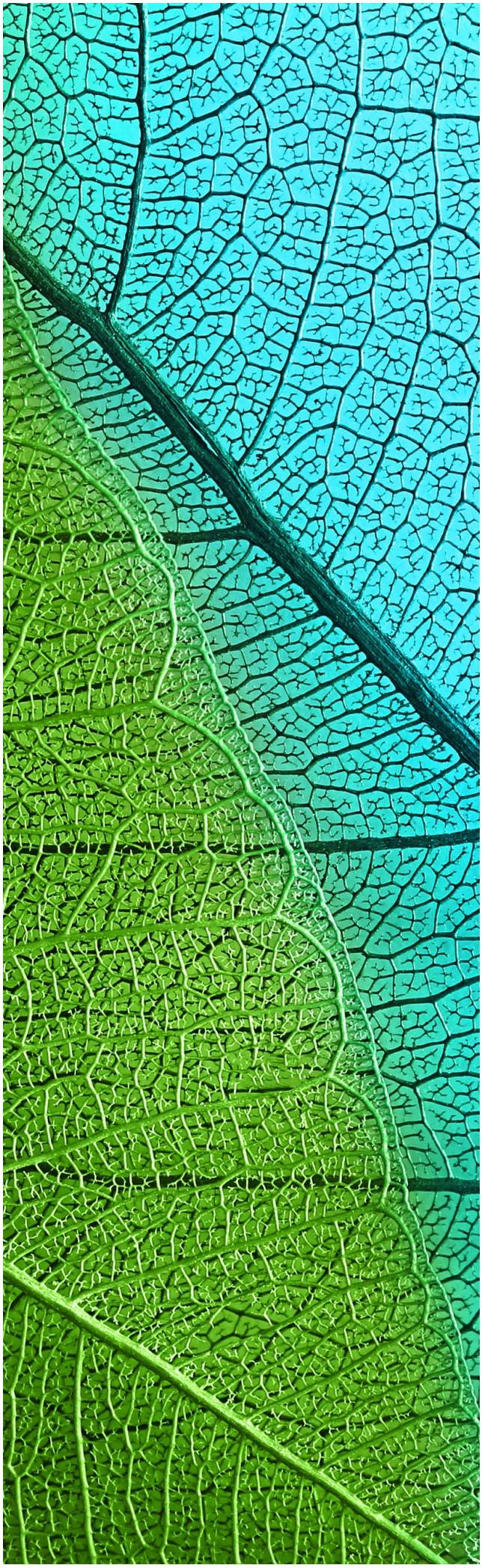

Gelliondale Wind Farm

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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Appendices

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.

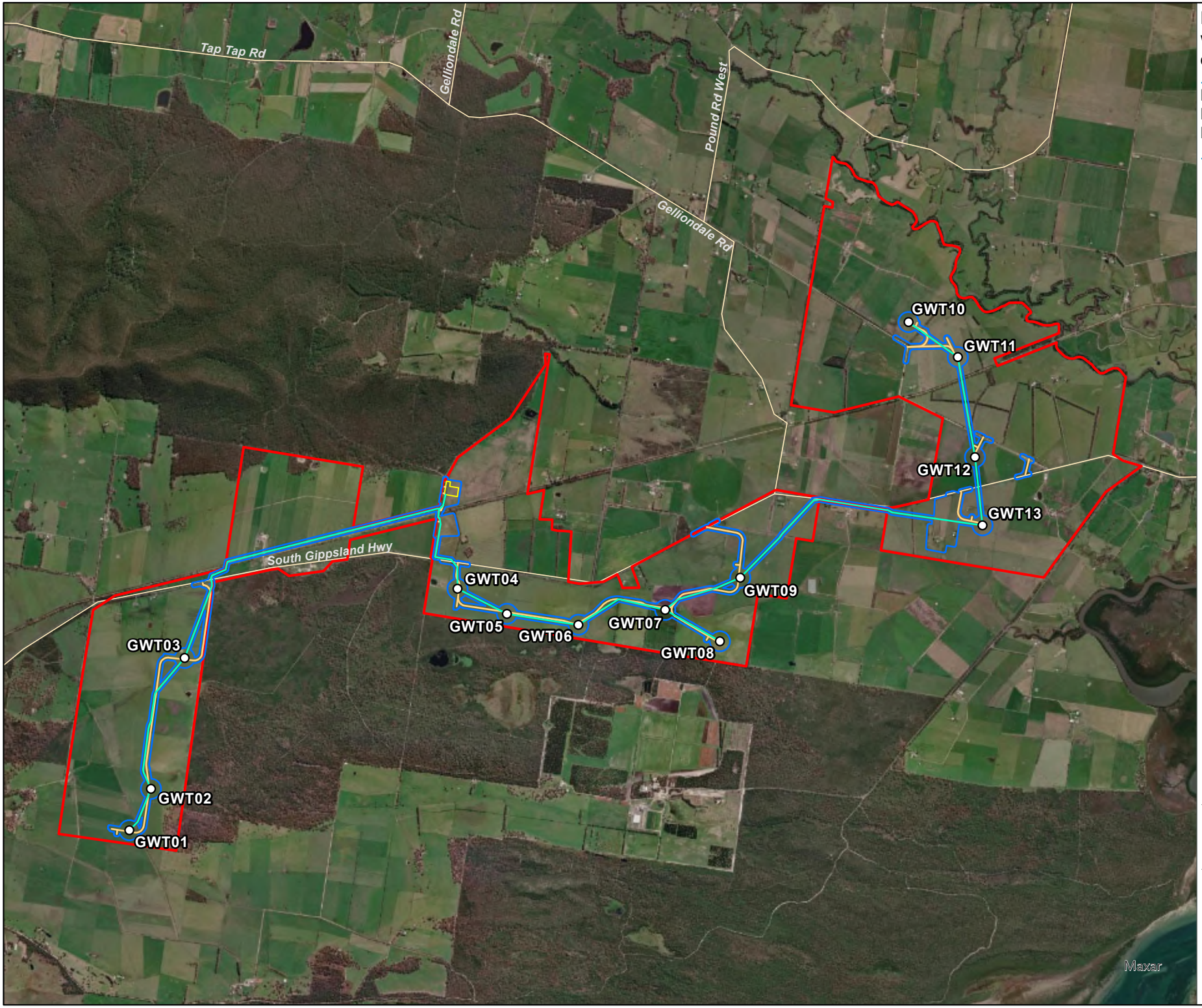

Figure 1: Study area and wind farm layout - overview

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. Six individuals of the FFG Act listed critically endangered species Bog Gum were recorded in this HZ.
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.

