since 1922, therefore **unikely to occur.**
Grey Plover	*Pluvialis squatarola*		M (JAMBA, CAMBA, ROKAMBA, Bonn Convention (A2H))		Entirely coastal, but occasionally inland. Mainly on marine shores, inlets, estuaries and lagoons where there are nearby large tidal mudflats for feeding and sandy beaches for roosting (Marchant and Higgins 1993).	1	1/01/1977	No suitable habitat and lack of recent records. **Unlikely to occur.**
Grey-tailed Tattler	*Tringa brevipes*		M (JAMBA, CAMBA, ROKAMBA, Bonn Convention (A2H))	L	Usually found on sheltered coasts with reefs and rock platforms or with mudflats exposed at low tide and forage on wet mudflats and among rocks, and often roost on rocks (Higgins and Davies, 1996).	1	1/01/1977	No suitable habitat and lack of recent records. **Unlikely to occur.**
Gull-billed Tern	*Gelochelidon nilotica macrotarsa*			L	Shallow freshwater and saline wetlands; intertidal mudflats, also in sheltered inshore marine waters where they roost on sandbars and beaches (Higgins and Davies 1996).	3	1/01/1977	No suitable habitat and lack of recent records. **Unlikely to occur.**
Hooded Plover	*Thinornis rubricollis rubricollis*			L	Inhabits sandy ocean beaches, especially those that are broad and flat, with a wide wave-wash zone for feeding. Widespread in all coastal waters of Victoria (Marchant and Higgins 1993).	None	N/A	No suitable habitat and lack of records. **Unlikely to occur.**
Intermediate Egret	*Ardea intermedia*			L	It mainly inhabits terrestrial wetlands; only occasionally visit coastal wetlands and forages amongst aquatic vegetation in shallow water and requires trees for roosting and nesting. It often occurs in wetlands that contain vegetation, including bulrush (Marchant and Higgins 1990).	2	25/04/2004	Suitable habitat exists and recent records in the study area. **Likely to occur.**
Latham's Snipe	*Gallinago hardwickii*		M (JAMBA, CAMBA, ROKAMBA, Bonn A2H)		Occurs in wide variety of permanent and ephemeral wetlands; it prefers open freshwater wetlands with dense cover nearby, such as the edges of rivers and creeks, bogs, swamps, waterholes (Naarding 1983; Higgins and Davies 1996).	6	20/12/2012	**Recorded** in study area

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Lesser Sand Plover	*Charadrius mongolus*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H)		Inhabits beaches of sheltered bays, harbours, and estuaries with large intertidal sandflats or mudflats (Marchant and Higgins 1993).	None	N/A	No suitable habitat and lack of records. **Unlikely to occur.**
Little Egret	*Egretta garzetta nigripes*			L	It occurs in a range of coastal and terrestrial wetlands, including freshwater wetlands with vegetation such as bulrush and requires trees for roosting and nesting (Marchant and Higgins 1990).	3	25/05/2001	**Recorded** in study area
Little Tern	*Sternula albifrons sinensis*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2S))	L	Sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets, especially those with exposed sandbanks or sand spits (Higgins and Davies 1996).	1	1/01/1977	No suitable habitat and lack of recent records. **Unlikely to occur.**
Marsh Sandpiper	*Tringa stagnatilis*		M (JAMBA, CAMBA, ROKAMBA, Bonn Convention (A2H))		Inhabits sandy, muddy or rocky shores, usually coastal, rarely far inland. Often on beaches and mudflats, sandflats and occasionally rock shelves (Higgins and Davies 1996).	None	N/A	No suitable habitat and lack of records. **Unlikely to occur.**
Orange-bellied Parrot	*Neophema chrysogaster*	CE	M (JAMBA)	L	Inhabits natural saltmarshes dominated by Beaded Glasswort and Shrubby Glasswort as well as associated grassy or weedy pastures (Commonwealth of Australia 2005).	None	N/A	There is limited suitable saltmarsh habitat within the broader study area and this species is an uncommon visitor to the region, **unlikely to occur.**
Osprey	*Pandion cristatus*		M (Bonn (A2S))		Rare vagrant to Victoria (Marchant & Higgins 1993). Littoral and coastal habitats and terrestrial wetlands. They are mostly found in coastal areas but occasionally travel inland along major rivers (Johnstone & Storr 1998; Marchant & Higgins 1993; Olsen 1995). They require extensive areas of open fresh, brackish or saline water for foraging (Marchant & Higgins 1993).	None	N/A	No suitable habitat. **Unlikely to occur.**
Pacific Golden Plover	*Pluvialis fulva*		M (JAMBA, CAMBA, ROKAMBA, Bonn Convention (A2H))		Inhabits sandy, muddy or rocky shores, usually coastal, rarely far inland. Often on beaches and mudflats, sandflats and occasionally rock shelves (Marchant and Higgins 1993).	None	N/A	No suitable habitat and lack of records. **Unlikely to occur.**
Painted Honeyeater	*Grantiella picta*	VU		L	Inhabits box-ironbark forests and woodlands and mainly feeds on the fruits of mistletoe. Strongly associated with mistletoe around the margins of open forests and woodlands (Higgins et al. 2001; Tzaros 2005).	None	N/A	No suitable habitat. **Unlikely to occur.**
Pin-tailed Snipe	*Gallinago stenura*		M (JAMBA, CAMBA, ROKAMBA, Bonn Convention (A2H))		Inhabit shallow fresh to saline wetlands, usually coastal to near-coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins and Davies 1996).	None	N/A	No suitable habitat. **Unlikely to occur.**

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Powerful Owl	*Ninox strenua*			L	Open and tall wet sclerophyll forests with sheltered gullies and old growth forest with dense understorey. They are also found in dry forests with box and ironbark eucalypts and River Red Gum. Large old trees with hollows are required by this species for nesting (Higgins 1999; Soderquist et al. 2002).	5	17/03/2008	Suitable forest and woodland habitat exists and recent records near the broader study area. **Likely to occur.**
Rainbow Bee-eater	*Merops ornatus*		M (JAMBA)		Usually in open or lightly timbered areas, often near water. Occur in partly cleared land such as farmland and in sand-dunes, both coastal and inland (Higgins 1999).	None	N/A	–No recent records in South Gippsland - **unlikely to occur**
Red Knot	*Calidris canutus*		M (JAMBA, CAMBA, ROKAMBA, Bonn Convention (A2H)		Inhabits intertidal mudflats, sandflats, and sandy beaches of sheltered coasts, in estuaries, bays, inlets, and lagoons (Higgins and Davies 1996).	2	27/02/2015	No suitable habitat. **Unlikely to occur.**
Red-necked Stint	*Calidris ruficollis*		M (JAMBA, CAMBA, ROKAMBA, Bonn Convention (A2H))		Inhabit shallow fresh to saline wetlands, usually coastal to near-coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins and Davies 1996).	5	27/02/2015	May occasionally pass through/fly over the study area - **potential to occur**
Regent Honeyeater	*Anthochaera phrygia*	CR	M (JAMBA)	L	Inhabits dry box-ironbark eucalypt forests near rivers and creeks on inland slopes of the Great Dividing Range. It could also occur in small remnant patches or in mature trees in farmland or partly cleared agricultural land (Higgins et al. 2001).	None	N/A	No suitable habitat. **Unlikely to occur.**
Ruddy Turnstone	*Arenaria interpres*		M (JAMBA, CAMBA, ROKAMBA, Bonn Convention (A2H))		Inhabit shallow fresh to saline wetlands, usually coastal to near-coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins and Davies 1996).	1	1/01/1977	No suitable habitat. **Unlikely to occur.**
Rufous Fantail	*Rhipidura rufifrons*		M (Bonn Convention (A2H))		Primarily found in dense, moist habitats. Less often present in dry sclerophyll forests and woodlands (Higgins et al. 2006).	2	29/01/1998	Suitable forest and woodland habitat exists and some records in the nearby search region. **Potential to occur.**
Sanderling	*Calidris alba*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		Inhabits open sandy beaches exposed to sea-swells; also on exposed sandbars and spits (Higgins and Davies 1996).	None	N/A	No suitable habitat. **Unlikely to occur.**
Satin Flycatcher	*Myiagra cyanoleuca*		M (Bonn Convention (A2H))		Tall forests and woodlands in wetter habitats but not in rainforest (Higgins et al. 2006)	2	29/01/1998	May pass through the area during migration - **potential to occur**

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Sharp-tailed Sandpiper	*Calidris acuminata*		M (JAMBA, CAMBA, ROKAMBA, Bonn Convention (A2H))		Inhabit shallow fresh to saline wetlands, usually coastal to near-coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins and Davies 1996).	None	N/A	No suitable habitat. **Unlikely to occur.**
Swift Parrot	*Lathamus discolor*	EN		L	Prefers a narrow range of eucalypts in Victoria, including White Box, Red Ironbark and Yellow Gum as well as River Red Gum when this species supports abundant 'lerp' (Emison et al. 1987; Higgins 1999; Kennedy and Tzaros 2005).	1	11/04/1991	Suitable woodland and forest habitat exists though recent and regular records are lacking in the study area - **potential to occur**
Terek Sandpiper	*Xenus cinereus*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))	L	Inhabits saline intertidal mudflats in sheltered estuaries, harbours and lagoons; on islets, mudbanks, sandbanks or spits (Higgins and Davies 1996).	None	N/A	No suitable habitat. **Unlikely to occur.**
Whimbrel	*Numenius phaeopus*		M (JAMBA, CAMBA, ROKAMBA, Bonn Convention (A2H))		Inhabit intertidal mudflats of sheltered coasts, harbours, lagoons, estuaries and river deltas. Prefer mudflats with mangrove, but also occur on open, unvegetated mudflats (Higgins and Davies 1996).	2	1/10/1983	No suitable habitat. **Unlikely to occur.**
White-bellied Sea-Eagle	*Haliaeetus leucogaster*			L	Maritime habitats, terrestrial large wetlands and coastal lands of tropical and temperate Australia and offshore islands, ranging far inland only over large rivers and wetlands (Marchant and Higgins 1993).	4	25/04/2004	Suitable habitat exists and recent records in the study area. **Likely to occur.**
White-throated Needletail	*Hirundapus caudacutus*		M (JAMBA, CAMBA, ROKAMBA)		Aerial, over all habitats, but probably more over wooded areas, including open forest and rainforest. Often over heathland and less often above treeless areas such as grassland and swamps or farmland (Higgins 1999).	9	29/02/2004	**Recorded** flying over the broader study area
Wood Sandpiper	*Tringa glareola*		M (JAMBA, CAMBA, ROKAMBA, Bonn Convention (A2H))		Inhabits well vegetated, shallow, freshwater wetlands, such as swamps, lakes, pools, and waterholes; typically with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reed (Higgins and Davies 1996).	None	N/A	Although there was some potential habitat in the broader study area this species is an uncommon visitor to the region and is considered **unlikely to occur**
Mammals								
Grey-headed Flying-fox	*Pteropus poliocephalus*	VU		L	Roosts in riverine habitat in Melbourne and forages widely in flowering eucalypts and fruit trees (Menkhorst 1995). A seasonal camp is located in Bairnsdale with up to 26,000 flying-foxes being documented by DELWP over the summer period, but then migrate elsewhere as the colder winter weather arrives.	None	N/A	No recent records in the search area and the Bairnsdale seasonal camp is approximately 125 kilometres from the proposed wind farm site - **unlikely to occur**

Common Name	Scientific name	Conservation Status			Habitat	Number of records	Date of last record	Likelihood of occurrence
		EPBC - T	EPBC - M	FFG				
Long-nosed Potoroo	*Potorous tridactylus*	VU		L	In Victoria – coastal heath and heathy woodland (Menkhorst 1995). Dominated by sandy loam vegetation species.	None	N/A	Suitable nearby habitat - **potential to occur**
Southern Brown Bandicoot	*Isoodon obesulus obesulus*	EN		L	Heathy forest, heath and coastal scrub, open grassy woodlands and with dense intact understory (Menkhorst 1995).	None	N/A	Suitable nearby habitat - **potential to occur**
Smoky Mouse	*Pseudomys fumeus*	EN		L	Coastal heath, heathy woodland, sub-alpine heath, dry forest and gullies in wet forest (Menkhorst 1995).	None	N/A	Although potentially suitable habitat occurs, there are no nearby records - **unlikely to occur**
Swamp Antechinus	*Antechinus minimus maritimus*			L	Dense wet heath, tussock grassland, sedgeland heathy woodland and coastal heath and scrub (Menkhorst 1995).	1	1/05/1981	Suitable nearby habitat - **potential to occur**
White-footed Dunnart	*Sminthopsis leucopus*			L	Coastal tussock grassland and sedgeland, wet heath, and forest or woodland with a dense heathy understorey or mid-storey vegetation (Menkhorst 1995).	1	1/01/1976	Suitable nearby habitat - **potential to occur**
Frogs								
Growling Grass Frog	*Litoria raniformis*	VU		L	Permanent, still or slow flowing water with fringing and emergent vegetation in streams, swamps, lagoons and artificial wetlands such as farm dams and abandoned quarries (Clemann and Gillespie 2004).	None	N/A	Suitable habitat exists in the broader study area though lack of nearby records. **unlikely to occur.**
Fish								
Australian Grayling	*Prototroctes maraena*	VU		L	Large and small coastal streams and rivers with cool, clear waters with a gravel substrate and altering pools and riffles (Cadwallader and Backhouse 1983).	4	6/01/1982	Suitable habitat exists in the Alberton River though lack of recent and regular records in the search region. **Potential to occur.**
Dwarf Galaxias	*Galaxiella pusilla*	VU		L	Barwon River to Mitchell River. Vegetated margins of still water, ditches, swamps and backwaters of creeks, both ephemeral and permanent (Allen et al. 2002).	None	N/A	Suitable habitat exists in the broader study area although lack of records. **unlikely to occur.**

Notes: EPBC-T = threatened species status under EPBC Act:

EX = presumed extinct in the wild

CE = critically endangered

EN = endangered

VU = vulnerable

EPBC-M = migratory status under the EPBC Act:

Bonn Convention (A2H) - Convention on the Conservation of Migratory Species of Wild Animals – listed as a member of a family

Bonn Convention (A2S) - Convention on the Conservation of Migratory Species of Wild Animals - species listed explicitly

CAMBA - China- Australia Migratory Birds Agreement

JAMBA - Japan-Australia Migratory Birds Agreement

ROKAMBA - Republic of Korea Australia Migratory Birds Agreement

FFG = threatened species status under the FFG Act: **L** = listed as threatened

5.8.3. Susceptibility of listed fauna to impacts

The following analysis identifies the susceptibility of listed fauna species which may utilise the study area to the potential impacts of the proposed wind farm. This analysis includes consideration of the factors below.

- The mobility of the species; and
- The availability and extent of other suitable habitat in the region and the degree to which each species may rely on habitat in the study area.

