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Final Report

Ecological Assessment of the Proposed Tall Tree Wind Farm, Victoria

Prepared for

ACCIONA Energy Australia Global Pty Ltd

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Ecology and Heritage Partners Pty Ltd

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Ecology and Heritage Partners acknowledge the Traditional Owners of the country we live and work on, and we pay our respect to Elders past, present and emerging.

EXECUTIVE SUMMARY

Introduction

Ecology and Heritage Partners Pty Ltd was commissioned by ACCIONA Energy Australia Global Pty Ltd to undertake an ecological assessment to determine the ecological values present within the Project Site, and inform the ecological planning and legislative implications of the proposed Tall Tree Wind Farm (the Project) (formerly known as Meredith Wind Farm), located across multiple parcels of land between Lethbridge, Teesdale, Meredith and Shelford townships, Victoria (the Project Site) within the proposed Central Highlands Renewable Energy Zone (REZ).

The assessment was undertaken to identify and characterise the vegetation on-site, determine the presence (or likelihood thereof) of any significant flora and fauna species and/or ecological communities, and address any implications under Commonwealth and State environmental legislation and policy.

Methods

The ecological field assessment program detailed in this report commenced in August 2023 and is currently ongoing. The field assessments sought primarily to assess the extent and condition of native vegetation communities and potential flora and fauna habitat, with consideration given to significant species and ecological communities. The survey program was designed to optimise the survey timing, methods and frequency to maximise the detection of flora and fauna species that occur seasonally.

Flora

Targeted surveys for the nationally significant Matted Flax-lily *Dianella amoena* and Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*, in addition to other summer flowering, nationally and State significant flora, were undertaken in areas of potential habitat along and adjacent to the infrastructure footprint (Study Area).

Vegetation Quality Assessments (VQA) were undertaken for native vegetation within the Study Area between October 2023 and January 2025.

Fauna

Fauna investigations included:

- Bird Utilisation Surveys;
- Brolga Level 1 and Level 2 assessments;
- Migratory Birds, Owls and Swift Parrot searches;
- Microbat surveys using Songmeter units;
- Latham's Snipe *Gallinago hardwickii* targeted surveys;
- Growling Grass Frog *Litoria raniformis major* targeted surveys;
- Golden Sun Moth *Synemon plana* targeted surveys; and,
- Striped Legless Lizard *Delma impar* targeted surveys (tile grids).

Results

Flora

A total of 489.59 hectares of native vegetation was recorded within the Study Area, representative of twelve EVC's: Lowland Forest (EVC 16); Grassy Dry Forest (EVC 22); Valley Grassy Forest (EVC 47); Plains Grassy Woodland (VVP EVC 55_61 and CVU EVC 55); Creekline Grassy Woodland (VVP/CVU EVC 68); Plains Grassy Wetland (EVC 125); Creekline Herb-rich Woodland (EVC 164); Grassy Woodland (VVP EVC 175 and CVU EVC 175_61); *Heavier-soils* Plains Grassland (EVC 132_61); Escarpment Shrubland (EVC 895); and Stream Bank Shrubland (EVC 851)..

These patches of vegetation contained 1,221 Large Trees. A total of 596 scattered trees were recorded within the Study Area, which consisted of 508 Large and 88 Small scattered trees.

A total of 156 flora species were recorded, comprising 105 native and 51 non-native species. The State significant Small Scurf-pea *Cullen parvum*, Tough Scurf-pea *Cullen tenax*, Fragrant Saltbush *Rhagodia parabolica*, Small-flowered Wallaby-Grass *Rytidosperma monticola*, and Austral Tobacco *Nicotiana suaveolens* were recorded, as well as 171.75 hectares of the Nationally significant Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) Community. One State significant vegetation community, Western (Basalt) Plains Grassland Community, is also present.

Targeted surveys did not record Matted Flax-lily *Dianella amoena* or Spiny Rice-flower *Pimelea spinescens* within the Study Area, although these species were observed at nearby reference sites.

Fauna

A total of 133 fauna species were recorded comprising 123 native and 10 non-native species.

Systematic surveys for Striped Legless Lizard identified 38.79 hectares of confirmed Striped Legless Lizard habitat in three discrete areas within the Study Area. Of this, approximately 3.76 hectares is proposed to be impacted.

Systematic surveys for Golden Sun Moth identified 375.40 hectares of confirmed habitat for the species in 12 discrete areas within the Study Area. Of this, approximately 84.31 hectares is proposed to be impacted.

No Swift Parrot were observed. The Project Site supports minimal foraging habitat for the species. One Growling Grass Frog individual was recorded within the Study Area during targeted surveys for the species.

Two nationally significant fauna; Brown Treecreeper *Climacteris picumnus*, Blue-winged Parrot *Neophema chrysostoma* and one State significant fauna; Eastern Great Egret *Ardea modesta*, were recorded during bird utilisation surveys.

Two State significant microbats – Eastern Bent-wing Bat *Miniopterus schreibersii* and Yellow-bellied Sheath-tailed Bat *Saccolaimus flaviventris* were recorded. The State significant Powerful Owl *Ninox strenua* (recorded outside the Project Site), Tussock Skink *Pseudemoia pagenstecheri* and Platypus *Ornithorhynchus anatinus* were also recorded during assessments.

Legislative and Policy Implications

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act – Commonwealth)

No EPBC Act-listed flora species were recorded within the Study Area.

Based on the Preliminary Impact Assessment, approximately 3.76 hectares of confirmed Striped Legless Lizard habitat, 84.31 hectares of confirmed Golden Sun Moth habitat, and 16.31 hectares of the Natural Temperate Grassland of the Victorian Volcanic Plain ecological community is proposed to be impacted.

The Project Site also contains suitable foraging and/or breeding habitat for Brown Treecreeper, Diamond Firetail, Gang-gang Cockatoo, Latham's Snipe, Hooded Robin, Painted Honeyeater, and Blue-winged Parrot. Blue-winged Parrot, Gang-gang Cockatoo and Latham's Snipe are known to fly at Rotor Swept Area and while turbines have been configured to reduce the risk of collision to this species, overall there is a low to moderate risk to the species from turbine collision.

The Project will be referred to the Commonwealth for consideration under the EPBC Act.

Flora and Fauna Guarantee Act 1988 (FFG Act – Victoria)

Five fauna species (Eastern Bent-wing Bat, Yellow-bellied Sheathtail Bat, Platypus, Tussock Skink, Eastern Great Egret), five flora species (Austral Tobacco, Small Scurf-pea, Tough Scurf-pea, Fragrant Saltbush, and Small-flowered Wallaby-Grass) and one ecological community [Western (Basalt) Plains Grassland] listed as threatened under the FFG Act were recorded within the Study Area. Evidence of Hairy or Western Burrowing Crayfish was also recorded within the Study Area. Powerful Owl was recorded outside the Project Site, within the Brisbane Ranges National Park.

Eight additional flora species (Black Wattle *Acacia mearnsii,* Golden Wattle *Acacia pycnantha*, Lobe-seed Daisy *Brachyscome dentata*, Lemon Beauty-heads *Calocephalus citreus*, Common Cassinia *Cassinia aculeata*, Common Cudweed *Euchiton involucratus*, Jersey cudweed *Laphangium luteoalbum*, Sun-orchid sp. *Thelymitra* sp.) listed as protected under the FFG Act were also recorded during field surveys. Where impacts to these species or communities occur on private land, a permit under the FFG Act is not required. However, where impacts are proposed on public land (i.e. road reserves), an FFG Act permit will be required.

Environment Effects Act 1978 (Victoria)

An Environment Effects Statement (EES) is likely to be triggered based on ecological impacts given that proposed impacts to native vegetation is likely to exceed 10 hectares. The project will be referred to DEECA under the EE Act for the Minister to make an assessment and decision as to whether an EES is required for the project. Implications relating to other legislation and policy are detailed in Section 6.

CONTENTS

1 INTRODUCTION

1.1 Background

Ecology and Heritage Partners Pty Ltd was commissioned by ACCIONA Energy Australia Global Pty Ltd (herein referred to as ACCIONA Energía) to undertake an ecological assessment to determine the ecological values present within the Project Site, and inform the future ecological planning and legislative implications of the proposed Tall Tree Wind Farm (the Project) (formerly known as Meredith Wind Farm), located across multiple parcels of land between Teesdale, Lethbridge, Shelford and Meredith townships, Victoria (the Project Site) (Figure 1), and within the proposed Central Highlands Renewable Energy Zone (REZ).

We understand that ACCIONA Energía has engaged various consultants to manage the planning and approvals process for the Project, and to undertake the initial ecological investigations for the project, including initial advice (Biosis 2022), preliminary bird utilisation surveys (ERM 2022a), fatal flaws assessment (ERM 2022b), and Level 1 and Level 2 Brolga assessments (Nature Advisory 2022, 2024).

The ecological assessments documented within this report provide further detail and clarity regarding the ecological values present within the Project Site, the ecological and legislative implications of the proposed project (including the associated approvals pathways), and options to avoid and minimise impacts to native vegetation and significant flora, fauna, and/or ecological communities present.

1.2 Objectives

The objectives of the detailed ecological investigations were to:

- Review the previous ecological assessments to identify areas for further assessment (e.g. detailed native vegetation assessments and targeted significant species surveys);
- Conduct detailed field assessments to identify the extent and quality of native vegetation present within the development footprint, according to the habitat hectares method (DSE 2004a);
- Conduct targeted surveys for significant flora and fauna that have the potential to occur on the site;
- Provide detailed maps showing areas of native vegetation and locations of significant flora and fauna species, and/or fauna habitat;
- Document the implications of the proposed development with respect to relevant environmental legislation and policy; and,
- Document any opportunities and recommendations to avoid and minimise potential direct and indirect ecological impacts, and any constraints associated with the proposed Project.

1.3 Project Site

The Project Site is situated on land located to the south of Meredith (approximately 2.5 kilometres), north of Teesdale (approximately 4.5 kilometres) and west of Lethbridge (approximately 6.7 kilometres) in Central West Victoria (Figure 1). The Project Site refers to the broader area within which the project footprint is situated. It

is located approximately 85 kilometres west of Melbourne, and approximately 23 kilometres north-west of Geelong, within the Golden Plains Shire.

The Project Site abuts the Leigh River system and is predominantly comprised of agricultural land (cropping and grazing) with stony outcrops, scattered dams, sheds and dwellings present. The Leigh River loosely tracks the western boundaries of the Project Site, and many tributaries such as Wilson Creek, Woodbourne Creek and associated smaller drainage lines are scattered across the site. Native vegetation is largely confined to these riparian corridors, though paddock trees and pockets of vegetation are also scattered across the landscape, particularly in the north and north-east of the Project site.

The Project Site abuts Bamganie State Forest and agricultural lands to the north, Meredith-Shelford Road and agricultural lands to the east, agricultural lands and residential lands to the south, and agricultural lands beyond Leigh River to the west. The terrain is predominantly flat with some undulation throughout the Project Site.

Surrounding land use is largely consistent with the Project Site, being predominantly agricultural with associated infrastructure, with Bamganie State Forest the exception. Several bushland reserves exist further afield, with Meredith State Forest, Coolebarchurk Streamside Reserve, Steiglitz Historic Park, and Brisbane Ranges National Park to the north-east.

According to the Victorian Department of Energy, Environment and Climate Action (DEECA) NatureKit Map (DEECA 2025a), the Project Site intersects both the Central Victorian Uplands and Victorian Volcanic Plain bioregions and is located within the Corangamite Catchment Management Authority (CMA) and Golden Plains Shire municipality.

1.3.1 Study Area

Due to the size of the Project Site, the native vegetation assessment (including the detailed habitat hectares assessment) was undertaken within a sub-section of the broader Project Site, comprising of the proposed impact footprint and a 300-metre buffer around each turbine and access tracks, as stipulated by ACCIONA Energía. This sub-section is the maximum extent that captures all possible locations of any land disturbance required for construction and operation of the project. It encompasses all potential micro-siting locations and clearing corridors assessed in the technical studies required for the project.

This area is referred to throughout the report as the 'Study Area'.

1.3.2 Project Infrastructure Layout

The Project Infrastructure Layout refers to the overall design and footprint for all proposed turbines ancillary infrastructure for the Project.

The Project Infrastructure Layout is proposed to include 53 turbines. The wind turbines for the Project have not been confirmed, but for the purpose of this report are assumed: Minimum clearance (i.e. space between ground and lowest point of blade) of 54.5 metres, and a maximum tip height of 250.5 metres.

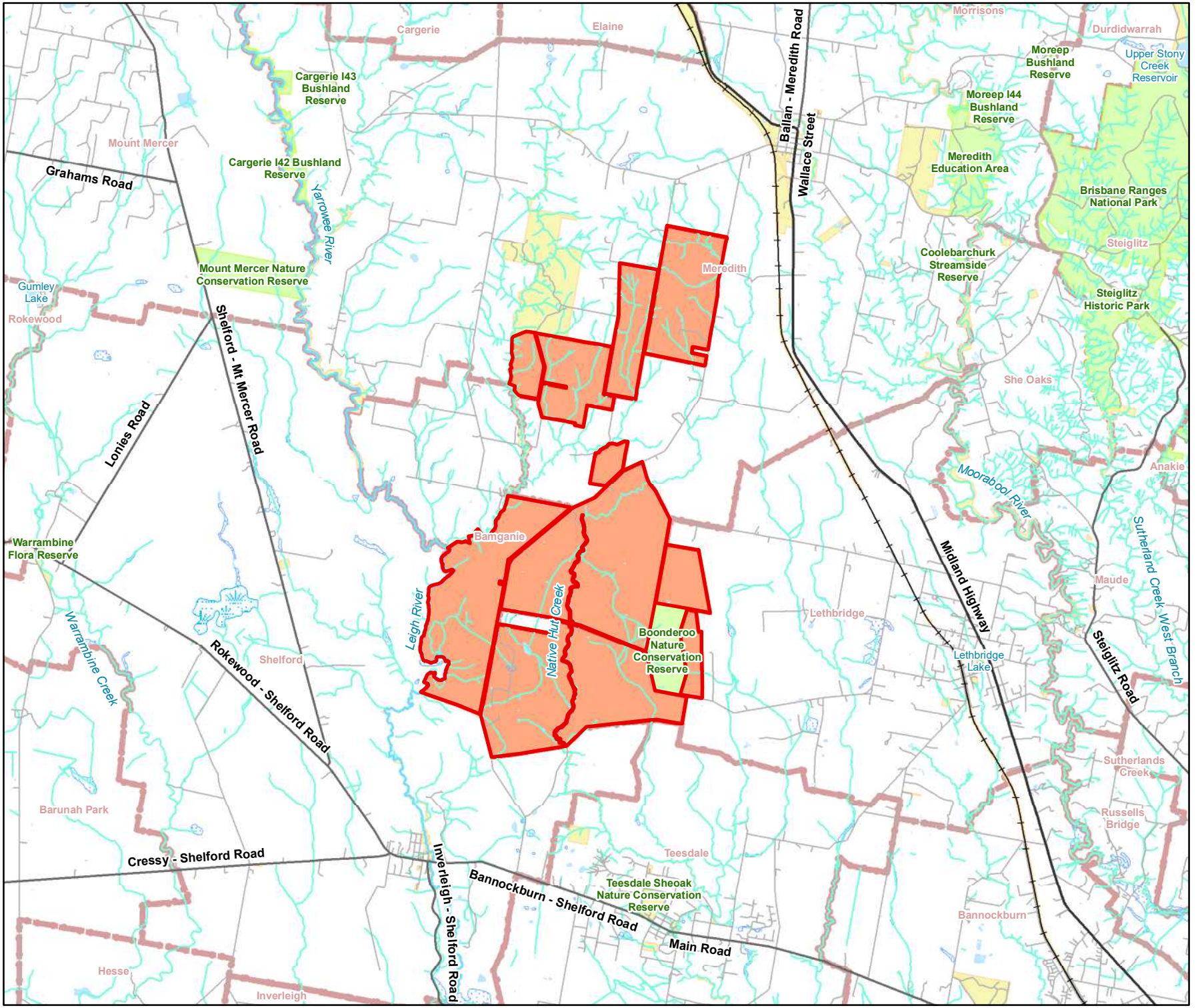
The Project is proposed to also include several (up to four) semi-permanent meteorological monitoring mast assuming a height up to 170 metres. In addition, the Project will include:

- A transmission line route extending approximately 15 kilometres from the Project Site (anticipated to be overhead, but depending on final design requirements may be partially or fully underground).
- Associated ancillary infrastructure (onsite concrete batching plant, access tracks, overhead and underground cabling, quarry, an Operations and Maintenance facility and hardstand/laydown areas).

As the exact turbine model has not yet been selected, a turbine envelope approach has been applied using an indicative model including 10 metre buffers. The maximum dimensions include a hub height of between 142 and 169 metres, with a blade length of up to 91.5 metres, a maximum overall tip height of 250.5 metres and a minimum ground clearance of 54.5 metres. Therefore, the Rotor Swept Area (RSA) is expected to be between 250.5 metres and 54.5 metres in height.

1.3.3 Radius of Investigation (ROI)

To understand ecological values within the broader landscape, a 10-kilometre buffer of the Project Site was applied, where applicable, during the desktop assessments. This area is herein referred to as the radius of investigation (ROI).



Legend

- Wind Farm boundary
- Railway
- Highway
- Arterial road
- Local or minor road
- Minor Watercourse
- Major Watercourse
- Permanent Waterbody
- Land Subject to Inundation
- Wetland/Swamp
- Parks and Reserves
- Crown Land
- Localities

Figure 1

Location of the study area

Proposed Tall Tree Wind Farm

0 1.5 3

Kilometers

Map Scale: 1:130,000 @ A4
Coordinate System: GDA 1994 MGA Zone 54

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2 METHODS

Throughout the assessment process, consideration has been given to the following Commonwealth and Victorian environmental policy and legislation:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- *Environment Effects Act 1978* (EE Act);
- *Flora and Fauna Guarantee Act 1988* (FFG Act);
- *Planning and Environment Act 1987* (P&E Act);
- The *Guidelines for the removal, destruction and lopping of native vegetation* (the Guidelines) (DELWP 2017);
- Development of Wind Energy Facilities in Victoria: Policy and Planning Guidelines (DTP 2023);
- Interim Guidelines for the Assessment, Avoidance, Mitigation and Offsetting of Potential Wind Farm Impacts on the Victorian Brolga Population (DSE 2012);
- Draft Brolga Assessment and Mitigation Standards for Wind Energy Facilities (DELWP 2020);
- Golden Plains Planning Scheme; including,
    - Clause 12.01 Biodiversity;
    - Clause 19.01-2S Renewable Energy;
    - Clause 52.17 Native Vegetation; and,
    - Clause 52.32 Wind Energy Facility.
- *Wildlife Act 1975* (Wildlife Act); and,
- *Catchment and Land Protection Act 1994* (CaLP Act).

2.1 Desktop Assessment

Relevant literature, online-resources and databases were reviewed to provide an assessment of flora and fauna values associated with the Project Site. The following information sources were reviewed:

- The DEECA NatureKit Map (DEECA 2025a) and Native Vegetation Regulation (NVR) Map (DEECA 2025b) for:
    - Modelled data for location risk, native vegetation patches, scattered trees and habitat for rare or threatened species; and,
    - The extent of historic and current Ecological Vegetation Classes (EVCs).
- Ecological Vegetation Class (EVC) benchmarks (DEECA 2025c) for descriptions of EVCs within the relevant bioregion;
- The Victorian Biodiversity Atlas (VBA) for previously documented flora and fauna records within the project locality (DEECA 2024b);

- The Atlas of Living Australia (ALA) (ALA 2024) for assistance with the distribution and identification of flora and fauna species;
- The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST) for Matters of National Environmental Significance (MNES) protected under the EPBC Act (DCCEEW 2024);
- Relevant listings under the FFG Act, including the latest Threatened (DEECA 2025) and Protected Lists;
- The online VicPlan Map (Department of Transport and Planning [DTP] 2024) to ascertain current zoning and environmental overlays in the study area;
- Aerial photography of the Project Site;
- Previous ecological assessments relevant to the Project Site; including;
    - Initial Environmental Approvals Advice (Biosis 2022);
    - Preliminary assessment of biodiversity values (Biosis 2024);
    - Preliminary bird utilisation surveys (ERM 2022a);
    - Fatal Flaws assessment (ERM 2022b); and,
    - Level 1 and 2 Brolga assessments (Nature Advisory 2022; 2025).
- Relevant environmental legislation and policies pertaining to target species including EPBC Act Policy Statements, FFG Act Action Statements, National Recovery Plans, Advisory Lists; including but not limited to:
    - DoE 2013a. Significant Impact Guidelines 1.1. Matters of National Environmental Significance
    - DEWHA 2009a. Significant impact guidelines for the critically endangered Golden Sun Moth (*Synemon plana*);
    - DEWHA 2009b. Significant impact guidelines for the critically endangered spiny rice-flower (*Pimelea spinescens* subsp. *spinescens*;
    - DEWHA 2009d. Significant impact guidelines for the vulnerable growling grass frog (*Litoria raniformis*);
    - DEWHA 2010a. Commonwealth Survey guidelines for Australia's threatened bats;
    - DEWHA 2010b. Commonwealth Survey guidelines for Australia's threatened birds;
    - DEWHA 2010c. Commonwealth Survey Guidelines for Australia's threatened frogs;
    - DSEWPaC 2011. Commonwealth Survey guidelines for Australia's threatened reptiles; and,
    - DSEWPaC 2011. Referral guidelines for the striped legless lizard;
    - DSEWPaC 2011. EPBC Act Policy Statement: Nationally Threatened Ecological Communities of the Victorian Volcanic Plain: Natural Temperate Grassland & Grassy Eucalypt Woodland;
    - DoE 2015. Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species.

2.1.1 *Literature Review*

Several ecological assessments have previously been undertaken within the Project Site that describe the ecological values present, or that are considered likely to occur. The following summarises the key ecological implications and recommendations related to the below, relevant assessments:

Biosis 2022: Initial Environmental Approvals Advice – Tall Tree (Meredith) Wind Farm

Biosis were engaged by ACCIONA Energía to provide high-level advice on two wind turbine generator layout options regarding potential project referral and approval triggers under the EPBC Act and EE Act. The advice was formulated based on estimating the quantum of native vegetation and/or threated ecological communities likely to be impacted under the two scenarios. The results were based on indicative turbine construction and operation footprints. An impact assessment relating to potential bird and bat mortality associated with turbine collisions, impacts to significant flora and fauna species, and ecological communities was not undertaken in detail.

All EVCs recorded within the Project Site are endangered and represent a number of FFG Act-listed communities (Table 1).

Table 1. Summary of native vegetation types and threatened ecological communities (Biosis 2022).

EVC	Bioregional conservation status	Threatened ecological community
Victorian Volcanic Plain bioregion		
Plains Grassy Woodland (VVP_0055_61)	Endangered	Grassy Eucalypt Woodland of the Victorian Volcanic Plain (EPBC Act); Western Basalt Plains (River Red Gum) Grassy Woodland; Floristic Community 55-04 (FFG Act)
Floodplain Riparian Woodland (VVP_0056)	Endangered	N/A
Creekline Grassy Woodland (VVP_0068)	Endangered	N/A
Plains Grassland (VVP_0132)	Endangered	Natural Temperature Grassland of the Victorian Volcanic Plain (EPBC Act); Western (Basalt) Plains Grassland Community (FFG Act)
Grassy Woodland (VVP_0175)	Endangered	Grassy Eucalypt Woodland of the Victorian Volcanic Plain (EPBC Act); Western Basalt Plains (River Red Gum) Grassy Woodland; Floristic Community 55-04 (FFG Act)
Escarpment Shrubland (VVP_0895)	Endangered	N/A
Central Victorian Uplands bioregion		
Plains Grassland (CVU_0132)	Endangered	Natural Temperature Grassland of the Victorian Volcanic Plain (EPBC Act)
Grassy Woodland (CVU_0175_61)	Endangered	N/A

Biosis 2024: Preliminary assessment of biodiversity values

Biosis Pty Ltd (Biosis) was commissioned by ACCIONA Energía to undertake a preliminary biodiversity values assessment of the proposed Tall Tree Wind Farm.

Biosis identified that the study area supported a diverse range of habitat types and landscape features, from modified farmlands to native grasslands, woodlands, wetlands, escarpments, and riparian zones. Notably, regions with the highest biodiversity value, posing potentially the greatest constraint to wind farm development, included: native grasslands (EVC 132) corresponding with Commonwealth and State-listed threatened ecological communities; remnant woodlands (EVCs 55 and 175) that in certain areas coincide with Commonwealth and State-listed threatened ecological communities; rocky habitats and natural or modified grasslands likely to support various threatened flora and fauna species; waterways, wetlands, and farm dams providing habitat for waterbird and aquatic species (including those classified as threatened); as well as remnant and planted vegetation serving as habitat and foraging resources for avifauna, including threatened and migratory birds and bats.

Under the layout provided, it was determined that the project would likely result in the removal of more than 10 hectares of native grassland, potentially impacting EPBC Act-listed grassland-dependent species such as the Striped Legless Lizard and Golden Sun Moth. The proposed layout also indicated impact to woodland vegetation, resulting in the removal of potential habitat for national and State significant avifauna. Disturbance to waterbodies (i.e. creek crossings, farm dams and wetlands) are suggested to consider impacts to Growling Grass Frog and Hairy Burrowing Crayfish *Engaeus sericatus*.

An initial analysis of offset requirements of the native vegetation removal footprint was also completed, with the project requiring Species Habitat Units for an estimated 33 rare or threatened species under the State Guidelines (DELWP 2017). It was stated that the offsets may be difficult to source given the scarcity of grassland/woodland species offsets. As such, further steps to avoid and minimise native vegetation removal were recommended to ensure the offsets for the project could be met. The preliminary assessment of biodiversity offsets (July 2023) relied solely on modelled site condition scores and required verification through detailed mapping and assessment of native vegetation within the final Project Infrastructure Layout.

Nature Advisory 2021-2025: Brolga Level One and Two Assessments – Meredith Wind Farm / Tall Tree Wind Farm

Nature Advisory Pty Ltd (Nature Advisory) were engaged by ACCIONA Energía to assess potential Brolga *Antigone rubicunda* habitat and breeding wetlands within the Radius of Investigation (ROI); a 10-kilometre buffer of the Project Site. This Level One assessment included a desktop assessment, a two-day roaming survey in Spring 2021, and Community Consultation interviews.

Following this Level One assessment in 2021, further investigations of Brolga and their habitat within the ROI have been undertaken throughout 2021 and 2023 (Nature Advisory 2022, 2025). This Level Two assessment included a review of existing database records and landowner consultation, additional field surveys for Brolga during breeding and non-breeding periods, aerial surveys, and the assessment of habitat suitability based on both field assessment, desktop assessment and aerial assessment.

Based on these assessments, no historical or currently active Brolga flocking sites were detected within the ROI. Given the lack of records and lack of large, permanent wetlands within the ROI, there was no evidence of Brolga flocking sites within the ROI. The nearest known flocking sites (i.e. Lake Murdeduke and Lake Weering) are located over 18 kilometres from the Tall Tree Wind Farm site.

While the desktop assessment identified Brolga breeding records from one wetland (54037) within the proposed wind farm boundary, this site had been permanently drained and was no longer a suitable Brolga breeding site. Additionally, eight Brolga breeding records attributable to two other wetlands (54103 and

52428) were identified within the ROI but outside of the proposed wind farm boundary. These sites are located more than six kilometres from the proposed wind farm boundary. Five other wetlands within the ROI contained Brolga breeding records, but these wetlands have since been permanently drained and are no longer suitable.

Level Two assessments identified no Brolga during the aerial survey. Roaming surveys recorded one Brolga pair foraging 4.3 kilometres south-west from the ROI. However, these surveys did not record breeding Brolga pairs within the ROI. Landholder consultation resulted in a single Brolga observation from over 30 years ago within the ROI. A total of four wetlands within the ROI have at least one previous Brolga breeding record, two of which have been identified as either current or future Brolga breeding sites. All Brolga breeding wetlands are located further than 3.2 kilometres from any proposed turbines.

The previous Brolga assessment (Nature Advisory 2022) concluded that proposed action is not likely to result in impacts on the Victorian Brolga population, and as such, no further Brolga assessments (i.e. Level Three) are required for the proposed development.

2.1.2 Groundwater Dependent Ecosystems (GDEs)

Groundwater Dependent Ecosystem assessments are proposed to be undertaken within the Project Site. GDEs are defined as:

'Ecosystems which require access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain their communities of plants and animals, ecological processes and ecosystem services' (Richardson et al. 2011).

Ecosystem dependency on groundwater can vary spatially and temporally. GDEs are currently classified into three types:

1) Ecosystems dependent on the surface expression of groundwater (surface expression GDEs) - rivers, wetlands, springs;
2) Ecosystems dependent on the subsurface presence of groundwater (terrestrial GDEs) - terrestrial vegetation and riparian areas (phreatophytes); and
3) Aquifer and cave ecosystems (subterranean GDEs).

GDE assessment is proposed to focus on GDE types 1 and 2: more specifically rivers, wetlands and terrestrial vegetation. According to the GDE Atlas there are number of GDEs mapped within the Project Site (BOM 2025).

2.2 Consultation

DEECA was consulted during the pre-application process to inform the development of the Project and discuss the survey design to ensure that a full understanding of potential impacts can be ascertained.

The stakeholder liaison activities that occurred during the pre-application process in relation to ecology is provided below (Table 2).

Table 2. Stakeholder engagement activities undertaken in relation to ecological investigations.

Stakeholder	Date	Matters Discussed
Golden Plains Shire Council	October 2021	General overview of the Project at the first preliminary stage.
DEECA Grampians Region	November 2021	Presentation on Brolga.
Golden Plains Shire Council	May 2022	Preliminary layout issued for surveys to commence.
Golden Plains Shire Council	February 2023	In person update with presentation about ecological survey status.
Golden Plains Shire Council	November 2023	General update on the project, targeted surveys conducted and planned and timeframes.
Golden Plains Shire Council	March 2024	Communicated via email update on the Community info sessions planned, Planning and Approval process and our timeframe of project submission in April/May.
DEECA / DTP	April 2024	General project briefing and biodiversity findings.
State-level CFA	April 2024	General project briefing.
Golden Plains Shire Council	May 2024	General project briefing.
Golden Plains Shire Council	September 2024	Meeting with Shire CEO to provide a general project update.
Golden Plains Shire Council	January 2025	Meeting with Shire engineers to discuss crossing of local council roads.
Golden Plains Shire Council	May 2025	General project briefing.