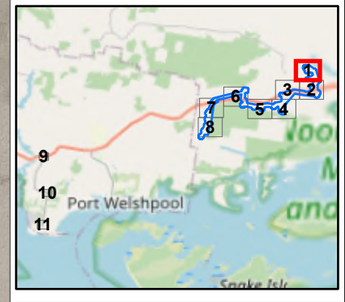
Figure 2-1 Native vegetation to be removed

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

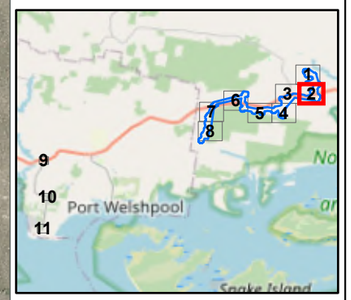

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Figure 2-3 Native vegetation to be removed

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

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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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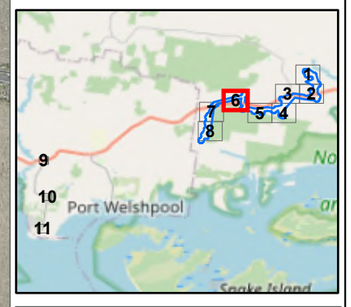
Figure 2-6 Native vegetation to be removed

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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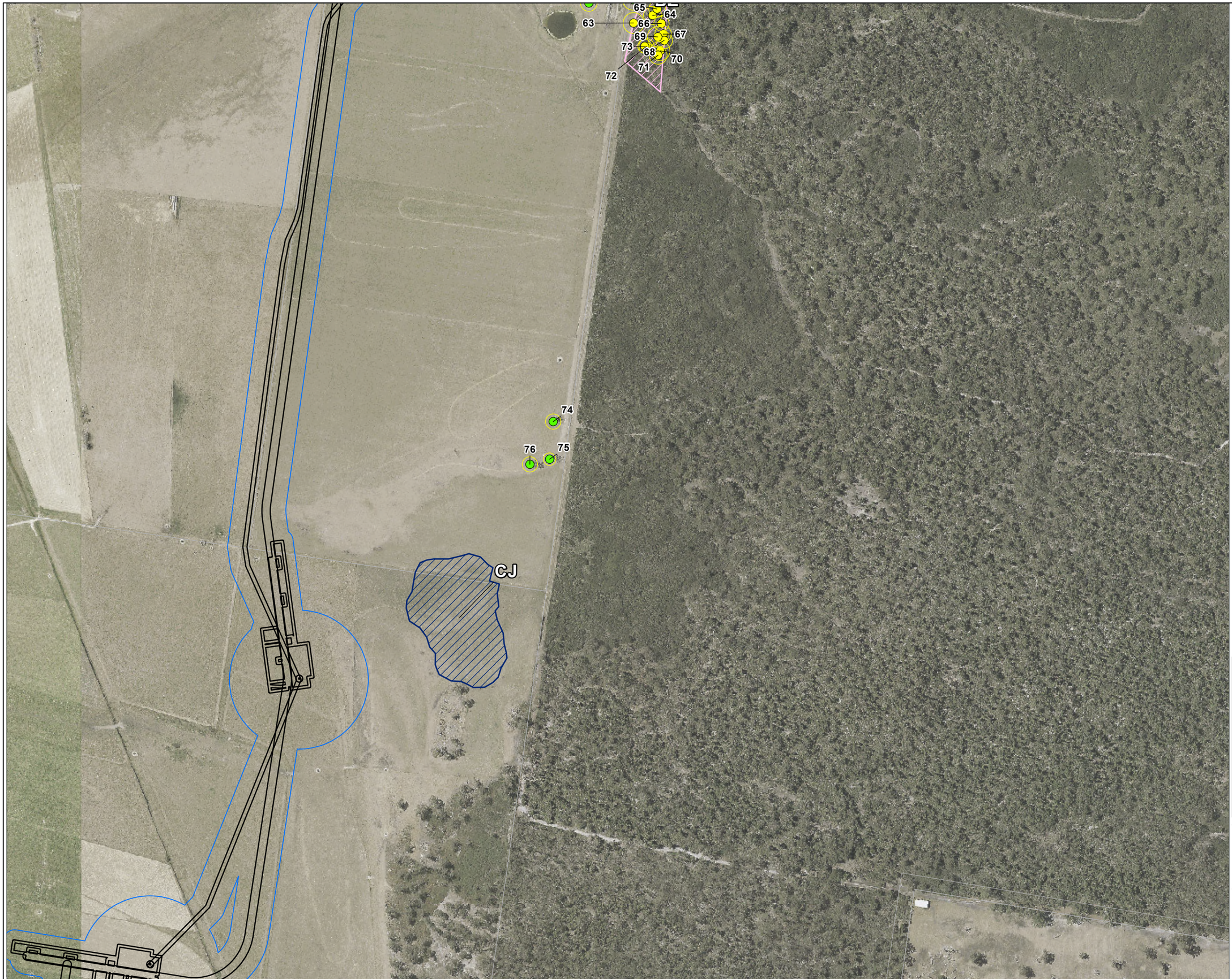


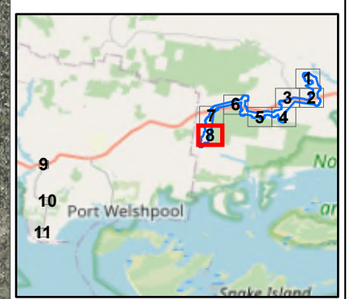
Figure 2-8 Native vegetation to be removed

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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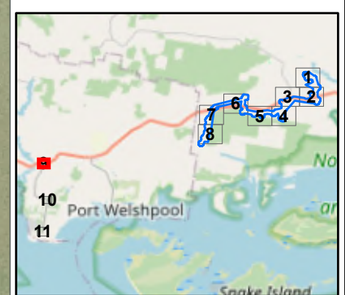
Figure 2-9 Native vegetation to be removed

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

DB
DA
81
80
79
Barry Rd

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.