Birds

Eight listed non-migratory bird species were recorded or are considered to have the potential to occur in the study area. The likelihood of occurrence in the study area and vulnerability of these species to possible impacts from the proposed development are discussed below.

- **Baillon's Crake** (FFG Act: Listed)
- **Eastern Great Egret** (FFG Act: Listed)
- **Intermediate Egret** (FFG Act: Listed)
- **Little Egret** (FFG Act: Listed)

  The above four species (with the exception of Intermediate Egret) were recorded during the current fauna survey, and are therefore known to utilise suitable habitats within the study area. Baillon's Crake was recorded from a dam north of Pound Road West, and Eastern Great Egret was recorded along Old Welshpool Road, east of proposed Turbine 27. These waterbird species are listed on the FFG Act and found in association with wetlands, creeks, rivers and farm dams.

  There is potential for direct impacts from strikes, although the number and frequency of occurrence of these species is on the site is low and the likelihood of turbine collision is considered very low. The low likelihood of collision with operating turbines makes a significant impact on these species from the project very unlikely. To avoid the direct loss of habitat for these species, it is recommended that turbines and associated infrastructure avoid drainage lines, ponds, dams, marshes and the Albert River and its tributaries by a wide a margin possible and by at least 100 metres (assuming turbine blade length up to 75 metres).

- **White-bellied Sea-Eagle** (FFG Act: Listed)

  This species is restricted to coastal habitats, but may occasionally travel inland along the river systems, including possibly the Albert River, whilst foraging or moving about its territory. This species has been recorded south of the broader study area boundaries, in association with its preferred habitat of coastal and estuarine ecosystems. Eagles are vulnerable to collision with operating turbines. No evidence was found for nesting near proposed turbine locations during site studies, however the species may occasionally fly across the wind farm site given its proximity to coastal habitats. This could put individuals at risk of occasionally colliding with operating wind turbines. The frequency of such collisions is likely to be very low so population consequences are not considered significant given the state population is estimated at 100 adult pairs plus sub-adults, with the Corner Inlet area in South Gippsland supporting approximately 25 of these pairs (DSE 2003). It will be

important to monitor for the presence of this species as part of any impact monitoring and mitigation plan and have a plan involving investigation and a targeted mitigation response should repeated collision be detected.

- **Powerful Owl** (FFG Act: Listed)

  This species has been historically recorded within habitats associated with the Alberton West State Forest to the north of the proposed wind farm site. Additionally, it has been seen within the northern section of the wind farm (local landholder *pers. comm.*). It is possible Powerful Owl may utilise some wooded areas of the study area and move occasionally into the southern forest at Hedley, where there are large hollow-bearing trees. The primary risk to this species is during nocturnal dispersive and foraging movements when they may potentially fly at RSA heights. Movements by the Powerful Owl are generally confined within forests habitats, which would therefore not involve any part of the proposed wind farm. Juvenile Owl dispersal from a breeding territory may result in a one-off flight across a gap between forest patches, such as north and south of the South Gippsland Highway between large nearby forest blocks, such as Alberton and Hedley. As no turbines are proposed between treed habitats at Hedley and the Alberton West State Forest at the narrowed gap between them, the likelihood of Powerful Owl being affected by nearby wind turbines is considered very low.

- **Swift Parrot** (EPBC Act: Critically Endangered; FFG Act: listed)

  This species has the potential to forage in indigenous and planted eucalypts in the study area. The Swift Parrot could occur occasionally during dispersive movements, particularly when in transit between large forested areas. This species has not been recorded in the area therefore it is expected that it would not occur regularly. The population of Swift Parrot likely to use the study area is very small relative to that using the larger forested blocks north of the Great Dividing Range or interstate. Therefore, this species is likely to experience minimal impact from the proposed wind farm.

Migratory Birds

Ten listed migratory bird species (excluding oceanic species and shorebirds) have been recorded or have the potential to occur in the study area based on the availability of suitable habitat.

Potential impacts to migratory species that may occur in the study area are discussed below.

- **Fork-tailed Swift** and **White-throated Needletail**

  Both species were recorded in the study area during BL&A Bird Utilisation Surveys. They are likely to occur over large areas of the proposed study area during the migratory dispersal period (mostly late spring and summer). They are aerial foragers, spending most of their time flying in search of aerial insect prey (Higgins 1999). Both species could therefore be susceptible to collisions with turbines and other structures as the species fly mostly at and above RSA height. The White-throated Needletail has been recorded colliding with wind turbines at a number of south-eastern Australian wind farms in recent years (BL&A, unpubl. data) and it is likely the occasional individual will be affected by the proposed project. The population of these species numbers 10,000 or more (Higgins 1999), so the loss of the occasional individual is expected to have negligible consequences for the species' populations.

- Latham's Snipe

  Latham's Snipe is a migratory species that visits south-eastern Australia from August to February. The species is a very agile and inconspicuous species and generally feeds in low light and throughout the night. Due to the presence of suitable aquatic habitat on the proposed wind farm site, including drainage lines and ephemeral wetlands, it is likely to occur occasionally in the study area. Most disturbance would occur to this habitat during the construction phase of the project, during which it would be able to move to alternative suitable habitat. Therefore, impacts would be minor and would not substantially modify its available habitat. The Latham's Snipe occasionally flies at turbine height but there are no known records of it colliding with wind turbines in Australia (BL&A unpubl. data). It is unlikely therefore that the project will represent a significant risk to the species' population.

- Cattle Egret

  This species is a summer visitor to southern Australia and feeds in pasture land. Given the large extent of pasture in the region and the ability of the species to move to alternative areas, the impacts to this species during construction are considered negligible. Risks during operation arise from the potential for collision with operating wind turbines. This is likely to be an infrequent event. Although this is a listed migratory species, it is nonetheless not threatened and occurs in thousands throughout eastern Australia. Therefore, the impacts on the overall population of an occasional turbine collision are considered negligible.

- Glossy Ibis and Red-necked Stint

  These two species are likely to occur in small numbers in ephemeral wetlands on the site in spring when these hold water or after heavy rainfall events. The likely low incidence of occurrence however makes it unlikely that the proposed wind farm will lead to a significant impact on their overall populations.

- Black-faced Monarch

  This species may occur in areas of remnant woodland during migratory dispersion. The proposed turbines are situated away from woodland and forest habitats to minimise risk to woodland bird species. The Black-faced Monarch usually confines to woodland habitats and is expected to fly below RSA. Therefore, this species is likely to experience minimal impact from the proposed wind farm.

- Rufous Fantail

  This species could occur in remnant areas of native vegetation in the broader study area. It is associated with rainforests and densely vegetated gullies. Similarly to Black-faced Monarch, it is expected to fly below RSA and generally confine its activities to wooded areas where no turbines are proposed to be built. Therefore, this species is likely to experience minimal impact from the proposed wind farm.

- **Satin Flycatcher**

  This species breeds in the cool temperate forests and woodlands in southern and mountain districts of Victoria and Tasmania, migrating north to New Guinea for winter (Higgins *et al*. 2006). The population of Satin Flycatcher likely to use the study area is very small relative to that occupying the larger forested blocks in the eastern highlands, Otway Range and Grampians and elsewhere in Victoria (Emison *et al*. 1987). It is expected to fly below RSA and generally confine its activities to wooded areas where no turbines are proposed to be built. Therefore, this species is likely to experience minimal impact from the proposed wind farm.

Mammals

Based on the assessment in Table 5, the following four listed ground-dwelling mammals have the potential to occur in suitable habitats within the study area and in adjacent remnant blocks of vegetation.

- **Southern Brown Bandicoot** (EPBC Act: endangered; FFG Act: Listed)
- **Long-nosed Potoroo** (EPBC Act: vulnerable; FFG Act: Listed)
- **Swamp Antechinus** (FFG Act: Listed)
- **White-footed Dunnart** (FFG Act: Listed)

  These species prefer habitat with dense vegetation cover (Menkhorst 1995). There are records of Swamp Antechinus and White-footed Dunnarts 30 years ago in close proximity to the wind farm boundary. These habitats provide a high level of constraint, and where possible, removal of vegetation in these areas should be avoided. Provided direct impacts on these habitats can be avoided no significant impacts are anticipated from the proposed wind farm.

Reptiles

No listed reptile species have the potential to occur in the study area.

Frogs

No listed frog species have the potential to occur on the proposed wind farm site. Frog species are not considered at risk from proposed wind farm developments because they generally occur on lowlands or near water bodies. Provided a suitable buffer of at least 50 metres is provided from waterways and wetland habitats impacts on frog habitat are not expected.

Fish

Two listed fish species are considered to have the potential to occur in the study area. The likelihood of occurrence in the study area and vulnerability of these species to possible impacts from the proposed development are discussed below.

- **Australian Grayling** (EPBC Act: vulnerable; FFG Act: Listed)

  Australian Grayling exists in large and small coastal streams and rivers with cool, clear waters with a gravel substrate and altering pools and riffles (Cadwallader and Backhouse 1983). Suitable habitat exists within the study area and there are historical records in the Albert River in the north-east of the study area. Provided there are no impacts on flows or water quality in the Albert River from construction

and operation of the proposed wind farm then impacts are not expected on this species. This can be assured by ensuring a minimum 30 metres separation between the development footprint (i.e. turbines, access tracks and power cabling) and the Albert River and any significant tributaries on the site.

- **Dwarf Galaxias** (EPBC Act: vulnerable; FFG Act: Listed)

  Dwarf Galaxias occur amongst marginal vegetation in still or gently flowing water of roadside ditches, swamps, and backwaters of creeks (Allen *et al*. 2002). Suitable habitat exists within the study area, particular with tributaries associated with the Albert and Jack Rivers in the north-east of the site. Provided there are no impacts on flows or water quality in the Albert River from construction and operation of the proposed wind farm then impacts are not expected on this species. This can be assured by ensuring a minimum 30 metres separation between the development footprint (i.e. turbines, access tracks and power cabling) and the Albert River and any significant tributaries on the site.

Invertebrates

No listed invertebrate species have recorded historically within the broader study area. There is potential for some listed invertebrate species to exist. During the fauna overview assessment for example, it was noted that many burrowing crayfish are present within wet habitats in the south-east of the study area, in association with the saltmarsh habitats linked with drainage lines. Provided these habitats can be avoided (see recommended separation of 30 metres from major waterway and wetland habitats above) significant impacts on such species, if present, are unlikely.

5.8.4. Susceptibility of non-listed fauna species to impacts

Koalas

A well known Koala population inhabits South Gippsland, the Strzelecki Ranges Koalas (probably around 500 animals). This non-threatened species in Victoria may occasionally visit the broader wind farm area. The 16 scattered trees proposed for removal include four Coast Mana-gum and 12 Swamp Paperbark trees. Pre-clearance surveys by a qualified zoologist should be undertaken for koalas for the Manna-gum trees as this is the preferred food tree of koalas. Should a koala be found in a tree proposed for removal, Wildlife Services should be called to relocate the koala to a different tree nearby that is going to be retained.

Wedge-tailed Eagles

The Wedge-tailed Eagle is considered to be a high profile species and one of the most vulnerable species to collision with operating turbines. This species was observed twice over the wind farm site but outside the formal BUS surveys. No evidence was found of eagles nesting within the wind farm boundary. Based on the above, the wind farm site is likely to be part of the territory of one pair of eagles that reside and probably breed in woodland outside the wind farm site. The pair is likely to forage over the wind farm site itself, although it was not observed regularly during the current survey (see also BL&A 2016a).

5.9. Listed ecological communities

Three ecological communities were modelled to potentially occur in the study area. Of these, the ecological communities below are considered to potentially occur in the study area due to the presence of loosely corresponding site characteristics and general species composition.

- Natural Damp Grassland of the Victorian Coastal Plains – listed as critically endangered under the EPBC Act (potential to occur in damp areas in the south-eastern corner of the broader study area). Areas of suitable habitat for this community occur within the proposed development footprint.

  The targeted surveys confirmed that this community is not present in the study area.

- Subtropical and Temperate Coastal Saltmarsh – listed as vulnerable under the EPBC Act (in areas of coastal saltmarsh, where tidal inundation is infrequent). Areas of suitable habitat for this community occur outside the proposed development footprint.

Based on an assessment of native vegetation in the study area against published descriptions and condition thresholds, the communities below were found not to occur in the study area based on the factors described below.

- Central Gippsland Plains Grassland Community - Native grasslands in the broader study area did not support the structure or floristic assemblage described in the FFG Act Action Statement (Craigie & Moorree 2003) and Characteristics of Threatened Communities description of this community (e.g. Dominance or presence of Kangaroo Grass and open to closed tussock grassland structure).

6. IMPACTS AND REGULATORY IMPLICATIONS

6.1. Proposed development

The proposed development will involve the construction of 34 wind turbines (each with an adjacent hardstand required for construction), access tracks, underground cabling, overhead powerlines and four work compounds.

The extent of the area of impact for the current proposal was considered to include the outer-most boundaries of the following:

- Access tracks – six metres wide;
- Underground cabling and associated trenching – three metres wide;
- Overhead transmission lines – 16 metres wide (complete removal along alignments assumed);
- 34 wind turbines –15 metre radii;
- One hardstand beside each wind turbine – 25 x 45 metres;
- Two small electrical substations – contained within the above impact areas
- One large electrical substation; and
- Four works compounds – 0.575 to 2.773 hectares (not all of these compounds will be used but impacts for all compounds have been assumed for this investigation).

Swept paths for site access points were not provided and were therefore not included in the current analysis.

6.2. Design response to mitigate impacts on flora and fauna

The project was designed to meet the strategies outlined in the Guidelines through the adoption of the specific design measures listed below.

- Where feasible, proposed access tracks follow existing, cleared farm tracks.
- The vast majority of the remaining development footprint has been sited within cleared agricultural land.
- Turbines T04, T05, T06 and T07 were moved approximately 150 metres west to their current locations. This measure was adopted to avoid impacts upon large, scattered trees and to reduce risks to avifauna moving in and about the state forest to the east.
- An access track was moved out of Birds Road (a narrow road lined on either side with diverse sedgy, shrubby and grassy vegetation as well as overhanging trees) and into the cleared private land to the east.
- Works compounds and electrical substations have been sited within cleared farm paddocks.
- A previously proposed turbine was eliminated from within a narrow band of cleared vegetation just north of the South Gippsland Highway, between Alberton West State Forest (to the north) and the aforementioned state forest (to the south). This turbine was considered to pose a high risk to avifauna moving between the two forests.