2.3 Field Assessments

The ecological field assessment program commenced in August 2023 and is ongoing. The field assessments sought primarily to assess the extent and condition of native vegetation communities and potential flora and fauna habitat and species presence, with consideration given to significant species and ecological communities. The survey program was designed to optimise the survey timing, methods and frequency to maximise the detection of flora and fauna species that occur seasonally.

All areas of the proposed infrastructure footprint and immediate surrounds were subject to field assessments, with a particular focus on the areas likely to support native vegetation and habitat for significant species and ecological communities as identified through the literature review (Section 2.1.1), and as part of the desktop assessment.

All fieldwork was carried out under the appropriate licences, including a Wildlife Research Permit (#10010929) issued by DEECA on 26 October 2023 under the *Wildlife Act 1975*, and a Protected Flora Research Permit (#10010917) issued by DEECA on 14 November 2023 under the FFG Act. Ethics Committee Approval to conduct research using live animals has been granted by the Wildlife and Small Institutions Animal Ethics Committee (05.17).

The timing and effort used for each survey event is summarised below (Table 3), while further detail on the methods used is provided in Sections 2.4, 2.5 and 2.6.

Table 3. Summary of Field Surveys.

Category	Survey dates	Resources
Flora Surveys		
Habitat hectare and Large Tree assessments	- 10/11/2023 - 15/01/2024 to 19/01/2024 - 05/02/2024 to 09/02/2024 - 12/02/2024 to 16/02/2024 - 26/02/2024 and 27/02/2024 - 29/02/2024 and 01/03/2024 - 12/03/2024 - 03/04/2024	1 x ecologist (22 person days)
	- 19/02/2024 to 22/02/2024 - 13/03/2024 to 15/03/2024 - 21/03/2024 and 22/03/2024 - 27/03/2024 and 28/03/2024 - 09/12/2024 to 12/12/2024	2 x ecologists (30 person days)
	- 18/03/2024 to 20/03/2024 - 07/01/2025 to 09/01/2025	3 x ecologists (18 person days)
	- 25/11/2024 and 26/11/2024 - 31/01/2025	4 x ecologists (12 person days)
Targeted Spiny Rice-flower surveys	- 14/08/2023 to 18/08/2023	5 x ecologists (25 person days)
	- 21/08/2023	4 x ecologists (4 person days)
	- 24/08/2023	3 x ecologists (3 person days)
	- 22/08/2023 and 25/08/2023 - 05/08/2024 to 09/08/2024	2 x ecologists (14 person days)
Targeted Summer Flora surveys	- - 05/02/2024 to 09/02/2024 - 29/02/2024 - 17/12/2024 to 20/12/2024 - 28/01/2025 to 31/01/2025	4 x ecologists (56 person days)
	- 15/01/2024 to 19/01/2024 - 12/02/2024 to 16/02/2024 - 19/02/2024 to 22/02/2024 - 09/12/2024 to 12/12/2024	2 x ecologists (36 person days)
	- 26/02/2024 to 28/02/2024 - 16/12/2024 - 06/01/2025 to 10/01/2025	3 x ecologists (27 person days)
Targeted Spring Flora surveys	- 25/11/2024 and 26/11/2024	4 x ecologists (8 person days)
Vegetation Assessment	- 25/09/2023 and 26/09/2023	2 x ecologists (4 person days)
	- 29/11/2023	1 x ecologist (1 person day)
Fauna Surveys		
Targeted Striped Legless Lizard surveys	- 19/09/2023 to 22/09/2023	2 x ecologists (74 person days)

Category	Survey dates	Resources
	- 02/10/2023 - 04/10/2023 - 16/10/2023 to 20/10/2023 - 30/10/2023 to 02/11/2023 - 13/11/2023 to 17/11/2023 - 20/11/2023 to 24/11/2023 - 27/11/2023 to 30/11/2023 - 07/12/2023 to 08/12/2023 - 11/12/2023 to 14/12/2023 - 21/12/2023 - 20/11/2024 - 27/11/2024 - 04/12/2024 - 11/12/2024 - 17/12/2024	
Targeted Golden Sun Moth surveys	- 08/11/2023 to 10/11/2023 - 23/11/2023 to 24/11/2023 - 12/12/2023 to 13/12/2023 - 15/12/2023 - 22/12/2023 - 20/11/2024 - 09/12/2024 to 13/12/2024 - 18/12/2024 to 19/12/2024 - 08/01/2025 to 10/01/2025	2 x ecologists (38 person days)
	- 04/12/2023 to 07/12/2023 - 21/12/2023	3 x ecologists (15 person days)
	- 05/01/2024 to 06/01/2024 - 16/12/2024 to 17/12/2024	4 x ecologists (16 person days)
	- 18/12/2023 - 04/01/2024 - 11/01/2024 to 12/01/2024	5 x ecologists (20 person days)
	- 09/01/2024 to 10/01/2024	6 x ecologists (12 person days)
Targeted Growling Grass Frog surveys	- 13/03/2024 to 15/03/2024	4 x ecologists (12 person days)
	- 18/03/2024 to 20/03/2024	3 x ecologists (9 person days)
Targeted Latham's Snipe surveys	- 07/01/2025 to 10/01/2025	2 x ecologists (8 person days)
Bird Utilisation surveys	- 21/08/2023 to 25/08/2023 - 15/01/2024 to 19/01/2024	2 x ecologists (20 person days)
Nocturnal Owl surveys	- 06/09/2023 - 11/09/2023	2 x ecologists (4 person days)
Targeted Bat surveys	- 19/10/2023 to 19/11/2023	8 x SM4 Songmeters (31 nights per unit)

2.3.1 *Biodiversity Assessment (including Habitat Hectare Assessment)*

Given the size of the Project Site and the type and extent of the proposed development (i.e. only a very small proportion of the Project Site is proposed to be disturbed), vegetation surveys and targeted surveys primarily focused in areas within or adjacent to the infrastructure layout. Native vegetation, scattered trees and large trees within 300 metres of each iteration of the turbine disturbance areas and within 100 metres of access tracks were assessed to ensure that all indirect impacts of the project footprint alignments could be fully assessed.

The Ecological Assessment was conducted by ecologists accredited by DEECA in the habitat hectare methodology (DSE 2004a) to quantify the quality and extent of native vegetation values within the Study Area (a 300 metre buffer around each turbine and access track centrelines), identify flora and fauna habitat values, and to determine conditions with reference to findings of the desk-based assessment, including the preliminary assessments undertaken by other consultants (Biosis 2022, 2024; ERM 2022a, 2022b; Nature Advisory 2022).

Native vegetation in the local area was also investigated to assist in determining the pre-European vegetation within the Project Site. EVCs were determined with reference to DEECA pre-1750 and extant EVC mapping and their published descriptions (DEECA 2025c).

The field assessments sought primarily to assess the extent and condition of native vegetation communities and potential flora and fauna habitat and species presence, with particular consideration given to significant species and ecological communities. Native vegetation was classified in accordance with the definitions provided below (Table 5), as defined in the Guidelines (DELWP 2017).

2.3.2 *Removal, Destruction or Lopping of Native Vegetation (the Guidelines)*

Under the *Planning and Environment Act 1987,* Clause 52.17 of the Golden Plains Planning Scheme requires a planning permit to remove, destroy or lop native vegetation. The assessment process for the clearing of vegetation follows the '*Guidelines for the removal, destruction or lopping of native vegetation*' (the Guidelines) (DELWP 2017). The '*Assessor's handbook: Applications to remove, destroy or lop native vegetation*' (Assessor's handbook) (DELWP 2018) provides clarification regarding the application of the Guidelines.

Assessment Pathway

The Guidelines manage the impacts on biodiversity from native vegetation removal using an assessment-based approach. Two factors – extent risk and location category – are used to determine the risk associated with an application for a permit to remove native vegetation.

There are three location categories that indicate the potential risk to biodiversity from removing an amount of native vegetation. These location categories include:

- Location 3 – includes locations where the removal of less than 0.5 hectares of native vegetation could have a significant impact on habitat for a rare or threatened species.
- Location 2 – includes locations that are mapped as endangered EVCs and/or sensitive wetlands and coastal areas, and are not included in Location 3.
- Location 1 – includes all remaining locations in Victoria.

The location category (1, 2 or 3) has been determined for all areas in Victoria and is available on DEECA's NVR Map (DEECA 2025b). If the native vegetation to be removed includes more than one location category, the higher location category is used to determine the assessment pathway.

Determination of assessment pathway is summarised in Table 4.

Table 4. Assessment pathways for applications to remove, destroy or lop native vegetation (DELWP 2017).

Extent		Location		
		1	2	3
Native Vegetation	Less than 0.5 hectares and not including any large trees	Basic	Intermediate	Detailed
	Less than 0.5 hectares and including one or more large trees	Intermediate	Intermediate	Detailed
	0.5 hectares or more	Detailed	Detailed	Detailed

Notes: For the purpose of determining the assessment pathway of an application to remove native vegetation the extent includes any other native vegetation that was permitted to be removed on the same contiguous parcel of land with the same ownership as the native vegetation to be removed, where the removal occurred in the five year period before an application to remove native vegetation is lodged.

Vegetation Assessment

Native vegetation (as defined in Table 5) is assessed using two key parameters: extent (in hectares) and condition. For the purposes of this assessment, both condition and extent were determined as part of the habitat hectare assessment.

Table 5. Determination of a patch of native vegetation (DELWP 2017).

Category	Definition	Extent	Condition
Patch of native vegetation	An area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native; OR An area with three or more native canopy trees where the drip line 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 in DELWP systems and tools.	Measured in hectares. Based on hectare area of the native patch.	Vegetation Quality Assessment Manual (DSE 2004a). Modelled condition for *Current Wetlands*.
Scattered tree	A native canopy tree that does not form part of a native patch.	Measured in hectares. Each Large scattered tree is assigned an extent of 0.071 hectares (15m radius). Each Small scattered tree is assigned a default extent of 0.031 hectares (10 metre radius)	Scattered trees are assigned a default condition score of 0.2 (outside a patch).

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

Current Wetlands (DEECA)

Wetlands can be difficult to map and assess accurately as they respond quite quickly to changes in environmental condition, especially rainfall. After a period of no or low rainfall they can disappear or appear very degraded. They do, however, recover rapidly after periods of increased rainfall. As a result, under the Guidelines (DELWP 2017) all mapped wetlands (based on 'Current Wetlands' layer in the DEECA NatureKit Map) that are to be impacted must be included as native vegetation, with the modelled condition score assigned to them (DEECA 2025a).

Note that mapped wetlands do not apply if they are covered by a hardened, man-made surface, for example, a roadway. If covered by any vegetation including crops, bare soil, a mapped wetland must be treated as a native patch.

Large Tree and Habitat Assessment

Large tree and habitat assessments were undertaken concurrently with the habitat hectare assessments to quantify the number of scattered trees and Large Trees within native vegetation, as well as to collate data pertaining to the presence of hollows and/or nests and significant 'habitat trees' that may provide habitat for fauna. Where present, hollows, nests or other relevant features were noted during the assessments.

Large Tree benchmarks relating to the EVCs present within the Project Site are summarised below (Table 6).

Table 6. Benchmark sizes for large trees within the Project Site.

EVC	Species	Large Tree (DBH)	Small Tree (DBH)
Lowland Forest (EVC 16)	*Eucalyptus* spp.	≥ 70 cm	< 70cm
Grassy Dry Forest (EVC 22)	*Eucalyptus* spp.	≥ 70 cm	< 70cm
Plains Grassy Woodland (EVC 55)	*Eucalyptus* spp.	≥ 80 cm	< 80cm
Creekline Grassy Woodland (EVC 68)	*Eucalyptus* spp.	≥ 80 cm	< 80cm
Plains Grassy Wetland (EVC 125)	N/A		
Plains Grassland (EVC 132)	N/A		
Creekline Tussock Grassland (EVC 654)	N/A		
Grassy Woodland (CVU EVC 175_61)	*Eucalyptus* spp.	≥ 70 cm	< 70cm
Grassy Woodland (VVP EVC 175)	*Eucalyptus* spp.	≥ 70 cm	< 70cm
	Allocasuarina spp.	≥ 40 cm	< 40cm
	Acacia spp.	≥ 30 cm	< 30cm
Stream Bank Shrubland (EVC 851).	*Eucalyptus* spp.	≥ 70 cm	< 70cm
Escarpment Shrubland (EVC 895)	*Eucalyptus* spp.	≥ 70 cm	< 70cm

Note. DBH = Diameter at Breast Height (i.e. 1.3 metres above ground level).

2.4 Targeted Flora Surveys

Based on the findings of the literature review (Biosis 2022, 2024; ERM 2022a, 2022b; Nature Advisory 2022) and desktop assessment, targeted surveys for the nationally significant Matted Flax-lily and Spiny Rice-flower were undertaken.

Several State significant flora have previously been recorded within, or in proximity to the Project Site (Table 7), with the potential presence of these species subject to specific attention during habitat hectare assessments undertaken in suitable habitats throughout the Study Area, as well as during the targeted flora surveys. Further targeted surveys for significant flora species are planned for 2025 onwards (Table 7).

Table 7. Significant flora species considered to have the highest likelihood of occurrence (Appendix 1.4).

Common name	Scientific Name	Significance #	Optimal Survey Timing *	Survey effort to date
Nationally Significant				
Clover Glycine	*Glycine latrobeana*	VU v	November - January	Completed (2024/25)
Matted Flax-lily	*Dianella amoena*	EN ce	Late Spring to Early Summer	Completed (2023/24)
Dwarf Spider-orchid	*Caladenia pumila*	CR ce	September - October	Proposed (2025)
White Sunray, Hoary Sunray, Grassland Paper-daisy	*Leucochrysum albicans* subsp. *tricolor*	EN e	October - November	Proposed (2025)
Trailing Hop-bush	*Dodonaea procumbens*	VU	October - December	Proposed (2025)

Common name	Scientific Name	Significance #	Optimal Survey Timing *	Survey effort to date
Spiny Rice-flower	*Pimelea spinescens* subsp. *spinescens*	CR ce	April - August	Partially completed (2023/24-present)
Button Wrinklewort	*Rutidosis leptorhynchoides*	EN e	October - November	Proposed (2025)
Large-headed Fireweed	*Senecio macrocarpus*	VU ce	August - October	Proposed (2025)
Green-striped Greenhood	*Pterostylis chlorogramma*	VU en	July - September	Proposed (2025)
State Significant				
Inverleigh Spider Orchid	*Caladenia sp. aff. fragrantissima (Inverleigh)*	ce	September - November	Proposed (2025)
Small Milkwort	*Comesperma polygaloides*	ce	September - December	Proposed (2025)
Studley Park Gum	*Eucalyptus × studleyensis*	ce	-	Completed (2025)
Small-flower Mat-rush	*Lomandra micrantha*	vu	September - February	Completed (2024/25)
Small Scurf-pea	*Cullen parvum*	en	September - December	Proposed (2025)
Tough Scurf-pea	*Cullen tenax*	en	November - February	Completed (2023/24-2024/25)
Derrinallum Billy-buttons	*Craspedia basaltica*	en	August - October	Proposed (2025)
Spotted Hyacinth-orchid	*Dipodium pardalinum*	en	January - February	Completed (2023/24-2024/25)
Purple Diuris	*Diuris punctata var. punctata*	ce	October - November	Proposed (2025)
Southern Blue-gum	*Eucalyptus globulus subsp. globulus*	en	-	Completed (2023/24)
Bog Gum	*Eucalyptus kitsoniana*	cr	-	Completed (2023/24)
Melbourne Yellow-gum	*Eucalyptus leucoxylon subsp. connata*	en	-	Completed (2023/24)
Yarra Gum	*Eucalyptus yarraensis*	cr	-	Completed (2023/24)
Pale-flower Crane's-bill	*Geranium sp. 3*	en	September - October	Proposed (2025)
Plains Yam-daisy	*Microseris scapigera s.s.*	cr	October - December	Proposed (2025)
Austral Tobacco	*Nicotiana suaveolens*	en	Spring - Summer	Completed (2023/24-2024/25)
Shelford Leek-orchid	Prasophyllum fosteri	cr	October - November	Proposed (2025)
Woodland Leek-orchid	*Prasophyllum sp. aff. validum*	en	October - December	Proposed (2025)
Hairy tails	*Ptilotus erubescens*	ce	Late Spring to Early Summer	Completed (2023/24-2024/25)

Common name	Scientific Name	Significance #	Optimal Survey Timing *	Survey effort to date
Fragrant Saltbush	*Rhagodia parabolica*	vu	November - January	Completed (2024/25)
Branching Groundsel	*Senecio cunninghamii var. cunninghamii*	en	October - April	Completed (2023/24-2024/25)
Southern Swainson-pea	*Swainsona behriana*	en	September - October	Proposed (2025)
Basalt Sun-orchid	*Thelymitra gregaria*	ce	September - November	Proposed (2025)
Crimson Sun-orchid	*Thelymitra X macmillanii*	vu	September - October	Proposed (2025)

Note: * Optimal timing based on flowering season, or when the species can be reliably identified using other morphological features. # EPBC Act Significance: CR – Critically Endangered; EN – Endangered; VU – Vulnerable; State Significance (DEECA 2025e): ce – Critically Endangered; e – Endangered; v – Vulnerable

2.4.1 *Matted Flax-lily and Summer Flora*

EPBC Act Conservation Status: Endangered

FFG Act Conservation Status: Critically Endangered

Matted Flax-lily is a perennial, tufted, mat-forming lily which can form patches of up to five metres wide. The plant can grow vegetatively, through sending underground rhizomatous roots, which rise above the ground with a tiller of several leaves, spread over a distance from the parent plant (Plate 1).

Plate 1. Matted Flax-lily (Ecology and Heritage Partners Pty Ltd).

The leaves of Matted Flax-lily are generally glaucous, blue in colour but may be red at the base and usually but not always having small hooks (teeth) along the margins and midrib. The leaves taper to approximately 45 centimetres long depending on site and climatic conditions and are born on tillers with the leaves arranged alternatively, with several leaves per tiller.

Matted Flax-lily generally occurs in grassland and grassy woodland habitats, on well drained to seasonally wet fertile sandy loams to heavy cracking clay soils derived from Silurian or Tertiary sediments, or from volcanic geology (Carter 2010). Intense active and historical grazing, weed invasion, and vegetation clearing was evident throughout the Project Site, however targeted surveys for the species were undertaken in all areas of suitable habitat.

Survey Method

Targeted surveys were completed by suitably qualified botanists experienced in the detection of the target species, including summer flowering flora, to coincide with the known flowering period of these species (Table 7). Local reference sites known to support a population of the species including Bannockburn Cemetery, were used to examine the diagnostic features of the species prior to undertaking surveys within the study area, and

to confirm active flowering. Matted Flax-lily and summer flora surveys were undertaken in accordance with the Biodiversity Precinct Planning Kit (DSE 2010):

- Targeted surveys were conducted by people familiar with recognising the species;
- The survey effort was directed to all potential habitat areas (i.e. grassland and the degraded woodland and grassland areas);
- Transects were walked at five-metre grid intervals through all potential habitat; and,
- Where found, locations of any plants were recorded by GPS (accuracy of +/- 3 metres) and the number of plants per land parcel was totalled.

2.4.2 *Spiny Rice-flower*

EPBC Act Conservation Status: Critically Endangered

FFG Act Conservation Status: Critically Endangered

Spiny Rice-flower subsp. *spinescens* is a perennial sub-shrub with spine-tipped stems to 30 centimetres long (Plate 2). Its leaves are opposite, narrowly elliptic to lanceolate and approximately two to 10 millimetres long and one to three millimetres wide. The inflorescence consists of small, dioecious and generally pale-yellow flowers (sometimes cream - white).

Plate 2. Spiny Rice-flower (Ecology and Heritage Partners Pty Ltd).

Spiny Rice-flower flowers between April and August. The fruit is a dry capsule approximately three millimetres long. The species is slow growing and produces a very large tap root that can be up to one metre long. Although plants may live greater than 100 years, they are thought to rarely recruit from seed (Carter and Walsh 2006).

Survey Method

Targeted surveys were completed by suitably qualified botanists experienced in the detection of the target species, to coincide with the known flowering period of the species (Table 7). Local reference sites known to support a population of the species including Bulban Road, Little River, were used to confirm active flowering. Targeted surveys followed the same methods as the Matted Flax-lily surveys (DSE 2010).

2.4.3 *Other Significant flora*

Several State significant species known to occur, or those considered to have a high likelihood of occurrence (Appendix 1.4), were surveyed for in areas of potential habitat concurrently with the habitat hectare assessments. Targeted surveys for spring flowering flora species are proposed to occur in mid-late 2025.

The State significant species listed in Table 7 have previously been recorded within the Project Site, or within the broader locality (i.e. within the ROI).

Handheld GPS units were used to record the location of any significant species encountered.

2.5 Fauna Surveys

Based on the findings of the literature review (Biosis 2022, 2024; ERM 2022a, 2022b; Nature Advisory 2022) and desktop assessment, targeted surveys for the nationally significant Striped Legless Lizard, Growling Grass Frog and Golden Sun Moth were undertaken.

Several State significant fauna have previously been recorded within, or in proximity to the Project Site (Table 8), with the potential presence of habitat for these species subject to specific attention during habitat hectare assessments and other field surveys undertaken in suitable habitats throughout the Study Area. Further targeted surveys are proposed for several species with a moderate to high likelihood of presence within the Project Site.

Table 8. Significant fauna species considered to have the highest likelihood of occurrence (Appendix 2.1).

Common name	Species Name	Significance #	Optimal Survey Timing *	Survey effort to date
Nationally Significant				
Striped Legless Lizard	*Delma impar*	VU e	September – December	Completed (2023-2024)
Growling Grass Frog	*Litoria raniformis major*	VU v	October – December	Completed (2024)
Golden Sun Moth	*Synemon plana*	VU v	August – October	Completed (2023/24)
Latham's Snipe	*Gallinago hardwickii*	VU -	November – February	Completed (2025)
Blue-winged Parrot	*Neophema chrysostoma*	VU -	March – August	BUS completed (2023/24)
Brown Treecreeper	*Climacteris picumnus*	VU -	-	BUS completed (2023/24)
White-throated Needletail	*Hirundapus caudacutus*	VU v	October – May	BUS completed (2023/24)
Diamond Firetail	*Stagonopleura guttata*	VU v	-	BUS completed (2023/24)
Gang-gang Cockatoo	*Callocephalon fimbriatum*	EN e	June – August	BUS completed (2023/24)
Yarra Pygmy Perch	*Nannoperca obscura*	EN v	May – August	-
Hooded Robin	*Melanodryas cucullata*	EN v	-	BUS completed (2023/24)
Painted Honeyeater	*Grantiella picta*	VU v	October – March	BUS completed (2023/24)
Swift Parrot	*Lathamus discolor*	CR ce	March – August	BUS and habitat assessment completed (2023/24)
State Significant				
Platypus	*Ornithorhynchus anatinus*	v	February – October	-
Powerful Owl	*Ninox strenua*	v	March – December	Completed (2023)
Barking Owl	*Ninox connivens*	ce	July – October	Completed (2023)

Common name	Species Name	Significance #	Optimal Survey Timing *	Survey effort to date
Masked Owl	*Tyto novaehollandiae*	ce	April – November	Completed (2023)
Tussock Skink	*Pseudemoia pagenstecheri*	e	September – December	Completed (2023-2024)
Hardhead	*Aythya australis*	vu	-	BUS completed (2023/24)
Yellow-bellied Sheathtail Bat	*Saccolaimus flaviventris*	vu	October – April	Completed (2023), Proposed (2025)
Speckled Warbler	*Pyrrholaemus sagittatus*	en	-	BUS completed (2023/24)
Eastern Bent-winged Bat	*Miniopterus orianae oceanensis*	ce	October – April	Completed (2023), Proposed (2025)
Little Eagle	*Hieraaetus morphnoides*	vu	-	BUS completed (2023/24)
Black Falcon	*Falco subniger*	ce	-	BUS completed (2023/24)
Grey Goshawk	*Accipiter novaehollandiae*	en	-	BUS completed (2023/24)

Note: *Optimal timing based on breeding/active season, or when the species can be reliably identified using other morphological features. # EPBC Act Significance: CR – Critically Endangered; EN – Endangered; VU – Vulnerable; State Significance (DEECA 2025e): ce – Critically Endangered; e – Endangered; v – vulnerable; BUS=Bird Utilisation Survey.

2.5.1 *Golden Sun Moth*

EPBC Act Conservation Status: Vulnerable

FFG Act Conservation Status: Vulnerable

Plate 3. Golden Sun Moth (Ecology and Heritage Partners Pty Ltd).

Ecology

Golden Sun Moth is a medium-sized, diurnal moth with green eyes, no functional mouthpart, and distinct clubbed antennae (DAWE 2021). Females have a wingspan of up to 31mm and are poor flyers due to a reduced hindwing and therefore rarely observed during field surveys. The hindwing of females is bright orange with black submarginal spots and the upper forewing is dark grey, patterned with pale grey (DAWE 2021). Males have a wingspan of up to 34mm and flight is typically low, no more than a metre above the ground, fast and can be prolonged, but they are generally not recorded flying more than 100-200 metres from suitable habitat (Clarke and O'Dwyer 1999). The hindwing of males is a dark bronze-brown with dark brown patches and the upper forewing is dark brown, patterned with pale grey (DAWE 2021). Male Golden Sun Moths generally fly between 10am and 3pm on calm, warm (over 20°C), sunny days.

Habitat

Golden Sun Moth typically occur in native grassland, grassy woodland, dominated by greater than 40% cover of wallaby-grass, in particular *Rytidosperma* spp. (DSE 2004b), but may also inhabit areas dominated by Kangaroo Grass *Themeda triandra* (Endersby and Koehler 2006) and introduced grassland dominated by Chilean Needle-grass *Nassella neesiana* and other introduced species (A. Organ pers. obs.).

Distribution

Prior to European settlement, the Golden Sun Moth was widespread and relatively continuous throughout its range, inhabiting grassy open woodlands and grassland, although it now mainly inhabits small isolated sites (DSE 2004b). The species is threatened by habitat loss, disturbance and fragmentation due to agricultural expansion and urbanisation. Many populations are isolated and fragmented, impeding the ability of the relatively immobile females to recolonise areas, thereby reducing the likelihood of genetic exchange (DSE 2004b). Such populations are therefore vulnerable as there is little likelihood of recolonisation in the event of a local extinction. The species is currently estimated to occupy 1,596km^2 of habitat, known to reside in 59 sites in New South Wales, 78 in the Australian Capital Territory, and 104 sites in Victoria (DAWE 2021).

Survey Method

Survey procedures followed those outlined in the *Significant Impact Guidelines for the Critically Endangered Golden Sun Moth* (DEWHA 2009). The following methods were followed:

- Surveys were conducted by ecologists experienced in the detection and identification of Golden Sun Moth;
- Each area of potential habitat was surveyed on four separate occasions, during the species' confirmed flight season;
- Surveys were undertaken during weather conditions suitable for detecting the species.
    - Male moths generally fly between 10am and 3pm on warm (over 20˚C by 10am) days with minimal cloud cover and still conditions. However, if males are observed flying on site after 3pm or during moderately windy conditions surveys can continue until males are no longer observed flying;
- Surveys were conducted using parallel transects at distances prescribed by the Commonwealth (DEWHA 2009) with observers walking or, where terrain permitted, driving in a car at < 10 km / hour (flying male moths can be readily seen from a vehicle) until moths are observed; and,
- A broad habitat assessment was completed detailing information on habitat quality, biomass levels, presence of weeds and floristic diversity.

2.5.2 *Growling Grass Frog*

EPBC Act Conservation Status: Vulnerable

FFG Act Conservation Status: Vulnerable

Plate 4. Growling Grass Frog (Ecology and Heritage Partners Pty Ltd.)

Ecology

One of the largest frog species in Australia, Growling Grass Frog can reach 104 millimetres in length, with females usually larger (60–104 millimetres) than males (55–65 millimetres) (Barker *et al*. 1995). The species varies in colour and pattern, but is generally olive to bright emerald green, with irregular gold, brown, black or bronze spotting (Plate 4).

Vörös *et al.* (2023) identified two lineages for *Litoria raniformis, L. r. raniformis* for the northern lineage and *L. r. major* for the southern lineage.

Habitat

Growling Grass Frog are largely associated with permanent or semi-permanent, still or slow flowing waterbodies (i.e. streams, lagoons, farm dams and old quarry sites) (Hero *et al.* 1991; Barker *et al*. 1995; Heard *et al.* 2010). The species can also utilise temporarily inundated waterbodies during breeding season, to facilitate reproduction (Organ 2005). The presence of key habitat attributes, primarily an extensive cover of emergent, submerged and floating vegetation (Robertson *et al*. 2002, Organ 2005), and the spatial orientation of waterbodies (Robertson *et al*. 2002; Heard *et al*. 2004; Hamer and Organ 2008) are strong determinants of the species' presence. Terrestrial vegetation (e.g. grasses, sedges), rocks and other ground debris around wetland perimeters also provide important foraging, dispersal and over-wintering sites. Dispersal is thought to occur primarily along drainage lines or other low-lying areas between waterbodies, and unhindered movement between and within waterbodies is considered important for population viability.

Distribution

Although formerly widely distributed across southern eastern Australia, including Tasmania (Littlejohn 1963; Hero *et al*. 1991), the Growling Grass Frog has declined markedly over the past two decades and in many areas, particularly in south and central Victoria where some populations have experienced local extinction.

Survey Method

Nocturnal Growling Grass Frog surveys were undertaken at five sites within the study area, during a time when the species was known to be active. Growling Grass Frog Surveys were undertaken in accordance with the methods outlined in:

- *Significant Impact Guidelines for the Vulnerable Growling Grass Frog* (SEWPaC 2010); and,
- *Survey Guidelines for Australia's Threatened Frogs* (DEWHA 2010).