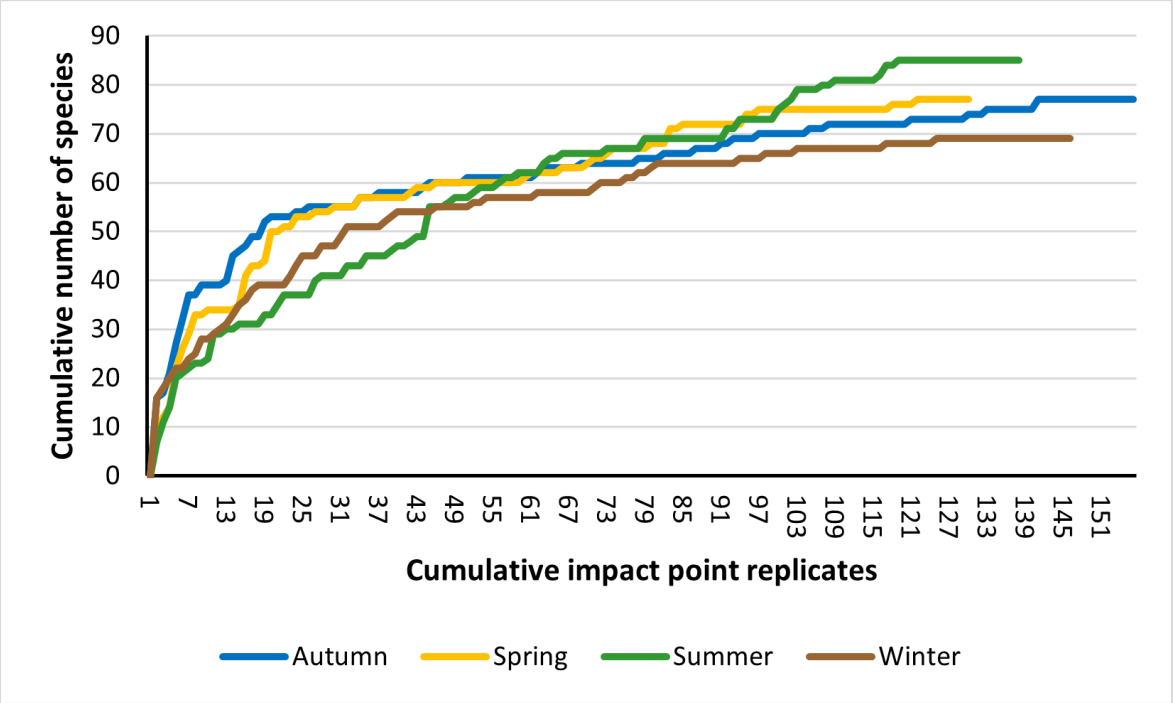

Figure 3: The cumulative number of bird species recorded during consecutive counts.

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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03 9815 2111 - info@natureadvisory.com.au

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

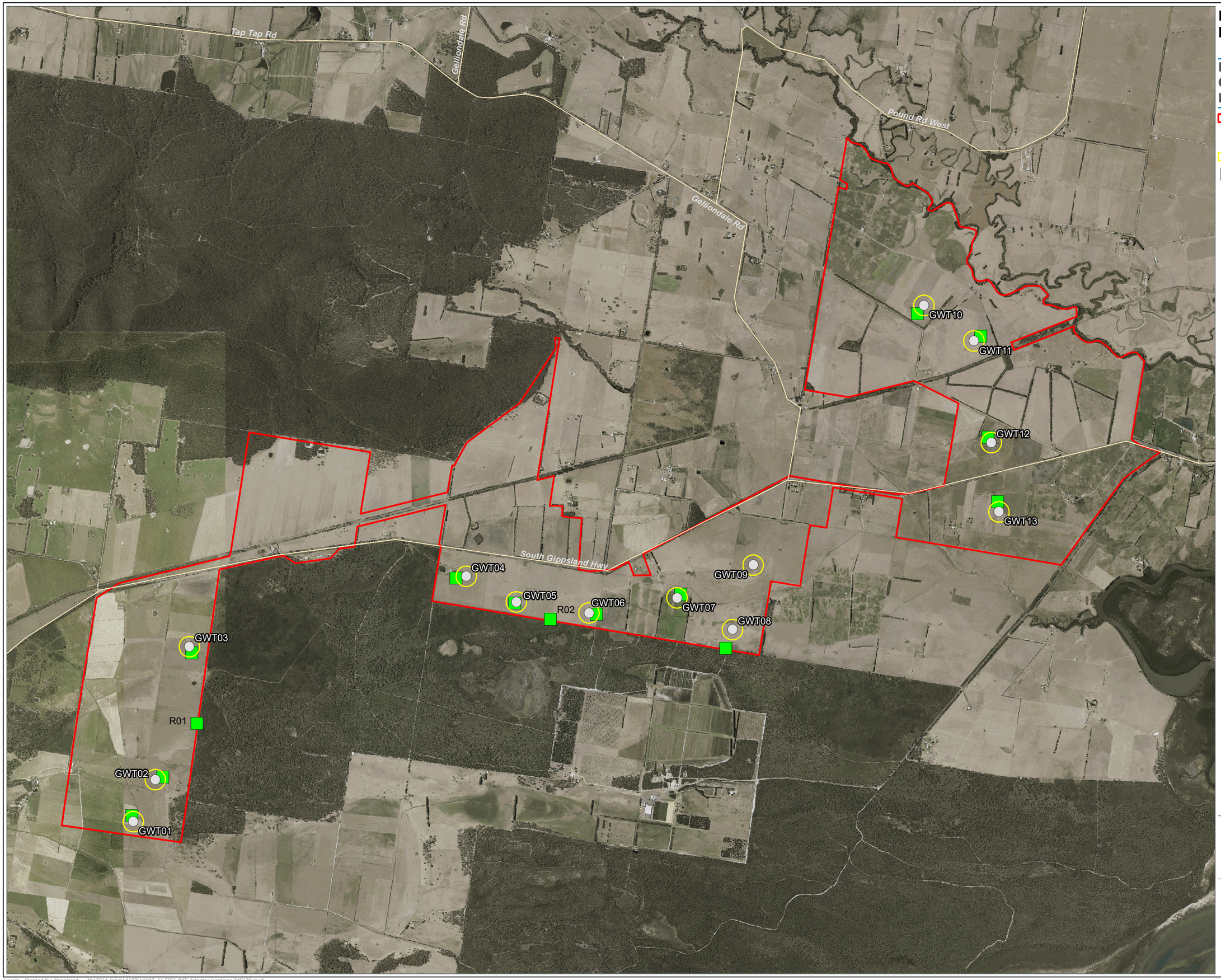

Figure 5: Bat detector locations

Project: Gelliondale Wind Farm
Client: Synergy Wind
Date: 5/02/2024

- Wind farm boundary
- Turbine
- Turbine buffer (100 m)
- Bat detector

N

Metres
0 400

Nature Advisory
PO Box 337, Camberwell, VIC 3124, Australia
www.natureadvisory.com.au
03 9815 2111 - info@natureadvisory.com.au

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.