- Turbines T08, T10, T11, T13, T16 and T19 were moved approximately 100 metres north to their current locations. This measure was adopted to reduce risks to avifauna moving in and about the state forest to the south.
- Access tracks to Turbines T08, T10, T11, T13, T16 and T19 were rerouted to cleared land to avoid overhanging trees and tree lines supporting native canopy and/or understorey vegetation.
- An access track was rerouted into cleared land to avoid impacts upon Vegetation Sites 15h and 15i as well as to Habitat Zones A, B, C and I.
- A turbine previously proposed to the north-east of the intersection between Lanes Road and the South Gippsland Highway was eliminated, reducing impacts to native vegetation.
- The access tracks to Turbine T29 was rerouted out of the well-vegetated rail trail (to the north-west) into adjacent cleared farmland.
- Turbine T34 was moved slightly, out of native vegetation and into weed pasture.
- Access tracks to Turbine T34 were rerouted to reduce the extent of native vegetation impacts.
- Turbine T24 and associated access tracks were microsited to avoid impacts upon native vegetation.
- The access point to Turbines T20, T21 and T23 was relocated to avoid impacts upon the Jack River and native vegetation within.
- An access track was moved out of Old Alberton Road (a narrow road lined on either side with shrubby vegetation) and into the cleared private land.

All of the above changes resulted in considerable reductions in overall proposed native vegetation removal.

The proponent has indicated that, where feasible, further micrositing of infrastructure will occur during the construction stage, to further reduce impacts to native vegetation. The impacts presented in this report therefore present a conservative account of proposed impacts.

Further recommendations to mitigate impacts on flora and fauna are presented in Section 6.5.

6.3. Residual impacts of proposed development under state provisions

Residual impacts have been identified for the proposed development following implementation of the above mitigation measures in the design process. These impacts on ecological values are outlined below and shown in Figure 3.

6.3.1. Flora and native vegetation

The proposed development footprint will result in the impacts below.

- Potential impacts upon of the following EPBC and FFG Act listed threatened flora species were confirmed to be very unlikely, as targeted surveys found none of the species within the study area during seasonally appropriate (spring) surveys of the potential habitat affected by the development footprint:
    - Clover Glycine

  - Eastern Spider-orchid
  - Maroon Leek-orchid
  - Metallic Sun-orchid
  - River Swamp Wallaby-grass
  - Strzelecki Gum
  - Thick-lip Spider-orchid
- Removal of 1.195 hectares of remnant patch native vegetation and
- Removal of sixteen scattered trees.

6.3.2. Fauna species

The analysis of susceptibility of listed fauna species to impacts presented in Section 5.8.3 identified that the following bird species could be impacted by the proposed wind farm development in the study area, as they fly at RSA height are likely to forage over the study area:

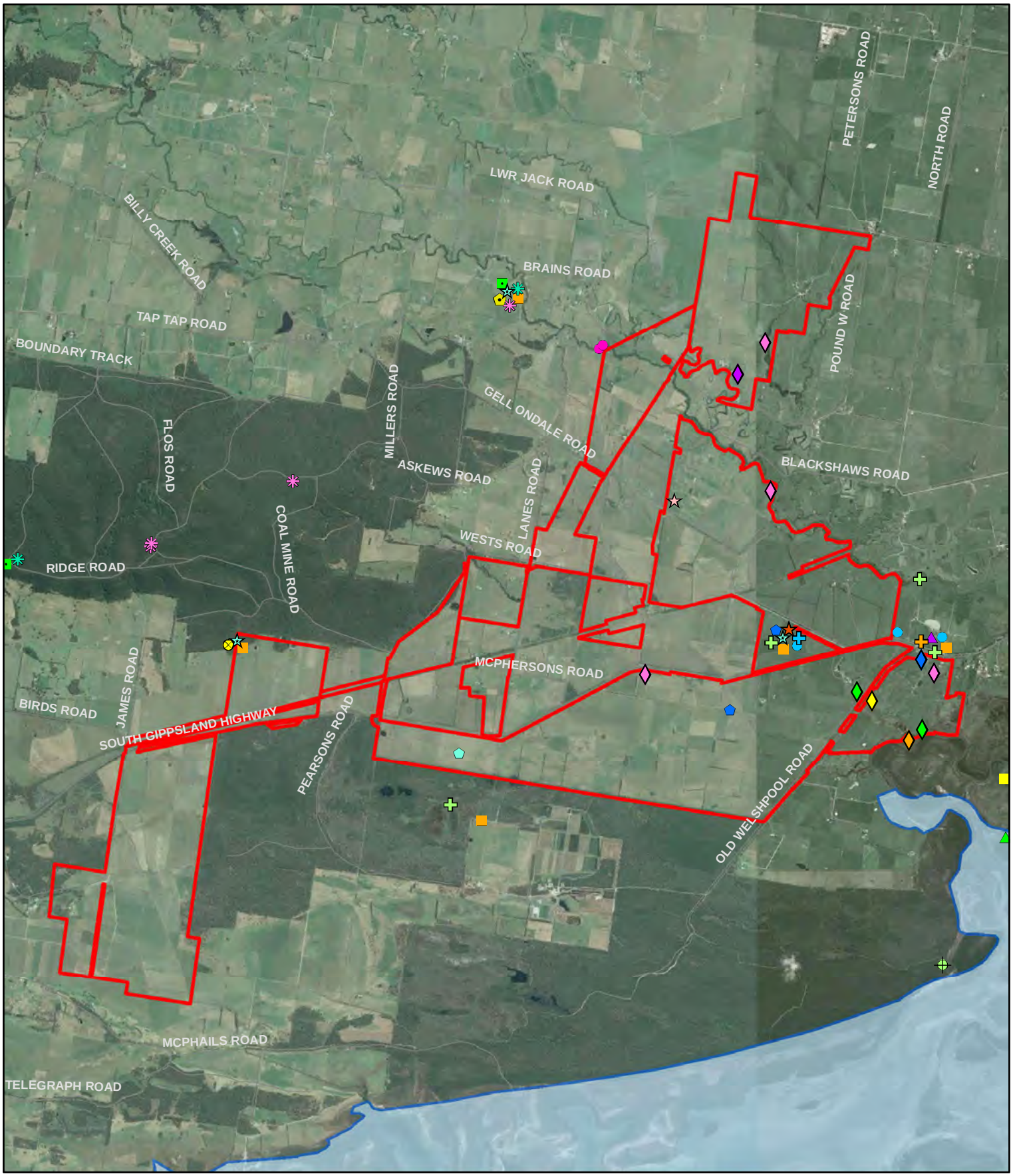
- Powerful Owl
- Fork-tailed Swift
- White-throated Needletail

Targeted surveys for Powerful Owl in areas of forest may well confirm their presence (already confirmed for the Alberton West state forest) but would not change conclusions in relation to the likelihood of impact, as discussed earlier in this report (see Section 5.8). The owl generally confines itself to forested habitats, none of which will have turbines built in them and dispersal of juvenile owls after breeding is finished would be a rare event most likely confined to the areas where treed habitats are closest. Where this occurs, either side of the South Gippsland Highway, no turbines are proposed to be constructed. The likelihood of an ongoing impact on this species is therefore considered to be very low.

Targeted surveys for the two swift species are not considered productive as these species are predominantly aerial foragers that move about the landscape at a continental scale over a range of habitats, from farmland and desert to dense forested mountains. Their movements are effectively random over time, depending on local and regional weather fronts, with occurrence in any part of the development footprint considered to have an equal likelihood.

Threatened ecological communities

Turbine T34 and associated access tracks were considered to potentially impact upon Natural Damp Grassland of the Victorian Coastal Plains, but targeted surveys confirmed that this ecological community does not occur within the proposed development footprint.



Legend

- Study area
- Ramsar site

Threatened Fauna - BL&A records

- Eastern Great Egret
- Latham's Snipe
- Little Egret
- Pacific Gull
- Royal Spoonbill
- Baillon's Crake

Threatened Fauna - VBA records

- Australian Grayling
- Cattle Egret
- Common Greenshank
- Common Sandpiper
- Eastern Great Egret
- Eastern Pygmy-possum
- Eastern Snake-necked Turtle
- Glossy Ibis
- Grey Goshawk
- Gull-billed Tern
- Latham's Snipe
- Little Egret
- Musk Duck
- Powerful Owl
- Rufous Fantail
- Satin Flycatcher
- Southern Toadlet
- White-bellied Sea-Eagle
- White-footed Dunnart
- White-throated Needletail

0 1 2 4 Kilometers

Figure 21: Threatened fauna records

Project: Alberton Wind Farm

Client: Synergy Wind Pty Ltd

Project No.: 14107	Date: 26/07/2016	Created By: M. Ghasemi / I. Kulik

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6.3.3. Risk based pathway

Extent Risk

The current development footprint will result in the loss of **2.321 hectares** of native vegetation. This is defined as the 'extent' of the native vegetation to be removed and comprised:

- 1.195 hectares of remnant patch native vegetation and
- 16 scattered trees.

It is understood that no native vegetation has been approved for removal on the properties for the current project within the last five years.

Example photographs of native vegetation proposed for removal are provided in Table 4.

Location Risk

The area of proposed native vegetation removal contained mapped areas of the following *location risk* categories:

- Location Risk A – covering the majority of this area;
- Location Risk B – in scattered locations, particularly about the base of the Strzelecki Ranges; and
- Location Risk C – associated with a highly localised area just south of the intersection between Coal Mine Road and the South Gippsland Highway (north-eastern corner of the unnamed state forest).

Risk based pathway

Based on the criteria outlined in Section 3.2.3 the Guidelines stipulate that the proposal will be assessed under the **high** risk assessment pathway.

6.3.4. Strategic biodiversity score

The strategic biodiversity score of each area of native vegetation loss has been determined using DELWP's EnSym Tool (see Appendix 5).

6.3.5. Important habitat

The current development footprint will not have a proportional impact on any rare or threatened species' habitats above the specific offset threshold as determined using DELWP's EnSym Tool and presented in Appendix 9.

6.3.6. Biodiversity Equivalence Score (BES) of vegetation proposed for removal

The Biodiversity Equivalence Score (BES) of the vegetation proposed for removal under the current development proposal is estimated to be a ***general* biodiversity equivalence score** (GBES) of **0.257.** This is calculated by multiplying the estimated losses from remnant patches and scattered trees in *habitat hectares* by the strategic biodiversity score, the latter generated using DELWP's EnSym Tool. Habitat scores for estimated native vegetation losses within the indirectly assessed study area were also obtained using EnSym.

6.4. Implications for the proposed development

6.4.1. Planning and Environment Act 1987

Local Provisions

Overlays

Environmental Significance Overlay – Schedule 1

A **permit is required** to remove, destroy or lop any vegetation, including dead vegetation. Before deciding on an application, the responsible authority must consider whether the proposal:

- Avoids and/or controls waste discharges to areas of high conservation significance.
- Protects sensitive coastal and foreshore vegetation, in particular heath-lands and dune vegetation, from clearing, pollution, grazing, and trampling.
- Emphasises the use of indigenous species in revegetation programs.
- Includes provision for the retention of vegetation and fauna habitat, the need to revegetate riparian buffers along waterways, gullies, ridge-lines, property boundaries and recharge areas, as well as site management measures to minimise the occurrence of salinity, erosion, groundwater and surface water problems for applications for agricultural development.

Environmental Significance Overlay – Schedule 2

A **permit is required** to remove, destroy or lop any vegetation, including dead vegetation. Before deciding on an application the responsible authority must consider:

- The integrity and long-term ecological and hydrological functioning of the wetland and areas surrounding the wetland.
- The contribution of the proposal towards the ecological restoration of the wetland, or the potential for the proposal to reduce the capability for ecological restoration of the wetland
- The benefit of requiring an agreement with the owner of the land under the Planning and Environment Act 1987, Wildlife Act 1975, Conservation, Forests and Lands Act 1987, or any other Act, to further protect or enhance the wetland and its flora and fauna.
- The benefit of a condition requiring:
    - The retention or planting of a buffer strip of native vegetation within a specified distance of the wetland.
    - The fencing of the wetland to exclude stock or vermin.
- The need for, or existence of, an appropriate land management plan and whether the proposed development is in accordance with such a plan.
- The views of DELWP

State provisions

A planning permit under Clause 52.17 of the Wellington Planning Scheme is required for the removal of native vegetation.

The current proposal would trigger a referral to DELWP as it meets the criteria specified in Section 3.2.3.

Offset requirements

Offsets required to compensate for the proposed removal of native vegetation from the study area have been determined using DELWP's EnSym Tool (see Appendix 9). A summary of the required offsets is presented in Table 7.

Table 7: Offset target

Offset type	Clearing site biodiversity equivalence score	Risk multipler	Offset requirements	
			Offset amount (BEU)	Offset attributes
General	0.257 GBES	1.5	0.386 general units	Offset must be within West Gippsland CMA or Wellington Shire Council Offset must have a minimum strategic biodiversity score of 0.286

Under the Guidelines *all* offsets must be secured prior to the removal of native vegetation.

Offset strategy

Offsets may include indigenous revegetation (generally woody vegetation only) and/or the management of one or more areas of existing native vegetation to improve its condition. Generally, revegetation may only be used to offset native vegetation removal which is assessed under the low risk assessment pathway (DEPI 2013b). Further, revegetation offsets may only utilise woody ecological vegetation types, as the success of non-woody revegetation is considered to be too uncertain.

All offsets must be protected using an appropriate security arrangement. All offsets must be managed for the first ten years of establishment to meet specific targets set out in an offset plan (which must meet DELWP guidelines) then managed in perpetuity to maintain those targets.

The offset target for the current proposal is likely to be achievable within the study area given the above requirements and the area of native vegetation to be retained.

For a site to be eligible as an offset, it must meet all of the requirements outlined below.

Offsets must be sited at least 150 metres away from any dwellings and associated buildings on the subject land or adjoining properties covered by a BMO, or at least 50 metres away from these structures on all other land occurring within Bushfire Prone Areas. They must also be set back at least six metres from property boundaries to allow for firebreaks, boundary fence maintenance, etc.

Offsets may not be located in areas subject to the following encumbrances or constraints, which impede the ability to achieve native vegetation management/revegetation objectives:

- Incompatible current and/or future land use (where known);
- Existing offsets or other existing agreements; or
- Identified threats to native vegetation condition.

Revegetation offsets must be at least one hectare in size; have an average width of at least 20 metres; and have a perimeter to area ratio of 1:20.

Offsite offsets can be identified through a native vegetation broker. For the planning permit application, the location of the offsets must be specified, they must meet the offset target and the offset site owner must have given permission for the offset to be placed on their property. A broker quote would be sufficient to satisfy this application requirement.

6.4.2. EPBC Act

Based on the relevant guidelines, the proposed development has negligible consequences for EPBC Act listed species and communities.

Impacts on the following species/communities were found to be very unlikely due to the fact they were not recorded in targeted surveys of the study area.

- Natural Damp Grassland of the Victorian Coastal Plains
- Clover Glycine
- Eastern Spider-orchid
- Maroon Leek-orchid
- Metallic Sun-orchid
- River Swamp Wallaby-grass
- Strzelecki Gum
- Thick-lip Spider-orchid

Although Subtropical and Temperate Coastal Saltmarsh is listed under the EPBC Act, Commonwealth approval is not required for actions that propose to significantly impact upon them due to their vulnerable ecological community status or extinct/conservation-dependent species status.

As a precaution, a Referral under the EPBC Act has been submitted in December 2016.