Habitat assessments and targeted surveys were completed on 13th to 15th and 18th to 20th March 2024. Sites included wetlands, watercourses and dams that provide potentially suitable habitat for Growling Grass Frog. Survey methods are outlined below:

- Nocturnal surveys (spotlighting, active searching, call play-back) were undertaken by two qualified zoologists who visited each site on two occasions in an effort to detect the species;
- Sites were not visited on consecutive nights. Surveys were undertaken during weather conditions considered suitable for Growling Grass Frog activity (warm, relatively still and clear);
- Zoologists searched fringing, emergent and floating vegetation within and adjacent to the watercourse/waterbody using "Olight" LED hand-held spotlights (up to 1020 lumens/8.4 volts) and used call-playback to initiate a response from any males that may have been present; and,
- All frog species heard or seen were recorded and several site-specific habitat variables were documented including a visual assessment of water quality, flow and depth, and records of fringing, emergent, floating and submerged vegetation cover. The presence of fish (specifically Plague Minnow *Gambusia holbrooki*) was also recorded.

2.5.3 Striped Legless Lizard

EPBC Act Conservation Status: Vulnerable

FFG Act Conservation Status: Endangered

Plate 5. Striped Legless Lizard (Ecology and Heritage Partners Pty Ltd).

Ecology

Striped Legless Lizard are an oviparous (egg-laying), diurnal lizard that can be distinguished by its characteristic longitudinal stripes. The species are light brown to pale-grey in colour, with darker brown stripes that run vertically along the body, becoming diagonal bands on the tail (Cogger 1992). Adult Striped Legless Lizard can be up to 30 centimeters long, with a maximum snout-to-vent length of 12 centimeters (DCCEEW 2023).

Habitat

Striped Legless Lizard typically occupy areas of native and introduced grassland, particularly where a high percentage of the native Kangaroo Grass is found. They are typically restricted to lowland tussock grassland habitat (Coulson 1990) in temperate south-eastern Australia, where the species has a limited and patchy distribution. A small percentage of the original habitat for Striped Legless Lizard now exists. As a result, this species is likely to occur in small, isolated populations due to the limited and severely fragmented nature of remaining habitat (Webster *et al.* 2003).

Distribution

In Victorian populations, the species frequents habitats with exposed basalt rocks in grassland and areas of cracking clay soils, where the species can seek refuge under rocks and in earth cracks (Dorrough *et al*. 1995). Although Striped Legless Lizards have been reported from areas of relatively undisturbed native grasslands, with a dense cover of perennial tussock grasses (Kukolic 1991; Kukolic and Osborne 1993), they are also known to inhabit areas of non-native grassland (Smith and Robertson 1999). This has been shown at several sites throughout the Basalt Plains in western Victoria, which are currently grazed at various stock densities (Rohr and Peterson 2003).

Survey Method

Potential habitat for Striped Legless Lizard was indicated by previous vegetation mapping assessments (Biosis 2022) and confirmed by Ecology and Heritage Partners field staff recorded during initial desktop, and field assessments. Subsequently, targeted Striped Legless Lizard surveys were completed within the study area in late 2023. Twenty-eight rectangular grids of 50 roof tiles were deployed across the study area between 14 August and 23 August 2023, with each tile grid checked eight times between 19 September 2023 and 21 December 2023. An additional two tile grids were deployed on 11-12 September 2024 and received five checks between 20 November 2024 and 17 December 2024.

The intention of establishing a grid of roof tiles is that Striped Legless Lizard will be drawn to use the artificial habitat for shelter and thermoregulation. The species can then be easily located when the tile is lifted. This adopted methodology is widely accepted as the primary survey technique for this species, particularly in areas supporting surface rock cover (DSEWPaC 2011a, 2011b). Targeted Striped Legless Lizard Surveys were undertaken in accordance with the *EPBC Act Referral Guidelines for the Vulnerable Striped Legless Lizard, Delma impar* (DSEWPaC 2011a) and the Biodiversity Precinct Structure Planning Kit, Guidelines for surveying Striped Legless Lizard *Delma impar*, as follows:

- Tile grids were installed within areas of contiguous habitat as per the densities prescribed in the survey guidelines;
- Tile grids were laid in grids consisting of 50 tiles, at five metre spacing between tiles, arranged in grids of ten tiles by five tiles, positioned in vegetated areas with a northerly aspect;
- All corners of each grid were marked with a wooden or steel stake and clearly marked;
- Any damaged tiles were replaced accordingly;
- Tile checks involved systematically lifting each tile in the grid and observing and recording the species utilising the artificial habitat;
- Each tile grid was checked eight times during the survey period; and,
- Optimal time for checking is when weather is fine but preferably with >50% cloud cover. Air temperature should be in low – mid 20s and ground temperature high 20s to low 30s (C°).

The following details were recorded:

- Location and number of each tile grid;
- Date and weather conditions for each survey, including air and ground temperature;
- Location and number of any Striped Legless Lizard recorded; and
- Any non-target species identified (the tile-grid method is likely to identify other reptiles and small marsupials on site, such as Tussock Skink and Fat-tailed Dunnart (Nelson and Jemison 2012).

Although the time between the establishment of tile grids and the commencement of tile checks was less than the three month period recommended by the *Survey Guidelines for Australia's Threatened Reptiles* (DSEWPaC 2011a), the timing was considered to be appropriate in this instance, with a greater importance placed on ensuring the surveys could fit within the peak period of detectability for the species (late September – late

November) (Scroggie *et. al.* 2019). Additional tile checks will be undertaken during the 2025 active season in tile grids that have received less than eight checks.

2.5.4 *Latham's Snipe*

EPBC Act Conservation Status: Vulnerable

FFG Act Conservation Status: Unlisted

Plate 6. Latham's Snipe (DCCEEW 2024).

Ecology

Latham's Snipe is the largest snipe in Australia, weighing up to 230 grams with a wingspan of 50-54 centimetres. They are well camouflaged with mainly brown plumage, their upper body boldly patterned with black, brown and white (Menkhorst *et al.* 2017).

EPBC-Act listed on 5 January 2024 (DCCEEW 2024); Latham's Snipe is also listed on the following international migratory bird treaties to which Australia is a signatory:

- Japan – Australian Migratory Bird Agreement (JAMBA);
- China – Australia Migratory Bird Agreement (CAMBA);
- Republic of Korea – Australia Migratory Bird Agreement (ROKAMBA); and,
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

Habitat

Latham's Snipe occur in a wide variety of permanent and ephemeral wetlands, preferring open freshwater wetlands with nearby cover, but have also been recorded on the edges of creeks, rivers and floodplains (Higgins and Davies 1996). Structure and composition do not appear to be a determining factor in the selection of habitat for the species, which have been found to occur in coastal heathlands, tussock grasslands, and wetlands dominated by either rushes, reeds and sedges (Naarding 1983). In addition, they have previously been recorded in disturbed sites, or areas located close to human activity (Naarding 1983).

The primary threat to Latham's Snipe is habitat loss through development, change in hydrology and agriculture (Garnett and Crowley 2000). The wetland habitats occupied by Latham's Snipe are threatened by a variety of processes including drainage, diversion of water for storage or agriculture, development of land for urban or other purposes and land management practices.

Distribution

Latham's Snipe breeds in the northern hemisphere, around Japan, during the winter period of Australia (i.e. May – August), then migrates south to the east coast of Australia over spring and summer (Higgins and Davies 1996). Current estimates for the population are 30,000 individuals (Hansen *et al.* 2016).

Survey Method

Diurnal and nocturnal Latham's Snipe surveys were undertaken at eight turbine locations (including 11 waterbodies) sites within the study area in January 2025, which is within the period between the species' arrival and departure in Australia (i.e. between October and February). Nocturnal surveys were undertaken as the species is known to be most active at night, and diurnal surveys were undertaken in an attempt to flush individuals from their daytime roosting locations within dense vegetation.

Latham's Snipe surveys were undertaken in accordance with the methods and advice outlined in:

- *Conservation Advice for Gallinago hardwickii (Latham's snipe)* (DCCEEW 2024); and,
- *Gallinago hardwickii — Latham's Snipe, Japanese Snipe Survey Guidelines* in Species Profile and Threats (SPRAT) database (DCCEEW 2025).

Habitat assessments and targeted surveys were completed between 7 and 10 January 2025. Sites included wetlands and dams that provide potentially suitable protective and foraging habitat for Latham's Snipe. Survey methods are outlined below:

- Diurnal surveys (active searching / flushing, call play-back) were undertaken by two qualified zoologists who visited each site on four occasions during daylight conditions, in an effort to detect the species. Zoologists searched and walked through fringing and emergent vegetation within and adjacent to each waterbody in an attempt to flush the species out of the vegetation, and used call-playback to initiate a response from any individuals that may have been present;
- Nocturnal surveys (spotlighting, active searching / flushing, call play-back) were undertaken by two qualified zoologists who visited each site on four occasions after dusk, in an effort to detect the species. Zoologists searched and walked through fringing and emergent vegetation within and adjacent to each waterbody in an attempt to flush the species out of the vegetation. They used "Olight" LED hand-held spotlights (up to 1020 lumens/8.4 volts) during this search, and used call-playback to initiate a response from any individuals that may have been present;
- Where possible, surveys were undertaken during weather conditions considered suitable for Latham's Snipe activity (relatively still / minimal wind); and,
- All waterbird species heard or seen were recorded and several site-specific habitat variables were documented including a visual assessment of water presence and depth, and records of fringing, emergent and submerged vegetation cover.

2.5.5 *Blue-winged Parrot*

EPBC Act Conservation Status: Vulnerable

FFG Act Conservation Status: Unlisted

Plate 7. Blue-winged Parrot (https://birdlife.org.au/bird-profiles/blue-winged-parrot/)

Ecology

Measuring up to 24 centimetres in length and weighing less than 50 grams, Blue-winged Parrot can be characterised by its slender build. The species supports an olive-green head and upper body, with lighter green hue on the fore-neck. The upper tail displays shades of green-blue alongside yellow sides, while its underparts are predominantly yellow, often featuring an orange centre on the belly. A yellow facial patch extends backward to the eye, complemented by a narrow, dark blue band stretching from eye to eye across the forehead. Notably, the Blue-winged Parrot earns its name from the prominent dark blue patch adorning its wings. While both sexes share similar characteristics, females typically exhibit slightly subdued colours compared with males (DCCEEW 2023a).

Habitat

Blue-winged Parrots are adaptable to various habitats, ranging from coastal and sub-coastal areas to inland regions, including semi-arid zones. They show a preference for grasslands, grassy woodlands, and areas near wetlands, both along the coast and in semi-arid regions (Higgins 1999). Additionally, these parrots can be found in modified environments such as airfields, golf courses, and paddocks. Typically seen in pairs or small groups, blue-winged parrots primarily forage near or on the ground, feeding on a diverse array of seeds from native and introduced grasses, herbs, and shrubs (Higgins 1999; DCCEEW 2023a).

Distribution

Blue-winged Parrot primarily breed on mainland Australia south of the Great Dividing Range, particularly in southern Victoria extending from Port Albert in Gippsland and west through to Nelson. During winter, a portion of the population migrates across Bass Strait, with some evidence suggesting non-stop flights due to limited records from Bass Strait islands. In the non-breeding season, from autumn to early spring, these parrots are observed in northern Victoria, eastern South Australia, southwestern Queensland, and western New South Wales. Some individuals may also reach south-east New South Wales and eastern Victoria, particularly during southern migrations (Higgins 1999).

Survey Method

See Section 2.5.13 (Bird Utilisation Surveys).

2.5.6 *Brown Treecreeper*

EPBC Act Conservation Status: Vulnerable

FFG Act Conservation Status: Vulnerable

Plate 8. Brown Treecreeper (Birdlife Australia 2024).

Ecology

Australia's largest treecreeper, Brown Treecreeper primarily support a light grey-brown plumage with black streaks upon the lower breast and belly, along with black bars on the undertail. During flight, the pale buff bands across flight feathers and lighter grey on the face and neck are also noticeable. Sexual dimorphism is evident across all plumages, with males featuring small patches of black and white streaks on the upper breast, while females exhibit rufous and white streaking.

Habitat

The species typically occupies a variety of eucalypt-dominated forests and woodlands, particularly those with an open grassy understorey and fallen timber (Menkhorst *et al.* 2017; DCCEEW 2023b). Nests are usually built in a tree hollow beneath the canopy, often in proximity to other Brown Treecreeper territories. The breeding season typically begins in July and can last until February, with most eggs laid between September and late October.

Distribution

Endemic to south-eastern Australia, Brown Treecreeper distribution ranges from the Grampians in western Victoria, through central New South Wales to Queensland, and from the coast to the inland slopes of the Great Diving Range.

Survey Method

See Section 2.5.13 (Bird Utilisation Surveys).

2.5.7 *White-throated Needletail*

EPBC Act Conservation Status: Vulnerable

FFG Act Conservation Status: Vulnerable

Plate 9. White-throated Needletail (https://ebird.org/australia/species/whtnee/JP-47-10)

Ecology

White-throated Needletail are a large (up to 20 centimetres in length and approximately 120 grams in weight) swift supporting a cigar-shaped body, long pointed wings, and a stubby tail (Higgins 1999). The species is a non-breeding migrant in Australia. White-throated Needletail arrive in southern Australia from

their breeding grounds around October, and typically leave between May and August.

Habitat

White-throated Needletail predominantly forage aerially in Australia, and rarely land on the ground or vertical substrates to forage for insects (TSSC 2019). White-throated Needletail have occasionally been observed perched on eucalypt flowers to forage for insects, and will sometimes utilise trees to launch upwards in the pursuit of flying insects (TSSC 2019). A study by Tarburton (2015) observed that after a period of high altitude feeding, White-throated Needletail divide into pairs and perform coordinated flight displays, which involves high-speed dives that commence at 1.5 kilometres above the ground, before the bird plummet down to tree-top level.

Although most research states that White-throated Needletail are almost exclusively aerial and are rarely observed roosting (Biosis Research 2006, BL&A 2018, DCCEEW 2023), numerous studies have observed this species displaying roosting behaviour, including within Australia. An assessment of the Coonooer Wind Farm by BL&A (2018) concluded that White-throated Needletail would not utilise terrestrial habitat at the site due to their nature as an aerial forager that sleeps on the wing. At least eight authors have reported White-throated Needletail roosting in trees at night, where Tarburton (2021) located ten published records of the species roosting and found 20 additional records in journals, newsletters and direct reports citing visual records of this species landing in Australia. Tarburton (2021) also found that all records of White-throated Needletail roosting were found in trees at ridgetops or forest break edges, positioned on vertical trunks and upper branches, as well as multiple records within tree hollows. Recent conservation advice states that White-throated Needletail primarily roost in trees amongst dense foliage (DCCEEW 2023f; TSSC 2019).

Distribution

White-throated Needletail is a northern hemisphere breeding migrant, and has a large distribution across Australia. The species is most often recorded before storms, low- pressure troughs and cold fronts, where they prey on swarming or disrupted insects. Because White-throated Needletails are an aerial species, it has been stated that conventional habitat descriptions are inapplicable (Cramp 1985), but nonetheless, there are certain habitat preferences exhibited by the species.

White-throated Needletail travel up and down the Great Dividing Range and east coast of Australia from one roost site to the next, and are known to frequently pass through numerous windfarms in the process.

White-throated Needletail are thought to typically fly well above the typical rotor swept area, with observable activity closely associated with low pressure systems that lift their food sources and assist with their flight (DCCEEW 2023; BL&A 2018). This species often flies at altitudes too high to be seen without good optics or tracking gear, beyond the detection of the human eye (Taburton 2015; 2021). Nonetheless, this species has been recorded across wide range of heights from less than 1 metre up to more than 1000 metres above the ground (DCCEEW 2023; Higgins 1999; Biosis Research 2006; TSSC 2019), and the species has been recorded flying at, above and below the rotor swept height at multiple wind farms (Biosis Research 2006).

Survey Methodology

See Section 2.5.13 (Bird Utilisation Surveys).

2.5.8 *Diamond Firetail*

EPBC Act Conservation Status: Vulnerable

FFG Act Conservation Status: Vulnerable

Plate 10. Diamond Firetail (Birdlife Australia 2024).

Ecology

Diamond Firetail is a small, stocky bird (measuring between 10 and 12 centimetres in length and weighing approximately 17 grams), with a distinctive broad, black band across a white breast, leading to predominately white-spotted, black flanks. Their rump is also distinct during flight, described as a red to scarlet colour, matching their vibrant red bill and eyes. Its back and head sport a grey hue, while its wings appear ashy-brown (DCCEEW 2023c) The female closely resembles the male, though occasionally smaller in size.

Habitat

The species is often found in riparian areas (rivers and creeks), feeding exclusively on the ground. Critical habitat to the survival of the species includes lightly timbered, or low-density, open-forests and woodlands (i.e. eucalypt, acacia, or casuarina) (DCCEEW 2023c).

Distribution

Diamond Firetails are distributed across south-east mainland Australia, from south-east Queensland to Eyre Peninsula, South Australia, and approximately 300 kilometres inland from the sea (Higgins *et al.* 2007).

Survey Method

See Section 2.5.13 (Bird Utilisation Surveys)..

2.5.9 *Gang-gang Cockatoo*

EPBC Act Conservation Status: Endangered

FFG Act Conservation Status: Endangered

Plate 11. Gang-gang Cockatoo (Ecology and Heritage Partners Pty Ltd).

Ecology

The Gang-gang Cockatoo is a small, stocky, yet distinct cockatoo, usually between 32 and 37 centimetres in length, with a wingspan between 62 and 76 centimetres. These birds are primarily slate-grey, with the males easily identifiable with a scarlet-coloured head and wispy crest, and the females supporting yellow and pink edged underbelly feathers, giving a barred effect. Juveniles are similar in appearance to the females, however their crest is rudimentary, while their underparts and upper wings appear a washed-green (Higgins 1999). Their call is also distinct, often likened to a creaking gate, or a cork being pulled from a bottle (OEH 2023).

Habitat

Gang-gang Cockatoo are endemic to south-eastern Australia. Literature for this species predominately arises from NSW, with limited published literature regarding species distribution and habitat requirements in Victoria. However, Gang-gang Cockatoo are considered to be widespread through north-east and southern regions, with records in east Melbourne, Mornington Peninsula, and south-west Gippsland (Higgins 1999; Menkhorst *et al.* 2017; DAWE 2022).

Monogamous breeders, the Gang-gang Cockatoo breeding season occurs from October to January, however breeding records from late August, early September and March exist (Higgins 1999). The species nest in old-growth hollows, which primarily occur in the tree trunk and limb or within the dead sprout of large, living eucalypts (DAWE 2022). Nest and roost sites are often located near water (Beruldsen 1980; DAWE 2022), this this may be product of large hollow-bearing trees being more common. Breeding aggregations are reliant on stands of suitable hollow-bearing trees (NSW OEH 2017; Davey and Mulvaney 2020), whereby multiple nests tend to be positioned in close proximity (i.e. within a few hundred metres).

Gang-gang Cockatoo work to enlarge and create suitable nesting hollows and may return to the same nest and roost sites over multiple years (Higgins 1999). Pairs may also use nest trees over different years (Davey and Mulvaney 2020), possibly to misnaming nest parasitism or predation (DAWE 2022). Preferred hollow attributes are presented below.

Table 1. Gang-gang Cockatoo preferred hollow attributes (Davey and Mulvaney 2020; DAWE 2022)

Hollow attribute	Dimensions
Entrance height	21.3 (minimum 12) centimetres
Entrance width	13.1 (range 9-24) centimetres
Floor diameter*	20 centimetres
Hollow depth*	50.5 (range 22-90) centimetres
Height above ground*	7.5 (5 - 9.4 metres)

*Hollow attributes considered a key component of habitat critical to the survival of Gang-gang Cockatoo (DAWE 2022)

Distribution

Gang-gang Cockatoo are an altitudinal migrant, being well-adapted to cooler climates the species is most common at higher altitudes and southern latitudes (DAWE 2022). During the summer months, the species primarily occurs in mature, wet sclerophyll forests dominated by eucalypts with dense, shrubby understories dominated by acacia and banksia (NSW Scientific Committee 2008). However, during the winter months, the species migrates to lower altitudes and drier woodland habitats and open eucalypt assemblages (Higgins 1999). Importantly, some overlapping of winter and summer ranges is common (Higgins 1999). Outside of the breeding season (October to January), the species can also be observed in suburban areas (i.e. Canberra, Sydney and Melbourne) including parks, gardens, and road-side plantations (DAWE 2022).

Typically feeding arboreally in small groups, foraging primarily occurs in the canopy of woodland assemblages (particularly eucalypts) (Higgins 1999). The species has a wide-ranging diet, regularly feeding on flower buds, seed pods blossoms, leaf buds, fruit and seed from native and ornamental species.

Gang-gang Cockatoo rely on eucalypts and acacia when feeding on native vegetation (DAWE 2022), and species such as hawthorn *Crataegus monogyna*, cotoneaster *Cotoneaster glaucophyllus* and *Pyracantha* berries when feeding on introduced vegetation (DAWE 2022). Gang-gang Cockatoo will also feed on insect larvae (Menkhorst *et al.* 2017).

Survey Method

See Section 2.5.13 (Bird Utilisation Surveys).

2.5.10 Hooded Robin (south-eastern)

EPBC Act Conservation Status: Endangered

FFG Act Conservation Status: Vulnerable

Plate 12. Hooded Robin (Birdlife Australia 2024).

Ecology

Hooded Robin, like many strikingly coloured robins, are highly sexually dimorphic; the males supporting a distinct black and white plumage (the black hood is where the species takes its name), while the female is primarily grey-brown. Hooded Robin are relatively large, reaching 17 centimetres in length (DCCEEW 2023d).

Habitat

Hooded Robin generally form monogamous pairs and occupy territories during the breeding season (between July and November) and non-breeding season. The species typically occupy lightly-timbered woodlands and shrublands dominated by eucalypts and wattles, with fallen logs/timber for low vantagepoint perches. Often characterised as shy and predominantly sedentary, the species can also be observed in pairs or small gatherings.

Distribution

Hooded Robin (south-eastern) are found across south-eastern Australia, ranging from far south-east Queensland to Yorke Peninsula, South Australia. Fragmented populations exist within this distribution and some are assumed genetically isolated (DCCEEW 2023d).

Survey Methodology

See Section 2.5.13 (Bird Utilisation Surveys).

2.5.11 Painted Honeyeater

EPBC Act Conservation Status: Vulnerable

FFG Act Conservation Status: Vulnerable

Plate 13. Painted Honeyeater (https://birdlife.org.au/wp-content/uploads/2023/05/Silcocks-listing-

Ecology

Painted Honeyeater is a diminutive bird, weighing between 20 and 25 grams and measuring around 16 centimetres in length, with a similar wingspan.

In adult male Painted Honeyeater, the face, crown, and upper body parts, including the scapulars, nape, and rump, are predominantly black, adorned with small white spots on either side of the head. The underside of their body, including the chin, throat, breast, belly, and the underside of the tail, is white, sometimes with black spots among the white feathers on the flanks, breast, and belly. The edges of black flight feathers are bright yellow, as are those of the tail feathers, which also have white tips. The striking colour contrast in the feathers of the remiges and rectrices is one of the species' most distinctive traits.

Habitat

Typically observed individually, in pairs, and to a lesser extent in small flocks, Painted Honeyeater prefers habitats including mistletoes found in eucalypt forests or woodlands, riparian woodlands, as well as environments with trees within farmland or gardens (DoE 2015). Preference is given to woodlands with a higher density of mature trees, as these tend to support more mistletoes. It is more commonly observed in broader blocks of remnant woodland rather than in narrower strips (Garnett *et al.* 2011). However, it is known to breed in relatively narrow roadside strips provided there is an abundance of mistletoe fruit available.

Distribution

Painted Honeyeater maintains a sparse distribution spanning from southeastern Australia to northwestern Queensland and eastern Northern Territory. The majority of breeding occurrences and highest concentrations are observed south of 26ºS, particularly along the inland slopes of the Great Dividing Range from the Grampians in Victoria to Roma in Queensland (Higgins *et al.* 2001). The species seasonal movements from north to south are primarily driven by the fruiting of mistletoe, which coincides closely with its breeding season (Barea and Watson 2007). Following breeding, many individuals migrate to semi-arid regions such as northeastern South Australia, central and western Queensland, and central Northern Territory. Due to its dispersal patterns, the species is considered to have a single population (Garnett *et al.* 2011).

Survey Method

See Section 2.5.13 (Bird Utilisation Surveys).

2.5.12 *Swift Parrot*

EPBC Act Conservation Status: Critically Endangered

FFG Act Conservation Status: Critically Endangered

Plate 14. Swift Parrot (Ecology and Heritage Partners Pty Ltd).

Ecology

Swift Parrot is a slim, medium-sized nectivorous parrot measuring approximately 25 centimetres in length, with angular pointed wings and long tapering tail feathers. It is predominantly green with a dark blue crown and a red face, chin and throat. The adult female is slightly duller than the male, with less red blotching on the underbelly, while juveniles can be distinguished by their dark brown iris and pale orange bill (Higgins 1999).

Habitat

Habitat utilised by the Swift Parrot when the species is in mainland Australia typically includes dry open eucalypt woodlands and forests comprised of box-ironbark communities, where the species feeds on seeds, insects, nectar of flowering eucalypts, pollen-exhibiting Golden Wattle *Acacia pycnantha* and lerp-infested trees. Swift Parrots display a preference for Red Ironbark *Eucalyptus tricarpa*, Mugga Ironbark *sideroxylon*, Grey Box *Eucalyptus microcarpa*, White Box *Eucalyptus albens* and Yellow Gum *Eucalyptus melliodora*, but are also known to utilise numerous other eucalypt species for foraging purposes (Higgins 1999; Saunders and Tzaros 2011).

Distribution

Swift Parrot breeding occurs solely within Tasmania, predominantly between August and February within dry, grassy, Blue Gum *Eucalyptus globulus* forests of south-eastern Tasmania, and occasionally in northern Tasmania within shrubby, coastal stringybark forest (Saunders and Tzaros 2011). These parrots undertake a migratory journey from their breeding grounds in Tasmania to their wintering grounds on the mainland, primarily in Victoria and New South Wales.

Survey Method

See Section 2.5.13 (Bird Utilisation Surveys).

2.5.13 *Bird Utilisation Surveys*

Bird utilisation surveys are the most commonly used method for generating quantitative data on bird use of a potential wind farm site. The bird utilisation surveys for the Project were designed to comply with the guidelines described in *AusWEA – Wind Farms and Birds: Interim Standards for Risk Assessment* (2005). According to these guidelines, bird utilisation surveys are undertaken to ascertain:

- The species composition of birds that use the Project Site;
- The frequency with which each of those species use the Project Site;
- The height at which each of these species fly in the Project Site; and,

- The distribution of these species across the landscape.

Bird utilisation surveys are a minimum requirement for proposed wind farm sites and are used to inform the design of higher-level investigations, if required. The total number of point counts was determined based on both the habitat conditions of the Project Site and the number of turbines proposed, in addition to any existing data that has already been collected (e.g. detailed significant species data).

At least 24 bird utilisation survey events were conducted (Table 3) for each of the 10 fixed point count locations (seven within the Project Site, and three outside the Project Site) (Figure 3). In total, over 240 bird utilisation survey events were conducted over three survey periods (winter 2023, summer 2024, autumn 2025). Zoologists noted any incidental records of significant birds species while undertaking other assessments within the Project Site.

AusWEA Wind Farms and Birds: Interim Standards for Risk Assessment

The Australian Wind Energy Association (AusWEA 2005) has developed interim standards for risk assessment of birds for wind farm developments in Australia. This document outlines the type of investigations required, the order in which they should be undertaken and a systematic approach for assessing risk of bird impact at wind farms. This process allows for more detailed studies should a potentially significant risk be identified during preliminary studies.

The AusWEA (2005) interim standards recommend three levels of investigations, with each level involving increasing levels of detail. These levels include:

- **Level 1** investigations provide an initial assessment of the risk of significant bird impacts from the operation of the proposed wind farm; Level One investigations involve a regional overview, review of existing data, an indicative bird utilisation survey and roaming surveys.

- **Level 2** investigations refine the risk assessment from the Level One investigation, using more intensive methods. Level Two investigations involve roaming surveys and risk modelling.

- **Level 3** investigations are initiated if the results of the Level Two investigations indicate a greater than low level of residual risk of significant bird impacts from the operation of the proposed wind farm. Level Three investigations involve population assessment and population viability analysis.

For the proposed wind farm development, a Level One investigation was undertaken.

The interim standards also recommend consultation with the wind farm developer and key representatives of agencies that assess and approve development to:

- Agree on the issues, questions and objectives of bird impact risk assessment studies;

- Agree on the consequence and, where relevant, likelihood criteria that apply to the results of the studies; and,

- Where required, agree on the nature and effectiveness of mitigation measures.

Fixed Point Bird Counts

Two Zoologists, experienced in bird identification, undertook the fixed-point count surveys to the specifications outlined below. Birds were identified to species level using 10 × 42 binoculars where able, or otherwise recorded to genus (e.g. non-calling Raven species).

The following was undertaken as part of the fixed-point bird counts:

- Ten locations were established at which to undertake fixed point counts with three of these located outside of the Project Site. The locations chosen were to ensure that the entire Project Site was sampled and that a range of habitat types represented in that sample (Figure 3);
- The search radius from the point was at least 100 metres for small birds and up to 800 metres for large birds (e.g. birds of prey, waterbirds), or further, if accurate identification to species level was achievable, using prominent landmarks;
- The duration of each fixed-point count was 20 minutes;
- The height at which each bird flew through the survey area was estimated to the nearest 10 metres;
- The direction of flight of each bird was recorded to the nearest 45 degrees of the compass;
- Each point was surveyed at different times of day (e.g. early morning, late morning, early afternoon and late afternoon) to account for diurnal differences in bird activity; and,
- Each point was surveyed at least 20-times over the course of the survey period.