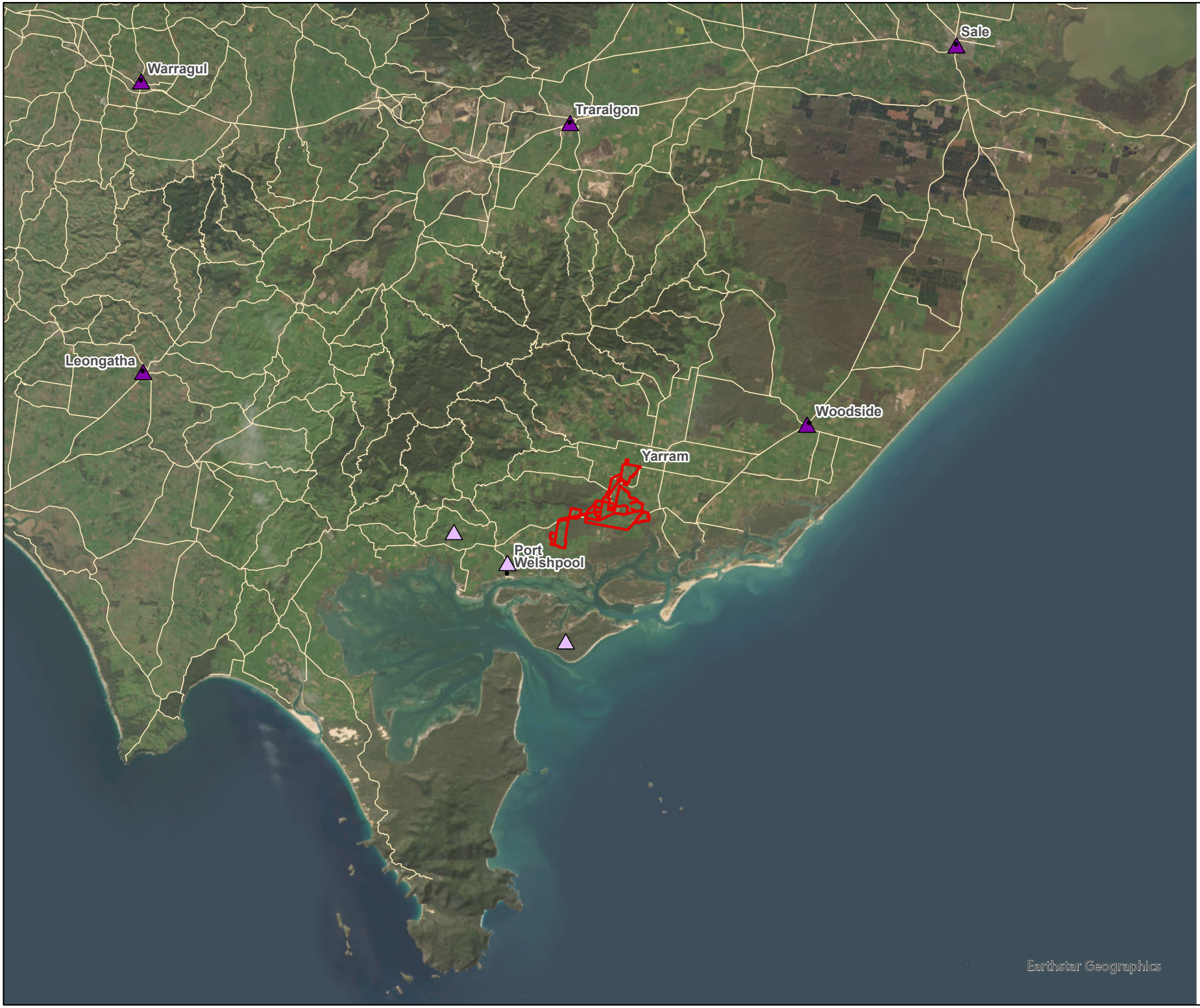

Figure 6: Location of known and potential flying-fox colonies in the vicinity of Gelliondale Wind Farm

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.

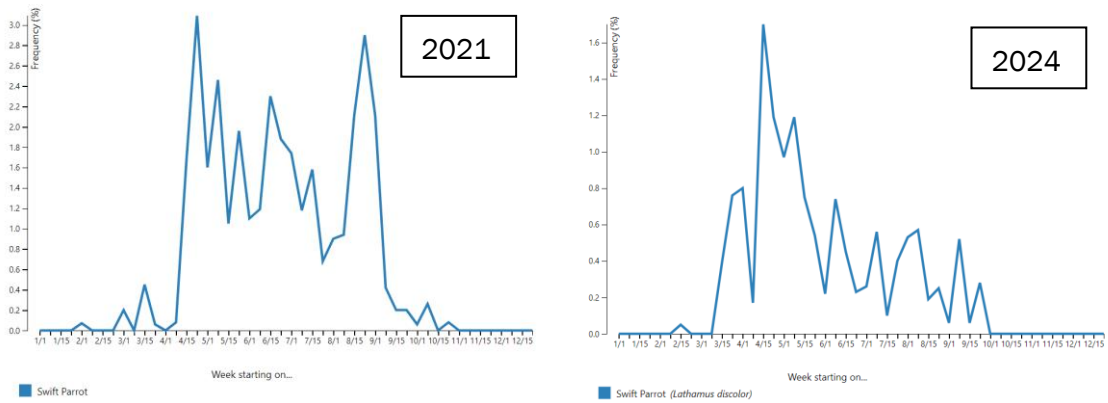


Figure 7: Swift Parrot records in Victoria during 2021 and 2024 (eBird)

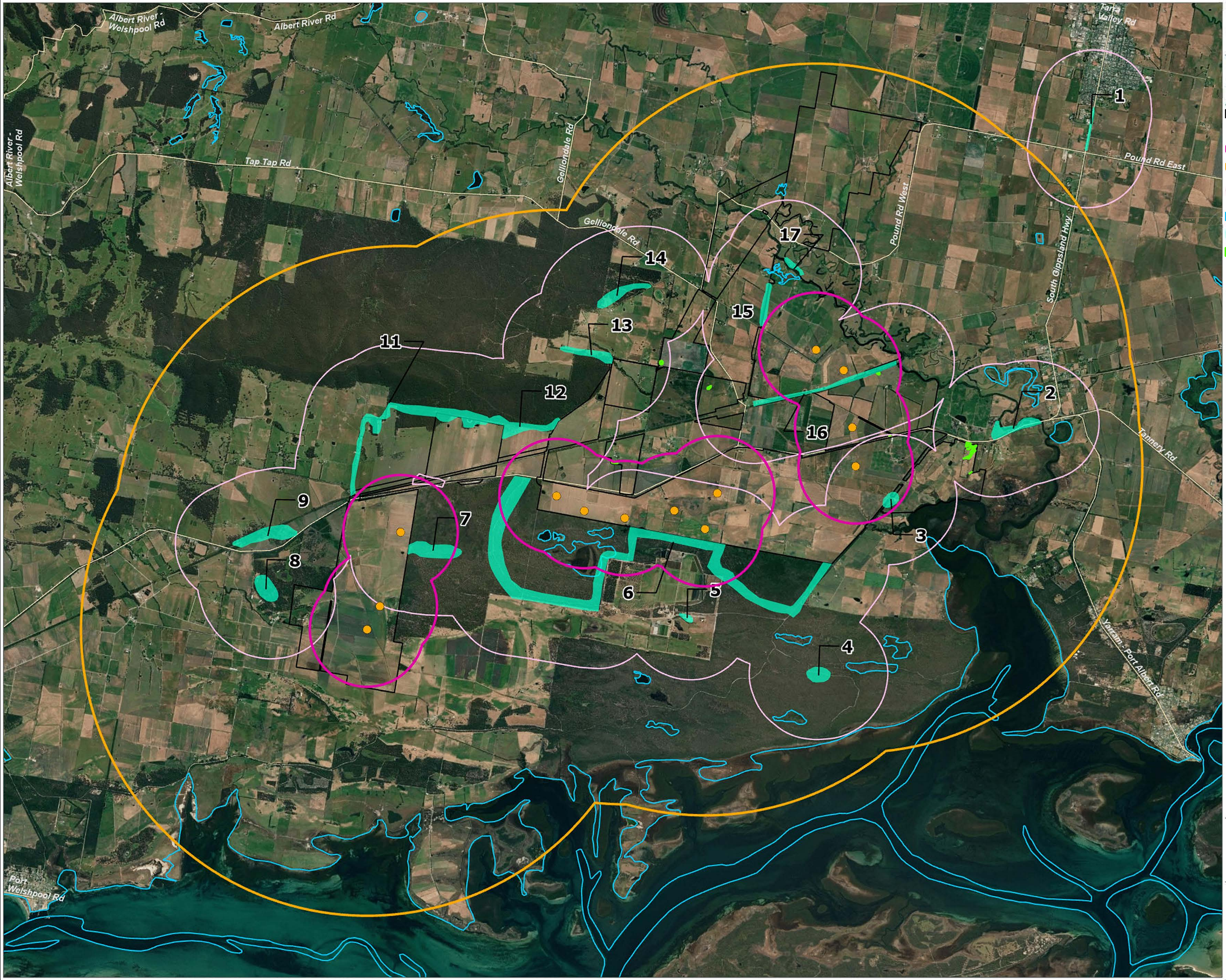
Table 16: Swift Parrot assessment of potential habitats within 5 km of Gelliondale Wind Farm in 2020/21.