6.4.3. FFG Act

Targeted surveys have been undertaken for the following FFG Act listed flora species that have been considered to potentially occur within the wind farm area.

- Clover Glycine
- Eastern Spider-orchid
- Maroon Leek-orchid

- Metallic Sun-orchid
- Strzelecki Gum

None of these have been found within the surveyed impact areas (BL&A 2016b).

The following FFG Act listed fauna species was considered to be susceptible to impacts from the proposed wind farm.

- White-bellied Sea-Eagle

The frequency of collisions is likely to be very low so population consequences are not considered significant given the state population is estimated at 100 adult pairs plus sub-adults, with the Corner Inlet area in South Gippsland supporting approximately 25 of these pairs (DSE 2003). It will be important to monitor for the presence of this species as part of any impact monitoring and mitigation plan and have a plan involving investigation and a targeted mitigation response should repeated collision be detected.

6.4.4. EE Act

A Referral to the state Minister for Planning is not required under the EE Act as the effects of the project on the environment are below the biodiversity impact criteria of the Ministerial Guidelines on Referral under this Act. This is set out below:

- Potential clearing of 10 hectares or more of native vegetation – the project will remove an estimated 1.195 hectares of native vegetation plus 16 scattered trees, below the threshold for referral;
- Potential removal of one percent or more of the habitat of a state threatened species – the project will have no impact on the habitat of a threatened species;
- Potential long term change in the ecological character of a wetland listed under the Ramsar Convention or in the national directory of important wetlands – impacts on the nearby Nooramunga and Corner Inlet Marine and Wildlife Reserves (a Ramsar Wetland) will not be significant due to the distance separating the project from the upper shores of these wetland areas; and
- Extensive major impacts on the health and biodiversity of aquatic, estuarine or marine ecosystems - impacts on nearby aquatic, estuarine and marine ecosystems will not be significant due to the distance separating the project from the upper shores of these wetland areas.

6.4.5. CaLP Act

In accordance with the *Catchment and Land Protection Act 1994*, the noxious weed species listed as 'C' (Regionally Controlled Weeds) in Appendix 4, which were recorded in the study area, must be controlled.

Precision control methods that minimise off-target impacts (e.g. spot spraying) should be used in environmentally sensitive areas (e.g. within or near native vegetation, waterways, etc.).

6.5. Recommendations for further mitigation

Where feasible, rather than constructing new, parallel and adjacent transmission lines existing overhead power lines should be utilised. During the detailed design stage for overhead transmission lines, power poles, anchor-points and works access points should be sited outside native vegetation wherever feasible.

It is recommended that, if feasible, these changes be made to reduce impacts upon native vegetation, and potentially to listed threatened flora and ecological communities.

Implementation of a Bat and Avifauna Management Plan for the proposed wind farm will ensure that procedures and strategies exist to respond to any unanticipated impacts on the White-bellied Sea-eagle and the Powerful Owl.

Implementing these mitigation measures will ensure that obligations under relevant legislation and policies are adhered to, and that requirements to offset native vegetation removal are avoided or minimised. It will also ensure that the environmental footprint of the project is appropriately limited.

Best-practice development and construction recommendations are provided in Appendix 7. These should be considered to ensure impacts are minimised to flora, fauna and/or native vegetation.

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Appendix 1: Details of investigated properties

Property No.*	Street address	Town/Suburb	Lot description	Land Designation (DTPLI 2015)	
				Zones	Overlays^
Private Land					
1	150 Todds Road	Hedley	Lot 1 PS51087	FZ	WMO, SLO3
2	169 Birds Road South	Hedley	Allot. 1 Sec. A Parish of Alberton West	FZ	WMO
3	6970 South Gippsland Highway	Hedley	Lot 1 TP110485	FZ	WMO
4	South Gippsland Highway	Hedley	Lot 1 TP578219	FZ	
5	South Gippsland Highway	Hedley	Lot 1 TP578908	FZ	
6	7085 South Gippsland Highway	Hedley	Lot 1 TP754717	FZ, PCRZ	WMO, ESO2
7	Coal Mine Road	Gelliondale	Lot 2 Lp92727	FZ	WMO, ESO2
8	67 Lanes Road	Gelliondale	Lot 2 PS50651	FZ	
9	South Gippsland Highway	Hedley	Allot. 53 Parish of Alberton West	FZ, IN1Z	
10	South Gippsland Highway	Hedley	Lot 2 PS404524	FZ	
11	7438 South Gippsland Highway	Hedley	Lot 1 PS40452	FZ	
12	7618 South Gippsland Highway	Gelliondale	Plan PC36214	FZ	
13	Lanes Road	Alberton West	Lot 1 TP88769	FZ	ESO2
14	115 Gelliondale Road	Gelliondale	Lot 63 LP315	FZ	ESO2
15	Gelliondale Road	Gelliondale	Lot 1 TP814120	FZ, PCRZ	ESO2
16	738 Pound Road West	Alberton West	Lot 1 PS61948	FZ, PCRZ	ESO2
17	47 Nicols Road	Devon North	Allot. 14A Parish of Yarram Yarram	FZ	
18	Nicols Road	Devon North	Allot. 14L Parish of Yarram Yarram	FZ	

Property No.*	Street address	Town/Suburb	Lot description	Land Designation (DTPLI 2015)	
				Zones	Overlays^
19	668 Pound Road West	Yarram	Lot 8 PS31552	FZ	
20	80 Crangs Road	Alberton West	Lot 1 PS61738	FZ	
21	212 Old Alberton West Road	Alberton	Lot 7 LP4703	FZ	
22	174 Old Alberton West Road	Alberton	Lot 1 PS71429	FZ	ESO2
23	Old Alberton West Road	Gelliondale	Lot 5 LP4703	FZ	
24	7913 South Gippsland Highway	Alberton	Lot 3 LP4703	FZ	
25	South Gippsland Highway	Gelliondale	Lot 1 TP864748	FZ	
26	7776 South Gippsland Highway	Gelliondale	Lot 1 TP109933	FZ	
27	7802 South Gippsland Highway	Gelliondale	Plan TP4297	FZ	
28	7890 South Gippsland Highway	Alberton	Lot 1 TP128952	FZ	
29	7996 South Gippsland Highway	Alberton	Lot 1 PS603015	FZ	ESO1
30	8028 South Gippsland Highway	Alberton	Lot 1 PS51087	FZ	
31	Ti Tree Road	Gelliondale	Allot. A Sec. 9 Alberton West	FZ	
32	7666 South Gippsland Highway	Gelliondale	Allot. 8a Parish of Alberton West	FZ	
33	555 Ti Tree Road	Hedley	Allot. 24c Sec. A Parish of Alberton West	PCRZ	ESO2
34	Wests Road	Alberton West	Lot 1 LP9272	FZ	
35	205 Lanes Road	Alberton West	Lot 1 TP83713	FZ	
36	Lanes Road	Alberton West	Lot 1 TP53216	FZ	
37	Lanes Road	Gelliondale	Allot. 44 Parish of Alberton West	FZ	ESO2 (does not cover study area)
38	68 James Road	North Hedley	Allot. 78 Parish of Alberton West	FZ	
39	South Gippsland Highway	Hedley	Allot. 62 Parish of Alberton West	FZ	

Property No.*	Street address	Town/Suburb	Lot description	Land Designation (DTPLI 2015)	
				Zones	Overlays^
40	806 Pound Road West	Alberton West	Lot 4 PS31552	FZ	ESO2 (does not cover study area)
41	Pound Road West	Alberton West	Allot. A11A Parish of Yarram Yarram	PCRZ	ESO2
42	Pound Road West	Alberton West	Allot. 2009 Parish of Yarram Yarram	FZ	
43	Pound Road West	Alberton West	Allot. 2010 Parish of Yarram Yarram	FZ	
44	179 Lower Jack Road	Jack River	Lot 1 LP14081	FZ	
45	Ross Road	Alberton West	Allot. A13A Parish of Yarram Yarram	PCRZ, FZ	
46	Pound Road West	Alberton West	Plan CP16737	PCRZ, FZ	
47	937 Pound Road West	Alberton West	Lot 1 LP143423	FZ	
48	1007 Pound Road West	Alberton West	Lot 1 TP56137	FZ	
49	246 Gelliondale Road	Alberton West	Lot 1 PS438124	FZ	
50	392a Old Alberton West Road	Alberton West	Lot 2 PS438124	FZ	
51	246 Gelliondale Road	Alberton West	Lot 1 PS620983	FZ	
52	1007 Pound Road West	Alberton West	Lot 1 TP561378	FZ	
53	1045 Pound Road West	Alberton West	Lot 1 TP375270	FZ	
54	370 Lanes Road	Alberton West	Lot 2 PS41020	FZ	
55	289 Gelliondale Road	Alberton West	Lot 1 PS41020	FZ	
Public Land					
NA	South Gippsland Highway		Road Reserve	RDZ1	
NA	Great Southern Rail Trail		Rail Reserve (disused)	PCRZ	
NA	Birds Road South		Road Reserve	FZ	
NA	Todds Road		Road Reserve	FZ	

Property No.*	Street address	Town/Suburb	Lot description	Land Designation (DTPLI 2015)	
				Zones	Overlays^
NA	Old Alberton West Road		Road Reserve	FZ	
NA	McPhersons Road		Road Reserve	FZ	
NA	Ti Tree Road		Road Reserve	FZ	
NA	Lanes Road		Road Reserve	FZ	
NA	Wests Road		Road Reserve	FZ	
NA	Great Southern Rail Trail (SOUTH GIPPSLAND HIGHWAY)		Rail Reserve (disused)	PCRZ	
NA	Coal Mine Road		Road Reserve	FZ	
NA	Old Alberton Road		Road Reserve	FZ	
NA	Simmons Street / Crangs Road		Road Reserve (paper road)	FZ	
NA	Pound Road West		Road Reserve	FZ	
NA	Gelliondale Road		Road Reserve	RDZ2	

* = BL&A property reference

^ = Only relevant overlays have been listed

FZ = Farming Zone

RDZ1 = Road Zone – Category 1

RDZ2 = Road Zone – Category 2

PCRZ = Public Conservation and Resource Zone

IN1Z = Industrial 1 Zone

ESO1 = Environmental Significance Overlay – Schedule 1

ESO2 = Environmental Significance Overlay – Schedule 2

SLO3 = Significant Landscapes Overlay – Schedule 3

Appendix 2: Detailed habitat hectare assessment results

Habitat Zone			A	B	C	D	E	F	G	H1
Bioregion			**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**
EVC Number			**53**	**53**	**53**	**863**	**863**	**132_62**	**132_62**	**53**
Total area of Habitat Zone (ha)			0.064338	0.100545	0.071820	0.064443	0.039296	0.026550	0.003715	0.009432
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	0	0	0	N/A	N/A	N/A	N/A	3
	Lack of Weeds	/15	13	13	13	9	0	0	0	0
	Understorey	/25	15	5	5	25	25	5	5	5
	Recruitment	/10	0	0	0	0	0	3	3	6
	Organic Matter	/5	0	0	3	5	4	2	2	4
	Logs	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.25	1.25	1.25	1.36	1.36	1.36	1.36	1.25
	Site Condition subtotal		*35*	*23*	*26*	*53*	*39*	*14*	*14*	*23*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1
	Neighbourhood	/10	0	0	0	0	0	0	0	0
	Distance to Core	/5	1	1	1	1	1	1	1	1
Total Condition Score		**/100**	**37**	**25**	**28**	**55**	**41**	**16**	**16**	**25**
Condition score out of 1			0.37	0.25	0.28	0.55	0.41	0.16	0.16	0.25
Habitat Hectares in Habitat Zone#			**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Area of Habitat Zone to be removed (ha)			0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004); # Habitat hectares = habitat score/100 X area [ha])

Habitat Zone			H2	H3	H4	H5	H6	H7	H8	H9
Bioregion			**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**
EVC Number			**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**
Total area of Habitat Zone (ha)			0.439893	0.112898	0.094372	0.118159	0.271903	0.009654	0.037440	0.011400
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	3	3	3	3	3	3	3	3
	Lack of Weeds	/15	0	0	0	0	0	0	0	0
	Understorey	/25	5	5	5	5	5	5	5	5
	Recruitment	/10	6	6	6	6	6	6	6	6
	Organic Matter	/5	4	4	4	4	4	4	4	4
	Logs	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
	Site Condition subtotal		*23*	*23*	*23*	*23*	*23*	*23*	*23*	*23*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1
	Neighbourhood	/10	0	0	0	0	0	0	0	0
	Distance to Core	/5	1	1	1	1	1	1	1	1
Total Condition Score		**/100**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**
Condition score out of 1			0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Habitat Hectares in Habitat Zone#			**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Area of Habitat Zone to be removed (ha)			0.007429	0.004917	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004); # Habitat hectares = habitat score/100 X area [ha])

Habitat Zone			H10	H11	H12	H13	H14	H15	H16	H17
Bioregion			**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**
EVC Number			**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**
Total area of Habitat Zone (ha)			0.040520	0.013507	0.029437	0.194263	0.027726	0.162791	0.041118	0.157929
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	3	3	3	3	3	3	3	3
	Lack of Weeds	/15	0	0	0	0	0	0	0	0
	Understorey	/25	5	5	5	5	5	5	5	5
	Recruitment	/10	6	6	6	6	6	6	6	6
	Organic Matter	/5	4	4	4	4	4	4	4	4
	Logs	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
	Site Condition subtotal		*23*	*23*	*23*	*23*	*23*	*23*	*23*	*23*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1
	Neighbourhood	/10	0	0	0	0	0	0	0	0
	Distance to Core	/5	1	1	1	1	1	1	1	1
Total Condition Score		**/100**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**
Condition score out of 1			0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Habitat Hectares in Habitat Zone#			**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Area of Habitat Zone to be removed (ha)			0.000000	0.000000	0.000000	0.003409	0.000000	0.000000	0.000000	0.000000

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004); # Habitat hectares = habitat score/100 X area [ha])

Habitat Zone			H18	H19	H20	I	J	K	L	M
Bioregion			**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**
EVC Number			**53**	**53**	**53**	**53**	**53**	**132_62**	**132_62**	**132_62**
Total area of Habitat Zone (ha)			0.036641	0.102818	0.084796	0.086068	0.222295	0.006982	0.019390	0.013672
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	3	3	3	0	0	N/A	N/A	N/A
	Lack of Weeds	/15	0	0	0	13	0	2	2	2
	Understorey	/25	5	5	5	15	5	5	5	5
	Recruitment	/10	6	6	6	0	3	0	3	3
	Organic Matter	/5	4	4	4	0	3	2	3	3
	Logs	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.25	1.25	1.25	1.25	1.25	1.36	1.36	1.36
	Site Condition subtotal		*23*	*23*	*23*	*35*	*14*	*12*	*18*	*18*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1
	Neighbourhood	/10	0	1	1	0	0	0	0	0
	Distance to Core	/5	1	3	3	1	1	3	3	3
Total Condition Score		**/100**	**25**	**28**	**28**	**37**	**16**	**16**	**22**	**22**
Condition score out of 1			0.25	0.28	0.28	0.37	0.16	0.16	0.22	0.22
Habitat Hectares in Habitat Zone#			**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Area of Habitat Zone to be removed (ha)			0.000000	0.070741	0.001148	0.000000	0.000000	0.006442	0.000000	0.004594