Incidental observations and roaming surveys

In addition to bird species recorded during the fixed-point count surveys, incidental observations of bird species were recorded while travelling between point counts and during other field-based activities. Birds seen adjacent to the Project Site were also recorded. Where suitable habitat for wading birds (principally *Charadriiformes*) and other waterbirds (ducks and herons) was observed, this habitat was surveyed for these species as per the '*Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species*' (DoEE 2017).

Statistical Analyses

Species accumulation curves were generated from the point count data and is presented as graphs. This, along with a measure of completeness provides an overall account of the survey efficacy in predicting the species likely to occur within the Project Site.

Completeness follows the methods of Watson (2003) which is widely used in the manufacturing industry and ecology-based projects (Watson 2003) and is calculated as the actual richness (A) divided by the predicted richness *(P)* expressed as a percentage. The predicted species richness was calculated computed with the EstimateS 9.1.0 program, using the Michaelis–Menten richness estimator (MMMeans) using 1000 runs and estimates of 101, which uses the ratio of species seen once (singletons) to the species seen more than once (doubletons) to predict species richness (Raaijmakers 1987; Colwell *et. Al.,* 2004; Colwell 2013).

The analysis was based on 241 bird point counts and 101 bird species.

Observations of birds were classified, according to their height, into four categories:

- Ground;
- Below RSA (1–54.5 metres);
- Within RSA (between 54.5 – 250.5 metres); and,
- Above RSA (>250.5 metres).

Analysis of the bird utilisation survey data is provided in Section 3.7.

2.5.14 Owl Surveys

DEECA (2024a) identified Barking Owl *Ninox connivens* and Masked Owl *Tyto novaehollandiae* as 'species of concern' when developing a science-based approach to defining key species of birds and bats of concern for wind farm developments in Victoria. While not a 'species of concern, Powerful Owl *Ninox strenua* was also considered during the survey program.

Ecology

Powerful Owl

EPBC Act Conservation Status: Unlisted

FFG Act Conservation Status: Vulnerable

Powerful Owls mate for life (approximately 30 years) and a breeding pair defend their home-range all year round. Home-ranges are known to vary widely depending upon landscape matrix, size of bushland patches, and prey and/ or tree-hollow density (Bilney 2013). They may cycle through multiple preferred nest hollows, spending between two and five years at each nest site before moving to the next (McNabb 1996) or continually utilise the same hollow (SWIFFT 2024).

Plate 15. Powerful Owl (Ecology and Heritage Partners Pty Ltd)

Barking Owl

EPBC Act Conservation Status: Unlisted

FFG Act Conservation Status: Critically Endangered

In Victoria, Barking Owl have an estimated population size of fewer than 50 pairs (Silveira 1997). Barking Owls are sedentary and likely remain in the same territory from year to year. The species hunts reasonably close to their nest site (1-2 kilometres), but home ranges have been observed to be an average of 2,000 hectares in semi-arid areas (Kavanagh and Bamkin 1995). Nesting occurs between July and October

Plate 16. Barking Owl (https://ebird.org/species/barowl1)

within large tree hollows, during which time the Barking Owl produces 2-3 young (SWIFFT 2025).

Masked Owl

EPBC Act Conservation Status: Unlisted

FFG Act Conservation Status: Critically Endangered

Plate 17. Masked Owl (https://www.swifft.net.au/cb_pages/sp_masked_owl.php)

The Masked Owl is one of the least known owl species in Australia. It is difficult to detect due to its secretive behaviour, including aversion to light and prolonged periods without calling during the non-breeding season (SWIFFT 2025b).

It is the second largest species of owl in Australia (second to Powerful Owl) and has a home range greater than 1,000 hectares (SWIFFT 2025b; McNabb *et al*. 2003). Masked Owls breed from April to November, but only when conditions are favourable and food is plentiful. They roost and nest in large tree hollows, and produce 1-2 fledglings which leave the nest in December (Birdlife Australia 2025).

Habitat Preferences

Powerful Owl

Powerful Owl is the largest owl species in Australia. It prefers tall open sclerophyll forest and woodlands, requiring large, hollow-bearing eucalypts for breeding. The Powerful Owl prefers areas with dense scrub nearby but has been recorded in a variety of wooded habitats. It prefers large tracts of continuous forest but will sometimes occur in more fragmented landscapes or near permanent streams dominated by Mountain Grey Gum *Eucalyptus cypellocarpa* and other eucalypts.

Powerful Owl is occasionally recorded in parklands and adjoining suburban areas, but rarely, if ever, breed in these areas (Higgins 1999). They have been increasingly reported in urban environments, that provide adequate prey, tree hollows for nesting and a high canopy cover with structural diversity of vegetation for roosting (Isaac *et al*. 2013), but rarely, if ever, breed in these areas (Higgins 1999). Powerful Owls prefer dense gullies for roosting and breeding.

Powerful Owl typically require large areas of forest or woodland vegetation and is most often observed in mixed-species foothill forests (DSE 2011b). Reaching up to 60 centimetres, suitable nesting hollows are generally considered to at least 50 centimetres wide, and one metre dep (Cooke *et. al.,*2002). The species prefers older forests, with dense gullies for roosting and breeding sites. A territory of 400 hectares in high quality habitat may support a pair of Powerful Owl (Higgins and Davies 1999), though territories of over 4,000 hectares can be required in lower quality or fragmented landscapes (Soderquist *et al.* 2002).

Barking Owl

Barking Owl predominantly inhabits open woodland forest habitats that adjoin farmlands. The species shows a strong habitat preference for areas with a high density of large trees (with a diameter greater than 60 centimetres) and a high density of hollow-bearing trees (comprising suitable nesting hollows with a diameter greater than 15 centimetres) (SWIFFT 2025a).

The species typically requires less territory than the Powerful Owl and can be more flexible across a range of habitat types, with the species often recorded within riparian corridors through otherwise cleared land (Higgins 1999). Like Powerful Owl, Barking Owl also preferentially hunt Ringtail Possum *Pseudocheirus peregrinus*, but may opportunistically hunt smaller birds, invertebrates, reptiles, rats and rabbits.

Masked Owl

The Masked Owl inhabits forests (wet sclerophyll, dry sclerophyll and non-eucalypt dominated forest), scrub, gullies, timbered waterways and cleared land with remnant old growth trees (i.e. grazed farmland) (SWIFFT 2025b; McNabb *et al.* 2003). It mainly requires old growth eucalypts with suitable hollows for nesting and roosting (1-3 metre depth, 0.5 metre width), and adjacent areas for foraging.

Masked Owl hunts during early night and predominantly feeds on small native mammals (i.e. Antechinus, rodents, possums and gliders), but may also predate on reptiles, birds and insects. Masked Owls are territorial, and pairs remain in or near the territory all year round, with a home range greater than 1,000 hectares (Birdlife Australia 2025; SWIFFT 2025b).

Distribution

Powerful Owl

Within Victoria, Powerful Owl mostly occurs to the south of the 36°30' line of latitude, predominantly in south-east mainland Australia, between southern Queensland and Victoria. The species' distribution in Victoria stretches from the eastern highlands into south-west Victoria, with much of the population occurring in the forested and alpine regions of eastern Victoria. Nonetheless, the species regularly occurs in the south-west, with records in the following bioregions; Central Victorian Uplands, Goldfields, Greater Grampians, Glenelg Plain, Otway Ranges, Otway Plain and Warrnambool Plain (SWIFFT 2024).

Barking Owl

Within Victoria, Barking Owl has been recorded from scattered localities throughout the state, however it is largely absent from unforested areas such as the volcanic plains and the semiarid north-west (NRE 2001; DSE 2003). The species predominantly occurs in the 400-700-millimetre rainfall zone north of the Great Dividing Range (Emison *et al.* 1987; DSE 2003).

Masked Owl

Masked Owl occurs across a broad band around most of the Australian mainland coastline. Within Victoria, most records occur in East Gippsland, but three areas of concentrated records also exist within the south-west region; the Otway Ranges, the Midlands and Portland area (SWIFFT 2025b). The Victorian sub-species of Masked Owl (*Tyto novaehollandiae novaehollandiae*) has the least stable population and its distribution is declining, especially following the 2019-2020 bushfires in East Gippsland.

Survey Method

Targeted survey searches for forest owl species were undertaken at eight locations (four within the Project Site, and four outside the Project Site), with the primary aim to determine the presence and absence of Powerful Owl, Barking Owl and Masked Owl, and to further investigate potential roosting sites if these species was recorded. Surveys were undertaken by two qualified ecologists on 6th, 7th, 11th and 12th September 2023. Survey methods were in accordance with approved industry best practise standards (DSE 2011b).

Surveys were undertaken during a time of increased detectability for these species, when breeding and nesting seasons are underway for Barking Owl (i.e. July to October) and Masked Owl (i.e. April to November) (SWIFFT 2025a; SWIFFT 2025b), and when juvenile Powerful Owls are almost ready to leave the nest and their begging calls can be heard at roost/nest sites (i.e. September to November) (DSE 2011b). Powerful Owl pairs display strong a preference for extensive territories, which are influenced by habitat quality (i.e. continuous forest or woodland habitat with suitable hollows), and prey abundance.

Two types of surveys were undertaken for these owl species: targeted call playback surveys and hollow assessments. Diurnal surveys were undertaken to determine the extent of potential roosting / breeding habitat within the Study Area by recording the size (small <15 centimetres, medium 15-40 centimetres, large >40 centimetres), type (spout, trunk), and location of hollows, which is a key indicator of hollow suitability for the species (Figure 12). Barking Owls are moderately large at a length of approximately 40 centimetres (SWIFFT 2025a), whilst Masked Owls are slightly larger with females reaching 47 centimetres (SWIFFT 2025b), and Powerful Owls reaching between 58 centimetres (females) to 67 centimetres (males) (SWIFFT 2024). As such, large hollows were of particular interest for further investigation.

Importantly, these owl species are vulnerable to disturbance during Spring as Barking Owls and Masked Owls begin nesting and juvenile Powerful Owls begin emerging from hollows (SWIFFT 2025a; DSE 2011b). For this reason, survey sites were separated by a minimum of three kilometres, with two-night surveys undertaken at eight sites (Figure 4).

In order to survey for the Powerful Owl, Barking Owl and Masked Owl concurrently, *Multi species large owl playback* sessions (*Section 6.1*, DSE 2011b) were undertaken at each site.

2.5.15 Bat Surveys

Potential occurrence of two State significant microbats, namely Eastern Bent-wing Bat *Miniopterus schreibersii* and Yellow-bellied Sheathtail Bat *Saccolaimus flaviventris*, was indicated via desktop and field assessments. As such, the purpose of the bat survey was to gain an understanding of the diversity of species that are likely to utilise habitat within and adjacent to the Project Site.

Eight Song Meter SM4 (Wildlife Acoustics™) sound recorders were deployed on 19 October 2023 and retrieved on 19 November 2023 (i.e. left out for 31 days (Figure 7).

The SM4's recorded audible sounds from 10kHz hz-55kHz which is the calling acoustic frequency for microbats. These instruments record the high frequency calls or echolocation, produced by the bats when they are in flight, and save these calls directly to a memory card. Different bat species produce distinguishable calls; therefore, detectors were used to identify the species present in each area. It is important to note that although detectors may give an index of overall bat activity levels, they cannot be used to determine bat abundance, as the number of individuals making the calls is not known.

Bat detector locations were chosen based on geography and habitat type to capture a representative sample of the Project Site (Figure 7). Weller and Zabel (2002) found detectors placed at a height of 1.4 metres recorded 30% more calls than those placed on the ground. This method was adopted at all locations within the Project Site.

Call Analysis

Identification of bat calls collected were analysed by Rob Gration from EcoAerial Consulting Services, a recognised expert in bat call analysis. All nights of data were assessed for the calls of all bats, with a particular focus on the detection of significant bats, such as Eastern Bent-Wing Bat and Yellow-bellied Sheathtail Bat.

If one of the call complex cohorts (i.e. Little Forest Bat *Vespadelus vulturnus* or Chocolate Wattled Bat *Chalinolobus morio*) was positively identified, it was recorded as present once only.

Call analysis involved the allocation of every data file to a species, and then counting the number of call records for each species. Results of the call analysis is provided in Section 3.8.

2.6 Likelihood of Occurrence Assessment

Relevant biological databases, literature (listed in Section 2.1) and expert advice were used to identify all species records of national, State and regional conservation significance within 10 kilometres of the Project Site (i.e. the ROI). The proximity, number, dispersion and date of known locality records (assuming over-dispersed and random patterns of locality records being more likely to occur in the Project Site) were considered to determine a species' likelihood of occurrence within the Project Site.

Additional factors also taken into consideration include: the known biogeographical distribution of the species; underlying geology of existing locality records; and, vegetation and habitat associations. The decision guidelines for determining the likelihood of occurrence of flora and fauna species are presented in Table 9 and Table 10 respectively.

The results of the likelihood of occurrence assessment for listed flora and fauna species are provided in Appendices 2.4 and 3.1, respectively.

Table 9. Decision guidelines for determining a flora species likelihood of occurrence within the Project Site.

Likelihood of occurrence	Decision guidelines
1 – Known occurrence	Recorded within the Project Site recently (i.e. within 10 years).
2 – High	Previous records of the species in the local vicinity; and/or, the Project Site contains areas of high-quality habitat.
3 – Moderate	Limited previous records of the species in the local vicinity; and/or, the Project Site contains some characteristics of the species' preferred habitat.
4 – Low	Poor or limited habitat for the species however other evidence (such as a lack of records or environmental factors) indicates there is a low likelihood of presence.
5 – Unlikely	No potential habitat and/or outside the species range.

Table 10. Decision guidelines for determining a fauna species likelihood of occurrence within the Project Site.

Likely presence or use of the Project Site	Decision guidelines
1 – Known occurrence	Recorded within the Project Site recently (i.e. within 10 years).
2 – High	Likely resident in the Project Site based on database records, or expert advice; and/or, recent records (i.e. within 10 years) of the species in the local area; and/or, the Project Site contains the species' preferred habitat.

Likely presence or use of the Project Site	Decision guidelines
3 – Moderate	The species is likely to visit the Project Site regularly (i.e. at least seasonally); and/or, previous records of the species in the local area; and/or, the Project Site contains some characteristics of the species' preferred habitat.
4 – Low	The species may visit the Project Site occasionally or opportunistically whilst en route to more suitable sites; and/or, there are only limited or historical records of the species in the local area (i.e. more than 20 years old); and/or, the Project Site contains few or no characteristics of the species' preferred habitat.
5 – Unlikely	No previous records of the species in the local area; and/or, the species may fly over the Project Site when moving between areas of more suitable habitat; and/or, out of the species' range; and/or, no suitable habitat present.

2.7 Assessment Qualifications and Limitations

Data and information held within the ecological databases and mapping programs reviewed in the desktop assessment (i.e. VBA, PMST, Nature Kit Maps etc.) are unlikely to represent all flora and fauna observations within, and surrounding, the Project Site. It is therefore important to acknowledge that a lack of documented records does not necessarily indicate that a species or community is absent. Furthermore, a documented record may indicate a species' presence in an area at a given point in time, but it generally does not offer information about how a species is making use of an area (e.g. foraging, nesting, dispersing). This can be important information when determining the potential impact of a proposed action on a threatened species.

The 'snap-shot' nature of a biodiversity assessment, meant that migratory, transitory or uncommon fauna species may have been absent from typically occupied habitats at the time of the field assessment. In addition, annual or cryptic flora species such as those that persist via underground tubers may also be absent. Nevertheless, the terrestrial flora and fauna data collected during the field assessment and information obtained from relevant desktop sources is considered adequate to provide an accurate assessment of the ecological values present within the Study Area.

Ecological values identified were recorded using a hand-held GPS or tablet with an accuracy of +/-3 metres. This level of accuracy is considered adequate to provide an accurate assessment of the ecological values present within the Study Area; however, this data should not be used for detailed surveying purposes.

Generally, the level of risk posed by the limitations described below is low due to the level of effort and resources used to conduct multiple ecological surveys to date throughout the Project Site. Additional information has been obtained from previous assessments (Biosis 2022, ERM 2022a, ERM 2022b, Nature Advisory 2022, 2024). Limitations and assumptions relating to the survey effort for ecological values are detailed below.

2.7.1 Vegetation Surveys

Only the Study Area was assessed as part of the habitat hectare assessments and targeted flora surveys.

Much of the field assessment was undertaken over one season. Further surveys may be required to maximise the likelihood of detection for significant flora and fauna species. Where biomass has been insufficient to adequately conduct assessments, these assessments have been rescheduled for when conditions become suitable.

The level of risk posed by these limitations is low due to the level of effort and resources used to conduct multiple vegetation surveys throughout the Project Site. Therefore, it is considered that the terrestrial flora data collected during the field assessment and information obtained from relevant desktop sources is considered to provide an accurate assessment of the ecological values present within the Project Site.

2.7.2 Bird Utilisation Surveys

The fixed-point bird counts may have suffered from some biases because of the use of estimation in determining the distance of birds from the observer. Horizontal distances became increasingly difficult to judge as the distance between the observer and the bird increased.

Vertical distances were also difficult to judge, depending on structures and other landmarks that could be used as a reference. However, the higher the bird the greater the likelihood of error. In addition, this difficulty was not consistent across species, with small and large species biasing the results in unknown directions.

To attempt to overcome these potential errors, and to calibrate the estimations of the observers, at each point count 200 metres was measured to use as a reference for the estimations that followed. To calibrate height, a landmark of known height (such as wind anemometer tower, power-line poles etc.) was used as a reference point. Whilst these precautions alleviated some of the bias in this process, the height and distance data need to be interpreted in a cautious manner, given the probability of a high degree of error in the data-set.

A further bias in the data-set is the over-representation of large birds. As the distance between the observer and the bird increases, smaller species are increasingly likely to be overlooked. This effect is also likely to be exacerbated by weather conditions with overcast, windy or wet conditions having a negative impact on the detectability of some birds.

2.7.3 General Limitations

General ecological limitations associated with the ecological investigations include:

- The assessment of likelihood of occurrence is based on survey effort and results, background information and previous records compiled;
- Non-vascular flora (i.e. mosses, liverworts) were not recorded, although their presence is noted as part of the cover of native species in the definition of a patch of native vegetation;
- Ecological features identified during field assessments were recorded using a differential GPS (dGPS) with sub-metre accuracy, or a hand-held tablet or GPS with an accuracy of between +/- 3 metres. This level of accuracy is considered adequate to provide an accurate assessment of the ecological features present within the Project Site; however, this data should not be used for detailed surveying purposes; and,
- For cryptic and less abundant species that are known to, or that have the potential to use habitat resources within the Study Area as a resident or a visitor on a regular or infrequent basis, the precautionary principle (i.e. the absence of a species during targeted surveys is not used as a reason for assuming the species is not present, or may utilise habitats within the Study Area, particularly where the species was/is known to occur within the locality, and the Study Area supports suitable habitats) has been applied when determining the likelihood of occurrence.

2.7.4 Updated Development Footprint

ACCIONA Energía provided the most recent development plan layout on 22 April 2025. The development of the layout has followed an iterative process considering a variety of factors including the avoidance and mitigation of potential ecological impacts.

The most recent development plan layout provided on the 22nd of April resulted in additional areas that will need to be surveyed. It is intended that these areas will be surveyed to ensure the presence of potential ecological values can be quantified and subsequently incorporated into an updated version of this report. However, the updated development plan is not anticipated to substantially alter the impacts included within this report, specifically the assessment against the EES referral thresholds detailed in Section 6.2.

3 EXISTING ECOLOGICAL CONDITIONS

3.1 Overview

Much of the Study Area is highly modified due to agricultural practices and is dominated by cropped land (e.g. – wheat, canola, barley) and heavily grazed paddocks dominated by exotic grasses and environmental weeds. Paddock and parcel boundaries often contained planted shelterbelts consisting of exotic species and Australian native species usually non-indigenous to the region. Dwellings and structures on parcels within the Project Site are generally surrounded by amenity plantings of exotic and Australian native species.

Native vegetation in the Study Area is representative of twelve (12) EVC's: Lowland Forest (EVC 16); Grassy Dry Forest (EVC 22); Valley Grassy Forest (EVC 47); Plains Grassy Woodland (VVP EVC 55_61 and CVU EVC 55); Creekline Grassy Woodland (VVP/CVU EVC 68); Plains Grassy Wetland (EVC 125); Creekline Herb-rich Woodland (EVC 164); Grassy Woodland (VVP EVC 175 and CVU EVC 175_61); *Heavier-soils* Plains Grassland (EVC 132_61); Escarpment Shrubland (EVC 895); and Stream Bank Shrubland (EVC 851). The presence of these EVCs is generally consistent with the modelled pre-1750s native vegetation mapping (DEECA 2025c).

A total of 671.05 hectares of native vegetation was recorded within the Study Area (Table 11).

A summary of the results of the vegetation assessments are given in Table 11 and Table 12, which outlines the type and extent of each EVC recorded, and scattered native trees (large and small) within the Study Area.

Table 11. Extent of mapped vegetation type (EVC).

EVC	BCS	Extent (hectares)^	# Large Trees in patches
Central Victorian Uplands Bioregion			
Lowland Forest (EVC 16)	Least Concern	0.14	2
Grassy Dry Forest (EVC 22)	Depleted	58.35	629
Valley Grassy Forest (EVC 47)	Vulnerable	13.88	88
Plains Grassy Woodland (EVC 55)	Endangered	7.09	3
Creekline Grassy Woodland (EVC 68)	Endangered	13.47	8
Plains Grassy Wetland (EVC 125)	Endangered	0.11	0
Plains Grassland (EVC 132)	Endangered	6.43	0
Creekline Herb-rich Woodland (EVC 164)	Vulnerable	0.37	11
Grassy Woodland (EVC 175)	Endangered	15.20	152
CVU Subtotal		115.05	893
Victorian Volcanic Plain Bioregion			
Grassy Dry Forest (EVC 22)	Depleted	1.83	64
Plains Grassy Woodland (EVC 55)	Endangered	12.92	90
Creekline Grassy Woodland (EVC 68)	Endangered	7.53	114
Plains Grassy Wetland (EVC 125)	Endangered	0.13	0
Plains Grassland (EVC 132)	Endangered	304.87	0

EVC	BCS	Extent (hectares)^	# Large Trees in patches
Grassy Woodland (EVC 175)	Endangered	2.95	34
Stream Bank Shrubland (EVC 851)	Endangered	5.34	26
Escarpment Shrubland (EVC 895)	Endangered	1.00	0
VVP Subtotal		336.58	328
Total (CVU + VVP)		451.629	1221

Note: ^ Area in hectares (rounded off to three decimal places); BCS = Bioregional Conservation Significance, CVU = Central Victorian Uplands Bioregion, VVP = Victorian Volcanic Plain Bioregion

The results of the habitat hectare assessment are provided in Appendix 1.3.

A total of 156 flora species were recorded, comprising 105 native and 51 non-native species. A list of all flora species recorded during the field assessment are provided in Appendix 1.1.

A total of 121 fauna species were recorded comprising 111 native and 10 non-native species. Of these, there were 91 birds (83 native and 7 non-native species); eight reptiles (all native); five amphibians (all native); 16 mammals (13 native and 3 non-native); and one invertebrate (native). A list of all fauna species recorded during the field assessment are provided in Appendix 2.2.

3.2 Patches of Native Vegetation

3.2.1 Lowland Forest (EVC 16)

Lowland Forest (LF) is characterised by a diverse range of understorey species and life forms including shrubs, grasses and herbs under a 20-metre-tall Eucalypt canopy layer. Lowland Forest typically occurs on moderately well-drained soils in areas of relatively high rainfall (DEECA 2025c).

Lowland Forest was predominately identified within the Project Sites north and was classified into one habitat zone (LF1; Figure 2).

One heavily modified area within the Project Sites northwest, identified as LF1, comprised a moderate cover of Austral Bracken *Pteridium esculentum* and the occasional Common Wallaby Grass *Rytidosperma caespitosum* within the understorey. The canopy layer comprised a dense cover of planted Blue Gum *Eucalyptus globulus* present as plantation. No middle layer was present (Plate 19).

Plate 18. Lowland Forest (LF1) recorded within the Project Sites north (Ecology and Heritage Partners Pty Ltd 26/03/2024).

Plate 19. Lowland Forest recorded within the Project Sites north (Ecology and Heritage Partners Pty Ltd 26/03/2024).

3.2.2 Grassy Dry Forest (EVC 22)

Grassy Dry Forest (GDF) is characterised by a canopy layer dominated by a mixture of low to medium height Eucalypts over a smaller secondary tree layer including a number of Wattle *Acacia* species. The understorey generally contains a sparse shrub layer over a diverse ground layer of drought tolerant grasses, herbs, and often ferns (DEECA 2025c).

Grassy Dry Forest was identified within the Project Sites northwest and was classified into two habitat quality zones (GDF2-3; Figure 2) based on habitat quality. The highest quality areas of Grassy Dry Forest contained a high cover of Messmate *Eucalyptus obliqua* with the occasional Manna Gum *Eucalyptus viminalis* subsp. *viminalis* in the canopy layer. A middle layer was also only present in high quality patches (GDF3), comprising recruiting canopy trees and scattered shrubs including Gold Dust Wattle *Acacia acinacea,* Sweet Bursaria *Bursaria spinosa.* The ground layer had a high coverage of bare ground and was generally lacking in native flora diversity, often only comprising a few species.

GDF2 and GDF3 contained a dense layer of large old, and often dead, Messmate Eucalypts in the canopy with scattered Manna Gum also present in fringing areas (Plate 22). Canopy species recruitment was notably high with a dominant coverage of small and medium Messmate present throughout all patches of GDF2 and GDF3. While no GDF habitat zone within the Project Site contained a highly diverse representation of native flora within the middle layer, GDF3 comprised the highest species diversity with the occasional Gold Dust Wattle and Sweet Bursaria. GDF3 also contained the highest coverage and diversity of native ground layer flora including a low coverage of Wattle Mat-rush *Lomandra filiformis,* Black-anther Flax-lily *Dianella revoluta,* Kidney-weed *Dichondra repens,* Honey-pots A*crotriche serrulata,* Common Wallaby Grass and Spear Grasses *Austrostipa* spp(Plate 23).

Grassy Dry Forest also occurred in several habitat zones within the proposed transmission line in the study areas north, in both the Victorian Volcanic Plain and the Central Victorian Uplands Bioregions. GDF4 contained a sparse canopy layer of Messmate Stringybark with relatively few large trees per hectare recorded. The

understory was sparse within open areas with a shrub layer only in treed areas consisting of Hedge Wattle and Blackwattle over a ground layer dominated by Honey-pots, Small St John's Wort *Hypericum gramineum,* Weeping Grass, Wallaby Grasses, and Kangaroo Grass.

Habitat zone GDF8 was in moderate-low condition. The understory was species poor, generally consisting only of a moderate cover of Wallaby Grass with several large trees in patches present.

GDF10 to GDF11 were along the Taylor Road roadside in good condition. They generally had a canopy cover of Rough-barked Manna Gum *Eucalyptus viminalis* subsp. *cygnetensis* over a shrub layer of Tree Violet, Blackwattle, and Blackwood, with a ground layer of Austral Bracken, Black-anther Flax-lily, Thatch Saw-sedge *Gahnia radula,* and Yellow Rush Lily *Tricoryne elatior.* Weed cover was moderate through these areas with common grassy weeds present such as Sweet Vernal-grass *Anthoxanthum odoratum* and Prairie Grass *Bromus catharticus* (Plate 22).

Habitat Zones GDF12 and GDF13 were in the northernmost portion of the proposed transmission line, where there had been historic clearing for the extent of the existing transmission line. GDF12 was treeless but exhibited high diversity and recruitment of native species. The shrub layer consisted of Yarra Burgan *Kunzea leptospermoides*, Hedge Wattle, over a diverse ground layer inclduing Austral Bracken, Bidgee-widgee Acaena novae-zelandiae, Matted Bush-Pea *Pultenaea pedunculata*, and Bent Goodenia *Goodenia geniculate* (Plate 23).

GDF13 was adjacent to the cleared area and comprised of a recovering stand of Messmate Stringybark which lacked large trees but contained some canopy cover. The understory was relatively species poor, comprising of Blackwood, Black-anther Flax-lily, Wattle Mat-rush, and Common Raspwort.

Plate 20. Grassy Dry Forest (GDF3) recorded within the Project Sites northwest (Ecology and Heritage Partners Pty Ltd 26/02/2024).

Plate 21. Grassy Dry Forest recorded within the Project Sites northwest (Ecology and Heritage Partners Pty Ltd 26/02/2024).

Plate 22. Grassy Dry Forest recorded along Taylor Road (Ecology and Heritage Partners Pty Ltd 26/11/2024).

Plate 23. Historically cleared but recruiting Grassy Dry Forest (GDF12) beneath the existing transmission line in the study areas northeast (Ecology and Heritage Partners Pty Ltd 25/11/2024).

3.2.3 Valley Grassy Forest (EVC 47)

Valley Grassy Forest is an EVC in the Central Victorian Uplands Bioregion that occurs on valley floors gently undulating slopes with a rainfall regime of 700-800 millimetres per annum. A variety of Eucalypt species that prefer moist and fertile conditions are usually present and grow to 25 metres. The midstory contains a sparse shrub layer over a ground layer of herbs, lilies, grasses, and sedges, although this becomes less diverse during the drier end of the spectrum (DEECA 2025c).

Valley Grassy Forest was identified in the project site within the northwest corner of the transmission line in one habitat zone in moderate-good condition. Habitat zone 1 (VGF1 on Figure 2) had a low share of large trees per hectare, with the sparse canopy layer consisting of Eucalypt species such as Messmate Stringybark and Rough-barked Manna Gum. Large areas of this habitat zone were cleared for grazing and consisted only of a ground layer of Wallaby Grasses and Spear Grasses with occasional Kangaroo Grass and Weeping Grass. When present, the shrub layer consisted of Blackwood, Blackwattle, and Hedge Wattle, over, Austral Bracken, Kidney Weed, and Honey-pots.

Plate 24. Treed portion of VGF1 (Figure 2) dominated by Messmate Stringybark (Ecology and Heritage Partners Pty Ltd 09/12/2024).

Plate 25. Cleared area of Valley Grassy Forest (VGF1 on Figure 2) (Ecology and Heritage Partners Pty Ltd 09/12/2024).