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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14107.12 Figure 2: Swift parrot survey 240326 - Created by: - E:\GIS\2014 Jobs\14107\14107.12 Fig1 240326.aprx

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.

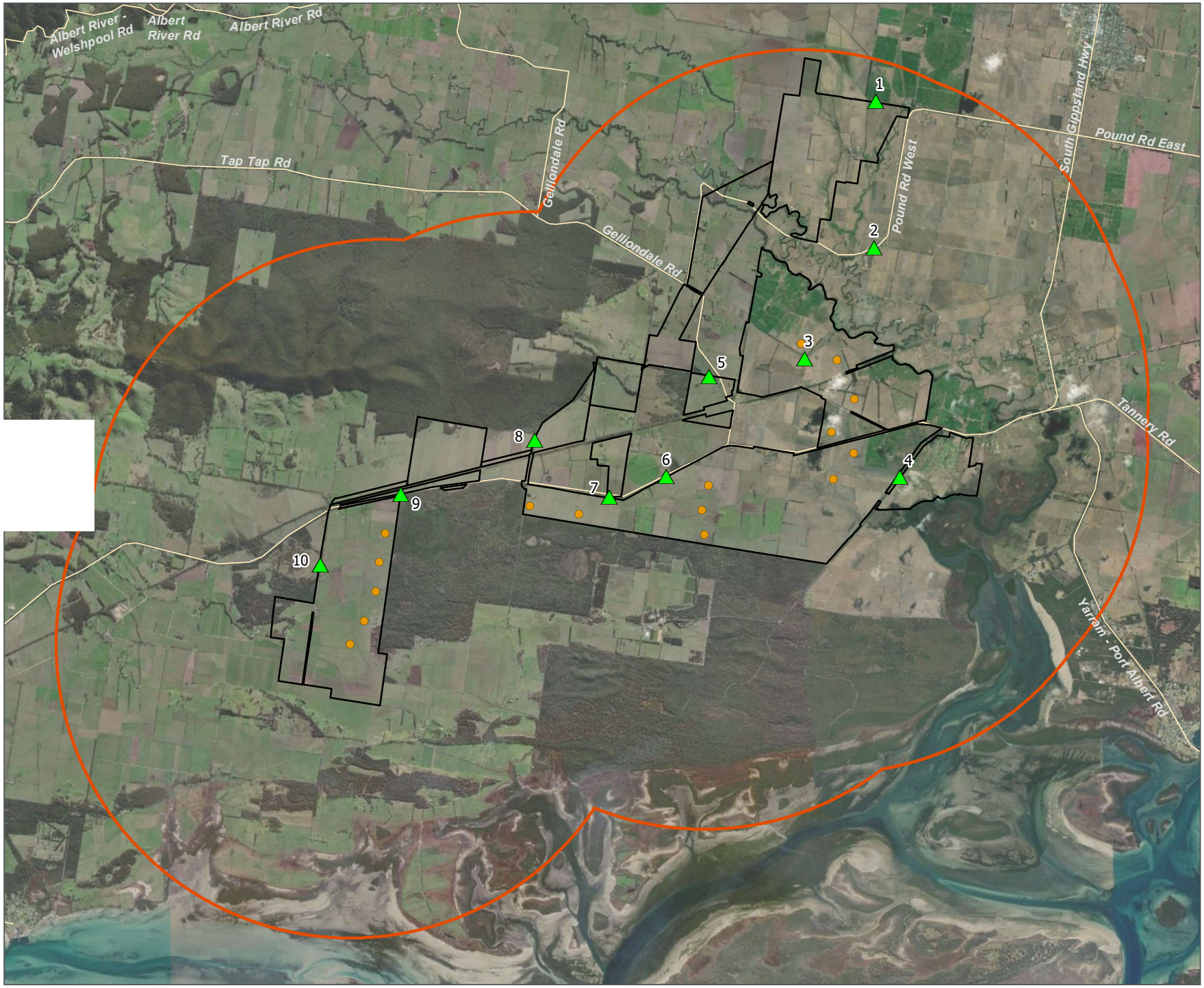

Figure 9: White-throated Needletail targeted survey points, March 2021

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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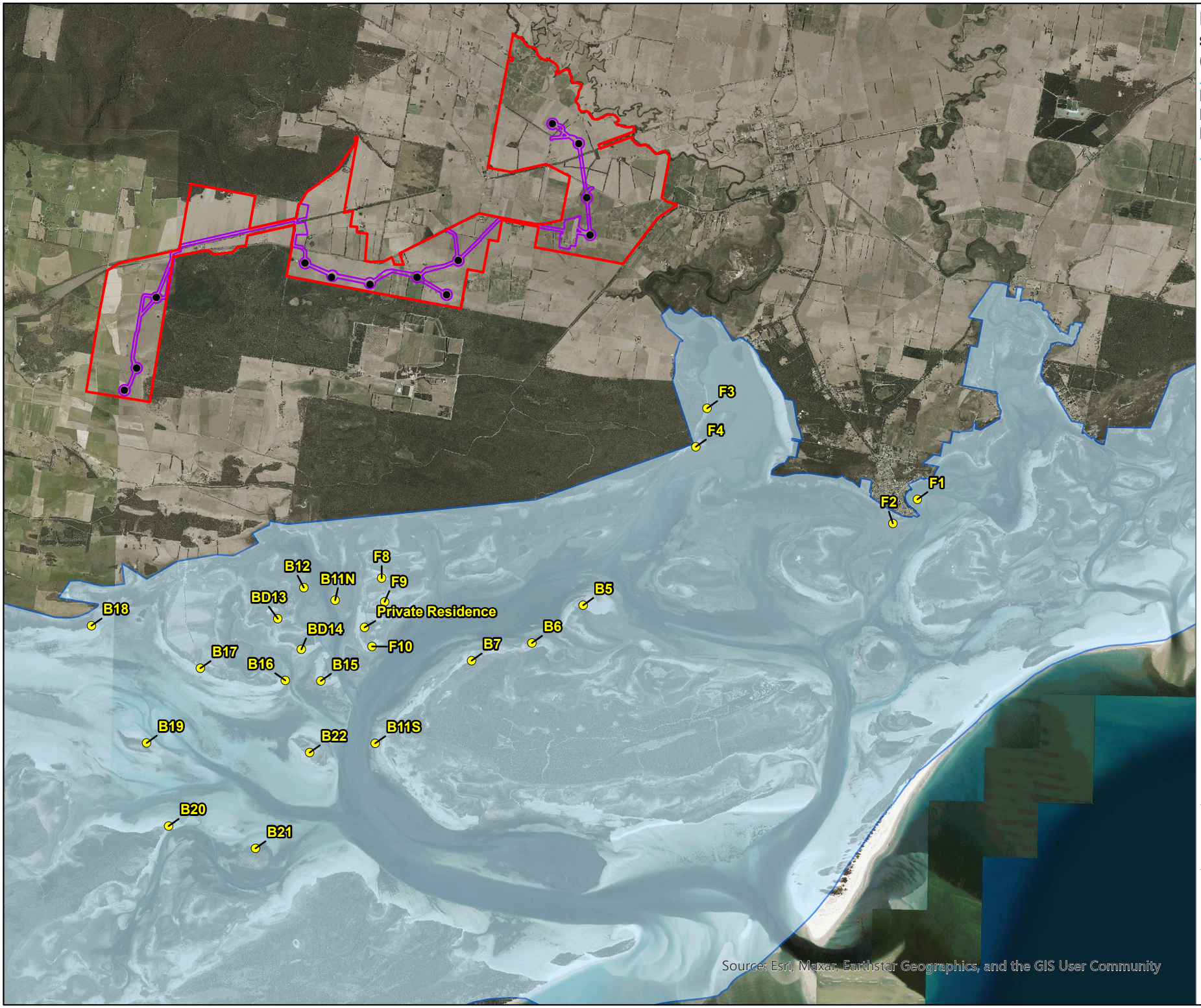
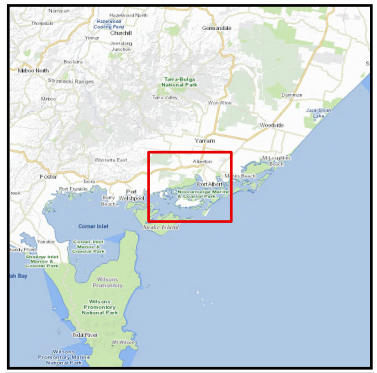