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004); # Habitat hectares = habitat score/100 X area [ha])

Habitat Zone			N	O	P1	P2	Q	R	S	T
Bioregion			**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**
EVC Number			**132_62**	**132_62**	**653**	**653**	**653**	**653**	**653**	**132_62**
Total area of Habitat Zone (ha)			0.014438	0.038226	0.056481	0.184685	3.756077	0.004952	0.006993	0.049900
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Lack of Weeds	/15	2	2	13	13	13	13	13	2
	Understorey	/25	5	5	15	15	15	15	15	5
	Recruitment	/10	3	3	0	0	0	0	0	3
	Organic Matter	/5	3	3	5	5	5	5	5	3
	Logs	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36
	Site Condition subtotal		*18*	*18*	*45*	*45*	*45*	*45*	*45*	*18*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1
	Neighbourhood	/10	0	0	0	0	0	0	0	0
	Distance to Core	/5	3	3	3	3	3	3	3	3
Total Condition Score		**/100**	**22**	**22**	**49**	**49**	**49**	**49**	**49**	**22**
Condition score out of 1			0.22	0.22	0.49	0.49	0.49	0.49	0.49	0.22
Habitat Hectares in Habitat Zone#			**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Area of Habitat Zone to be removed (ha)			0.000000	0.002258	0.000000	0.000000	0.116074	0.000000	0.000000	0.000000

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004); # Habitat hectares = habitat score/100 X area [ha])

Habitat Zone			U	V	W	X	Y	Z	AA	BB
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			132_62	53	53	132_62	653	53	53	53
Total area of Habitat Zone (ha)			0.015321	0.041376	0.036150	0.046855	1.146997	0.404180	0.066075	1.474050
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	N/A	0	0	N/A	N/A	0	0	0
	Lack of Weeds	/15	2	6	6	0	0	4	0	4
	Understorey	/25	5	5	5	5	5	5	5	15
	Recruitment	/10	0	0	0	0	0	3	0	6
	Organic Matter	/5	5	3	5	4	3	3	0	3
	Logs	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.36	1.25	1.25	1.36	1.36	1.25	1.25	1.25
	Site Condition subtotal		*16*	*18*	*20*	*12*	*11*	*19*	*6*	*35*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1
	Neighbourhood	/10	0	0	0	0	0	0	0	0
	Distance to Core	/5	3	3	3	3	3	1	1	1
Total Condition Score		**/100**	**20**	**22**	**24**	**16**	**15**	**21**	**8**	**37**
Condition score out of 1			0.20	0.22	0.24	0.16	0.15	0.21	0.08	0.37
Habitat Hectares in Habitat Zone#			**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Area of Habitat Zone to be removed (ha)			0.000000	0.000000	0.000000	0.000000	0.000070	0.004040	0.000000	0.000000

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004); # Habitat hectares = habitat score/100 X area [ha])

Habitat Zone			CC	DD1	DD2	EE	FF1	FF2	FF3	FF4
Bioregion			**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**
EVC Number			**48**	**48**	**48**	**48**	**53**	**53**	**53**	**53**
Total area of Habitat Zone (ha)			0.114089	0.050884	1.035370	0.016989	0.148646	0.031222	0.015563	0.024655
Site Condition	Large Old Trees	/10	0	0	0	10	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	0	0	0	3	0	0	0	0
	Lack of Weeds	/15	0	0	0	9	4	4	4	4
	Understorey	/25	0	0	0	15	5	5	5	5
	Recruitment	/10	0	0	0	6	6	6	6	6
	Organic Matter	/5	2	2	2	5	5	5	5	5
	Logs	/5	0	0	0	0	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.00	1.00	1.00	1.00	1.25	1.25	1.25	1.25
	Site Condition subtotal		*2*	*2*	*2*	*38*	*25*	*25*	*25*	*25*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1
	Neighbourhood	/10	2	2	2	2	1	1	1	1
	Distance to Core	/5	4	4	4	4	3	3	3	3
Total Condition Score		**/100**	**9**	**9**	**9**	**45**	**30**	**30**	**30**	**30**
Condition score out of 1			0.09	0.09	0.09	0.45	0.30	0.30	0.30	0.30
Habitat Hectares in Habitat Zone#			**1.350**	**1.350**	**1.350**	**6.750**	**0.000**	**0.000**	**0.000**	**0.000**
Area of Habitat Zone to be removed (ha)			0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004); # Habitat hectares = habitat score/100 X area [ha])

Habitat Zone			FF5	FF6	GG1	GG2	GG3	HH1	HH2	HH3
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			53	53	8	8	8	53	53	53
Total area of Habitat Zone (ha)			0.006698	0.004152	0.010681	0.017169	0.039438	0.172195	0.036708	0.259863
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	0	0	N/A	N/A	N/A	0	0	0
	Lack of Weeds	/15	4	4	0	0	0	0	0	0
	Understorey	/25	5	5	5	5	5	5	5	5
	Recruitment	/10	6	6	0	0	0	3	3	3
	Organic Matter	/5	5	5	2	2	2	3	3	3
	Logs	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.25	1.25	1.36	1.36	1.36	1.36	1.36	1.36
	Site Condition subtotal		*25*	*25*	*10*	*10*	*10*	*15*	*15*	*15*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1
	Neighbourhood	/10	1	1	1	1	1	0	0	0
	Distance to Core	/5	3	3	3	3	3	1	1	1
Total Condition Score		**/100**	**30**	**30**	**15**	**15**	**15**	**17**	**17**	**17**
Condition score out of 1			0.30	0.30	0.15	0.15	0.15	0.17	0.17	0.17
Habitat Hectares in Habitat Zone#			**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Area of Habitat Zone to be removed (ha)			0.002285	0.002963	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004); # Habitat hectares = habitat score/100 X area [ha])

Habitat Zone			II1	II2	II3	JJ	KK	1A	1B	1C
Bioregion			**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**
EVC Number			**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**
Total area of Habitat Zone (ha)			0.102497	0.158417	0.208613	0.128370	0.103619	0.084729	0.078037	0.565571
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	4	4	4	0	0	0	0	0
	Lack of Weeds	/15	0	0	0	6	6	0	11	0
	Understorey	/25	15	15	15	5	5	5	5	5
	Recruitment	/10	6	6	6	0	0	0	0	10
	Organic Matter	/5	3	3	3	3	3	4	3	5
	Logs	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.36	1.36	1.36	1.25	1.25	1.25	1.25	1.25
	Site Condition subtotal		*38*	*38*	*38*	*18*	*18*	*11*	*24*	*25*
Landscape Context	Patch Size	/10	1	1	1	1	1			
	Neighbourhood	/10	0	0	0	1	1	3	0	0
	Distance to Core	/5	1	1	1	3	3	4	3	3
Total Condition Score		**/100**	**40**	**40**	**40**	**23**	**23**	**18**	**27**	**28**
Condition score out of 1			0.40	0.40	0.40	0.23	0.23	0.18	0.27	0.28
Habitat Hectares in Habitat Zone#			**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.015**	**0.021**	**0.158**
Area of Habitat Zone to be removed (ha)			0.000000	0.004344	0.006297	0.000000	0.000000	0.000000	0.000064	0.109426

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004); # Habitat hectares = habitat score/100 X area [ha])

Habitat Zone			1D	1E	1F	1G	1H	1I	1J	1K
Bioregion			**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**
EVC Number			**53**	**53**	**53**	**53**	**53**	**53**	**53**	**53**
Total area of Habitat Zone (ha)			0.595197	1.597214	0.863953	0.313873	0.032872	0.059529	0.035095	0.010464
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	0	0	0	0	0	0	4	0
	Lack of Weeds	/15	0	0	0	0	0	0	0	0
	Understorey	/25	5	5	5	15	15	5	5	5
	Recruitment	/10	10	10	10	10	6	0	5	0
	Organic Matter	/5	5	5	5	5	4	0	3	4
	Logs	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
	Site Condition subtotal		*25*	*25*	*25*	*38*	*31*	*6*	*21*	*11*
Landscape Context	Patch Size	/10								
	Neighbourhood	/10	0	0	0	0	1	1	1	1
	Distance to Core	/5	3	3	3	4	3	3	3	3
Total Condition Score		**/100**	**28**	**28**	**28**	**42**	**35**	**10**	**25**	**15**
Condition score out of 1			0.28	0.28	0.28	0.42	0.35	0.10	0.25	0.15
Habitat Hectares in Habitat Zone#			**0.167**	**0.447**	**0.242**	**0.132**	**0.012**	**0.006**	**0.009**	**0.002**
Area of Habitat Zone to be removed (ha)			0.000000	0.056330	0.023712	0.012146	0.000000	0.000000	0.000000	0.000000

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004); # Habitat hectares = habitat score/100 X area [ha])

Habitat Zone			1L	1M	1N	1O	1P	1Q	1R	1S
Bioregion			**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**
EVC Number			**53**	**53**	**132_62**	**53**	**53**	**3**	**3**	**3**
Total area of Habitat Zone (ha)			0.118907	0.014857	0.176973	0.070075	0.096550	0.109558	0.053637	0.128338
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	0	0	0
	Tree Canopy Cover	/5	0	0	N/A	0	0	3	5	0
	Lack of Weeds	/15	0	4	0	11	11	4	0	7
	Understorey	/25	15	15	10	5	5	15	5	5
	Recruitment	/10	6	5	0	0	0	6	0	3
	Organic Matter	/5	4	5	2	5	5	5	5	5
	Logs	/5	N/A	N/A	N/A	N/A	N/A	2	4	0
	Site condition standardising multiplier*		1.25	1.25	1.36	1.25	1.25	1.00	1.00	1.00
	Site Condition subtotal		*31*	*36*	*16*	*26*	*26*	*35*	*19*	*20*
Landscape Context	Patch Size	/10								
	Neighbourhood	/10	1	1	1	1	1	2	2	2
	Distance to Core	/5	3	3	3	3	3	4	4	4
Total Condition Score		**/100**	**35**	**40**	**20**	**30**	**30**	**41**	**25**	**26**
Condition score out of 1			0.35	0.40	0.20	0.30	0.30	0.41	0.25	0.26
Habitat Hectares in Habitat Zone#			**0.042**	**0.006**	**0.035**	**0.021**	**0.029**	**0.045**	**0.013**	**0.033**
Area of Habitat Zone to be removed (ha)			0.000317	0.000000	0.002744	0.000616	0.004928	0.021406	0.029665	0.000000

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004); # Habitat hectares = habitat score/100 X area [ha])

Habitat Zone			1T	1U	1V	1W	1X	1Y	1Z	2A
Bioregion			**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**
EVC Number			**3**	**3**	**8**	**8**	**8**	**53**	**53**	**53**
Total area of Habitat Zone (ha)			0.271771	0.073948	0.171244	0.601363	0.171894	0.077291	0.194732	1.173056
Site Condition	Large Old Trees	/10	4	0	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	5	0	N/A	N/A	N/A	0	0	3
	Lack of Weeds	/15	13	4	11	11	7	0	7	0
	Understorey	/25	15	5	15	15	15	15	5	5
	Recruitment	/10	0	3	6	5	3	10	3	3
	Organic Matter	/5	5	5	5	3	5	5	3	4
	Logs	/5	0	0	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.00	1.00	1.36	1.36	1.36	1.25	1.25	1.25
	Site Condition subtotal		*38*	*17*	*50*	*46*	*41*	*38*	*23*	*19*
Landscape Context	Patch Size	/10								
	Neighbourhood	/10	2	2	2	2	2	1	0	0
	Distance to Core	/5	4	4	4	4	4	4	1	1
Total Condition Score		**/100**	**44**	**23**	**56**	**52**	**47**	**43**	**24**	**20**
Condition score out of 1			0.44	0.23	0.56	0.52	0.47	0.43	0.24	0.20
Habitat Hectares in Habitat Zone#			**0.120**	**0.017**	**0.096**	**0.313**	**0.081**	**0.033**	**0.047**	**0.235**
Area of Habitat Zone to be removed (ha)			0.000324	0.009107	0.013537	0.075430	0.023715	0.000000	0.013591	0.088889

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004); # Habitat hectares = habitat score/100 X area [ha])

Habitat Zone			2B	2C	2D	2E	2F	2G	2H	2I
Bioregion			**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**
EVC Number			**151**	**151**	**53**	**53**	**53**	**53**	**53**	**53**
Total area of Habitat Zone (ha)			0.239983	0.046214	0.087455	0.052418	0.047202	0.087134	0.617425	0.229620
Site Condition	Large Old Trees	/10	5	9	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	2	2	0	0	0	0	5	0
	Lack of Weeds	/15	7	7	11	11	7	7	13	7
	Understorey	/25	15	15	5	5	15	15	15	5
	Recruitment	/10	6	6	5	5	5	5	6	3
	Organic Matter	/5	3	3	3	3	5	5	5	3
	Logs	/5	4	5	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.00	1.00	1.25	1.25	1.25	1.25	1.25	1.25
	Site Condition subtotal		*37*	*38*	*30*	*30*	*40*	*40*	*55*	*23*
Landscape Context	Patch Size	/10								
	Neighbourhood	/10	0	0	3	3	3	3	3	1
	Distance to Core	/5	3	4	4	4	4	4	4	1
Total Condition Score		**/100**	**40**	**42**	**37**	**37**	**47**	**47**	**62**	**25**
Condition score out of 1			0.40	0.42	0.37	0.37	0.47	0.47	0.62	0.25
Habitat Hectares in Habitat Zone#			**0.096**	**0.019**	**0.032**	**0.019**	**0.022**	**0.041**	**0.383**	**0.057**
Area of Habitat Zone to be removed (ha)			0.085926	0.012541	0.018663	0.001946	0.000000	0.000000	0.000000	0.011743

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004); # Habitat hectares = habitat score/100 X area [ha])

Habitat Zone			2J	2K	2L	2M	2N	2O
Bioregion			**GipP**	**GipP**	**GipP**	**GipP**	**GipP**	**GipP**
EVC Number			**53**	**53**	**53**	**53**	**821**	**53**
Total area of Habitat Zone (ha)			0.341394	0.071791	0.101576	0.052993	0.225379	0.092189
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	0	0	0	0	N/A	0
	Lack of Weeds	/15	4	0	7	0	7	11
	Understorey	/25	5	5	5	5	15	5
	Recruitment	/10	3	6	6	5	0	0
	Organic Matter	/5	3	5	5	4	3	5
	Logs	/5	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.25	1.25	1.25	1.25	1.36	1.25
	Site Condition subtotal		*19*	*20*	*29*	*18*	*34*	*26*
Landscape Context	Patch Size	/10						
	Neighbourhood	/10	0	0	0	1	0	0
	Distance to Core	/5	4	3	3	1	1	1
Total Condition Score		**/100**	**23**	**23**	**32**	**20**	**35**	**27**
Condition score out of 1			0.23	0.23	0.32	0.20	0.35	0.27
Habitat Hectares in Habitat Zone#			**0.079**	**0.017**	**0.033**	**0.011**	**0.079**	**0.025**
Area of Habitat Zone to be removed (ha)			0.006415	0.012931	0.015351	0.010914	0.007064	0.003634