3.2.4 Plains Grassy Woodland (EVC 55)

Plains Grassy Woodland (PGW) occupies a range of geologies primarily persisting on the fertile soils of flat or undulating plains at low elevations. It is characterised as an open Eucalypt woodland to 15 metres tall with a sparse shrub layer and a diverse ground layer of grasses and herbs (DEECA 2025c). This EVC was recorded across the Project Site in both bioregions.

Plains Grassy Woodland recorded within the Project Site was classified into twenty habitat zones (PGW1-31) (Plate 23; Figure 2) based on quality, vegetation structure, and landscape context. A further 11 previously mapped habitat zones are excluded from this section as they no longer fall within the micrositing corridor. Occurrences of PGW within the Project Site were typically of low-quality, usually containing no canopy layer. When a canopy layer was present (i.e. PGW4, PGW7, PGW10), River Red Gum *Eucalyptus camaldulensis* formed the sole species over a scattering of disturbance-tolerant shrubs including Tree Violet *Melicytus dentatus,* Blackwood *Acacia melanoxylon*, Black Wattle *Acacia mearnsii*, Golden Wattle *Acacia pycnantha* and Sweet Bursaria. The understorey layer across habitat zones within the Project Site was highly variable, with some habitat zones entirely absent of native flora in the ground layer and other higher quality occurrences comprising a suite of grasses including Wallaby Grasses, Spear Grasses, Kangaroo Grass *Themeda triandra,* Windmill Grass and the occasional Common Tussock Grass *Poa labillardierei.* While less common, herbs and small shrubs such as Pink Bindweed *Convolvulus erubescens*, Nodding Saltbush *Einadia nutans* subsp. *nutans,* Ruby Saltbush *Enchylaena tomentosa* and Kidney-weed were present.

Habitat zones PGW1-6 represented the lower quality areas of Plains Grassy Woodland vegetation within the Project Site and contained no canopy layer (except for PGW4), instead typically comprising a scattered shrub layer (e.g. Tree Violet) over a variety of native grasses of which were most commonly limited to either Common Wallaby Grass, Hill Wallaby Grass *Rytidosperma erianthum* and/or Clustered Wallaby Grass *Rytidosperma racemosum*. The lowest quality representations (i.e. PGW1) were limited to the presence of one lifeform within either the middle (e.g. Golden Wattle) or ground layers (e.g. Common Wallaby Grass).

While habitat zone PGW7 represented the highest quality occurrence of Plains Grassy Woodland vegetation within the Project Site, generally comprising large canopy trees and a moderate diversity and abundance of native species (Plate 28). Flora species coverage and diversity within the majority of habitat zones across the Project Site was poor (Appendix 1.3). Most habitat zones were treeless, containing one or two shrub species over a moderate cover of native grasses (e.g. Common Wallaby Grass).

Similarly to earlier habitat zones, PGW31 consisted of rudimentary patches comprising only of one or a few native shrubs, such as Blackwoods or young Eucalypts.

Habitat zones PGW13 to PGW16 received similar scores. Habitat zones PGW13 and 16 consisted of a species poor understory primarily comprising of native grasses. However, these two patches contained a relatively high number of large canopy trees such as and Mana Gum and River Red Gum.

Conversely, habitat zones PGW14 and 15 lacked large trees and a canopy layer but had a more diverse understory. These patches generally had a shrub layer of Golden Wattle and Black Wattle, with a ground layer of Kangaroo Grass, Wallaby Grasses, Common Tussock-grass, and occasional Rushes *Lomandra* spp.

PGW17 represented a very low-quality area of Plains Grassy Woodland Vegetation within the project site, containing no large trees and an almost entirely absent understory. The canopy consisted of a sparse layer of Mana Gum *Eucalyptus viminalis* over an understory containing Wallaby Grass and Hedge Wattle. Among the understory was a high biomass of weeds of Toowoomba Canary Grass and Caterpillar Grass.

PGW19, 20, 22, and 23 all received similar scores of low quality Plains Grassy Woodland. These habitat zones all had very low understory biodiversity along with high levels of weeds present. River Red-gum was the dominant Eucalyptus species present in the canopy layer. The understory consisted of a low diversity of Hedge Wattle and Tree Violet with native grasses such as Wallaby Grass and Spear Grass present in low numbers. Habitat zones PGW20, 21, and 22 all had River Red-gum present as large trees.

Habitat zones PGW18 and PGW21 received the highest score due to a complex understory present. The shrub layer was dominated by Hedge Wattle with occurrences of Tree violet and Drooping Sheoak. A diverse layer of graminoids was present consisting of Wallaby Grass, Spear Grass, Flax-lily, and Juncus. The ground layer supported a few herbs such as Common Raspwort *Gonocarpus tetragynus* and Grassland Wood-sorrel *Oxalis perenanns.*

PGW30 comprised poor quality patches recorded along the transmission line within the existing rail corridor. It contained occasional canopy species such as Swamp Gum, often only as young individuals, and a shrub layer dominated by Hedge Wattle and Blackwood with occasional Cherry Ballart *Exocarpos cupressiformis*. The ground layer was sparse with scattered occurrences of Black-anther Flax-lily and Wallaby Grasses, but was generally dominated by exotic grass species such as Toowoomba Canary-grass.

Plate 26. Plains Grassy Woodland (PGW4) recorded within the Project Sites south (Ecology and Heritage Partners Pty Ltd 26/02/2024).

Plate 27. Plains Grassy Woodland (PGW1) recorded within the Project Sites north (Ecology and Heritage Partners Pty Ltd 03/04/2024).

Plate 28. Plains Grassy Woodland (PGW) recorded along Taylor Road in the Project Sites north (Ecology and Heritage Partners Pty Ltd 10/12/2024).

Plate 29. Plains Grassy Woodland (PGW30a) recorded within the Project Sites north (Ecology and Heritage Partners Pty Ltd 09/12/2024).

3.2.5 Creekline Grassy Woodland (EVC 68)

Creekline Grassy Woodland (CGW) is characterised by a Eucalypt woodland canopy to 15 metres and a scattered shrub middle layer over a generally grassy ground layer. A range of sedges and herbs may also be present in the understorey. Creekline Grassy Woodland typically occurs on low-gradient drainage lines on fertile colluvial/alluvial soils across a range of geological substrates. Ephemeral to intermittent, occurrences of Creekline Grassy Woodland along drainage lines are presumed to have previously resembled a linear wetland or system of interconnected ponds (DEECA 2025c).

Creekline Grassy Woodland between the two bioregions occurs on similar substrates within particular geographical features such as ephemeral river-banks and drainage lines on fertile colluvial/alluvial soils,

however exhibit distinct differences in vegetation structure and species composition within the middle and ground layers.

Creekline Grassy Woodland was identified within the Project Site and was classified into 15 habitat zones based on vegetation structure, species coverage and diversity, and landscape context. When present, the canopy layer comprised a high cover of characteristic Eucalypts including River Red Gum and Manna Gum. The middle and ground layers were highly variable, comprising a high cover of shrubs including Blackwood, Black Wattle and Silver Wattle *Acacia Dealbata* in higher quality representations with few to no middle storey species present within the lower quality habitat zones (i.e. CGW1-3).

The ground layer most often comprised a low to moderate cover of one or two native grass species from either the *Rytidosperma*, *Austrostipa, Poa* and/or *Themeda* genus (Plate 30). A moderate to high coverage of exotic grassy weeds was prevalent throughout the lower quality areas (i.e. CGW1-3) with species such as Perennial Rye *Lolium perenne,* Toowoomba Canary-grass *Phalaris aquatica*, Cocksfoot *Dactylis glomerata* and Brown-top Bent *Agrostis capillaris* often comprising a dominant coverage in the ground layer.

Moderate quality patches (CGW7-8) generally had some large trees present, but maintained a relatively species poor understory usually comprising of a cover of *Rytidosperma*, *Austrostipa, Poa* and/or *Themeda.*

In addition to containing a higher cover of these native grass species, the highest quality areas contained a number of large canopy trees and sporadically contained a range of other native grasses including Windmill Grass *Chloris truncata,* Weeping Grass *Microlaena stipoides* var. *Stipoides,* Common Wheat Grass *Anthosachne scaber* var. *scaber* and herbs including Pink Bindweed *Convolvulus erubescens* and Kidney weed in low abundance (i.e. CGW8-15). A number of patches (Figure 2) were also of sufficient quality to qualify as the *Threatened Ecological Community* Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP).

Plate 30. Creekline Grassy Woodland (CGW8) recorded within the Project Site (Ecology and Heritage Partners Pty Ltd 26/02/2024).

Plate 31. Creekline Grassy Woodland (CGW13) recorded within the Project Site (Ecology and Heritage Partners Pty Ltd 26/02/2024).

3.2.6 Plains Grassy Wetland (EVC 125)

Plains Grassy Wetland (PGWe) (EVC 125) is a typically treeless EVC although can include sparse occurrences of River Red Gum in addition to a sparse shrub component. The ground cover is dominated by grasses, herbs and

small sedges often rich in species diversity along the fringes, and species-poor in the wetter central areas (DEECA 2025c).

Although not modelled as occurring within the Project Site (DEECA 2025a), several small patches of Plains Grassy Wetland were mapped in low-lying areas, particularly man-made paddock dams. This EVC supported a wetland with a moderate diversity of herbs and native grasses including Rushes *Juncus* spp., Brown-back Wallaby-grass *Rytidosperma duttonianum* and Variable Willow-herb *Epilobium billardierianum* (Plate 32; Plate 33). Common grassy weed species such as Brown-top Bent and Toowoomba Canary-grass were often prevalent around dryer fringes.

Plate 32. Plains Grassy Wetland (PGWe1) recorded within the Project Site (Ecology and Heritage Partners Pty Ltd 19/03/2024).

Plate 33. Plains Grassy Wetland (PGWe1) recorded within the Project Site (Ecology and Heritage Partners Pty Ltd 19/03/2024).

3.2.7 Plains Grassland (EVC 132)

Plains Grassland (PG) is usually treeless vegetation to one metre high. This EVC is usually dominated by an array of graminoids and herbs, however occasional shrubs may also be present (DEECA 2025c). Plains Grassland was recoded in both Victorian Volcanic Plain (VVP) and Central Victorian Uplands (CVU) bioregions and varied from low to high quality across habitat zones PG1 to PG46.

Low quality Plains Grassland (PG1-5) occurred in intermittent patches throughout the southern portion of the Project Site within the VVP. These habitat zones were often devoid of native herbs and comprised of relatively low cover (<30%) of common native grass species such as wallaby-grasses (often Common Wallaby-grass or Clustered Wallaby-grass) and Spear grasses (often Kneed Spear-grass *Austrostipa bigeniculata* or Rough Spear-grass *Austrostipa scabra*). Weed cover was generally high in these patches with the vegetation usually dominated (>50% cover) by exotic grasses such as Toowoomba Canary-grass, Sweet Vernal Grass *Anthoxanthum odoratum* and Brown-top Bent *Agrostis capillaris*.

Plains Grassland habitat zones PG6-20 were of moderate quality, usually having a higher cover of native species (>30 and <50%). These patches were dominated by native grasses but had a higher diversity often including grass species such as Common Tussock-grass, Kangaroo Grass, and Windmill Grass. Some native herbs were also generally present with patches including common grassland species such as Sheeps Burr *Acaena echinata* and Grassland Wood-sorrel *Oxalis perennans.* Weed cover was generally moderate to high in these zones, with

grassy weeds such as Toowoomba Canary-grass and Chilean Needle Grass *Nassella neesiana* frequently occurring (Plate 34).

Habitat zones PG21-23 were considered high quality and were usually dominated by native species. Kangaroo Grass, wallaby-grasses and spear-grasses often persisted in dense, high cover (>50%) swathes often to the exclusion of high threat grassy weeds, with herbs such as Kidney Weed and Tall Bluebell *Wahlenbergia stricta* subsp. *stricta.* Grassy and herbaceous weeds were still prevalent with species such as Serrated Tussock *Nassella trichotoma* and Chilean Needle Grass occurring particularly at the fringes and in swathes throughout.

Several patches of very high quality were recorded as habitat zones PG25-30, and PG37. These zones generally covered a large area (>20ha) with a very high cover of native species and the highest species diversity including additional native grasses such as Common Wheat-grass and Long-hair Plume-grass *Dichelachne crinita* (Plate 35; Plate 36). These areas also had the highest diversity of herbs such as Blue Devil *Eryngium ovinum*, Lemon Beauty-heads *Calocephalus citreus* and Yellow Rush Lily *Tricoryne elatior*, with occasional occurrences of uncommon species such as Small Scurf-pea *Cullen Parvum* (Plate 37). Weeds generally occurred in lower covers (<25%) with scattered tussocks of grassy weeds such as Serrated Tussock, and low threat herbaceous weeds such as Common Centaury *Centaurium erythraea* and Flatweed *Hypochaeris radicata*.

A very poor-quality patch of Plains Grassland was recorded as habitat zone PG36. This habitat zone had only Wallaby Grass and Spear Grass present in low cover. A high biomass of Toowoomba Canary Grass was present with greater than 55% coverage. Habitat Zones PG31, PG34, and PG35 all scored similarly, aside from PG31 having greater species diversity. All habitat zones had a high cover of several graminoid species such as *Poa labillardieri,* Wallaby Grass, *Juncus* sp., and Spear Grass. PG31 had several more graminoid species along with a few herbs. The additions of Windmill Grass and *Dianella sp.* were accompanied by Willow Herb and Jersey Cudweed.

Habitat zones PG32 and PG33 had a slightly greater lifeform diversity with more medium herbs present. Wallaby Grass and *Poa labillardieri* were still present with a ground layer of herbs consisting of Grassland Wood-sorell, Bidee Widgee, Pink Bindweed, and Wahlenbergia.

Habitat Zones PG38-PG43 occurred in similar conditions, all of which being recorded as moderate quality Plains Grassland patches within the study areas central portion. These patches were generally species poor, lacking in grass diversity and were often being without herbs. However, they usually had a high proportion of native grasses, and were dominated by species such as Kneed Spear-grass, Kangaroo Grass, and Clustered Wallaby Grass. Weed cover was generally moderate (approximately 35%), with it being lowest in PG43, which also met the condition thresholds to be considered the Natural Temperate Grasslands of the Victorian Volcanic Plain vegetation community.

Habitat zones PG44 and 45 were recorded within the transmission line in the study areas north, and varied in quality. PG43 was a poor-quality patch with a high cover (>50%) of weeds, and a low diversity of native species, being defined by a low cover of Wallaby Grasses. PG45 and 46 were of moderate quality and generally had a lower cover of exotic species and a relatively higher cover and diversity of native species including Common Wheat Grass, Weeping Grass, Clustered Wallaby Grass, and Grassland Wood Sorrel.

Plate 34. Moderate quality Plains Grassland (Figure 2) with high cover of grassy weeds (Ecology and Heritage Partners Pty Ltd 21/02/2024).

Plate 35. High-quality Plains Grassland (PG28 on Figure 2) dominated by Wallaby grasses (Ecology and Heritage Partners Pty Ltd 20/02/2024).

Plate 36. High-quality Plains Grassland (PG30 on Figure 2) with a high diversity of native grasses and herbs (Ecology and Heritage Partners Pty Ltd 07/02/2024).

Plate 37. FFG Act-listed Small Scurf-pea within patch of Plains Grassland (PG30 on Figure 2) within the study area (Ecology and Heritage Partners Pty Ltd

3.2.8 Creekline Herb-rich Woodland (EVC 164)

Creekline Herb-rich Woodland (CHrW) is an open forest or woodland occupying creek terraces and ephemeral drainage lines with seasonally wet sands and silts. It is dominated by variety of Eucalypt species up to 15 meters tall over a sparse shrub layer, and a grassy/sedgy understory rich in herbs (DEECA 2025c).

Creekline Herb-rich Woodland was identified in the northwest corner of the transmission line within the creeklines present in two habitat zones. Habitat zone 1 (CHrW1 on Figure2) was present in a moderate condition. It lacked a large tree canopy layer and had a high weed cover with Gorse present in much of the creek. The shrub layer consisted of Yarra Burgan and Hedge Wattle over a ground layer of Honey-pots, Rushes *Juncus* spp. Wallaby Grasses and occasional Blue Pincushions *Brunonia australis*.

Plate 38. Dry Creekline Herb-rich Woodland within the Project Site (Figure 2) (Ecology and Heritage Partners Pty Ltd 11/12/2024).

Plate 39. Blue Pincushion within CHrW1 (Figure 2) (Ecology and Heritage Partners Pty Ltd 25/11/2024).

3.2.9 Grassy Woodland (EVC 175)

Grassy Woodland (GW) is characterised as a variable open eucalypt woodland to 15 metres tall on plains and undulating hills. It usually has a sparse shrub layer over a diverse ground layer of grasses and herbs. In the VVP, this EVC occasionally occurs as a Sheoak or Acacia woodland to 10 metres tall (DEECA 2025c). Grassy Woodland was observed in both bioregions with varying quality across the habitat zones GW1 to GW20.

Grassy Woodland occurred primarily in the northern portion of the Project Site, within the CVU bioregion. Within habitat zones GW1 and GW3 it was low quality. These habitat zones usually lacked Large Trees and had little or no canopy cover. They usually persisted as only a ground layer of Wallaby and Spear grasses, or as isolated patches of shrubs such as Sweet Bursaria *Bursaria spinosa*, Drooping Sheoak *Allocasuarina verticillata*, and Hedge Wattle *Acacia paradoxa*. These zones usually had a high cover (>50%) of grassy and herbaceous weeds in the understory such as Cocksfoot *Dactylis glomerata*, Lesser Canary-grass *Phalaris minor*, and Ribwort *Plantago lanceolata*.

Moderate quality Grassy Woodland occurred in habitat zones GW5 to GW9 where some canopy trees such as Narrow-leaf Peppermint *Eucalyptus radiata* or Manna Gum *Eucalyptus viminalis* were present. These areas often contained some Large Trees, and some understory trees and shrubs such as Black Wattle *Acacia mearnsii*, however, generally had minimal cover of native species in the understory and often only scattered native grasses such as Tall Spear-grass *Austrostipa pubinodis* (Plate 40).

Grassy Woodland zone GW13 generally had far more large trees per hectare, including Messmate Stringybark *Eucalyptus obliqua*, and a higher cover and diversity of native understory species. A sparse shrub layer was often present over the grassy and herbaceous ground layer usually including Black-anther Flax-lily *Dianella revoluta*, Thatch Saw-sedge, and Weeping Grass *Microlaena stipoides* var. *stipoides*. Woody species were often actively recruiting in these areas and while weeds such as Cocksfoot and Curly Dock *Rumex crispus* were still present, it generally had a far lower cover than other habitat zones (<25%) (Plate 41).

Habitat zones GW14 and GW15 occurred in the middle and western portions of the study area respectively and were of moderate-low quality. Both habitat zones had few native species in the understory with a high cover of exotic species present. They were primarily defined by the extent of canopy trees species such as River Red Gum. Habitat zones GW16 to GW18 were of moderate quality. While they typically had few large trees present, they had a higher diversity of native species in the understory and lower weed cover throughout. The shrub layer typically consisted of Tree Violet, Blackwood, and Sweet Bursaria, over a ground layer of Black-anther Flax-lily, Wallaby Grasses, Long-hair Plume-grass, and Kidney Weed.

Habitat Zone GW20 occurred in the western and northern portions of the alignment respectively and were in good condition. Both habitat zones had several large trees (River Red Gum) within, a low cover of weeds, and a diverse understory. Species composition was similar to that of GW18, and included additional species such as Drooping Sheoak, Hedge Wattle, Spiny-headed Mat-rush, and Common Tussock Grass.

Plate 40. Moderate-condition Grassy Woodland (Patch GW15 on Figure 2) largely defined by canopy trees (Ecology and Heritage Partners Pty Ltd 05/02/2024).

Plate 41. Higher-quality Grassy Woodland (Figure 2) along Dean's Road (Ecology and Heritage Partners Pty Ltd 13/03/2024).

3.2.10 Stream Bank Shrubland (EVC 851)

Stream Bank Shrubland (SBS) is characterised by a shrubland to eight metres tall over a ground layer of sedges and herbs usually along a fast flowing and flood prone river or major stream. The water course consists of either rocky banks, a flat rocky stream bed or broad gravel bank. A sparse Eucalypt canopy layer may also be present to 15 metres tall (DEECA 2025c).

Two patches of Stream Bank Shrubland (SBS1 and SBS2 on Figure 2) were identified within the Project Sites west and although not modelled as occurring within the Project Site (DEECA 2025a), based on the field surveys, the area is located in a low-lying area that supports a rocky, fast-flowing watercourse (Leigh River; Figures 2s-t). Areas fringing the Leigh River contained a moderately diverse range of native riparian vegetation, including Common Reed *Phragmites australis*, Short-stem Sedge *Carex breviculmis*, Rushes *Juncus* spp. and Common Spike-rush *Eleocharis acuta*. A canopy layer of River Red-gum *Eucalyptus camaldulensis* was occasionally present, over the middle layer of shrubs such as Fragrant Saltbush *Rhagodia parabolica*, Tea tree *Leptospermum* spp. and Wattles *Acacia spp.* (Plate 42; Plate 43).

Although the EVC was largely free of weedy species, scattered clusters of Gorse *Ulex europaeus* and Blackberry *Rubus fruticosus* spp. agg were recoded with common grassy weeds such as Toowoomba Canary-grass, Wild Oat *Avena fatua*, and Panic Veldt-grass *Erharta erecta* recorded in scattered high density swathes.

Plate 42. Stream Bank Shrubland (SBS1) recorded within the Project Sites northwest (Ecology and Heritage Partners Pty Ltd 21/02/2024).

Plate 43. Stream Bank Shrubland (SBS2) recorded within the Project Sites northwest (Ecology and Heritage Partners Pty Ltd 21/02/2024).

3.2.11 Escarpment Shrubland (EVC 895)

Escarpment Shrubland (ES) occurs on rocky, lichen-covered limestone and basaltic escarpments in steep valleys or gorges. Soils are often shallow, well-drained and subject to regular summer drought. A eucalypt canopy layer may be present to 15 metres tall or a non-eucalypt shrubland to 8 metres tall (DEECA 2025c).

One patch of Escarpment Shrubland was mapped along a steep escarpment within the Project Sites west, immediately adjacent of the Leigh River (ES1 on Figure 2). While no Eucalypts were identified within the canopy layer, other canopy species typical of Escarpment Shrubland were present in moderate abundance including Lightwood *Acacia impexa*, Drooping Sheoak *Allocasuarina verticillata*, Black wattle *Acacia Mearnsii* and Sweet Bursaria (Plate 36). The mid storey also comprised a moderately diverse range of native flora including a mixture of small to medium shrubs such as Fragrant Saltbush, Wedge-leaf Hop-bush *Dodonaea viscosa* subsp. *cuneata* and Common Cassinia *Cassinia aculeata* over a range of grasses such as Common Wheat Grass, Spear Grasses and the occasional Common Wallaby Grass (Plate 44; Plate 45).

Although the EVC was largely free of weedy species, scattered occurrences of Blackberry, Gorse and Toowoomba Canary Grass were recorded in high densities.

Plate 44. Escarpment Shrubland (ES1) recorded within the Project Sites west (Ecology and Heritage Partners Pty Ltd 03/04/2024).

Plate 45. Escarpment Shrubland (ES1) recorded within the Project Sites west (Ecology and Heritage Partners Pty Ltd 03/04/2024).

3.3 Large Trees and Scattered Trees

3.3.1 Large Trees in Patches

A total of 1,221 Large Trees (LTs) were recorded within patches of native vegetation (Figure 2). The majority of Large Trees comprise Messmate Stringybark, Manna Gum and Dead Stags, with River Red-gum, Swamp Gum and Narrow-leaved Peppermint also common (Table 12) (Plate 46; Plate 47).

Table 12. Species composition of Large Trees in patches.

Common Name	Species Name	# of specimens
Dead Stag	*NA*	87
Messmate Stringybark	*Eucalyptus obliqua*	607
Swamp Gum	*Eucalyptus ovata*	36
Narrow-leaved Peppermint	*Eucalyptus radiata*	41
Manna Gum	*Eucalyptus viminalis*	358
River Red-gum	*Eucalyptus camaldulensis*	89
Red Box	*Eucalyptus polyanthemos*	3
Total		**1,221**

Plate 46. Large Tree (Messmate Stringybark) in Grassy Woodland patch (Ecology and Heritage Partners Pty Ltd 13/03/2024).

Plate 47. Large Tree (River Red Gum) in Stream Bank Shrubland (Ecology and Heritage Partners Pty Ltd 07/02/2024).

3.3.2 Scattered Trees

A total of 609 scattered trees were recorded within the Study Area, which consisted of 521 Large and 88 Small scattered trees (Figure 2; Table 13). These trees would have once formed part of the EVC's recorded throughout the Project Site; however, the understorey vegetation has been cleared predominantly for farming or grazing practices and contained predominantly introduced species (mainly exotic pasture grasses) and the trees no longer formed a patch of native vegetation (Plate 48; Plate 49).

Table 13. Summary of scattered trees within the Study Area.

Common Name	Species Name	Large Tree	Small Tree	Total
Black Sheoak	*Allocasuarina literalis*	1	0	1
Swamp Gum	*Eucalyptus ovata*	12	6	18
Narrow-leaved Peppermint	*Eucalyptus radiata*	33	10	43
Manna Gum	*Eucalyptus viminalis*	99	15	114
Rough-barked Manna Gum	*Eucalyptus viminalis subsp. cygnetensis*	7	3	10
Messmate Stringybark	*Eucalyptus obliqua*	53	7	60
River Red-gum	*Eucalyptus camaldulensis*	194	13	209
Yellow Box	*Eucalyptus melliodora*	1	0	1
Yellow Gum	*Eucalyptus leucoxylon*	3	0	3
Red Ironbark	*Eucalyptus tricarpa*	0	2	2
Eucalyptus sp.	*Eucalyptus sp.*	1	0	1
Dead Stag	*NA*	117	32	149
Total		**521**	**88**	**609**

Plate 48. Large Scattered Tree (Stag) within grazed pastures typical for the Project Site (Ecology and Heritage Partners Pty Ltd 13/03/2024).

Plate 49. Large Scattered Tree (Messmate Stringybark) within grazed farmland within the Project Site (Ecology and Heritage Partners Pty Ltd 13/03/2024).

3.3.3 Introduced and Planted Vegetation

Areas not supporting native vegetation had a high cover (>90%) of exotic grass species, many of which were direct-seeded for use as pasture, and environmental weeds. Areas used for cropping were generally devoid of native species (Plate 52; Plate 51). These areas were dominated by crops with annual grassy and herbaceous weeds occurring along edges and access tracks.

Non-cropped areas which did not support native vegetation were generally heavily grazed by livestock. These areas were dominated by exotic grasses such as Toowoomba Canary-grass, Brown-top Bent, and Chilean Needle Grass. Environmental weeds were abundant throughout these areas including Horehound *Marrubium vulgare*, Common Centaury *Centaurium erythraea*, and Variegated Thistle *Silybum marianum*. Scattered native grasses were generally present in these areas, however they did not have the required 25% relative cover to be considered a patch.

Windrows acting as visual screens and wind breaks along fence lines within farmland properties and along parcel boundaries consisted of exotic and Australian native species such as Eucalypt varieties and Bottlebrushes (Plate 51).

Several northern areas in the Project Site consisted of large plantations of Southern Blue Gum *Eucalyptus gobulus.* These plantations had occasional scattered native understory species throughout however did not have the required 25% over to be considered a patch (Plate 50).

Plate 50. Southern Blue Gum within a plantation in the Project Site (Ecology and Heritage Partners Pty Ltd 12/03/2024).

Plate 52. Young Southern Blue Gum plantation within the project Site (Ecology and Heritage Partners Pty Ltd 13/03/2024).

Plate 51. Australian native Eucalypt species in a planted windrow (Ecology and Heritage Partners Pty Ltd 13/03/2024).

Plate 53. Exotic pastures typical of the Project Site (Ecology and Heritage Partners Pty Ltd 21/03/2024).

3.4 Fauna Habitats

The fauna habitats across the Project Site exhibited evidence of sustained agricultural land-use, with large areas dominated by introduced cropping and pasture species. The majority of moderate to high quality terrestrial fauna habitat is present in the form of canopy and riparian vegetation distributed throughout the broader area.

3.4.1 Habitat Connectivity

On a broader landscape scale, there are several habitat features that provide connectivity to and from larger core areas of habitat such as Bamganie State Forest to the north, and Meredith State Forest, Coolebarchurk Streamside Reserve, Steiglitz Historic Park, and Brisbane Ranges National Park to the north-east.

There are several habitat corridors to and from these areas of core habitat. Vegetated road reserves, particularly along Meredith-Mt Mercer Road provide good habitat corridors for a variety of woodland

dependent species, including woodland birds, arboreal mammals, small ground-dwelling mammals and reptiles. These roadside reserves provide connectivity (via habitat corridors and 'stepping stones') with large areas of native bushland located north-east of the Project Site.

Scattered trees within paddocks throughout the Project Site also act as 'stepping stones' as a means of connection for more mobile fauna, including birds, microbats and arboreal mammals.

There are several other reserves located in the broader locality, including Enfield State Park (approximately 20 kilometres north-west), and Mount Doran Bushland Reserve (approximately 18 kilometres north). Although these areas are not directly connected to the Project Site, there is a potential for more mobile fauna (e.g. birds and mammals) to move between these consolidated areas of habitat and the Project Site (e.g. through remnant native vegetation along roadsides). While the native vegetation within the Study Area largely occurs as isolated patches, some are connected to riparian corridors (e.g. Leigh River) or vegetation within road reserves.

Riparian habitat acts as important dispersal corridors for native flora and fauna, with the Leigh River extending along the western boundary of the Project Site, and Wilson and Woodbourne Creeks intersecting the Project Site. Such habitat corridors and associated connectivity is important in a landscape that has largely been cleared for agricultural purposes.