Figure 12: Corner Inlet shorebird survey sites (Nature Advisory)

Project No: 14107.18
Project: Gelliondale Wind Farm
Date: 17/04/2025

- Site Boundary
- Construction footprint
- Turbine
- Ramsar site
- Survey site



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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**	

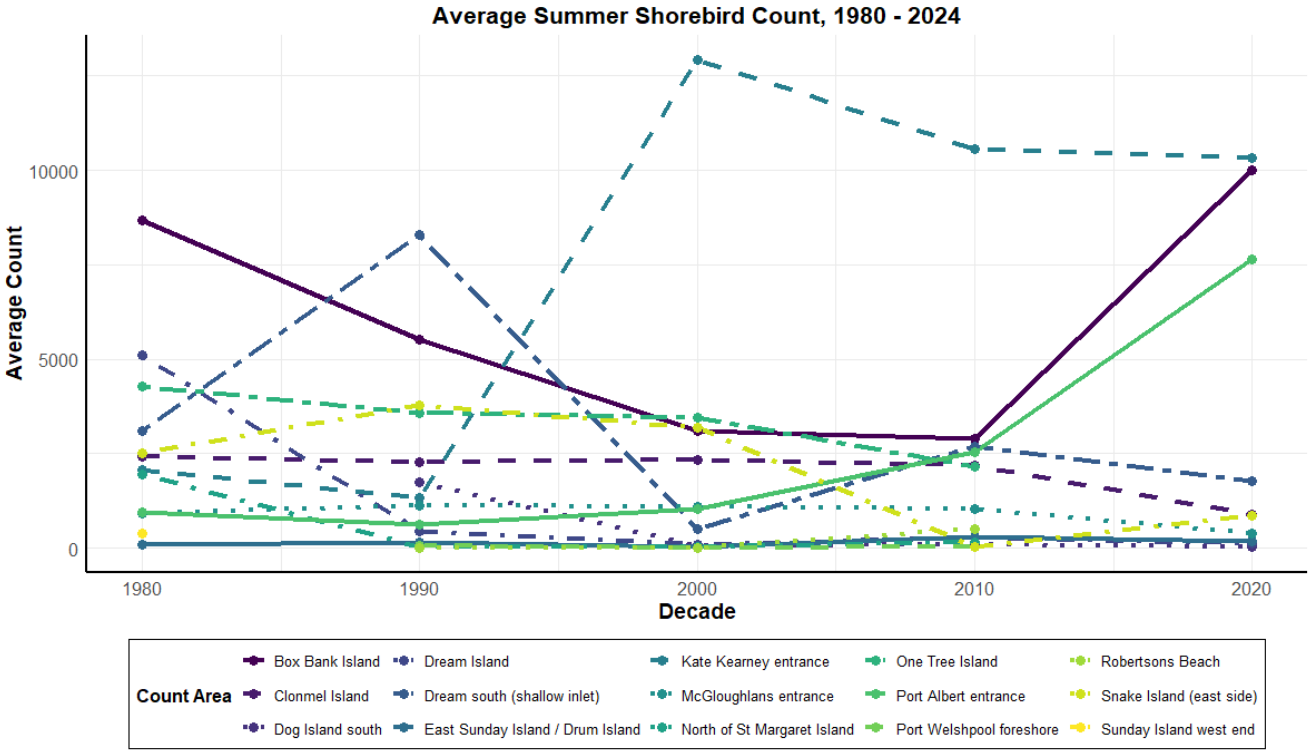

Figure 13: Trends in average summer count for all migratory shorebird species at each site between 1980 and 2024