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004); # Habitat hectares = habitat score/100 X area [ha])

Habitat Zone			57	62	60a	46a	58	60g
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP
EVC Number			53	53	53	653	53	53
Total area of Habitat Zone (ha)			0.045	0.003	0.093	0.019	0.104	0.020
Site Condition	Large Old Trees	/10	0	0	0	0	0	0
	No. large trees in habitat zone							
	Bench No. Trees / hectare							
	Canopy health		30-70%	30-70%	30-70%	30-70%	30-70%	30-70%
	Tree Canopy Cover	/5	0	0	0	0	0	0
	Lack of Weeds	/15	4	4	4	7	4	0
	Understorey	/25	5	5	5	15	5	5
	Recruitment	/10	0	0	6	0	10	1
	Organic Matter	/5	0	3	3	5	3	3
	Logs	/5	0	0	0	0	0	0
	m small logs in hab zone							
	m large logs in hab zone							
	Bench m logs / 0.1 hectare							
	Site condition standardising multiplier*		1.25	1.25	1.25	1.36	1.25	1.25
	Site Condition subtotal		*11*	*15*	*23*	*37*	*28*	*11*
Landscape Context	Patch Size	/10	1	1	1	1	8	1
	Neighbourhood	/10	1	0	0	1	1	1
	Distance to Core	/5	3	1	1	1	4	3
Total Condition Score		/100	16	17	25	40	41	16
Condition score out of 1			0.16	0.17	0.25	0.40	0.41	0.16
Habitat Hectares in Habitat Zone#			0.007	0.001	0.023	0.008	0.043	0.003
Area of Habitat Zone to be removed (ha)								

Appendix 3: Scattered trees in the study area

Tree No.	Common name	Scientific Name	DBH (cm)	Habitat category	Radius of TPZ (m)	Remove/Retain	Notes
1	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	97	L	11.64	Removed	Dead stag
2	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	71	L	8.52	Removed	
3	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	81	L	9.72	Removed	
4	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	75	M	9	Removed	
5	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	87	L	10.44	Retained	
6	Swamp Gum	*Eucalyptus ovata var. ovata*	86	L	10.32	Retained	
7	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	81	L	9.72	Retained	
8	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	54	L	6.48	Retained	
9	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	64	M	7.68	Retained	
10	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	59	M	7.08	Retained	
11	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	50	M	6	Retained	Dead stag
12	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	59	L	7.08	Retained	
13	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	67	M	8.04	Retained	
14	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	64	L	7.68	Retained	
15	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	50	L	6	Retained	

Tree No.	Common name	Scientific Name	DBH (cm)	Habitat category	Radius of TPZ (m)	Remove/Retain	Notes
16	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	68	M	8.16	Retained	
17	Swamp Paperbark	*Melaleuca ericifolia*	16	S	2	Retained	
18	Swamp Gum	*Eucalyptus ovata var. ovata*	14	M	2	Retained	
19	Swamp Gum	*Eucalyptus ovata var. ovata*	45	M	5.4	Retained	
20	Swamp Gum	*Eucalyptus ovata var. ovata*	73	M	8.76	Retained	
21	Swamp Paperbark	*Melaleuca ericifolia*	6	S	2	Removed	
22	Swamp Paperbark	*Melaleuca ericifolia*	7	S	2	Removed	
23	Swamp Paperbark	*Melaleuca ericifolia*	6	S	2	Removed	
24	Swamp Paperbark	*Melaleuca ericifolia*	7	S	2	Removed	
25	Swamp Paperbark	*Melaleuca ericifolia*	7	S	2	Removed	
26	Swamp Paperbark	*Melaleuca ericifolia*	6	S	2	Removed	
27	Swamp Paperbark	*Melaleuca ericifolia*	8	S	2	Removed	
28	Swamp Paperbark	*Melaleuca ericifolia*	10	S	2	Removed	
29	Swamp Paperbark	*Melaleuca ericifolia*	11	S	2	Removed	
30	Swamp Paperbark	*Melaleuca ericifolia*	9	S	2	Removed	
31	Swamp Paperbark	*Melaleuca ericifolia*	10	S	2	Removed	
32	Swamp Paperbark	*Melaleuca ericifolia*	8	S	2	Removed	
33	Swamp Paperbark	*Melaleuca ericifolia*	7	S	2	Retained	
34	Southern Blue Gum	*Eucalyptus globulus*	71	M	8.52	Retained	
35	Swamp Gum	*Eucalyptus ovata*	59	M	7.08	Retained	
36	Swamp Gum	*Eucalyptus ovata*	>90	L	15	Retained	
37	Swamp Gum	*Eucalyptus ovata*	LOT	L	15	Retained	
38	Swamp Gum	*Eucalyptus ovata*	103	L	12.36	Retained	
39	Swamp Gum	*Eucalyptus ovata*	92	L	11.04	Retained	
40	Swamp Gum	*Eucalyptus ovata*	88	L	10.56	Retained	

Notes: DBH = Diameter at breast height (130 cm from the ground); **TRZ** = Tree Retention Zone (see Appendix 6); **L** = Large, hollow-bearing trees (high habitat value); **M** = trees with intermediate habitat value; **S** = small trees with low habitat value

Appendix 4: Flora species recorded in the study area and threatened species known (or modelled) to occur in the search region

Origin	Common name	Scientific name	Conservation status				Weed status			Recorded
			EPBC-T	FFG-T	FFG-P	DELWP	CaLP Act	WONS	GS Target	
	Ace of Spades	*Epacris gunnii*			p					X
*	African Box-thorn	*Lycium ferocissimum*					C	WONS		X
*	African Love-grass	*Eragrostis curvula*					C		B	X
*	Agapanthus	*Agapanthus spp.*								X
*	Agapanthus	*Agapanthus praecox subsp. orientalis*							A	X
	Annual Fireweed	*Senecio glomeratus*			p					X
*	Annual Meadow-grass	*Poa annua*								X
	Austral Bracken	*Pteridium esculentum*								X
	Austral Grass-tree	*Xanthorrhoea australis*			p					X
	Australian Gipsywort	*Lycopus australis*								X
	Australian Salt-grass	*Distichlis distichophylla*								X
	Australian Sheep's Burr	*Acaena ovina*								X
	Australian Sweet-grass	*Glyceria australis*								X
*	Barley Grass	*Hordeum spp.*								X
	Beaded Glasswort	*Sarcocornia quinqueflora*								X
	Bent	*Agrostis s.s. spp.*								X
	Bidgee-widgee	*Acaena novae-zelandiae*								X
*	Bird's-foot Trefoil	*Lotus corniculatus*								X
*	Black Nightshade	*Solanum nigrum s.l.*								X
	Black Wattle	*Acacia mearnsii*			p					X
*	Blackberry	*Rubus fruticosus spp. agg.*					C	WONS		X
	Blackwood	*Acacia melanoxylon*								X
#	Blady Grass	*Imperata cylindrica*								X
PI	Blue Box	*Eucalyptus baueriana*								X
	Blue Dampiera	*Dampiera stricta*								X
	Bog Gum	*Eucalyptus kitsoniana*				r				X

Origin	Common name	Scientific name	Conservation status				Weed status			Recorded
			EPBC-T	FFG-T	FFG-P	DELWP	CaLP Act	WONS	GS Target	
	Bordered Panic	*Entolasia marginata*								X
	Bottle Daisy	*Lagenophora spp.*			p					X
	Bristly Wallaby-grass	*Rytidosperma setaceum*								X
	Broad-leaf Cumbungi	*Typha orientalis*								X
	Broad-leaf Rush	*Juncus planifolius*								X
	Broom Spurge	*Amperea xiphoclada var. xiphoclada*								X
	Brown-back Wallaby-grass	*Rytidosperma duttonianum*								X
*	Brown-top Bent	*Agrostis capillaris*							B	X
*	Buck's-horn Plantain	*Plantago coronopus*								X
*	Bulbous Rush	*Juncus bulbosus*								X
	Bulrush	*Typha spp.*								X
	Bush-pea	*Pultenaea spp.*								X
	Buttercup	*Ranunculus spp.*								X
	Button Everlasting	*Coronidium scorpioides s.s.*			p					X
*	Cape weed	*Arctotheca calendula*								X
*	Capitate Rush	*Juncus capitatus*								X
	Centella	*Centella cordifolia*								X
	Chaffy Saw-sedge	*Gahnia filum*								X
	Cherry Ballart	*Exocarpos cupressiformis*								X
*	Chickweed	*Stellaria media*								X
*	Cleavers	*Galium aparine*							B	X
	Clover Glycine	*Glycine latrobeana*	VU	L	p	v				
	Club Sedge	*Isolepis spp.*								X
*	Clustered Dock	*Rumex conglomeratus*								X
	Coarse Dodder-laurel	*Cassytha melantha*								X
	Coast Ballart	*Exocarpos syrticola*				r				
	Coast Beard-heath	*Leucopogon parviflorus*			p					X

Origin	Common name	Scientific name	Conservation status				Weed status			Recorded
			EPBC-T	FFG-T	FFG-P	DELWP	CaLP Act	WONS	GS Target	
	Coast Boronia	*Boronia anemonifolia subsp. variabilis*			p	v				
	Coast Coral Heath	*Epacris microphylla var. microphylla*			p	v				
	Coast Fescue	*Poa billardierei*				r				
	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*								X
	Coast Tussock-grass	*Poa poiformis*								X
	Cobra Greenhood	*Pterostylis grandiflora*			p	r				
*	Cocksfoot	*Dactylis glomerata*							B	X
	Common Apple-berry	*Billardiera mutabilis*								X
*	Common Barb-grass	*Hainardia cylindrica*								X
	Common Blown-grass	*Lachnagrostis filiformis s.l.*								X
	Common Bog-sedge	*Schoenus apogon*								X
	Common Cassinia	*Cassinia aculeata subsp. aculeata*			p					X
	Common Cinnamon-wattle	*Acacia leprosa var. graveolens*			p	k				
	Common Duckweed	*Lemna disperma*								X
	Common Grass-sedge	*Carex breviculmis*								X
	Common Heath	*Epacris impressa*			p					X
	Common Rapier-sedge	*Lepidosperma filiforme*								X
	Common Reed	*Phragmites australis*								X
	Common Rice-flower	*Pimelea humilis*								X
	Common Sneezeweed	*Centipeda cunninghamii*			p					X
*	Common Sow-thistle	*Sonchus oleraceus*								X
	Common Spike-sedge	*Eleocharis acuta*								X
	Common Swamp Wallaby-grass	*Amphibromus nervosus*								X
	Common Tussock-grass	*Poa labillardierei var. labillardierei*								X
*	Common Water-starwort	*Callitriche stagnalis*								X
	Common Wheat-grass	*Anthosachne scabra s.l.*								X
	Common Woodruff	*Asperula conferta*								X

Origin	Common name	Scientific name	Conservation status				Weed status			Recorded
			EPBC-T	FFG-T	FFG-P	DELWP	CaLP Act	WONS	GS Target	
	Common Woodruff	*Asperula conferta*								X
	Cotton Fireweed	*Senecio quadridentatus*			p					X
*	Couch	*Cynodon dactylon var. dactylon*							B	X
	Creeping Brookweed	*Samolus repens var. repens*								X
*	Creeping Buttercup	*Ranunculus repens*							B	X
	Creeping Raspwort	*Gonocarpus micranthus subsp. micranthus*								X
	Creeping Rush	*Juncus revolutus*				r				
*	Curled Dock	*Rumex crispus*								X
*	Drain Flat-sedge	*Cyperus eragrostis*								X
PI	Drooping Sheoak	*Allocasuarina verticillata*								X
	Dusky Violet	*Viola fuscoviolacea*				r				
	Eastern Spider-orchid	*Caladenia orientalis*	EN	L	p	e				
	Eel Grass	*Vallisneria spp.*								X
*	Fiddle Dock	*Rumex pulcher subsp. pulcher*								X
*	Field Forget-me-not	*Myosotis arvensis*								X
	Finger Rush	*Juncus subsecundus*								X
*	Flatweed	*Hypochaeris radicata*								X
	Floating Pondweed	*Potamogeton tricarinatus s.l.*								X
	Forest Clematis	*Clematis glycinoides*								X
	Fringed Helmet-orchid	*Corybas fimbriatus*			p	r				
*	Garden Dandelion	*Taraxacum officinale spp. agg.*								X
	Gold Rush	*Juncus flavidus*								X
	Golden Wattle	*Acacia pycnantha*			p					X
*	Gorse	*Ulex europaeus*					C	WONS		X
	Grass Triggerplant	*Stylidium graminifolium s.l.*			p					X
	Grassy Club-sedge	*Isolepis hookeriana*								X
*	Great Brome	*Bromus diandrus*								X

Origin	Common name	Scientific name	Conservation status				Weed status			Recorded
			EPBC-T	FFG-T	FFG-P	DELWP	CaLP Act	WONS	GS Target	
*	Greater Plantain	*Plantago major*								X
	Green Leek-orchid	*Prasophyllum lindleyanum*			p	v				
	Grey Mangrove	*Avicennia marina subsp. australasica*				r				X
	Groundsel	*Senecio spp.*			p					X
	Hairpin Banksia	*Banksia spinulosa var. cunninghamii*								X
*	Hairy Bird's-foot Trefoil	*Lotus subbiflorus*								X
*	Hairy Hawkbit	*Leontodon taraxacoides subsp. taraxacoides*								X
	Hairy Sheep's Burr	*Acaena agnipila*								X
*	Hastate Orache	*Atriplex prostrata*								X
	Hazel Pomaderris	*Pomaderris aspera*								X
	Heath Tea-tree	*Leptospermum myrsinoides*								X
*	Hemlock	*Conium maculatum*					C			X
	Hop Goodenia	*Goodenia ovata*								X
	Hop Wattle	*Acacia stricta*			p					X
	Ivy-leaf Violet	*Viola hederacea sensu Entwisle (1996)*								X
	Jagged Fireweed	*Senecio biserratus*			p					X
	Kidney-weed	*Dichondra repens*								X
*	Kikuyu	*Cenchrus clandestinus*							A	X
	Knob Sedge	*Carex inversa*								X
	Knotweed	*Persicaria spp.*								X
	Large Bindweed	*Calystegia sepium subsp. roseata*								X
*	Large Quaking-grass	*Briza maxima*							B	X
	Large White Spider-orchid	*Caladenia venusta*			p	r				
	Leafy Flat-sedge	*Cyperus lucidus*								X
*	Lesser Reed-mace	*Typha latifolia*							B	X
	Lizard Orchid	*Burnettia cuneata*			p	r				
	Long Purple-flag	*Patersonia occidentalis var. occidentalis*								X