Wildlife corridors and scattered connections of vegetation have numerous benefits to native fauna populations, particularly in modified landscapes where much of the surrounding vegetation is restricted to linear strips along roadsides or streams. They can, and often do, constitute valuable habitat in their own right. Some of the key benefits of wildlife corridors associated with the maintenance of biodiversity on a local, and at a landscape level, include:

- Protection and ongoing maintenance of ecosystem functionality through the reduction of threatening processes (i.e. erosion, weed spread, hydrological alterations);
- Protection for populations of threatened species, or disturbance sensitive species (i.e. orchids) that may have been lost from the surrounding landscape;
- Provision of habitat (i.e. refuge, shelter, breeding opportunities) for a range of fauna either residing within corridors, or moving through the landscape;
- Maintenance of species richness and diversity;
- A source of seed dispersal for flora species sensitive to moderate levels of disturbance;
- Immigration of fauna to supplement declining populations, thus reducing the likelihood of local extinctions;
- Availability of habitat for reintroduction following extinction events;
- Prevention of demographic changes occurring in populations that may result from prolonged isolation from other populations of the same species by aiding gene flow, thus enhancement of genetic variation and reduced risk of inbreeding; and,
- Facilitating fauna movement through modified landscapes to more optimal habitats.

3.4.2 Grasslands

Grassland areas exhibit varying degrees of quality across the Study Area. Despite extensive agricultural land use on privately owned land, patches of grassland remnants have maintained moderate to high habitat value for native fauna. Particularly in the south-east, as well as along roadsides and riparian zones, these remnants offer habitat niches for a range of grassland-dependant native fauna and facilitate crucial habitat connectivity within a largely altered landscape.

Various threatened fauna, including invertebrates (i.e. Golden Sun Moth), reptiles (i.e. Striped Legless Lizard, Tussock Skink), and ground-dwelling mammals (i.e. Fat-tailed Dunnart), may inhabit, forage in, rely on, regularly use, and traverse through grassland vegetation within the Project Site.

3.4.1 Woodlands

Woodland vegetation varies in quality throughout the Study Area. However, in the context of extensive agricultural land use within privately owned land they are, overall, of moderate to high habitat value for native fauna. These remnants, particularly in areas of the north and north-west, as well as roadside and riparian vegetation, are structurally and floristically diverse and the vegetation cover provides habitat niches for a diversity of native fauna and important habitat connectivity in an otherwise highly modified landscape.

A variety of arboreal mammals, microbats, ground-dwelling mammals, woodland birds, reptiles and amphibians are likely to reside in, forage in, rely upon, regularly use and move through woodland vegetation within the Project Site. A high diversity of woodland bird species were observed within this vegetation type during the bird utilisation surveys. These areas support occasional hollow-bearing trees, providing habitat for hollow-dependent fauna including possums, gliders, microbats and hollow-nesting birds such as parrots and owls. Additionally, a high degree of canopy connectivity enables arboreal mammals to move easily between trees.

3.4.2 Scattered Trees

The habitat value of scattered trees is dependent on the tree species, maturity and landscape context however, overall, they are of moderate value for native fauna.

Scattered trees in varying densities occur throughout the Study Area and provide an important resource for more mobile tree-dependent fauna. Many of the scattered trees are large mature eucalypts, providing an array of small, medium, large hollows, bark fissures and crevices, with small and medium-sized hollows most frequently recorded within the Study Area. These are likely to be relied upon for shelter and nesting by a range of hollow-dependent fauna including parrots, microbats, possums, gliders and owls.

Scattered trees provide foraging habitat for insectivorous and nectivorous birds as well as vantage points and nesting areas for diurnal and nocturnal raptors and other non-hollow dependant species including Australian Magpie *Cracticus tibicen* and Australian Raven *Corvus coronoides*. These trees also provide stepping stones for more mobile fauna moving through the Study Area, enhancing landscape permeability for a wide range of woodland birds, possums, reptiles, as well as predators such as raptors.

3.4.3 *Open Pasture / Crops*

The majority of the Project Site consists of paddocks which are either cropped or contain improved exotic pasture. Bird species which are tolerant of modified open areas are likely to use these areas, including foraging nocturnal and diurnal raptors. During the current suite of assessments, Black-shouldered Kite *Elanus axillaris*, Brown Falcon *Falco berigora* and Nankeen Kestrel *Falco cenchroides,* and Wedge-tailed Eagle *Adua audax* were observed foraging in these areas. Common opportunist species including Australian Magpie, Sulphur-crested Cockatoo *Cacatua galerita*, Galah *Eolophus roseicapilla* and Little Corella *Cacatua sanguinea* were also observed utilising this habitat during the field assessments.

3.4.4 *Creeklines and artificial waterbodies*

Several drainage lines and creeklines, as well as artificially constructed farm dams occur throughout the Study Area, providing habitat of varying quality for a range of waterbirds and frog species. Many of the farm dams were in poor condition, with livestock having unrestricted access. However, several dams contained fringing and emergent vegetation and are likely to support amphibians and water birds. The network of drainage lines and creeklines are spatially well connected. During the assessments undertaken in 2023/24, most dams were dry and few refuge pools remained, while aquatic vegetation had senesced.

Nonetheless, when inundated and connected, the network of waterbodies is likely to provide dispersal opportunities for fauna, particularly frogs and fish that may be residing, refuging and/or breeding in the dams and creeklines throughout the Study Area.

3.5 National Significance Assessment

Matters of National Environmental Significance (MNES) are listed and protected under the EPBC Act.

3.5.1 *Flora*

The VBA contains records of ten nationally significant species previously recorded within the ROI (DEECA 2024b) (Appendix 1.4; Figure 10). The majority of these records are located in areas of relatively high quality, undisturbed habitat or waterways and roadsides (Figure 10).

The PMST nominated an additional 16 nationally significant species which have not been previously recorded but have the potential to occur in the locality (DCCEEW 2024) (Figure 10; Appendix 1.4).

Of the 26 nationally significant flora species that have previously been recorded, or are predicted to occur within the locality, the following two species are considered to have the highest likelihood of occurrence within the proposed wind farm development footprint (Table 14).

Table 14. Nationally significant flora with the highest likelihood of occurrence.

Species	Suitable habitat within the Study Area (ha)	Closest known records
Matted Flax-lily	377.18	The VBA identified 11 records of the species within the ROI, most recently in 2022 (DEECA 2024b). These records are primarily within the road reserves and immediately adjacent paddocks of Meredith-Mt Mercer Road to the north (Figure 10).

Species	Suitable habitat within the Study Area (ha)	Closest known records
Spiny Rice-flower	311.30	The VBA identified 114 records of the species within the ROI, most recently in 2022 (DEECA 2024b). These records are primarily contained within the road reserves and immediately adjacent paddocks of Shelford-Mt Mercer Road, and Rokewood-Shelford Road to the south-west of the Project (Figure 10).

Matted Flax-lily

Despite targeted surveys being undertaken in areas of potential habitat within the Study Area at an appropriate time of year when the species was known to be flowering, no Matted Flax-lily were recorded.

Based on the results of the targeted surveys, the condition of potential habitats present, and the confirmed presence of the species flowering in the nearby reference site (Bannockburn Cemetery; Plate 54), it is considered unlikely that a population of Matted Flax-lily is present within the Study Area.

Spiny Rice-flower

Despite targeted surveys being undertaken in areas of potential habitat within the Study Area at an appropriate time of year when the species was known to be flowering, no Spiny Rice-flower were recorded.

Based on the results of the targeted surveys, the condition of potential habitats present, and the confirmed presence of the species flowering in the nearby reference site (Bulban Road, Werribee; Plate 55), it is considered unlikely that a population of Spiny Rice-flower is present within the Study Area, however further assessments are planned for winter 2025.

Plate 54. Matted Flax-lily recorded within Bannockburn Cemetery (Ecology and Heritage Partners Pty Ltd 05/02/2024).

Plate 55. Spiny Rice-flower recorded within Bulban Road, Werribee (Ecology and Heritage Partners Pty Ltd 14/08/2023).

Other Nationally Significant Flora

No other nationally significant flora were recorded as part of the ecological survey program.

Moderate to high-quality native remnant grasslands in the form of Plains Grassland were recorded during Vegetation Quality Assessments (VQA) undertaken in January to March 2024. Several of the higher quality patches (in proximity to turbine numbers 44 and 45) have the potential to support other nationally significant flora (Table 7), with targeted surveys proposed to be undertaken for these species in 2025 (Appendix 1.4).

3.5.2 *Fauna*

The VBA contains records of 16 nationally significant species previously recorded within the ROI (DEECA 2024b) (Figure 11). The PMST nominated an additional 15 nationally significant species which have not been previously recorded but have the potential to occur in the locality (DCCEEW 2024) (Figure 11; Appendix 2.1).

Of the 31 nationally significant fauna species that have previously been recorded, or are predicted to occur within the locality, the following species were considered to have the highest likelihood of occurrence within the Project footprint (Table 15).

Table 15. Nationally significant fauna with the highest likelihood of occurrence.

Species	Suitable habitat within the Project Site	Closest VBA records
Brown Treecreeper	Woodland areas including roadside vegetation, containing medium to large-sized hollows.	33 records within ROI, most recently from 2018.
Striped Legless Lizard	Relatively undisturbed native grasslands, with a dense cover of perennial tussock grasses, but are also known to inhabit areas of non-native grassland. The species prefers areas with exposed basalt rocks in grasslands with areas of cracking clay soils.	Nine records ROI, most recently from 2016.
Growling Grass Frog	Permanent or semi-permanent still or slow flowing waterbodies, with an extensive cover of emergent, submerged and floating vegetation.	Six records within ROI, most recently from 2018.
Golden Sun Moth	Woodland/grassland with a ground layer comprising a cover of at least 20% Wallaby-grass.	217 records within ROI, most recently from 2019.

Striped Legless Lizard

Striped Legless Lizard tile grids were deployed across the Project Site between 14 August and 23 August 2023, and 11-12 September 2024. Each tile grid was checked eight times between 19 September 2023 and 21 December 2023, except for the tile grids deployed in 2024 which received five checks between 20 November 2024 and 17 December 2024.

A total of 12 fauna species were recorded during the tile checks, including nine reptile and three amphibian species. Striped Legless Lizard was recorded at three sites (Site 37 (Grid 37), 41 (Grids 40.1 and 41) and 54 (Grid 54)) (Plate 56, Plate 57; Figure 5).

The three sites where Striped Legless Lizard was recorded were within relatively close proximity to one another in the south-east of the Project Site, with the furthest distance between any two of these sites being 3.4 kilometres (i.e. between Sites 41 and 54) (Figure 5; Table 16). Based on the recorded presence of Striped Legless Lizard, a total of 38.79 hectares of confirmed Striped Legless Lizard habitat is present within the Study Area.

Table 16. Striped Legless Lizard results. *indicates number of separate/distinct sites where Striped Legless Lizard was recorded. For example; Striped Legless Lizard was recorded in T41 on six occasions, but this counts as one site. There are 3 total sites.

Date	Grid	Site Count*	No. SLL recorded
20/09/2023	T41 (Northern parcel)	1	2

Date	Grid	Site Count*	No. SLL recorded
18/10/2023	T41 (Northern parcel)	- -	8
30/10/2023	T37	2	4
13/11/2023	T37	-	5
23/11/2023	T41 (Northern parcel)	-	5
27/11/2023	T54	3	7
	T37	-	7
13/12/2023	T37	-	8
14/12/2023	T41 (Northern parcel)	-	7

The four discrete areas of confirmed Striped Legless Lizard habitat within the Study Area are varied in quality. Although the survey grid at site T37 is not located in a mapped patch, it is situated in an area of approximately 18 hectares of confirmed Striped Legless Lizard habitat containing native grasses at below 25% cover, including Plains Grassland patches to the north, east, south of the survey grid containing spear grasses and Kangaroo Grasses. While Striped Legless Lizard was recorded outside the study area in proximity to T41, confirmed habitat for the species is contiguous with suitable habitat within the study area. Sites in proximity to T41 comprise contiguous high-quality NTGVVP. The survey grid at T54 is located on the edge of a small Plains Grassland patch contributing to approximately one hectare of confirmed Striped Legless Lizard habitat. A low cover of native grasses is present within the surveyed area and immediately adjacent, however areas to the west are cropped and do not contain suitable habitat.

Other species observed during tile checks include the FFG Act-listed Tussock Skink (Figure 9), Eastern Three-lined Skink *Acritoscincus duperreyi*, White's Skink *Liopholis whiteii*, Spotted Marsh Frog *Limnodynastes tasmaniensis*, and Little Whip Snake *Suta flagellum* (Section 3.6.2).

Plate 56. Striped Legless Lizard within the Project Site (Ecology and Heritage Partners Pty Ltd 11/12/2024).

Plate 57. Striped Legless Lizard within the Project Site (Ecology and Heritage Partners Pty Ltd 11/12/2024).

Growling Grass Frog

Growling Grass Frog has been previously recorded within the ROI; most recently from 2018, with the nearest record approximately three kilometres east of the Project (DEECA 2024b). Preferred habitat characteristics for

the species include vegetation lined banks, emergent, submerged and floating vegetation, and exposed rocks and areas for basking.

Two nocturnal surveys were undertaken at six turbine locations within the Project Site. One location (44/45) received only one survey due to the absence of suitable habitat.

Five common frog species; Southern Brown Tree Frog *Litoria ewingii*, Spotted Marsh Frog *Limnodynastes tasmaniensis*, Eastern Banjo Frog *Limnodynastes dumerilii*, Eastern Common Froglet *Crinia signifera*, Eastern Sign-bearing Froglet *Crinia parinsignifera* – were recorded during the site assessments. Most observations were made by sight, with several by call only.

One Growling Grass Frog was detected during the targeted surveys with weather conditions suitable during all survey events (Table 17). Frog activity was relatively high during all survey events with several species heard calling on each survey event. Growling Grass Frog were confirmed to be regionally active on each survey date. The Growling Grass Frog specimen was observed audibly and confirmed by both zoologists conducting the survey. The individual was recorded calling from an ephemeral wetland in a paddock following several days of rain, likely originated from higher-quality aquatic habitat nearby.

Table 17. Results of targeted Growling Grass Frog nocturnal assessments.

Date	Site	Weather conditions						
		Survey Temp (C°)	Wind speed (km/hr)	Wind direction	Humidity	Cloud Cover (%)	Rain (during survey)	No. GGF
13/03/2024	44/45 – survey 1	16.3	7.4	ESE	78	90	0	0
13/03/2024	20 – survey 1	15.4	0	N	84	0	0	0
13/03/2024	21 – survey 1	16.3	7	ESE	77	100	0	0
14/03/2024	19 – survey 1	15.2	7	ESE	85	100	0	0
18/03/2024	51/52 – survey 1	22.5	9.3	ENE	51	0	0	0
18/03/2024	31/32 – survey 1	25	11.1	E	41	0	0	1
19/03/2024	9 – survey 1	18.4	7	W	65	70	0	0
14/03/2024	20 – survey 2	14.2	5.5	SSE	80	100	0	0
14/03/2024	21 – survey 2	13.9	5.5	SSE	80	30	0	0
14/03/2024	19 – survey 2	14	5.5	SSE	80	10	0	0
19/03/2024	51/52 – survey 2	13	13	W	95	100	0	0
19/03/2024	31/32 – survey 2	14.8	14.8	WSW	94	100	0	0
19/03/2024	9 – survey 2	18.2	9	WNW	60	90	0	0

Golden Sun Moth

Most of the Project Site is highly modified for agriculture purposes and does not provide suitable habitat for Golden Sun Moth due to the low cover of suitable native grass species such as Wallaby-grass, and absence of preferred exotic species such as Chilean Needle-grass.

Targeted surveys focused on areas of potential habitat for Golden Sun Moth identified by Biosis (2022), as well as any additional areas of potential habitat identified during targeted winter flora and spring fauna surveys within the Study Area. These areas were predominantly located within areas of pasture where the cover of Wallaby-grass was at least 20%, which is the generally accepted cover threshold acknowledged to support preferred habitat for the species, as well as roadside vegetation where there has generally been less disturbance (i.e. grazing, pasture improvement, fertiliser usage) (DEWHA 2009a). These areas were deemed to contain the highest quality habitat for the species due to the higher abundance of native grasses.

Systematic surveys identified 220 Golden Sun Moth (Plate 58, Plate 51) across 13 discrete areas within the Study Area (Figure 6a, Figure 6b; Table 18). Four surveys were undertaken across most sites (Figure 6b), with those sites receiving only three checks during the 2023-24 season undergoing at least one additional survey check during the species active period in the 2024-25 season.

Targeted Golden Sun Moth surveys are scheduled to be undertaken during the 2025 active period in areas that are yet to be surveyed.

Plate 59. Golden Sun Moth recorded within Study Area (Ecology and Heritage Partners Pty Ltd 12/12/2023).

Plate 60. Golden Sun Moth recorded within Study Area (Ecology and Heritage Partners Pty Ltd 15/12/2023).

Table 18. Golden Sun Moth results. *indicates number of separate/distinct sites where Golden Sun Moth was recorded. For example; Golden Sun Moth was recorded in T35 on three occasions, but this counts as one site. There are 13 total sites.

Date	Site	Site Count*	No. GSM recorded
23/11/2023	T38	1	95
	T39	2	38
04/12/2023	T34	3	4
	T35	4	8
	T46	5	4
06/12/2023	T51	6	22
	T44	7	14

Date	Site	Site Count*	No. GSM recorded
15/12/2023	T50 (roadside)	9	1
22/12/2023	T35	-	1
09/01/2024	T35	-	1
11/01/2024	T51	-	1
11/01/2024	T44	-	1
20/11/2024	T71	10	23
	T29	11	18
04/12/2024	T71	-	1
09/12/2024	T9	12	2
	T10	13	7
11/12/2024	T71	-	15
13/12/2024	T34	-	1

The limited dispersal ability of the Golden Sun Moth means that these discrete areas of confirmed habitat, where separated by 200 metres or more, are effectively isolated and should be considered as separate habitat area (DEWHA 2009b). Further, isolated sites where the species has gone extinct are unlikely to be naturally recolonised (DEWHA 2009a).

Where Golden Sun Moth are present, moderate and high quality habitat in the form of scattered Wallaby-grass *Rytidosperma* spp., and Spear-grass *Austrostipa* spp., is present. In some cases, a secondary grassland is present where a cover of Wallaby-grass has regrown following past disturbance (i.e. ploughing/scalping).

Despite the presence of Wallaby-grass in some patches or native vegetation, or within pasture, habitat quality was considered sub-optimal for the species due to the relatively low coverage of preferred native grass species and ground cover generally consisting of less than 10% Wallaby-grass. Further, most areas considered as unsuitable habitat showed clear signs of recent agricultural disturbance (i.e. soil ripping/ploughing).

Based on the recorded presence of Golden Sun Moth, a total of 375.40 hectares of confirmed Golden Sun Moth habitat is present within the Study Area (Figure 12).

Latham's Snipe

Latham's Snipe prefers open freshwater wetlands with nearby cover, but have also been recorded in a wide variety of permanent and ephemeral wetlands, including disturbed sites, or areas located close to human activity. Some low-quality potential foraging habitat is present within the study area in the form of vegetated dams, and as such, targeted surveys were undertaken for the species between 7-10 January 2025.

Two nocturnal and two diurnal surveys were undertaken at 11 different farm dams/wetlands across eight turbine locations ("sites") within the Project Site. One location (Site 11) received only three surveys due to site access issues, although it must be noted that this dam only had minimal availability of suitable habitat.

Weather conditions were suitable during most survey events, however, potentially unfavourable wind speeds occurred during four survey events. Strong winds can impact bird activity and may therefore reduce detectability.

Seven common waterbird species were recorded during the site assessments; Pacific Black Duck *Anas superciliosa*, White-faced Heron *Egretta novaehollandiae*, Australian Wood Duck *Chenonetta jubata*, Chestnut Teal *Anas castanea*, Australian Shelduck *Tadorna tadornoides*, Black-fronted Dotterel *Elseyornis melanops* and Masked Lapwing *Vanellus miles*. Most observations were made by sight, with several by call only. Overall waterbird activity was low to moderate, with waterbirds only recorded during 13 of the 31 survey events, at five different sites (9, 11, 20, 51 and 53).

No Latham's Snipe were detected during the targeted surveys (Table 19).

Table 19. Results of targeted Latham's Snipe nocturnal and diurnal assessments.

Date	Site	Survey Timing	No. Latham's Snipe recorded
07/01/2025	51	Survey 1 (diurnal) Survey 2 (nocturnal)	0
	53	Survey 1 (diurnal) Survey 2 (nocturnal)	0
	9	Survey 1 (diurnal) Survey 2 (nocturnal)	0
	11	Survey 1 (diurnal) -	0
08/01/2025	North of 29	Survey 1 (diurnal) Survey 2 (nocturnal)	0
	9	Survey 3 (diurnal) Survey 4 (nocturnal)	0
	11	Survey 2 (diurnal) Survey 3 (nocturnal)	0
	20	Survey 1 (diurnal) Survey 2 (nocturnal)	0
	21	Survey 1 (diurnal) Survey 2 (nocturnal)	0
	McColl's Road	Survey 1 (diurnal) Survey 2 (nocturnal)	0
09/01/2025	North of 29	Survey 3 (diurnal) Survey 4 (nocturnal)	0
	20	Survey 3 (diurnal) Survey 4 (nocturnal)	0
	21	Survey 3 (diurnal) Survey 4 (nocturnal)	0
	McColl's Road	Survey 3 (diurnal) Survey 4 (nocturnal)	0
	51	Survey 3 (diurnal) Survey 4 (nocturnal)	0
	53	Survey 3 (diurnal)	0

Date	Site	Survey Timing	No. Latham's Snipe recorded
		Survey 4 (nocturnal)	

Migratory Species

Migratory species are protected under the EPBC Act if they are listed under the following agreements:

- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention);
- China Australia Migratory Bird Agreement (CAMBA);
- Japan Australia Migratory Bird Agreement (JAMBA); or the
- Republic of Korea Australia Migratory Bird Agreement (ROKAMBA).

The VBA (DEECA 2024b) indicates that four migratory bird species (Latham's Snipe *Gallinago hardwickii* [1 record from 1986], Curlew Sandpiper *Calidris ferruginea* [a single record from 1977], Swift Parrot *Lathamus discolor* [16 records, most recently from 2017], and White-throated Needle-tail *Hirundapus caudacutus* [eight records, most recently in 2004]) have been recorded within the ROI (Appendix 2.1).

The Project Site would not be classed as 'important habitat' for Migratory species as defined under the EPBC Act Policy Statement 1.1 Principal Significant Impact Guidelines (DoE 2013). The proposed wind farm is not located between, or in proximity to, either migratory bird feeding areas, or important, regularly used, feeding and roosting sites, hence the likelihood of migratory birds moving through the Project Site when moving between wetlands in the local area is low. Some low-quality potential foraging habitat is present for Latham's Snipe in the form of vegetated dams, and as such, targeted surveys were undertaken for the species in January 2025 (see previous section).

While it is possible that small numbers of migratory birds could fly over the site during migration, it has been well documented that shorebirds typically fly between 0.5 and six kilometres in elevation during migration, well above the tip of the proposed turbines (Williams *et al.* 1981; Piersma *et al.* 1990; Tulp *et al.* 1994). Similarly, White-throated Needletail are likely to fly over the study area on occasion during migration and/or while aerially foraging, predominantly well above rotor swept area height. Owing to these factors, it is considered that the likelihood of migratory bird mortality through turbine collisions is low and that the proposed wind farm is unlikely to have a significant impact on any migratory species.

The most abundant and recent migratory bird visitor to the ROI is Swift Parrot. Victorian foraging habitat trees for the species, including primary foraging species Yellow Gum *Eucalyptus leucoxylon*, Red Ironbark *Eucalyptus tricarpa*, Mugga Ironbark *Eucalyptus sideroxylon*, Grey Box *Eucalyptus microcarpa*, White Box *Eucalyptus albens*, and Yellow Box *Eucalyptus melliodora*, were largely absent from the Study Area. A total of one large Yellow Box and three large Yellow Gum individuals were recorded in the north-west of the Study Area. There is a low likelihood the species will visit such a small patch of foraging habitat, even during flowering periods.

The extant grassy woodland and plains woodland located within the Project Site may, at best, serve as 'rest points' on route to more suitable habitats to the east within Brisbane Ranges National Park. Although remnant woodland vegetation persists within the Project Site, this vegetation is located primarily along ridge lines and gullies (i.e. along Wilson Creek and the western border of the Project Site). According to current and historical

Swift Parrot annual survey results, this is not preferred habitat location for Swift Parrot, which are more likely to be found on upper and lower slopes (Ingwersen *et al*. 2021).

Other Nationally Significant Fauna

Two Nationally significant fauna: Brown Treecreeper *Climacteris picumnus* and Blue-winged Parrot *Neophema chrysostoma* were recorded during bird utilisation surveys. Brown Treecreeper was recorded on three occasions, all at BU6, a call-playback location situated outside of the Project Site but within the ROI, while Blue-winged Parrot was recorded on one occasion, within the Project Site at BU2 (Figure 3).

Habitat critical to the survival of both Brown Treecreeper and Blue-winged Parrot includes relatively undisturbed grassy woodland with native understorey, open habitat structure (i.e. from moderate levels of disturbance by fire and/or grazing) at ground level (so birds are able to feed on or near the ground and maintain vigilance against predators), large living and dead trees (essential for roosting and nesting sites), fallen timber which provides essential foraging habitat for Brown Treecreeper, and hollows in standing dead or live trees (for nesting).

Given Brown Treecreeper was recorded within the Bamganie State Forest (i.e. at BU 6; Figure 3), where habitat critical to the survival of the species is present, Brown Treecreeper is likely to visit the Project Site in areas where grassy woodland is present. The species is likely to occupy the north-west section of the Project Site that is contiguous with Bamganie State Forest (i.e. near WTG sites 19, 20), and roadside habitat corridors containing large old hollow-bearing trees. Blue-winged Parrot is likely to fly within the Project Site on occasion in search of suitable foraging and / or breeding opportunities.

While not recorded during assessments, Diamond Firetail *Stagonopleura guttata* [33 VBA records within ROI, most recently 2018], Hooded Robin *Melanodryas cucullate* [5 VBA records within ROI, most recently 2001], and Gang-gang Cockatoo *Callocephalon fimbriatum* [7 VBA records within ROI, most recently 2001] are likely to visit the Project Site on occasion, with areas containing grassy woodland including roadside habitat corridors most likely to support these species.

No other nationally significant fauna were recorded as part of the ecological survey program to date.

Based on habitat present within the Project Site, the landscape context and the proximity of previous records, additional nationally significant fauna species are considered unlikely to occur within the site (Appendix 2.1).

3.5.3 Ecological Communities

Five nationally listed ecological communities are predicted to occur within the ROI (DCCEEW 2024):

- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains;
- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain; and,
- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Due to the absence of key eucalypt species dominating (or formerly dominating) the canopy of patches of native vegetation, and the low coverage of native understorey vegetation where key canopy species are

present, or the vegetation structure not meeting key thresholds, five of the six nationally significant ecological communities are assessed as being absent from the Study Area. However, some patches of Creekline Tussock Grassland EVC, Creekline Grassy Woodland EVC and Plains Grassland EVC meet the thresholds that define the *Natural Temperate Grassland of the Victorian Volcanic Plain* ecological community.

Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP)

Based on an assessment against the condition thresholds for the community, many habitat zones of Plains Grassland and Creekline Grassy Woodland EVCs qualify as the NTGVVP Community (Figure 2). These habitat zones are located throughout the Project Site with the largest areas occurring in proximity to Turbine areas 41, 44, 45 and 51 (Figure 2). An assessment against the condition thresholds for the Community are given below:

- Does the patch occur within or near the Victorian Volcanic Plain? Yes
- Is the site dominated by remnant native vegetation? Yes
- Are trees absent or sparse such that projective foliage cover of native trees is <5% Yes
- Is the ground vegetation dominated by native grasses and/or other native herbs? Yes
- Is the total perennial cover of *Themeda, Rytidosperma, Austrostipa*, or *Poa* at least 50%? Yes
- Is the remnant grassland patch bigger than or equal to 0.05 hectares? Yes

The listed national ecological community is therefore present.

A total of 171.75 hectares of the NTGVVP Community is present within the Study Area. Of this, a total of 16.31 hectares is proposed to be impacted under the current development footprint (Figure 2).

3.5.4 Other MNES

No Ramsar wetlands occur within or surrounding the Project Site. The closest Ramsar wetlands are Port Phillip Bay (Western Shoreline), and Bellarine Peninsula (approximately 40 kilometres south-east), and Western Lakes District (approximately 37 kilometres south-west). The Project Site is located well upstream of the nearest Ramsar wetlands.

3.6 State Significance Assessment

Biodiversity matters present within the Project Site that are considered of significance to the State of Victoria are outlined below.

3.6.1 Flora

The VBA contains records of 53 State significant flora species from within the ROI (DEECA 2024b (Appendix 1.4; Figure 8).

Two State significant flora species listed as protected under the FFG Act, Sun-orchid sp. *Thelymitra sp.* and Jersey cudweed *Laphangium luteoalbum,* were recorded within the Project Site during the field survey (Figure 8). Five species listed as Threatened under the FFG Act: Fragrant Saltbush, Austral Tobacco, Small-flowered Wallaby-Grass *Rytidosperma monticola,* Small Scurf-pea *Cullen parvum*, and Tough Scurf-pea *Cullen tenax,* were recorded within the Study Area during the field survey (Figure 8).

While there are no VBA records of Studley Park Gum (a naturally occurring hybrid between River Red Gum and Swamp Gum) in the ROI, several potential candidates were recorded during field assessments. Targeted surveys were undertaken on the 18th and 19th of February 2025 to determine the presence of Studley Park Gum within the Project Site (Table 7). Specimens inspected (such as Tree 1895 on Figure 2r) demonstrated some characteristics, such as in the fruit morphology, of Studley Park Gum. However, across its range the morphology of River Red Gum can vary (N. Walsh pers. coms.), so this is not considered definitive evidence of the hybrid. Given that both River Red Gum and Swamp Gum are present in the wider landscape, Studley Park Gum is a variable hybrid, and the specimens inspected demonstrated some characteristics of Studley park Gum, its presence within the ROI cannot be discounted entirely. However, based on the variable nature of the hybrid and its parent species, difficulties persist in classifying the examined individuals. While seedling trials can be performed to differentiate the Studley Park Gums (N. Walsh pers. coms.), this was outside the scope of the assessment.