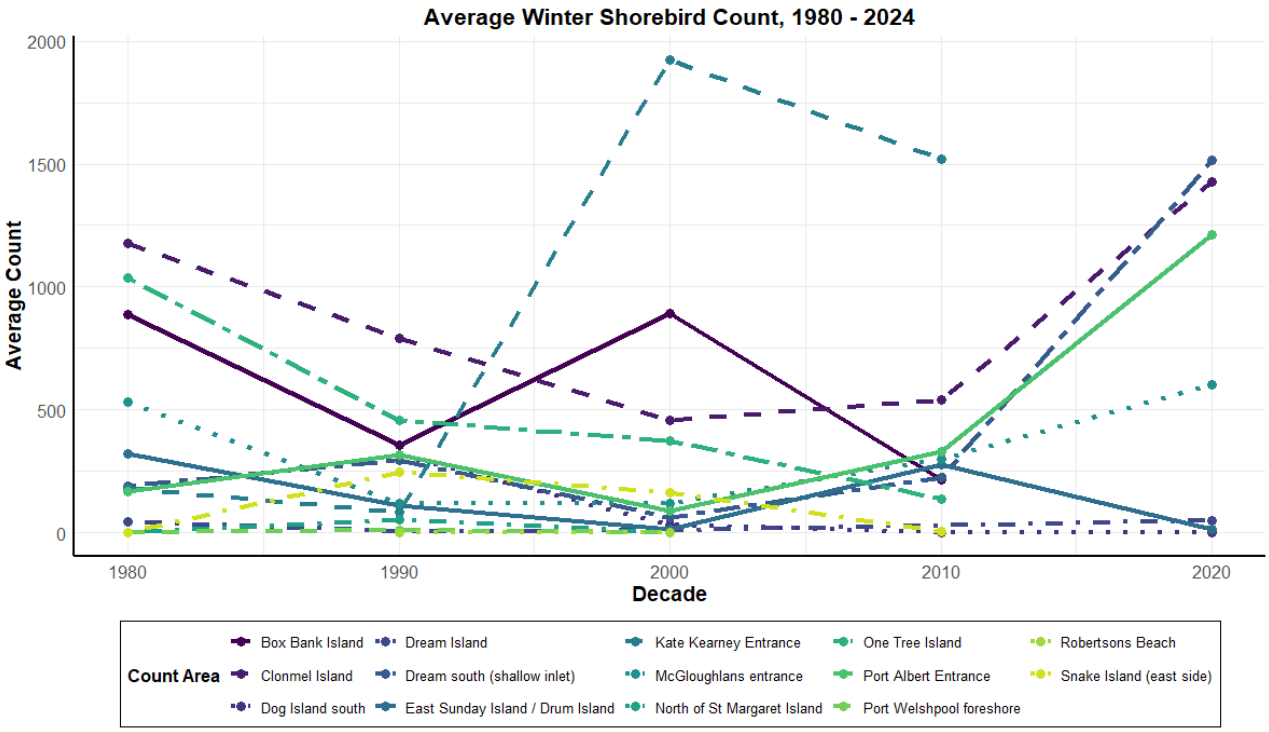

Figure 14: Trends in average winter count for all migratory shorebird species at each site between 1980 and 2024

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.

Department of Sustainability and Environment

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

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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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

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.

Published by the Victorian Government Department of Sustainability and Environment April 2004

Department of Sustainability and Environment

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

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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

Published by the Victorian Government Department of Sustainability and Environment February 2005

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

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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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.

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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Department of Sustainability and Environment

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

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

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

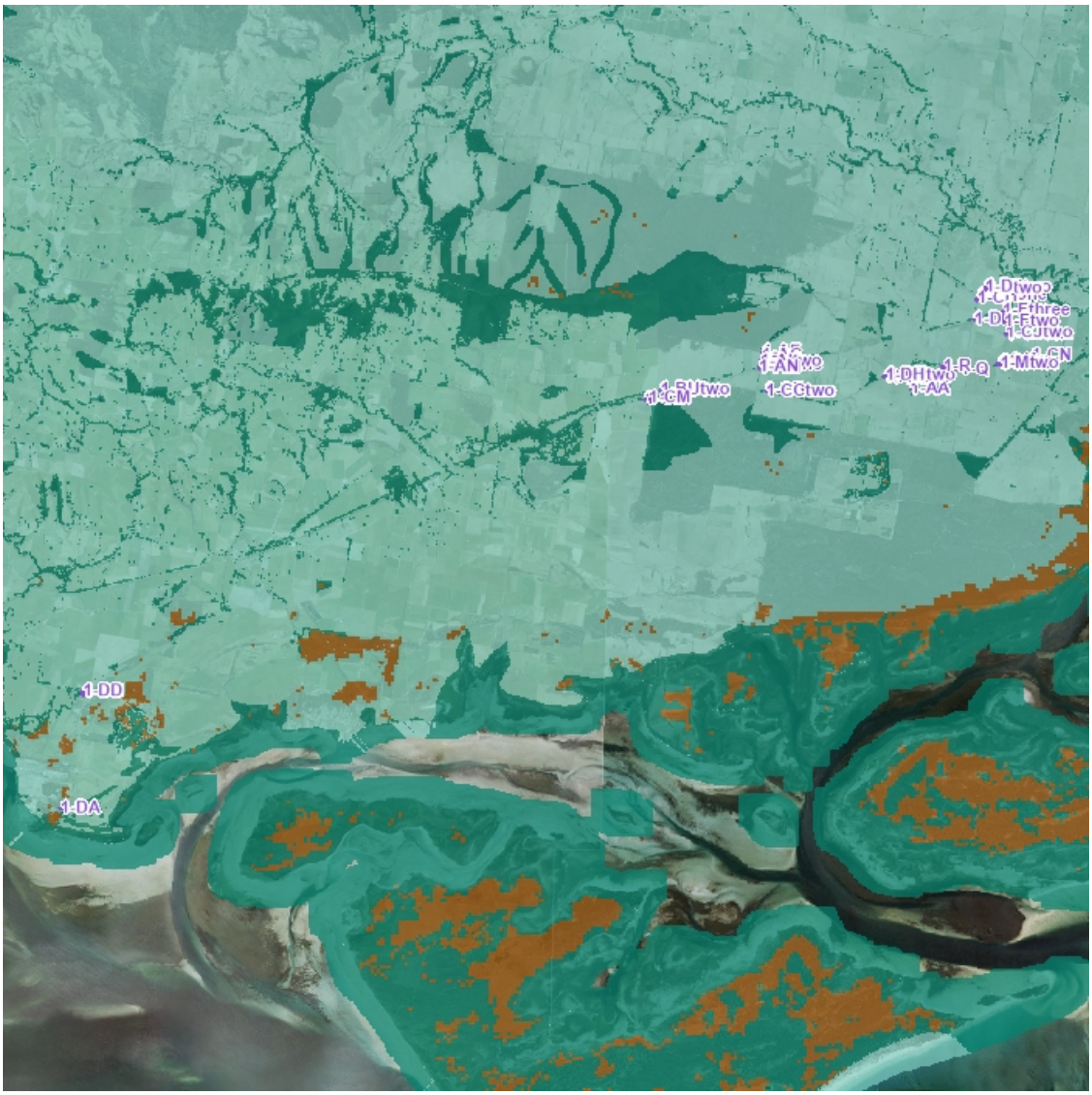
2. Aerial photograph showing mapped native vegetation