Origin	Common name	Scientific name	Conservation status				Weed status			Recorded
			EPBC-T	FFG-T	FFG-P	DELWP	CaLP Act	WONS	GS Target	
	Maroon Leek-orchid	*Prasophyllum frenchii*	EN	L	p	e				
	Marsh Saltbush	*Atriplex paludosa subsp. paludosa*				r				
	Mat Grass	*Hemarthria uncinata var. uncinata*								X
	Matted Flax-lily	*Dianella amoena*	EN	L	p	e				
	Matted St John's Wort	*Hypericum japonicum*								X
*	Meadow Fox-tail	*Alopecurus pratensis*								X
	Mentone Greenhood	*Pterostylis X toveyana*			p	v				
	Messmate Stringybark	*Eucalyptus obliqua*								X
	Metallic Sun-orchid	*Thelymitra epipactoides*	EN	L	p	e				
	Milky Beauty-heads	*Calocephalus lacteus*			p					X
*	Mirror Bush	*Coprosma repens*								X
*	Monterey Cypress	*Cupressus macrocarpa*								X
*	Montpellier Broom	*Genista monspessulana*					C	WONS		X
*	Moort	*Eucalyptus platypus subsp. platypus*								X
	Mountain Clematis	*Clematis aristata*								X
	Mud Dock	*Rumex bidens*								X
	Naked Crane's-bill	*Geranium sp. 5*								X
	Narrow-leaf Cumbungi	*Typha domingensis*								X
	Narrow-leaf Peppermint	*Eucalyptus radiata s.l.*								X
	Native Sea-spurrey	*Spergularia sp. 1*								X
	Nodding Saltbush	*Einadia nutans*								X
*	Onion Grass	*Romulea rosea*								X
	Orange-tip Finger-orchid	*Caladenia aurantiaca*			p	r				
	Pacific Azolla	*Azolla filiculoides*			p					X
	Pale Grass-lily	*Caesia parviflora*								X
	Pale Rush	*Juncus pallidus*								X
	Pale Swamp Everlasting	*Coronidium gunnianum*			p	v				X

Origin	Common name	Scientific name	Conservation status				Weed status			Recorded
			EPBC-T	FFG-T	FFG-P	DELWP	CaLP Act	WONS	GS Target	
	Pale-fruit Ballart	*Exocarpos strictus*								X
	Panic	*Entolasia spp.*								X
*	Panic Veldt-grass	*Ehrharta erecta var. erecta*							B	X
	Parrot Pea	*Dillwynia spp.*								X
	Parsley Xanthosia	*Xanthosia leiophylla*				r				
*	Paspalum	*Paspalum dilatatum*							B	X
*	Perennial Rye-grass	*Lolium perenne*								X
*	Pine	*Pinus spp.*								X
	Pithy Sword-sedge	*Lepidosperma longitudinale*								X
*	Prairie Grass	*Bromus catharticus*								X
	Prickly Broom-heath	*Monotoca scoparia*			p					X
	Prickly Moses	*Acacia verticillata subsp. verticillata*			p					X
*	Prickly Paperbark	*Melaleuca styphelioides*								X
	Prickly Spear-grass	*Austrostipa stipoides*								X
	Prickly Tea-tree	*Leptospermum continentale*								X
*	Prostrate Knotweed	*Polygonum aviculare s.l.*								X
*	Prunus	*Prunus spp.*								X
	Purple Blown-grass	*Lachnagrostis punicea subsp. punicea*				r				
*	Purple Cudweed	*Gamochaeta purpurea s.l.*								X
	Rainforest Crane's-bill	*Geranium homeanum*								X
*	Rat-tail Grass	*Sporobolus africanus*								X
*	Red Clover	*Trifolium pratense*								X
	Red-fruit Saw-sedge	*Gahnia sieberiana*								X
	Reed Bent-grass	*Deyeuxia quadriseta*								X
*	Ribwort	*Plantago lanceolata*								X
*	River Oak	*Casuarina cunninghamiana subsp. cunninghamiana*								X
PI	River Red-gum	*Eucalyptus camaldulensis*								X

Origin	Common name	Scientific name	Conservation status				Weed status			Recorded
			EPBC-T	FFG-T	FFG-P	DELWP	CaLP Act	WONS	GS Target	
	River Swamp Wallaby-grass	*Amphibromus fluitans*	VU							
*	Rough Dog's-tail	*Cynosurus echinatus*								X
	Rough Fireweed	*Senecio hispidulus s.l.*			p					X
*	Rough Sow-thistle	*Sonchus asper s.l.*								X
#	Rough-barked Honey-myrtle	*Melaleuca parvistaminea*								X
	Rush	*Juncus spp.*								X
#	Sallow Wattle	*Acacia longifolia subsp. longifolia*			p					X
	Salt Lawrencia	*Lawrencia spicata*				r				
	Salt Pratia	*Lobelia irrigua*								X
	Saw Banksia	*Banksia serrata*								X
*	Scarlet Pimpernel	*Lysimachia arvensis (Red-flowered variant)*								X
	Scented Paperbark	*Melaleuca squarrosa*								X
	Screw Fern	*Lindsaea linearis*			p					X
	Scrub Nettle	*Urtica incisa*								X
	Scrub Sheoak	*Allocasuarina paludosa*								X
	Sea Rush	*Juncus kraussii subsp. australiensis*								X
	Seaberry Saltbush	*Rhagodia candolleana subsp. candolleana*								X
*	Self-heal	*Prunella vulgaris*								X
	Shade Raspwort	*Gonocarpus humilis*								X
	Shady Wood-sorrel	*Oxalis exilis*								X
*	Sheep Sorrel	*Acetosella vulgaris*								X
	Shining Pennywort	*Hydrocotyle sibthorpioides*								X
	Shiny Swamp-mat	*Selliera radicans*								X
	Shrubby Fireweed	*Senecio minimus*			p					X
	Silky Guinea-flower	*Hibbertia sericea s.l.*								X
	Silver Banksia	*Banksia marginata*								X
	Silver Everlasting	*Argentipallium dealbatum*			p	r				

Origin	Common name	Scientific name	Conservation status				Weed status			Recorded
			EPBC-T	FFG-T	FFG-P	DELWP	CaLP Act	WONS	GS Target	
	Slender Bog-sedge	*Schoenus lepidosperma subsp. pachylepis*				r				
	Slender Knotweed	*Persicaria decipiens*								X
	Slender Leek-orchid	*Prasophyllum parviflorum*			p	v				
	Slender Tussock-grass	*Poa tenera*								X
	Slender Wallaby-grass	*Rytidosperma racemosum var. racemosum*								X
	Small Loosestrife	*Lythrum hyssopifolia*								X
	Small St John's Wort	*Hypericum gramineum spp. agg.*								X
	Small-flower Flax-lily	*Dianella brevicaulis*								X
	Small-leaf Bramble	*Rubus parvifolius*								X
	Smooth Pomaderris	*Pomaderris elliptica var. elliptica*								X
	Sneezeweed	*Centipeda spp.*			p					X
	Snowy Daisy-bush	*Olearia lirata*			p					X
*	Soft Brome	*Bromus hordeaceus subsp. hordeaceus*								X
	Soft Crane's-bill	*Geranium potentilloides*								X
#	Southern Blue-gum	*Eucalyptus globulus subsp. globulus*				r				
#	Southern Blue-gum	*Eucalyptus globulus*								X
	Southern Bristle-sedge	*Chorizandra australis*				k				
*	Sowbane	*Chenopodium murale*								X
*	Spanish Heath	*Erica lusitanica*								X
	Spear Grass-tree	*Xanthorrhoea resinosa*			p					X
*	Spear Thistle	*Cirsium vulgare*					C			X
	Spike Sedge	*Eleocharis spp.*								X
	Spike Wattle	*Acacia oxycedrus*			p					X
	Spiny-headed Mat-rush	*Lomandra longifolia*								X
	Spreading Guinea-flower	*Hibbertia procumbens*								X
	Spreading Rope-rush	*Empodisma minus*								X
	Spreading Sneezeweed	*Centipeda minima s.l.*			p					X

Origin	Common name	Scientific name	Conservation status				Weed status			Recorded
			EPBC-T	FFG-T	FFG-P	DELWP	CaLP Act	WONS	GS Target	
	Spurred Helmet-orchid	*Corybas aconitiflorus*			p	r				
*	Squirrel-tail Fescue	*Vulpia bromoides*							B	X
*	St John's Wort	*Hypericum perforatum subsp. veronense*					C		B	X
*	St John's Wort	*Hypericum perforatum subsp. veronense*					C		B	X
	Star Cudweed	*Euchiton involucratus s.s.*			p					X
#	Sticky Wattle	*Acacia howittii*			p	r				X
	Streaked Arrowgrass	*Triglochin striata*								X
	Strzelecki Gum	*Eucalyptus strzeleckii*	VU	L	p	v				
	Summer Spider-orchid	*Caladenia flavovirens*			p	r				
	Sun Orchid	*Thelymitra spp.*			p					X
	Supple Spear-grass	*Austrostipa mollis*								X
	Swamp Crassula	*Crassula helmsii*								X
	Swamp Everlasting	*Xerochrysum palustre*	VU	L	p	v				
	Swamp Goodenia	*Goodenia humilis*								X
	Swamp Gum	*Eucalyptus ovata var. ovata*								X
#	Swamp Paperbark	*Melaleuca ericifolia*								X
	Swamp Selaginella	*Selaginella uliginosa*			p					X
*	Sweet Briar	*Rosa rubiginosa*					C			X
#	Sweet Pittosporum	*Pittosporum undulatum*								X
*	Sweet Vernal-grass	*Anthoxanthum odoratum*							B	X
*	Tall Fescue	*Festuca arundinacea*							B	X
	Tall Saw-sedge	*Gahnia clarkei*								X
	Tall Sedge	*Carex appressa*								X
	Tall Spike-sedge	*Eleocharis sphacelata*								X
	Tasman Flax-lily	*Dianella tasmanica*								X
	Tasman Pomaderris	*Pomaderris apetala subsp. maritima*				v				
	Tassel Sedge	*Carex fascicularis*								X

Origin	Common name	Scientific name	Conservation status				Weed status			Recorded
			EPBC-T	FFG-T	FFG-P	DELWP	CaLP Act	WONS	GS Target	
	Thatch Saw-sedge	*Gahnia radula*								X
	Thick-lip Spider-orchid	*Caladenia tessellata*	VU		p	v				
	Tiny Arrowgrass	*Triglochin minutissima*				r				
	Toad Rush	*Juncus bufonius*								X
*	Toowoomba Canary-grass	*Phalaris aquatica*							B	X
	Tree Violet	*Melicytus dentatus s.s.*								X
	Tufted Lily	*Thelionema caespitosum*								X
	Tussock Grass	*Poa spp.*								X
	Twig Sedge	*Baumea spp.*								X
	Twiggy Daisy-bush	*Olearia ramulosa*			p					X
	Variable Stinkweed	*Opercularia varia*								X
	Varied Raspwort	*Haloragis heterophylla*								X
	Veined Spear-grass	*Austrostipa rudis*								X
	Wallaby Grass	*Rytidosperma spp.*								X
*	Water Buttons	*Cotula coronopifolia*								X
*	Water Couch	*Paspalum distichum*							B	X
	Water Milfoil	*Myriophyllum spp.*								X
	Water Plantain	*Alisma plantago-aquatica*								X
	Water Woodruff	*Asperula subsimplex*								X
*	Watercress	*Nasturtium officinale*								X
	Wattle Mat-rush	*Lomandra filiformis*								X
	Weeping Grass	*Microlaena spp.*								X
	Weeping Grass	*Microlaena stipoides var. stipoides*								X
	Weeping Wallaby-grass	*Rytidosperma penicillatum*								X
*	Weeping Willow	*Salix babylonica s.l.*								X
	Wetland Wallaby-grass	*Rytidosperma semiannulare*								X
*	White Arum-lily	*Zantedeschia aethiopica*							B	X

Origin	Common name	Scientific name	Conservation status				Weed status			Recorded
			EPBC-T	FFG-T	FFG-P	DELWP	CaLP Act	WONS	GS Target	
*	White Clover	*Trifolium repens var. repens*								X
*	Willow	*Salix spp.*					P	WONS		X
	Winged Water-starwort	*Callitriche umbonata*				r				
	Wiry Buttons	*Leptorhynchos tenuifolius*			p					X
PI	Yellow Box	*Eucalyptus melliodora*								X
	Yellow Sea-lavender	*Limonium australe var. australe*				r				
	Yellow Stringybark	*Eucalyptus muelleriana*								X
	Yertchuk	*Eucalyptus consideniana*								X
*	Yorkshire Fog	*Holcus lanatus*							b	X

Notes:

X = recorded in the study area
* = introduced to Victoria
# = Victorian native taxa occurring outside their natural range
PI = all individuals planted and managed without public funding

EPBC-T = threatened species status under EPBC Act:
EN = endangered
VU = vulnerable

FFG-T = threatened species status under the FFG Act: **L** = listed as threatened
FFG-P = protected species status under the FFG Act: **p** = listed as protected

DELWP = status under DELWP's Advisory List (DEPI 2014a):
x = presumed extinct in the wild
cr = critically endangered
e = endangered
v = vulnerable
r = rare
k = insufficiently known

CaLP Act = declared noxious weeds status under the CaLP Act:
S = State Prohibited Weeds (Any infestations are to be reported to DELWP. DELWP is responsible for control of State Prohibited Weeds)
P = Regionally Prohibited Weeds (Land owners must take all reasonable steps to eradicate regionally prohibited weeds on their land)
C = Regionally Controlled Weeds (Land owners have the responsibility to take all reasonable steps to prevent the growth and spread of Regionally controlled weeds on their land)
R = Restricted Weeds (Trade in these weeds and their propagules, either as plants, seeds or contaminants in other materials is prohibited)

WONS = Weeds of National Significance

Appendix 5: Vertebrate terrestrial fauna species recorded in the broader study area

Origin	Common name	Scientific name	Conservation status				Recorded
			EPBC-T	EPBC-M	FFG-T	DELWP	
Birds							
	Australasian Pipit	*Anthus novaeseelandiae*					X
	Australian Hobby	*Falco longipennis*					X
	Australian Magpie	*Gymnorhina tibicen*					X
	Australian Pelican	*Pelecanus conspicillatus*					X
	Australian Raven	*Corvus coronoides*					X
	Australian Shelduck	*Tadorna tadornoides*					X
	Australian White Ibis	*Threskiornis molucca*					X
	Australian Wood Duck	*Chenonetta jubata*					X
	Baillon's Crake	*Zapornia pusilla*			L	v	X
	Black Swan	*Cygnus atratus*					X
	Black-faced Cuckoo-shrike	*Coracina novaehollandiae*					X
	Black-fronted Dotterel	*Elseyornis melanops*					X
	Black-shouldered Kite	*Elanus axillaris*					X
	Blue-winged Parrot	*Neophema chrysostoma*					X
	Brown Falcon	*Falco berigora*					X
	Brown Goshawk	*Accipiter fasciatus*					X
	Brown Songlark	*Cinclorhamphus cruralis*					X
	Brown Thornbill	*Acanthiza pusilla*					X
	Brown-headed Honeyeater	*Melithreptus brevirostris*					X
	Brush Bronzewing	*Phaps elegans*					X
	Chestnut Teal	*Anas castanea*					X
	Clamorous Reed Warbler	*Acrocephalus stentoreus*					X
*	Common Blackbird	*Turdus merula*					X
	Common Bronzewing	*Phaps chalcoptera*					X
*	Common Myna	*Acridotheres tristis*					X