3.6.2 Fauna

The VBA contains records of 22 State significant fauna species within the ROI (DEECA 2024b) (Appendix 2.1; Figure 11).

Five State significant fauna were recorded within the Project Site during the field assessments, with evidence of an additional species recorded (Figure 9). A Platypus *Ornithorhynchus anatinus* carcass was recorded along Leigh River within the Study Area (Plate 61), Tussock Skink was recorded during tile grids checks, Eastern Great Egret *Ardea modesta* was recorded on a single occasion during bird utilisation surveys, and Eastern Bent-wing Bat and Yellow-bellied Sheathtail Bat were recorded during microbat assessments. Burrowing Crayfish burrows were recorded in two locations within the Study Area (Figure 9; Plate 62). Based on the distribution of Victorian species of burrowing crayfish and the habitat type present, the burrows can be attributed to either Hairy Burrowing Crayfish *Engaeus sericatus* or Western Burrowing Crayfish *Engaeus merosetosus*. Targeted habitat assessment for these State significant burrowing crayfish species may be required to confirm the extent of habitat for these species. Powerful Owl was recorded during the field assessments, however the species was observed outside the Project Site within the Brisbane Ranges.

Plate 61. Platypus remains recorded within Study Area (Ecology and Heritage Partners Pty Ltd 13/3/2024).

Plate 62. Burrowing Crayfish burrow recorded within the Study Area (Ecology and Heritage Partners Pty Ltd 23/8/2023).

No evidence of Powerful Owl, Barking Owl or Masked Owl activity was recorded within or immediately adjacent to the Project Site during the surveys, however Powerful Owl was recorded responding to call-playback at PO_8, a control/reference site approximately 10.5 kilometres east, within the Brisbane Ranges (Figure 4). As such, there is a moderate likelihood that Powerful Owl uses native vegetation within the Project Site for foraging and roosting activities, as there are 167 hollow-bearing trees containing large (>40-centimetre diameter entrance) hollows in the Study Area (Figure 12).

Targeted surveys are proposed for several other State significant fauna with a moderate likelihood of presence within the Project Site, including Brush-tailed Phascogale *Phascogale tapoatafa* and Fat-tailed Dunnart *Sminthopsis crassicaudata* (Table 8).

3.6.3 Ecological Communities

One significant ecological community, Western (Basalt) Plains Grassland Community is considered to be present within the Project Site, corresponding with all patches of Plains Grassland EVC.

Western (Basalt) Plains Grassland is described as an open grassland community comprised primarily of Kangaroo Grass, Wallaby-grasses, Spear-grasses, and Tussock Grasses, with little to no shrub or tree layer.

3.7 Bird Utilisation Surveys

3.7.1 Overview

Ninety-eight bird species were recorded, consisting of 7,621 individuals, during the fixed-point bird counts. An additional three species (Collared Sparrowhawk *Accipiter cirrocephalus*, Black-fronted Dotterel *Elseyornis melanops* and Chestnut Teal *Anas castanea*) were recorded incidentally. Seven introduced species were recorded, several of which include Common Starling *Sturnus vulgaris*, Eurasian Skylark *Alauda arvensis*, and House Sparrow *Passer domesticus*. Two nationally significant species were recorded during fixed-point bird counts, with one species recorded within the Study Area (Blue-winged Parrot; Vulnerable) and one adjacent to the Project Site (Brown Treecreeper; Vulnerable). One State significant species was recorded within the Project Site (Eastern Great Egret; Vulnerable).

The most commonly recorded species were Little Raven *Corvus mellori* (16.72% of all records), Australian Magpie *Gymnorhina tibicen* (8.35% of all records), Red Wattlebird *Anthochaera carunculate* (8.18% of all records), and Eurasian Skylark (5.88% of all records).

A total of 78.4% of bird observations made during the point counts were of individuals that were either on the ground or flying below the Rotor Swept Area. A further 19.2% did not have their height recorded as they were obscured from vision, with no birds recorded flying above the Rotor Swept Area.

Birds observed flying within the Rotor Swept Area (2.4%) comprised, Little Raven, Brown Falcon *Falco berigora*, Nankeen Kestrel *Falco cenchroides*, Australian Pelican *Pelecanus conspicillatus*, Peregrine Falcon *Falco peregrinus*, Brown Goshawk *Accipiter fasciatus,* the EPBC Act-listed Blue-winged Parrot, Galah *Eolophus roseicapilla*, Straw-necked Ibis *Threskiornis spinicollis*, Wedge-tailed Eagle *Aquila audax*, and Long-billed Corella *Cacatua tenuirostris*.

One species (Eastern Great Egret) recorded during the bird utilisation surveys is defined as 'Species of Concern' for wind farms (DEECA 2024a).

A variety of other bird species were also recorded (-) (see Appendix 2.2 for full species list), including:

- Generalist bird species common in modified landscapes, such as open paddocks, including Little Raven, Noisy Miner *Manorina melanocephala*, Willie Wagtail *Rhipidura leucophrys* and Little Raven;
- Woodland bird species using larger patches of native and non-native vegetation and other bushland in the Project Site, such as White-winged Chough, Red Wattlebird, Weebill *Smicrornis brevirostris* and Striated Pardalote *Pardalotus striatus*;
- Waterbirds using dams and streams in the Project Site, including Australian Pelican, Australian Wood Duck *Chenonetta jubata*, Australian Shelduck *Tadorna tadornoides*, Straw-necked Ibis and White-faced Heron *Egretta novaehollandiae*;
- Raptors foraging over paddocks, roadsides and waterbodies, including Australian Hobby *Falco longipennis*, Black-shouldered Kite *Elanus axillaris*, Peregrine Falcon, Brown Falcon, Wedge-tailed Eagle, Collared Sparrowhawk, Nankeen Kestrel and Whistling Kite *Haliastur sphenurus*; and,
- Parrot species feeding on sowed crops and using large hollow-bearing gums, including Crimson Rosella *Platycercus elegans,* Eastern Rosella *Platycercus eximius*, and Musk Lorikeet *Glossopsitta concinna*.

Incidental observations recorded in the Project Site included three additional species to those recorded during point-counts.

Plate 64. Collared Sparrowhawk recorded within the Study Area (Ecology and Heritage Partners Pty Ltd 29/1/2023).

Plate 66. Wedge-tailed Eagle recorded within Study Area (Ecology and Heritage Partners Pty Ltd 24/1/2024).

Plate 63. Red-browed Finch recorded within the Study Area (Ecology and Heritage Partners Pty Ltd 29/1/2023).

Plate 65. Superb Fairy-wren recorded within Study Area (Ecology and Heritage Partners Pty Ltd 13/3/2024).

3.7.2 Species Richness

The predicted species richness estimate for the point count surveys was 98 species, which converts to a completeness of over 99% and means that an additional one species was undetected during bird utilisation surveys relative to the predicted total number of species likely to occupy the Project Site. A high number of actual species relative to predicted species is an indication that survey effort was high and covered a range of conditions and seasons. The study has reached asymptote (or plateau) (Graph 1). The results show a clear relationship between effort and the number of species detected.

3.7.3 Flight Heights

The following is based on turbine specifications of a 54.5 metre minimum clearance and a maximum 250.5 metre tip height. As such, the Rotor Swept Area (RSA) is between 54.5 metres and 250.5 metres.

The majority of birds recorded (78.4%) during the point counts were either observed on the ground or flying below the Rotor Swept Area (Table 20). Just over 2% of birds recorded were within the Rotor Swept Area, consisting of 11 species (11% of species). Of these species, Straw-necked Ibis (120 individuals; 91%) was most

frequently observed species in the Rotor Swept Area, followed by Little Raven (19). This result is typical of surveys for wind farms located in areas characterised by open pasture.

Wedge-tailed Eagle and other raptors are likely to fly at and above Rotor Swept Area when foraging, while other birds, such as Galah and Little Raven, tend to fly in the Rotor Swept Area as they move daily between roosts and feeding areas. No significant wetlands are present in or near the Project Site, however two waterbird species were recorded during point count surveys – Australian Pelican and Straw-necked Ibis – observed flying in the Rotor Swept Area.

Bird point count survey locations were assigned to capture a representative sample of vegetation and habitat type. Given much of the Project Site comprises open paddocks, most bird point count survey locations are situated in these areas, however several sites were situated to capture any woodland and waterbird habitats in the Project Site.

Generally, non-passerine birds such as raptors, wetland/waterbirds and parrots have flight characteristics that make them prone to collisions with wind turbines. These species are usually larger, less mobile, occur in flocks (particularly parrots) and forage in more open areas. Some minor changes in local distribution and abundance of these species may be expected as a consequence of ongoing operation of the turbines, and although these impacts are not expected to be significant and minimal in line with the stated AusWEA (2005), collision potential and post construction monitoring should be established to further assess the impact of the project on bird species and populations.

A summary of species recorded during point count surveys and associated flying heights against Rotor Swept Area is provided in Table 20, Table 21 and Graph 1.

Table 20. Summary of birds recorded at the varying flight heights

Flight Height	# of birds	% of birds
Height not observed	1,462	19.2%
Ground (0 metres)	938	12.3%
Below RSA (1-54.5m)	5,035	66.1%
RSA (54.5-250.5m)	186	2.4%
Above RSA (>250.5m)	0	0.0%

Table 21. Number of instances of bird species recorded in Point Count Surveys classified according to the RSA at which they were detected (excluding incidental records).

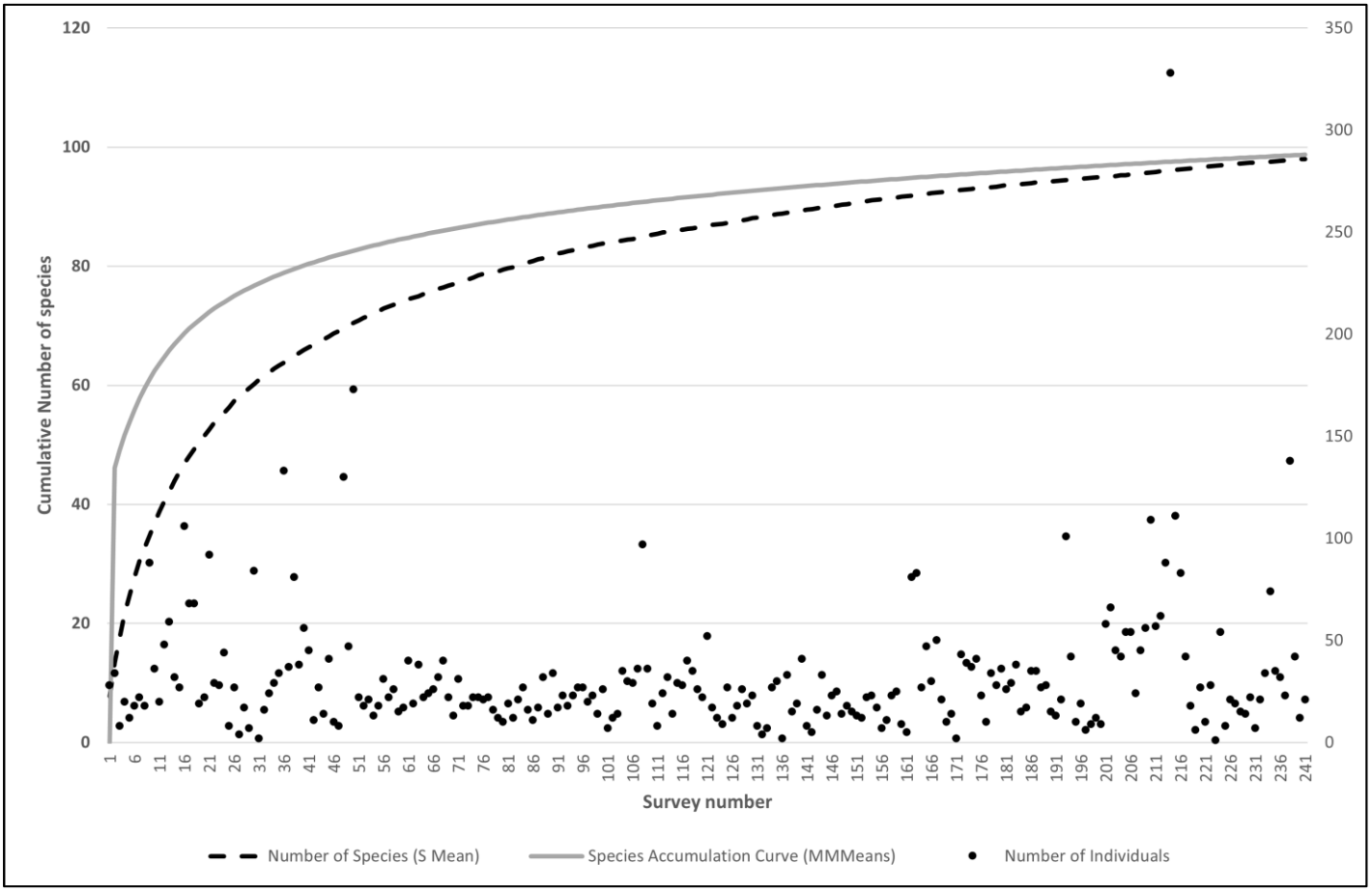
Species	Height not observed	Ground	Below RSA	RSA	Total
Straw-necked Ibis	100	25	1	140	266
Little Raven	69	392	832	19	1312
Galah	45	5	258	7	315
Wedge-tailed Eagle	0	0	4	6	10
Long-billed Corella	6	1	172	4	183
Brown Falcon	0	0	7	3	10

Species	Height not observed	Ground	Below RSA	RSA	Total
Australian Pelican	0	0	0	2	2
Blue-winged Parrot	0	0	0	1	1
Brown Goshawk	0	0	2	1	3
Nankeen Kestrel	0	0	28	1	29
Peregrine Falcon	0	0	1	1	2
Whistling Kite	1	0	2	1	4
Australasian Pipit	9	6	5	0	20
Australian Hobby	0	0	1	0	1
Australian Magpie	133	161	355	0	649
Australian Raven	0	0	2	0	2
Australian Shelduck	1	2	20	0	23
Australian Wood Duck	0	6	8	0	14
Black-faced Cuckoo-shrike	0	1	9	0	10
Black-shouldered Kite	0	0	16	0	16
Blue-faced Honeyeater	1	0	0	0	1
Brown Songlark	3	0	8	0	11
Brown Thornbill	12	3	20	0	35
Brown Treecreeper	5	0	0	0	5
Brown-headed Honeyeater	0	0	21	0	21
Brush Cuckoo	0	0	1	0	1
Buff-rumped Thornbill	24	8	48	0	80
Common Bronzewing	1	1	5	0	7
Common Cicadabird	1	0	0	0	1
Common Myna	2	0	31	0	33
Common Starling	119	1	301	0	421
Crested Pigeon	2	1	33	0	36
Crimson Rosella	34	3	140	0	177
Dusky Woodswallow	0	0	5	0	5
Eastern Great Egret	0	0	2	0	2
Eastern Rosella	4	1	105	0	110
Eastern Shrike-tit	1	0	0	0	1
Eastern Yellow Robin	1	0	1	0	2
Eurasian Blackbird	16	4	1	0	21
Eurasian Skylark	163	32	262	0	457
European Goldfinch	6	0	13	0	19
Fan-tailed Cuckoo	1	0	0	0	1

Species	Height not observed	Ground	Below RSA	RSA	Total
Golden Whistler	9	0	4	0	13
Golden-headed Cisticola	3	0	8	0	11
Grey Butcher Bird	2	0	2	0	4
Grey Currawong	1	0	10	0	11
Grey Fantail	5	4	45	0	54
Grey Shrike-thrush	15	11	14	0	40
Horsfield's Bronze-Cuckoo	0	1	0	0	1
House Sparrow	51	28	118	0	197
Jacky Winter	1	0	4	0	5
Laughing Kookaburra	25	0	5	0	30
Little Corella	7	0	22	0	29
Little Lorikeet	0	0	5	0	5
Little Wattlebird	37	0	41	0	78
Magpie Lark	6	12	66	0	84
Masked Lapwing	5	1	1	0	7
Musk Lorikeet	49	0	249	0	298
New Holland Honeyeater	14	17	49	0	80
Noisy Miner	6	10	54	0	70
Pacific Black Duck	2	0	96	0	98
Pied Cormorant	0	0	2	0	2
Pied Currawong	1	0	2	0	3
Rainbow Lorikeet	0	0	23	0	23
Red Wattlebird	113	16	507	0	636
Red-browed Finch	1	0	19	0	20
Red-rumped Parrot	0	3	32	0	35
Restless Flycatcher	1	0	3	0	4
Rufous Whistler	4	1	5	0	10
Scarlet Robin	4	1	8	0	13
Silvereye	3	0	18	0	21
Spiny-cheeked Honeyeater	0	0	1	0	1
Spotted Dove	0	1	4	0	5
Spotted Pardalote	20	0	7	0	27
Striated Pardalote	58	5	10	0	73
Striated Thornbill	2	2	66	0	70
Stubble Quail	30	30	9	0	69
Sulphur-crested Cockatoo	15	43	90	0	148

Species	Height not observed	Ground	Below RSA	RSA	Total
Superb Fairy-wren	79	35	144	0	258
Tree Martin	1	0	42	0	43
Varied Sittella	0	0	1	0	1
Weebill	5	0	0	0	5
Welcome Swallow	4	6	73	0	83
White-breasted Woodswallow	0	0	5	0	5
White-browed Scrubwren	2	0	1	0	3
White-eared Honeyeater	4	6	23	0	33
White-faced Heron	0	1	1	0	2
White-naped Honeyeater	1	0	1	0	2
White-necked Heron	0	0	3	0	3
White-plumed Honeyeater	41	12	137	0	190
White-throated Treecreeper	10	2	14	0	26
White-winged Chough	0	5	28	0	33
Willie Wagtail	8	8	18	0	34
Yellow Thornbill	9	0	10	0	19
Yellow-billed Spoonbill	0	0	1	0	1
Yellow-faced Honeyeater	18	7	54	0	79
Yellow-rumped Thornbill	30	17	63	0	110
Yellow-tailed Black Cockatoo	0	0	97	0	97
Grand Total	1462	938	5035	186	7621

Note. Ground – 0 metres; Below RSA – 1-54.5 metres; RSA 54.5-250.5 metres; Above RSA > 250.5 metres.



Graph 1. Species accumulation curve across the entire survey period.

Source: Species accumulation curve produced using EstimateS (Colwell 2013).

3.7.4 Raptors

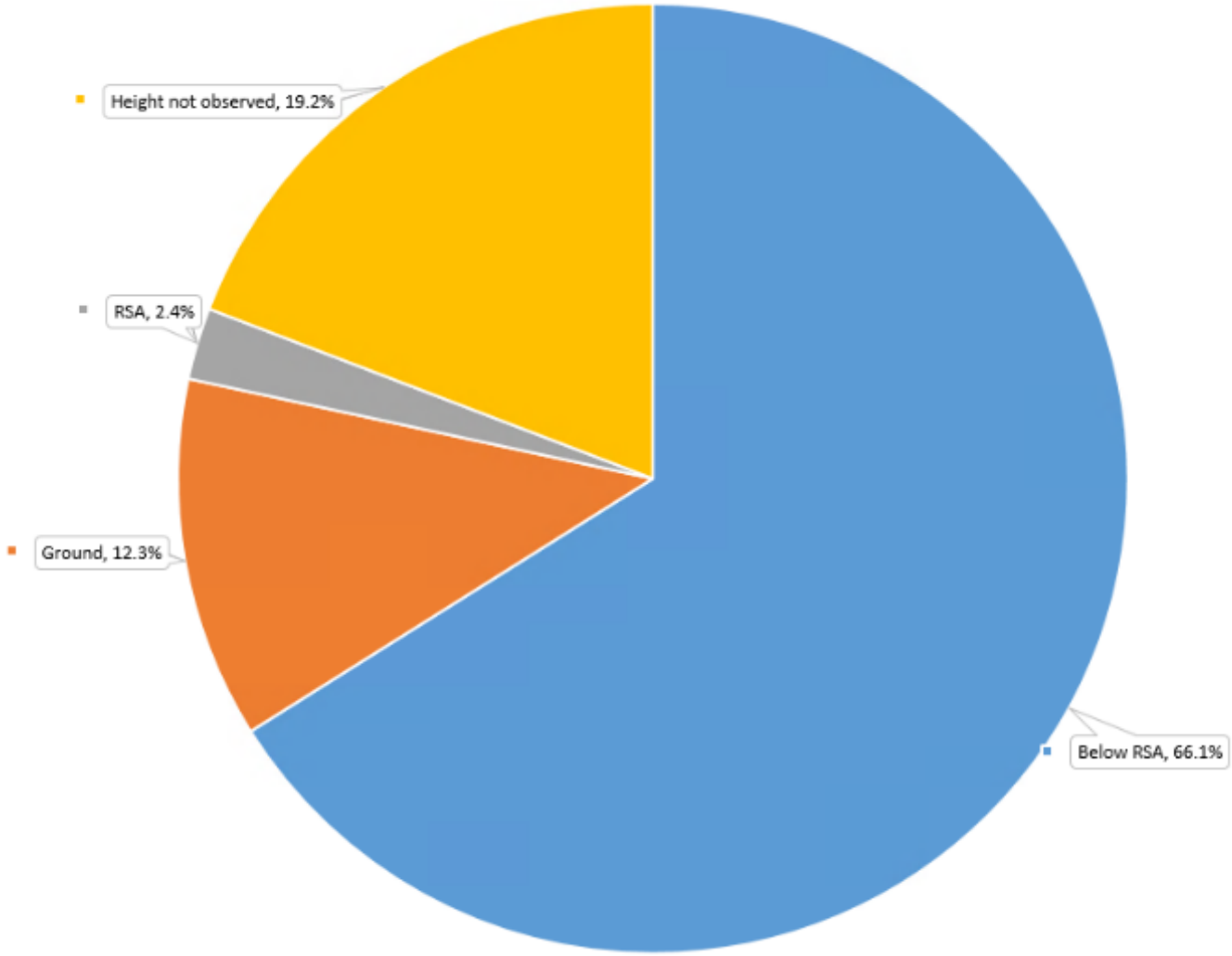
Wedge-tailed Eagles were observed flying in the Rotor Swept Area. In addition, several raptor species were observed in or near the Project Site, comprising Australian Hobby, Black-shouldered Kite, Brown Goshawk, Collared Sparrowhawk, Brown Falcon, Peregrine Falcon, Nankeen Kestrel, and Whistling Kite (Appendix 2.2).

Based on the results of the bird utilisation surveys, the proposed wind farm footprint is likely to be located within the territory of at least two pairs of Wedge-tailed Eagle. Five Wedge-tailed Eagle or other raptor nests were recorded within the Project Site during assessments (Figure 12). While 14 individual Wedge-tailed Eagle were recorded during surveys, most of these records are likely to be the same individuals. Wedge-tailed Eagles are known to occupy a territory of approximately 30-40 square kilometres (Hatton *et al.* 2015). Given the Project Site is approximately 55-60 square kilometres, at least two resident pairs – plus juveniles in spring and summer – are likely to occupy the Project Site.

Raptors in general accounted for a low percentage (1.3%) of birds recorded throughout the investigation.

Plate 67. Wedge-tailed Eagle nest recorded within Study Area (Ecology and Heritage Partners Pty Ltd 21/8/2023).

Plate 68. Wedge-tailed Eagle nest recorded within Study Area (Ecology and Heritage Partners Pty Ltd 13/3/2024).



Graph 2. Percentage of birds recorded at ground level, below rotor swept area (RSA), and at RSA (54.5 – 250.5 metres), during the survey period. Note: no species were recorded above RSA, although several parrot and raptor species are likely to utilise heights within and above RSA.

3.8 Microbat Surveys

3.8.1 Desktop Review

The database search of the VBA (DEECA 2024b) contained records for ten bat species within the ROI (Table 22). One State significant microbat (Eastern Bent-wing Bat) had been previously recorded within the ROI on one occasion in 1990 (DEECA 2024b).

Table 22. Microbat species previously recorded within the ROI (DEECA 2024b).

Scientific Name	Common Name	Significance #	No. of VBA records within ROI	Most recent record within ROI
Austronomus australis	White-striped Freetail Bat	-	11	2018
Chalinolobus gouldii	Gould's Wattled Bat	-	36	2018
Chalinolobus morio	Chocolate Wattled Bat	-	34	2002
Miniopterus orianae oceanensis	Eastern Bent-wing Bat	ce	1	1990
Nyctophilus geoffroyi	Lesser Long-eared Bat	-	51	2021
Nyctophilus gouldi	Gould's Long-eared Bat	-	6	1999
Ozimops ridei	Ride's Free-tailed Bat	-	1	1991
Vespadelus darlingtoni	Large Forest Bat	-	54	2002
Vespadelus regulus	Southern Forest Bat	-	35	2002
Vespadelus vulturnus	Little Forest Bat	-	72	2021

Note: # State Significance (DEECA 2025e): ce – Critically Endangered

3.8.2 Bat Survey Results

A minimum of ten bat species were detected during the bat surveys, including Chocolate Wattled Bat; Eastern Bent-wing Bat; Eastern Falsistrelle *Falsistrellus tasmaniensis*; Gould's Wattled Bat; Inland Broad-nosed Bat *Scotorepens balstoni*; Large Forest Bat; Little Forest Bat; Southern Freetail Bat *Ozimops planiceps*; White-striped Freetail Bat; and Yellow-bellied Sheathtail Bat *Saccolaimus flaviventris*. A maximum of up to 11 native bat species were recorded when calls that could not be identified to species level are considered.

Nocturnal and Bat detector surveys were undertaken across the Project Site, with eight Songmeters deployed over 59 nights (totalling 472 night-surveys) across October – November 2023 and January – February 2025. No calls were attributable to nationally significant species. The following calls are calls attributable to State significant species:

- Eastern Bent-wing Bat at Site BS02 (located in the centre of the Study Area) (Plate 69; Plate 70; Figure 7) on 1 and 9 November 2023; and,
- Yellow-bellied Sheathtail Bat at BS34 (located in the north-west of the Study Area) (Figure 7) on 11, 15, 16, 18, 19 November 2023.

A number of other calls detected during surveys could not be identified to species level, and were assigned to one of three call complexes: Lesser Long-eared Bat / Gould's Long-eared Bat; Southern Freetail Bat *Ozimops planiceps* / Ride's Free-tailed Bat; or Little Forest Bat / Large Forest Bat / Southern Forest Bat.

Of the 14 species either detected during the survey, or identified during the desktop assessment, ten species (listed in Table 22) are considered to have a moderate to high risk of collision due to their flight behaviour (Moloney *et al.* 2019). White-striped Freetail Bat is particularly at risk, having recorded the highest number of collision incidents from a sub-sample of turbines across 15 Victorian Wind Energy Facilities between 2003 and 2018 (ARI 2019; Moloney 2019). However, this was not considered large enough to meet the criteria for listing at the State level (ARI 2019).

Eastern Bent-wing Bat, recorded at one location within the Project Site (BS02; Figure 7) is a cave dwelling bat that forages at and around canopy height in treed areas, and close to the ground in grassy areas. The species has previously been shown to fly consistently below turbine height, with no collision mortalities published in Victoria (ARI 2019).

Yellow-bellied Sheathtail Bat, recorded at one location within the Project Site (BS34; Figure 7), is a cavity-roosting species that are generally reliant on old-growth forest hollows, though the species may also opportunistically use abandoned animal burrows and human structures, and roost under dry clay and rock. The species exhibits a flight behaviour characterised by swift, direct flight paths and slow wing beats, being distinguishable in flight due to its light-coloured ventral side. Due to its size, the species is well-adapted for rapid flight but with low manoeuvrability, primarily suited for flight at canopy levels and open spaces. No collision mortalities have been published in Victoria (ARI 2019).

All other bat species recorded in the Project Site (including call complex level) that have a moderate to high risk of collision are not listed as threatened under the EBPC Act or the FFG Act, with stable populations and widespread distribution. However, both Eastern Bent-wing Bat and Yellow-bellied Sheathtail Bat are listed as 'Probable Species of Concern' (DEECA 2024a).

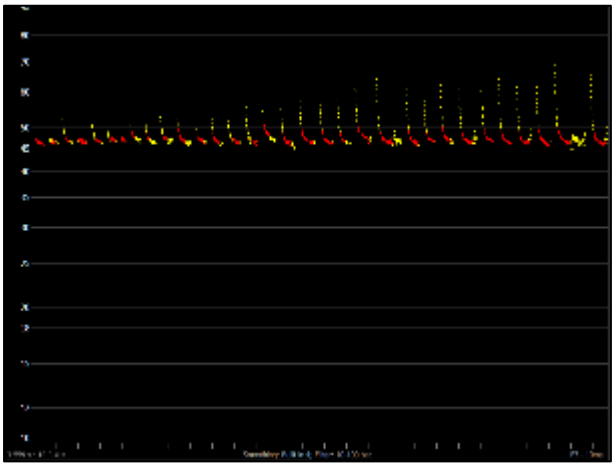


Plate 69. Eastern Bent-wing Bat - Long characteristic frequency (OPS), downturned tail (Fc-Fend) with frequency between 44-47kHz (Fc). (EcoAerial).

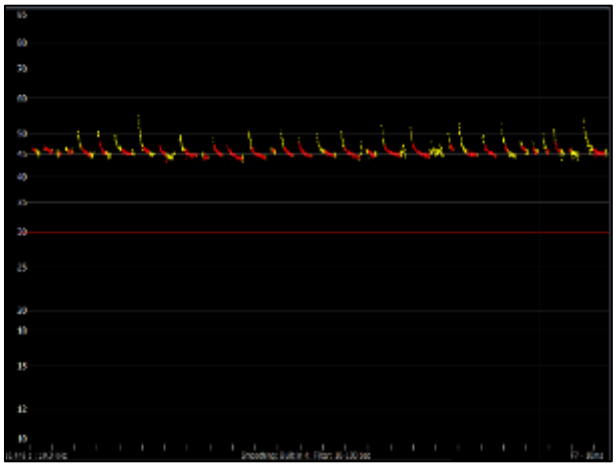


Plate 70. Eastern Bent-wing Bat - Long characteristic frequency (OPS), downturned tail (Fc-Fend) with frequency between 44-47kHz (Fc). (EcoAerial).