Proposed Removal
Past Removal
Partial Removal

N

3500 m

3. Location Risk Map



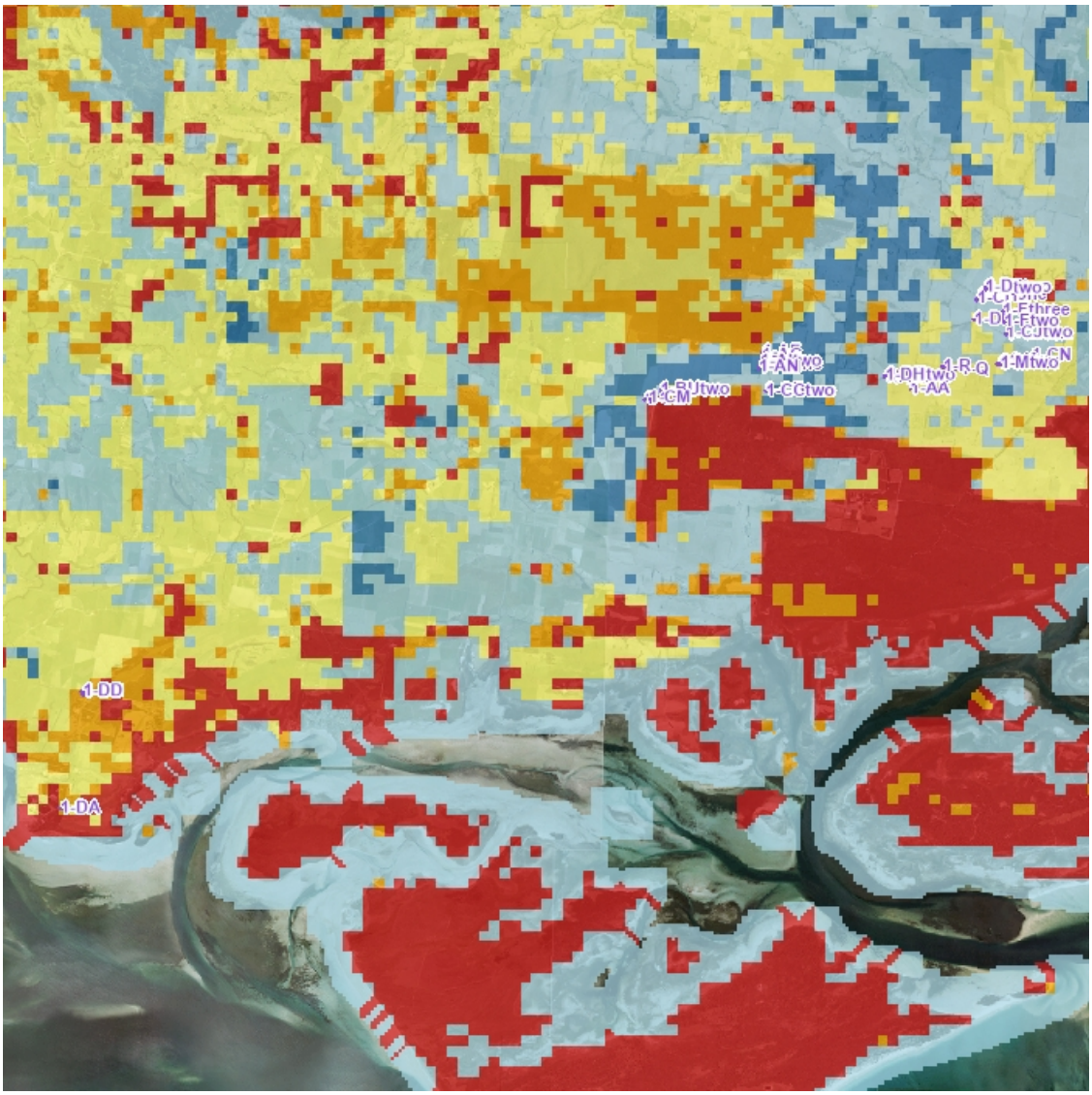
Proposed Removal
Past Removal
Partial Removal

Location 1
Location 2
Location 3

N

3500 m

4. Strategic Biodiversity Value Score Map



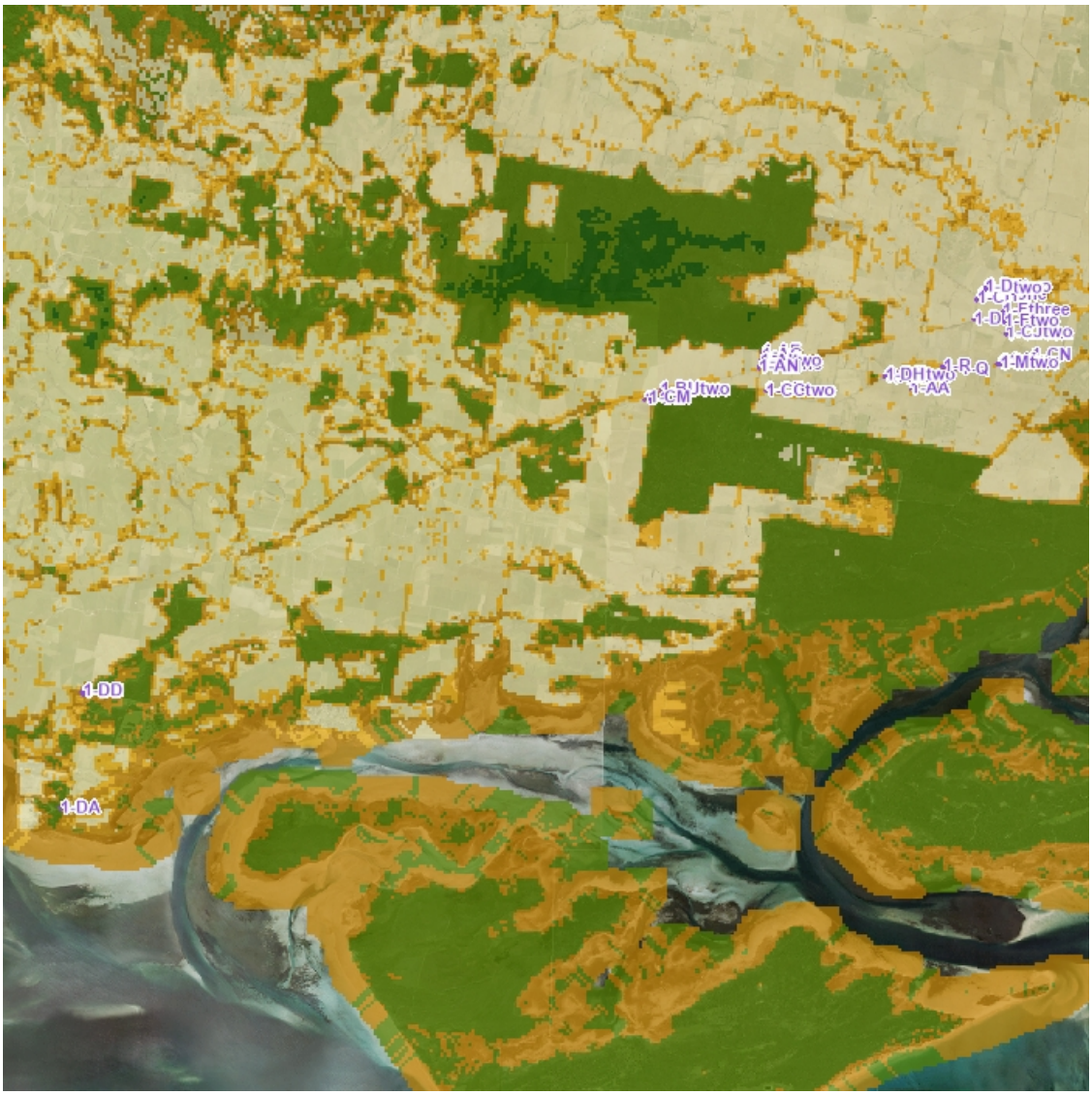
Proposed Removal
Past Removal
Partial Removal

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

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

For more information contact the DEECA Customer Service Centre 136 186 or the Native Vegetation Credit Register at nativevegetation.offsetregister@delwp.vic.gov.au