Origin	Common name	Scientific name	Conservation status				Recorded
			EPBC-T	EPBC-M	FFG-T	DELWP	
*	Common Starling	*Sturnus vulgaris*					X
	Crimson Rosella	*Platycercus elegans*					X
	Dusky Moorhen	*Gallinula tenebrosa*					X
	Eastern Great Egret	*Ardea modesta*		M (JAMBA, CAMBA)	L	v	X
	Eastern Rosella	*Platycercus eximius*					X
	Eastern Yellow Robin	*Eopsaltria australis*					X
	Eurasian Coot	*Fulica atra*					X
	European Goldfinch	*Carduelis carduelis*					X
*	European Greenfinch	*Carduelis chloris*					X
*	European Skylark	*Alauda arvensis*					X
	Fairy Martin	*Hirundo ariel*					X
	Forest Raven	*Corvus tasmanicus*					X
	Fork-tailed Swift	*Apus pacificus*		M (JAMBA, CAMBA, ROKAMBA)			X
	Galah	*Eolophus roseicapilla*					X
	Golden Whistler	*Pachycephala pectoralis*					X
	Golden-headed Cisticola	*Cisticola exilis*					X
	Great Cormorant	*Phalacrocorax carbo*					X
	Grey Butcherbird	*Cracticus torquatus*					X
	Grey Currawong	*Strepera versicolor*					X
	Grey Fantail	*Rhipidura albiscarpa*					X
	Grey Shrike-thrush	*Colluricincla harmonica*					X
	Grey Teal	*Anas gracilis*					X
	Hoary-headed Grebe	*Poliocephalus poliocephalus*					X
*	House Sparrow	*Passer domesticus*					X

Origin	Common name	Scientific name	Conservation status				Recorded
			EPBC-T	EPBC-M	FFG-T	DELWP	
	Latham's Snipe	*Gallinago hardwickii*		M (JAMBA, CAMBA, ROKAMBA, Bonn A2H)		nt	X
	Laughing Kookaburra	*Dacelo novaeguineae*					X
	Lewin's Honeyeater	*Meliphaga lewinii*					X
	Little Black Cormorant	*Phalacrocorax sulcirostris*					X
	Little Egret	*Egretta garzetta nigripes*			L	e	X
	Little Grassbird	*Megalurus gramineus*					X
	Little Pied Cormorant	*Microcarbo melanoleucos*					X
	Little Raven	*Corvus mellori*					X
	Little Wattlebird	*Anthochaera chrysoptera*					X
	Magpie-lark	*Grallina cyanoleuca*					X
	Masked Lapwing	*Vanellus miles*					X
	Nankeen Kestrel	*Falco cenchroides*					X
	New Holland Honeyeater	*Phylidonyris novaehollandiae*					X
	Noisy Miner	*Manorina melanocephala*					X
	Pacific Black Duck	*Anas superciliosa*					X
	Peregrine Falcon	*Falco peregrinus*					X
	Purple Swamphen	*Porphyrio porphyrio*					X
	Rainbow Lorikeet	*Trichoglossus haematodus*					X
	Red Wattlebird	*Anthochaera carunculata*					X
	Red-browed Finch	*Neochmia temporalis*					X
	Red-rumped Parrot	*Psephotus haematonotus*					X
*	Rock Dove	*Columba livia*					X
	Royal Spoonbill	*Platalea regia*				nt	X
	Rufous Whistler	*Pachycephala rufiventris*					X
	Sacred Kingfisher	*Todiramphus sanctus*					X
	Silvereye	*Zosterops lateralis*					X

Origin	Common name	Scientific name	Conservation status				Recorded
			EPBC-T	EPBC-M	FFG-T	DELWP	
	Singing Honeyeater	*Lichenostomus virescens*					X
	Spotted Pardalote	*Pardalotus punctatus*					X
*	Spotted Turtle-Dove	*Streptopelia chinensis*					X
	Straw-necked Ibis	*Threskiornis spinicollis*					X
	Striated Fieldwren	*Calamanthus fuliginosus*					X
	Striated Pardalote	*Pardalotus striatus*					X
	Striated Thornbill	*Acanthiza lineata*					X
	Sulphur-crested Cockatoo	*Cacatua galerita*					X
	Superb Fairy-wren	*Malurus cyaneus*					X
	Swamp Harrier	*Circus approximans*					X
	Tree Martin	*Petrochelidon nigricans*					X
	Wedge-tailed Eagle	*Aquila audax*					X
	Welcome Swallow	*Petrochelidon neoxena*					X
	White-browed Scrubwren	*Sericornis frontalis*					X
	White-eared Honeyeater	*Lichenostomus leucotis*					X
	White-faced Heron	*Egretta novaehollandiae*					X
	White-fronted Chat	*Epthianura albifrons*					X
	White-naped Honeyeater	*Melithreptus lunatus*					X
	White-necked Heron	*Ardea pacifica*					X
	White-plumed Honeyeater	*Lichenostomus penicillatus*					X
	White-throated Needletail	*Hirundapus caudacutus*		M (JAMBA, CAMBA, ROKAMBA)		v	X
	White-throated Treecreeper	*Cormobates leucophaeus*					X
	Willie Wagtail	*Rhipidura leucophrys*					X
	Yellow-faced Honeyeater	*Lichenostomus chrysops*					X
	Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*					X
	Yellow-tailed Black-Cockatoo	*Calyptorhynchus funereus*					X

Origin	Common name	Scientific name	Conservation status				Recorded
			EPBC-T	EPBC-M	FFG-T	DELWP	
Mammals							
	Black Wallaby	*Wallabia bicolor*					X
*	Cat	*Felis catus*					X
	Common Wombat	*Vombatus ursinus*					X
	Eastern Grey Kangaroo	*Macropus giganteus*					X
*	European Hare	*Lepus europeaus*					X
*	European Rabbit	*Oryctolagus cuniculus*					X
*	Hog Deer	*Cervus porcinus*					X
*	Red Fox	*Vulpes vulpes*					X
	Red-necked Wallaby	*Macropus rufogriseus*					X
	Short-beaked Echidna	*Tachyglossus aculeatus*					X
Reptiles							
	Easter Brown Snake	*Pseudonaja textilis*					X
	Eastern Three-lined Skink	*Acritoscincus duperreyi*					X
	Garden Skink	*Lampropholis guichenoti*					X
	Jacky Lizard	*Amphibolurus muricatus*					X
	Metallic Skink	*Niveoscincus metallicus*					X
	Tiger Snake	*Notechis scutatus*					X
Frogs							
	Common Froglet	*Crinia signifera*					X
	Pobblebonk Frog	*Limnodynastes dumerilii insularis*					X
	Spotted Marsh Frog	*Limnodynastes tasmaniensis*					X

Notes:

X = recorded in the study area
* = introduced to Victoria
# = Victorian native taxa occurring outside their natural range

EPBC-T = threatened species status under EPBC Act:

EX = presumed extinct in the wild
CE = critically endangered

EN = endangered

VU = vulnerable

EPBC-M = migratory status under the EPBC Act – **M** = listed migratory taxa:

Bonn Convention (A2H) - Convention on the Conservation of Migratory Species of Wild Animals – listed as a member of a family

Bonn Convention (A2S) - Convention on the Conservation of Migratory Species of Wild Animals - species listed explicitly

CAMBA - China- Australia Migratory Birds Agreement

JAMBA - Japan-Australia Migratory Birds Agreement

ROKAMBA - Republic of Korea Australia Migratory Birds Agreement

FFG-thrt = threatened species status under the FFG Act: **L** = listed as threatened

DELWP = status under DELWP's Advisory List (DEPI 2014c):

x = presumed extinct in the wild

cr = critically endangered

e = endangered

v = vulnerable

nt = lower risk near threatened

dd = data deficient

Appendix 6: Guidelines for impacts to trees

DELWP guidelines (DSE 2010) provide definitions regarding tree retention and losses. These are outlined below, and it is considered that they should be applied to scattered trees and edges of treed remnant patches when determining the proximity of development to retained native vegetation.

Any tree is deemed lost when:

- Earthworks encroach on more than 10% of its Tree Retention Zone (TRZ) during construction activities. Tree Retention Zones:
    - Are defined as the area from the respective tree within a radius of 12 times the DBH of the respective tree, including the area above and below ground, notwithstanding it can be a minimum of two metres and a maximum of 15 metres radius around the respective tree
    - Extend at least one metre outside the crown projection, if the tree is a Tree Fern (DSE 2010)
    - Must be securely fenced off with high-visibility temporary fencing and appropriately signed as "Tree Retention Zone – keep out"
- Directional drilling within its TRZ occurs at less than 600 millimetres below the surface, or is not confirmed to be appropriate (including considerations concerning bore hole width) by a qualified arborist
- Lopping removes more than 1/3 of its crown
- Its trunk is damaged
- It is likely to pose a risk to safety or property as a result of the proposed development/works (e.g. a dwelling is proposed to be constructed near a tree that a qualified arborist has deemed likely to pose a risk to the dwelling)

Appendix 7: General development recommendations

Consideration should be given to including the measures described below in a construction and operational environmental management plan for the project.

Pre-construction phase:

- Where feasible, development and associated works should be sited at least thirty metres away from rivers, creeks and significant drainage lines.
- The proposed development should be designed in a way that does not alter the site's hydrology in areas that support native vegetation or act as tributaries to rivers, creeks and significant drainage lines.
- Construction contractors should be inducted into an environmental management program for construction works.
- All environmental controls should be checked for compliance on a regular basis.

Construction phase:

- Environmentally sensitive areas including retained native vegetation within 50 metres of works (including access points and routes) should be securely fenced at two metres from the perimeter and appropriately signed. All machinery, vehicles, equipment, personnel, waste materials/spoil and earthworks are to be excluded from these areas.
- Tree Retention Zones (TRZs) are to be established and maintained around all retained scattered trees within 50 metres of works (including access points and routes) for the duration of construction activities. Construction and construction-related activities are to be excluded from the TRZ. Encroachment into the TRZ (including earthworks such as trenching for pipelines or cabling, etc. that disturb the root zone) must not affect more than 10% of the total area of the TRZ. Directional drilling must not be undertaken within TRZs, unless:
    - The directional drilling bore is at least 600 millimetres deep; AND
    - A qualified arborist has confirmed in writing that the radius of the bore will not significantly damage the tree causing it to be lost in the future; AND
    - A qualified arborist has confirmed in writing that the use of directional drilling is appropriate for the specific project/works.
- Any pruning of native trees should be undertaken using a suitably qualified arborist and be carried out in accordance with *Australian Standard 4373 – 2007 Pruning of Amenity Trees* to the satisfaction of the Responsible Authority . An excavator, backhoe, bulldozer blade or loader should not be used to trim branches.
- A suitably qualified arborist (Level 5) should be on-site during all works within Tree Protection Zones of any native canopy tree located within five metres of the works to ensure all efforts are taken to avoid impacts on the root zones, to monitor root damage and carry out any amelioration to disturbed roots.
- Any stockpiling should occur outside of environmentally sensitive areas.
- All machinery should enter and exit works sites along defined routes that do not impact on native vegetation or cause soil disturbance and weed spread.

- All machinery brought on site should be clean and free of weeds and pathogens (including seeds and other propagules).
- All machinery wash down, lay down and personnel rest areas should be defined (fenced) and located in disturbed areas.
- All works must be undertaken in a manner that will minimise soil erosion and adhere to Construction Techniques for Sediment Pollution Control (EPAV 1991).

Post-construction phase:

- Weed control, by an experienced bush regenerator, is to be carried out along disturbed areas after construction to control any weed outbreaks in farmland or native vegetation as well as along watercourses.
- The use of local indigenous plant species, of local genetic provenance, should be considered in the landscaping of any development on the site. Locally indigenous species generally have low water-use requirements, high survival rates and provide habitat to local fauna species.

Decommissioning phase:

- As per construction phase.

Appendix 8: EVC benchmarks

Gippsland Plain:

- Damp Sands Herb-rich Woodland (EVC 3)
- Wet Heathland (EVC 8)
- Coastal Saltmarsh (EVC 9)
- Riparian Forest (EVC 18)
- Heathy Woodland (EVC 48)
- Swamp Scrub (EVC 53)
- Floodplain Riparian Woodland (EVC 56)
- Swampy Riparian Woodland (EVC 83)
- South Gippsland Plains Grassland (EVC 132_62)
- Sedge Wetland (EVC 136)
- Mangrove Shrubland (EVC 140)
- Plains Grassy Forest (EVC 151)
- Riparian Scrub (EVC 191)
- Aquatic Herbland (EVC 653)
- Brackish Wetland (EVC 656)
- Damp Heathland (EVC 710)
- Tall Marsh (EVC 821)
- Floodplain Reedbed (EVC 863)
- Estuarine Flats Grassland (EVC 914)
- Brackish Grassland (EVC 934)

Appendix 9: Biodiversity impact and offset requirements report – (BIOR)

Appendix 14: Bat utilisation survey, summary of ultrasonic detector results

Species	Summer 2015	Spring/ Summer 2023	Summer/ Autumn 2024	Winter/ Spring 2024	Spring/ Summer 2024	Summer/ Autumn 2025	Autumn/ Winter 2025	Winter 2025
Chocolate Wattled bat	p	p	p	p	p	p	p	p
Eastern Bent-wing Bat	-	3	-	5	2	-	-	-
Eastern Falsistrelle	p	p	p	p	p	p	p	-
Eastern Broad-nosed Bat	-	p	p	p	p	p	p	p
Gould's Wattled Bat	p	p	p	p	p	p	p	p
Large Forest Bat	p	p	p	p	p	p	p	p
Little Forest Bat	p	p	p	p	p	p	p	p
Ride's Freetail Bat	-	p	p	p	p	p	p	p
Southern Freetail Bat	p	p	p	p	p	p	p	p
White-striped Freetail Bat	p	p	p	p	p	p	p	p
Complexes								
Forest Bat complex	p	p	p	p	p	p	p	p
Long-eared Bat complex	p	p	p	p	p	p	p	p
Eastern Falsistrelle / Eastern Broad-nosed Bat complex	-	p	p	p	p	p	p	-

NOTE: p signifies presence.