4 REMOVAL, DESTRUCTION OR LOPPING OF NATIVE VEGETATION (THE GUIDELINES)

4.1 Avoid and Minimise Statement

The land within the Project Site has not been subject to any strategic level planning process, while significant ecological values are present within the Project Site (Figure 2a).

ACCIONA Energia considers that the location selected represents a good balance of grid availability, wind resource availability, and reduced potential environmental impacts relative to comparable sites.

The collective layout and positioning of the components forming the collective Project presented within this report represents an iterative development process. Each version of the layout has built on the continuation of analysis and data capture within the project site. While environmental assessments are ongoing, the design is informed in part by the technical team's assessment results to date including in-house, and external technical, environmental and planning specialists, as well as landowner preferences and feedback from consultation with neighbours and local communities.

Due to the nature of the proposed development, and the objective to maximise the wind energy potential of the site, it is not possible to avoid impacts to native vegetation entirely. However, through the iterative design process, ACCIONA Energía have minimised impacts through the re-siting of project infrastructure which has reduced impacts down to the current proposed impacts detailed in this section (Table 23).

Table 23. Avoidance and minimisation of impacts to ecological values through development of project layout from 2023 to 2025

Infrastructure	Values potentially impacted by previous layout iteration	Design Change	Avoidance and minimisation
Tracks and hardstands between WTGs 1 and 2	• Grassy Woodland (EVC 175 - Endangered)	• Align tracks along boundary of paddock rather than route directly	• Minimisation of impacts to Grassy Woodland (EVC 175 - Endangered)
WTG 5 and associated infrastructure	• Grassy Woodland (EVC 175 - Endangered)	• Movement of turbine and associated infrastructure east to avoid wooded area	• Avoidance of impacts to Grassy Woodland (EVC 175 - Endangered)
WTGs 66, 67 and 68; associated hardstands, tracks and cabling	• EPBC Act-listed Ecological Community NTGVVP; • Plains Grassland (EVC 132 - Endangered).	• Deletion of turbines and associated infrastructure	• Complete avoidance of NTGVVP and EVC impacts in this area
WTGs 63, 64 and 65; associated hardstands, tracks and cabling	• EPBC Act-listed Golden Sun Moth habitat	• Deletion of turbines and associated infrastructure	• Complete avoidance of impacts to Golden Sun Moth habitat in this area
WTGs 40 and 41; associated hardstands, tracks and cabling	• EPBC Act-listed Ecological Community NTGVVP; • EPBC Act-listed Striped Legless Lizard habitat;	• Deletion of turbines and associated hardstands and tracks;	• Minimisation (by ~90%) of impacts to grassland; • Avoidance (with ~200m setback) of confirmed SLL habitat area.

Infrastructure	Values potentially impacted by previous layout iteration	Design Change	Avoidance and minimisation
	• Plains Grassland (EVC 132 - Endangered).	• Movement of underground cable to southern boundary.	
WTGs 38 and 39; associated hardstands, tracks and cabling	• EPBC Act-listed Ecological Community NTGVVP; • EPBC Act-listed Golden Sun Moth habitat; • Plains Grassland (EVC 132 - Endangered).	• Movement of turbines and associated infrastructure east into area absent of NTGVVP community; • Diversion of track around highest Golden Sun Moth concentrations in the north.	• Minimisation (by ~90%) of impacts to grassland; • Minimisation of Golden Sun Moth habitat impacts
WTGs 19 and 20	• Grassy Dry Forest (EVC 22 - Depleted); • Raptor nest.	• Movement of turbines and associated infrastructure out of woodland area; • Relocation of turbine 20 to maintain minimum 200m buffer from raptor nest.	• Minimisation of impacts to Grassy Dry Forest (EVC 22 - Depleted); • 200m buffer provided to raptor nest.
WTG 21	• Grassy Dry Forest (EVC 22 - Depleted); • Raptor nest.	• Deletion of turbine and associated infrastructure	• Avoidance of Grassy Dry Forest (EVC 22 - Depleted) in this area; • >200m buffer provided to raptor nest.
WTG 9	• Raptor nest	• Movement of turbine to the west to maintain minimum 200m buffer from raptor nest	• 200m buffer provided to raptor nest
WTG 61	• Raptor nest	• Movement of turbine to the north-west to maintain minimum 200m buffer from raptor nest	• 200m buffer provided to raptor nest
Access tracks to WTGs 61 and 62	• Large River Red-gum trees	• Movement of track and hardstand alignment to minimise tree removal and lopping requirements	• Minimisation of impacts to River Red-gum trees
WTG 36 and associated infrastructure	• Plains Grassland (EVC 132 - Endangered)	• Movement of WTG and associated infrastructure east out of grassland area	• Minimisation of impacts to Plains Grassland (EVC 132 - Endangered)
Substation and O&M facility	• Plains Grassland (EVC 132 - Endangered)	• Relocation of permanent facilities 1.8km east, outside identified grassland area	• Complete avoidance of Plains Grassland (EVC 132 - Endangered) in this area
Temporary construction compound, carpark, batch plant	• Plains Grassland (EVC 132 - Endangered)	• Relocation of temporary construction facilities 1.5km north-east, outside identified grassland area	• Complete avoidance of Plains Grassland (EVC 132 - Endangered) in this area
Hardstand and track for WTG 50	• Plains Grassland (EVC 132 - Endangered)	• Realign track and hardstand area away from grassland area to the east	• Minimisation of impacts to Plains Grassland (EVC 132 - Endangered)

Infrastructure	Values potentially impacted by previous layout iteration	Design Change	Avoidance and minimisation
Cable route north of turbine 51	• Plains Grassland (EVC 132 - Endangered)	• Deletion of cable route, establishment of alternative cable routes	• Avoidance of impacts on Plains Grassland (EVC 132 - Endangered) due to cable trenching
Access track to WTG 56 from public road	• Plains Grassy Woodlands (EVC 55 - Endangered); • Large trees in patch and scattered trees.	• Track moved north to align with existing farm track, avoid woodland area	• Minimisation of impacts to Plains Grassy Woodlands (EVC 55 - Endangered); • Minimisation of impacts to large and scattered trees.

It should be noted that the current impacts are an over-estimate, with further minimisation likely to be achieved through the refinement of buffers, and micro-siting of project infrastructure away from areas of known ecological value.

4.2 Residual Impacts

The below clearing scenario is based on the extent of the infrastructure footprint and associated buffers as provided by ACCIONA Energía on 22 April 2025 and assessed against the extent of native vegetation mapped to date within the Study Area. An updated clearing scenario will be provided in the forthcoming version of the report.

Specifically, the buffers applied around the infrastructure footprint comprise:

- Reticulation – 30 metres wide;
- Access Tracks – 60 metres wide;
- Other Infrastructure – 30 metre buffer around edge of footprint.

The above figures are conservative and ACCIONA Energia anticipates that actual disturbance will be well within these corridors. It should be noted that no offsite impacts (i.e. swept paths, transport impacts) have been assumed at this stage, beyond the local roads which have been surveyed.

4.2.1 Vegetation proposed to be removed

The Project Site is within Location 3, with 74.263 hectares of native vegetation (including scattered trees) proposed to be removed, comprising 67.79 hectares of native vegetation patches, 225 Large Trees in patches, and 128 scattered trees (96 Large and 32 Small). As such, the permit application falls under the Detailed assessment pathway (Table 24).

Condition scores for vegetation proposed to be removed are provided in Appendix 1.3.

Table 24. Removal of Native Vegetation (the Guidelines) (DELWP 2017).

Assessment pathway	Detailed
Location Category	3
Total Extent of vegetation (including scattered trees) (ha)	74.263
Extent of proposed removal of patch vegetation (ha)	67.79
Large Trees (scattered and in patches) to be removed (no.)	321
Small scattered trees to be removed (no.)	32
EVC Conservation Status of vegetation to be removed	Endangered (CGW, PG, PGW, GW, PGWe) Vulnerable (VGF, CHrW) Depleted (GDF)

Note: CGW = Creekline Grassy Woodland, PG = Plains Grassland, PW = Plains Woodland, PGWe = Plains Grassy Wetland, PGW = Plains Grassy Woodland, GDF = Grassy Dry Forest, GW = Grassy Woodland, VGF = Valley Grassy Forest, CHrW = Creekline Herb-rich Woodland..

4.2.2 Offset Targets

The offset requirement for native vegetation removal is 2.743 General Habitat Units and 304 Large Trees.

A summary of proposed vegetation losses and associated offset requirements is presented in Table 25 and the Native Vegetation Removal (NVR) report is presented in Appendix 3.

Table 25. Offset Targets.

General Habitat Units Required	2.743 General Habitat Units
	13.979 species units of habitat for Fragrant Leek-orchid, *Prasophyllum*
	11.370 species units of habitat for White Sunray, *Leucochrysum albicans* subsp. *tricolor*
	27.280 species units of habitat for Forked Rice-flower, *Pimelea hewardiana*
	32.043 species units of habitat for Fragrant Saltbush, *Rhagodia parabolica*
	42.680 species units of habitat for Melbourne Yellow-gum, *Eucalyptus leucoxylon* subsp. *connata*
	31.938 species units of habitat for Brittle Greenhood, *Pterostylis truncata*
	13.428 species units of habitat for Shiny Leionema, *Leionema lamprophyllum* subsp. *obovatum*
	11.557 species units of habitat for Gum-barked Bundy, *Eucalyptus goniocalyx* subsp. *laxa*
Large Trees	304
Vicinity (catchment/council)	Corangamite CMA / Golden Plains Shire
Minimum Strategic Biodiversity Value*	0.248

*The minimum Strategic Biodiversity Value is 80% of the weighted average score across habitat zones where a General offset is required.

4.3 Offset Strategy

According to DEECAs Native Vegetation Offset Register (DEECA 2025d), there are three offset sites within the Corangamite CMA or Golden Plains Shire region that can be used to satisfy the General Habitat Unit and Large tree offset requirements. There are currently no sites available to satisfy the Species Habitat Unit requirements. Species Habitat Unit requirements may be met via the establishment of an onsite offset site.

An offset register search statement identifying the relevant offsite sites is provided in Appendix 4.

5 POTENTIAL IMPACTS

The project footprint will be finalised with reference to the findings of this assessment to avoid and minimise impacts on ecological values where possible. Likely impacts associated with the project footprint and operation of the proposed renewable energy project are discussed in the following sections.

5.1 Construction Related Impacts

In the absence of suitable mitigation measures, construction-related impacts are likely to include:

- The introduction and spread of weeds and soil pathogens due to on-site activities;
- Disturbance to wildlife from increased human activity and noise during construction; and,
- Indirect impacts on adjacent areas if construction activities, erosion and drainage are not appropriately managed.

The Project Site is located within a relatively flat agricultural landscape with interspersing ephemeral drainage lines which are unlikely to hold water for any length of time. Where possible, access tracks have been located in cleared paddocks or are located along existing roads. There will be some impacts to native vegetation and common fauna species, primarily as a result of the construction of the proposed turbines, and widening of existing roads to facilitate access and egress. As part of these works, there is anticipated to be impacts to nationally significant Golden Sun Moth and Striped Legless Lizard populations and well as 16.31 hectares of the nationally significant NTGVVP community. In relation to flora, 1 specimen of the State protected Jersey Cudweed, and 2 specimens of the State significant Small Scurf-pea. are proposed to be impacted. The State significant Western (Basalt) Plains Grassland Community is also proposed to be impacted.

Impacts have been avoided to State-listed 35 Tough Scurf-pea specimens, 100+ Small Scurf-pea specimens, 25 Austral Tobacco specimens, Small-flowered Wallaby-grass, Fragrant Saltbush, as well as several State-protected Jersey Cudweed and orchids. The preparation of a Construction Environment Management Plan will further avoid and mitigate impacts by ensuring the protection of retained vegetation prior to, and during construction, as well as control the spread of weeds and pathogens.

5.1.1 Striped Legless Lizard

Direct Loss

A total of 3.46 hectares out of 38.79 hectares is proposed to be impacted. Based on an assessment against the significant impact criteria (DEWHA 2011), the removal of 3.46 hectares of confirmed habitat is considered to be a significant impact to Striped Legless Lizard (Section 6.1.3). Although impacted Striped Legless Lizard individuals may be relocated and/or translocated the populations are considered lost for the purposes of this assessment.

Indirect Loss

There is not considered to be any indirect loss or impact to Striped Legless Lizard habitat. Areas to be retained that support the species' habitat will be located outside of the infrastructure footprint and will continue to be managed as per the current land use, or will be located within a protected offset site. Further, the

infrastructure footprint within areas of the species' habitat will mostly be narrow, linear impacts in the form of access roads or reticulation, or hardstands that will not fragment existing areas of habitat or impede the dispersal of the species. The infrastructure footprint also includes a construction buffer located between retained Striped Legless Lizard habitat and development areas which will act as a buffer to construction activities, and mitigate against potential edge effects that have the potential to degrade suitable habitat for the species, and therefore, any Striped Legless Lizard populations existing outside of the impact area, and any other populations located outside of the study area within this region will not be indirectly impacted by the development.

Unknown, unpredictable or irreversible impacts

Impacts are not considered to be unknown or unpredictable. Although the loss of existing habitat within the Project Site is considered irreversible, the impact will be mitigated through the retention, protection and enhancement of retained areas of confirmed habitat.

5.1.2 Golden Sun Moth

Direct Loss

A total of 84.31 hectares out of 375.40 hectares is proposed to be impacted. Based on an assessment against the significant impact criteria (DoE 2013a), the removal of 84.31 hectares of confirmed habitat is considered to be a significant impact to Golden Sun Moth (Section 6.1.2).

Indirect Loss

There is not considered to be any indirect loss or impact to Golden Sun Moth habitat. Areas to be retained that support Golden Sun Moth habitat will be located outside of the infrastructure footprint and will continue to be managed as per the current land use, or will be located within a protected offset site. Further, the infrastructure footprint within areas of the species' habitat will mostly be narrow, linear impacts in the form of access roads or reticulation, or hardstands that will not fragment existing areas of habitat or impede the dispersal of the species. The infrastructure footprint also includes a construction buffer located between retained Golden Sun Moth habitat and development areas will act as a buffer to construction activities, and mitigate against potential edge effects that have the potential to degrade suitable habitat for the species, and therefore, any Golden Sun Moth populations existing outside of the impact area, and any other populations located outside of the study area within this region will not be indirectly impacted by the development.

Unknown, unpredictable or irreversible impacts

Impacts are not considered to be unknown or unpredictable. Although the loss of existing habitat within the Project Site is considered irreversible, the impact will be mitigated through the retention, protection and enhancement of retained areas of confirmed habitat.

5.1.3 *Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP)*

Direct Loss

A total of 171.75 hectares of the NTGVVP community was recorded within the Study Area (Figure 2). The proposed Project will result in a direct impact to 16.31 hectares of the NTGVVP community, with 155.44 hectares being retained.

Indirect Loss

There is not considered to be any indirect loss to other remnants of the NTGVVP community. The remaining NTGVVP recorded within the Study Area will be retained.

The removal of 16.31 hectares of the community in five discrete locations is not considered to result in any indirect impacts or increase the likelihood of indirect impacts via edge effects.

Mitigation measures must be detailed as part of a future Construction Environment Management Plan (CEMP) or similar to be prepared for the Project, such as installation of No-Go zone fencing with clear delineation (using star pickets, flagged and signed/marked areas or high visibility bunting) to ensure retained areas of NTGVVP located outside of the infrastructure footprint is retained during construction activities

Unknown, unpredictable or irreversible impacts

Impacts are not considered to be unknown or unpredictable, although the loss of several, small areas of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands within the Project Site is considered irreversible.

5.2 Operational Impacts

There are likely to be bird and bat mortalities as a result of turbine collision and barotrauma associated with the operation of the wind farm.

5.2.1 *Birds*

The primary focus of the impacts of wind farms on birds is related to collision with wind turbines (Kuvlesky *et al.* 2007), although collision with powerlines associated with wind farms has also been recorded (Janss and Ferrer 2000; Kuvlesky *et al.* 2007). However, wind farms have the potential to directly and indirectly impact birds and other taxa in other ways as well. For example, in Europe, displacement through habitat loss is considered the main detrimental effect of wind farms on avian abundance (Kuvlesky *et al.* 2007). This effect has been shown to manifest itself on both grassland birds that use habitat under the wind turbines (Leddy *et al.* 1999) and birds of prey that are frequently encountered within RSA (Farfán *et al.* 2009), although it is likely to affect all bird species to some extent. This effect is likely to occur because of the noise, movement and human disturbance associated with wind turbines (Leddy *et al.* 1999). This type of research has not been conducted in Australia, therefore the impact that this type of disturbance will have on Australian grassland birds is not well known.

The impact of increased bird mortality as a result of collisions with wind turbines or powerlines will affect different species in different ways. Affected species that are short-lived, with high annual reproduction rates, are likely to be able to absorb this additional mortality with little impact to their overall population size at a

regional or national level (Chamberlain *et al.* 2006). By contrast, affected species that are long-lived, slowly reproducing species are more vulnerable to this type of additive mortality and may be less able to maintain viable population sizes when faced by such stresses (Sæther and Bakke 2000).

Given that raptors are long-lived and are a slowly reproducing species, they are distributed in low densities compared to other birds, and are therefore exposed to increased risk of local population declines. The loss of a single breeding individual could potentially adversely impact the local population. However, it is well known based on published literature that certain raptors adapt their behaviour in the presence of wind turbines (Farfán *et al.* 2009), although detailed avoidance rates for most species worldwide is not known (Chamberlain *et al.* 2006). Particular raptor species have been identified as being 'of concern' due to their proneness to collision with operational wind turbines, although these species do appear to become conditioned to the presence of wind turbines after an extended period of time, and adjust their foraging behaviour to avoid wind turbines (i.e. up to 99% avoidance rates for most species).

During the bird utilisation surveys, 2.4% of observations made were of birds within, or above, RSA (Table 21). It cannot be assumed that all the birds observed within the Project Site flying at RSA height will collide with the wind turbines, as birds are known to adapt their behaviour in the presence of wind turbines to avoid an obstacle, such as a wind turbine in their flight path (Farfán *et al.* 2009; A. Organ, pers. comm.). Of importance, with regards to assessing the risk of turbine collision, are those birds that are threatened on a regional, State, or National level.

Overseas studies have shown that even collision-prone bird species avoid collisions with wind generators on most occasions (Winkelman 1992a; 1992b; Still *et al.* 1995). A range of avoidance rates of bird species from overseas studies range from 100% to 98% (Winkelman 1992; Still *et al.* 1995). In Australia, three avoidance rates are commonly used when calculating collision risk of birds at wind farms: 95%, 98% and 99%. Avoidance rates in Australia have previously been recorded at the Codrington Wind Farm in Victoria, where birds have regularly exhibited 100% avoidance of turbines.

Despite the specific composition of the birds observed using RSA, it is likely that other species recorded during both the fixed-point count and incidental surveys will occasionally fly within RSA and a varying degree of mortality is likely to be expected for these species. Further, survey sites near forest vegetation (i.e. BU6; Figure 3), may have resulted in a reduced number of birds observed within the RSA, with these birds predominantly moving between the canopy of trees.

Given the variation in habitat type across the Project Site, the risk for turbine collision is similarly varied. A higher risk is present in forested areas (i.e. in the north-west corner of the Project Site) where bird foraging, breeding and flight activity is likely to be greater. For all non-forested areas, given the low proportion of bird flights within the RSA (2.4% of bird movements observed during the surveys), the abundance of those species most likely to fly within this area, the high level of avoidance behaviour exhibited by many species of birds, buffers around the limited areas of high quality habitat, and the predominantly low quality habitat that comprises the rest of the Project Site, it is unlikely that the construction of the proposed wind farm will have a significant impact on the avifauna.

Given the higher turbine collision risk present at sites containing forested vegetation (i.e. Sites 19, 20), ongoing monitoring of bird populations and mortalities at the wind farm, once built, would be required to ensure that bird mortality is at a low level. Investigations should include specific monitoring of turbines near forested vegetation, as part of any future Bird and Avifauna Management (BAM) Plan (Section 8).

Forest Owls

Results of the desktop assessment identified 11 Powerful Owl records within the ROI (DEECA 2024b). The most recent Powerful Owl record is from 2018, and the nearest to the Project Site is within Bamganie State Forest from 1988 (DEECA 2024b).

There is one record of Barking Owl within the ROI, DEECA 2024b located in Bamganie State Forest from 1988 (DEECA 2024b).

There are two records of Masked Owl within the ROI, with one 1997 record located along Midland Highway to the east, and one 1995 record at Moreep Reserve campground to the north (DEECA 2024b).

Active searching for evidence (i.e. pallets, white-wash, prey remains and/or use of hollows) of significant forest owl species in suitable habitats was undertaken during roaming surveys of suitable habitats within the Project Site. No forest owls were detected.

Although no evidence of Powerful Owl, Barking Owl or Masked Owl roosting or breeding activity was found during surveys within the Project Site, Powerful Owl was recorded responding to call-playback at PO_8, a control/reference site approximately 10.5 kilometres east, within the Brisbane Ranges (Figure 4). As such, there is a moderate likelihood that Powerful Owl uses native vegetation within the Project Site for foraging and roosting activities.

Barking Owls have been shown to prefer forest edge, wooded creek lines and forest interior (80% of foraging locations) for foraging compared with scattered trees in paddocks and small isolated patches (20%) (Taylor *et al.* 2002). While there exists a number of large hollow-bearing trees in the Project Site (particularly in the north-west, immediately south of Bamganie State Forest), areas of the species' preferred foraging habitat within the Project Site are in the most part proposed to be retained, and given the lack of recent nearby records of Barking Owl, there is a low-moderate likelihood that Barking Owl uses native vegetation within the Project Site for foraging and roosting activities.

Masked Owls predominantly require forest, scrub or cleared land with mature hollow-bearing eucalypts, but do show a habitat preference for gullies, waterways, and areas with dense understorey, tending to forage near a boundary between two vegetation types. Habitat preference is largely dictated by availability of prey species than habitat quality (Cisterne *et al.* 2020). The species is likely to visit such habitat within the study area occasionally or opportunistically whilst en route to more suitable sites.

In relation to wind turbine collision risk, Powerful Owl, Barking Owl, Masked Owl (and other *Ninox* species) are canopy foraging species and rarely ascend beyond canopy height during foraging activities, due primarily to their 'stop start' hunting technique (Carter *et al*. 2019). The species also tends to avoid flying through open areas, preferring to move instead along habitat corridors (i.e. roadside remnant vegetation). In this context, Powerful Owl, Barking Owl and Masked Owl are considered to have a very low collision risk.

Swift Parrot

Swift Parrot are defined as 'species of interest' as outlined in Lumsden *et al.* (2019), meaning "*there is a higher probability that they are of 'concern' or 'extreme concern' from the impacts of wind turbine collisions at the state-wide population level, compared to the other categories of 'minimal' and 'mild' concern*".

Based on the desktop and field assessments, it is likely that Swift Parrot use the Project Site on very rare occasions to forage, while passing through during their migratory period. The Project Site contains a low number of Swift Parrot feeding tree species, comprising a total of one Yellow Box and three Yellow Gum individuals across the entire Study Area (Section 3.1). No patches of the species preferred habitat (box-ironbark forest) are present within the Study Area. The extant grassy woodland and plains grassy woodland located within the Project Site may, at best, very occasionally serve as 'rest points' on route to more suitable habitats to the north-east (i.e. Brisbane Ranges, Coolebarchurk Streamside Reserve). Remnant woodland vegetation within the Assessment contains only secondary foraging trees for the species (i.e. River Red-gum), and this vegetation is located primarily along ridge lines and gullies. According to current and historical Swift Parrot annual survey results, this is not preferred habitat for Swift Parrot, which are more likely to be found on upper and lower slopes (Ingwersen *et al*. 2021).

While the species is observed to fly at RSA height, often when embarking on longer distance flights, most of the time Swift Parrots tend to only fly at canopy height along foraging grounds (Biosis 2006). A modelling study conducted on the cumulative impacts of wind farms on Swift Parrot found the impacts to be negligible, with approximately one fatality caused every ten years (Biosis 2005). This study modelled the risk to Swift Parrot of 39 wind farm proposals in south-eastern Australia, and while a number of wind farms have been constructed since this study, many of the 39 wind farms did not proceed. As such, the study's modelling is still considered an accurate measure of cumulative risks to Swift Parrot. The same study also documented that only 16% of the total population of this species would be affected by wind farms in Victoria, that risk of collision is higher in close proximity to foraging resources, and that Swift Parrot would, due to their accurate flying ability, show a 95-100% avoidance of turbines (Biosis 2005).

Due to the presence of only marginal Swift Parrot habitat in the Project Site, the failure to detect the species during surveys, and the low number of species' records within 10 kilometres of the Project Site, turbine collision risk for Swift Parrot is low.

The risk of collision can be further reduced by ensuring turbines are configured to provide a significant buffer between secondary potential Swift Parrot feeding grounds (i.e. large or contiguous patches of remnant eucalypt forests containing secondary eucalypt foraging species) and active turbines in the Project Site. Based on the current development layout, the turbines in closest proximity to possible Swift Parrot secondary feeding grounds are Turbines 5, 8, 13, 19, 20, 44 and 46 (Figure 2).

Given the species' total population is low and in decline, any impacts to Swift Parrot through turbine collision could potentially represent a significant impact to the species. While turbines have been configured to reduce the risk of collision to the species, overall there is a low risk to the species from turbine collision given the absence of foraging habitat patches in the Project Site.

Brolga

Cranes, both overseas and in Australia, have been identified as being prone to collision with powerlines (Goldstraw and Du Guesclin 1991; Janss and Ferrer 2000; Kuvlesky *et al.* 2007), although this does not specifically relate to turbine collisions. Brolgas, as Australian representatives of the Crane family, are therefore also seen as being potentially significantly impacted by collisions with aerial infrastructure, such as wind turbines. Indeed, the impact of wind farms on Brolgas is one of the key environmental issues facing the industry in south-western Victoria (DSE 2012), given the limited distribution of Brolgas in Victoria.

Wind farms have the potential to impact on the Brolga in the following ways:

- Habitat loss by removal of wetlands and nearby pasture habitats as a result of the construction of wind farm infrastructure;
- Collision with wind turbines, power lines and monitoring equipment;
- Disturbance of birds leading to displacement and exclusion from areas of suitable habitat or changes in behaviour; and
- Creation of barriers to flying birds, interrupting migratory movements between important habitat areas or disrupting local flight paths.

Brolga investigations are provided in Appendix 5.

5.2.2 Bats

Bats are susceptible to mortality caused by wind turbines (Arnett 2005; Bearwald *et al*. 2008, Kunz *et al*. 2007). In some habitats both a high number of individuals and species are struck by wind turbines, especially those bat species that undertake large scale annual migrations (Kunz *et al*. 2007; Kuvlesky *et al*. 2007; Cryan and Barclay 2009). Furthermore, bats may be attracted to wind turbines following vortices created by the blade tips and have been observed investigating all parts of the turbine (Horn *et al*. 2008; Cryan and Barclay 2009). There is also potential for bats to die as a result of barotrauma caused by changes in pressure produced by the rotating turbines (Bearwald *et al*. 2008, Cryan and Barclay 2009).

Collisions with turbine blades are understood to be the most frequent interaction causing mortality or injury, although the cause of these collisions is poorly known. General observations to date indicate that bats do not typically collide with turbine towers, transmission structures, guy wires, or meteorological towers (i.e. stationary structures); however current understanding of how and why bats come into contact with turbines is lacking. This is due to the limited ability to observe how bats behave at night around these structures as they move across the landscape between patches of vegetation and during foraging activities (MNR 2007, Horn *et al.* 2008a).

There are four main factors that contribute to bat mortality at wind farm sites:

- Bat species and abundance in the area;
- Season (i.e. time of year) and weather conditions (e.g. clear, warm nights with low wind). Such factors are likely to influence the level of bat activity and thus mortality at wind farms (MNR 2007);
- Habitat/landscape features in the area (e.g. migration routes, forested ridges, and hibernacula/swarming sites may be important features).
    - High levels of bat activity have been documented in forested ridge habitats, and areas where the woodland patches have been cleared for wind turbine placement also offer attractive foraging habitat for some species of bats. Edges of remnant woodlands and scattered remnant trees in paddocks provide favourable foraging areas where bats can easily capture airborne insect prey, creating areas of concentrated bat activity (Barclay 1985; Lumsden and Bennett 2000, 2005; Kunz *et al.* 2007, Horn *et al.* 2008a); and,
- The number of turbines contained within the wind farm.

Bats Species in the Project Site

The majority of species previously recorded or predicted to occur within the Project Site are likely to focus their foraging activities in forested areas, around patches of vegetation and scattered remnant trees, at or below canopy height.

Species that use more open areas, generally fly close to the ground (less than five metres high) when in these areas (Churchill 1998). Bat species that typically fly high are at the highest risk of flying within the RSA and suffering mortality from barotrauma or collision. Of the species likely to occur, the White-striped Freetail Bat is known to fly at RSA height (50 metres or above) (Churchill 1998), and therefore this species is considered to be at highest risk of blade collisions and barotrauma. However, the potential impacts to White-striped Freetail Bat and other bats during operation of the wind farm are expected to be low due to the location of the majority of turbines in a cleared landscape, some distance from significant woodland habitats and large trees that would be favoured for foraging by most bat species.

Given the higher turbine collision risk present at sites containing forested vegetation (i.e. Sites 19, 20), ongoing monitoring of bird populations and mortalities at the wind farm, once built, would be required to ensure that bird mortality is at a low level. Investigations should include specific monitoring of turbines near forested vegetation, as part of any future Bird and Avifauna Management (BAM) Plan (Section 8). Eastern Bent-wing Bat, recorded at one location within the Project Site (BS02; Figure 7) is a cave dwelling bat that forages at and around canopy height in treed areas, and close to the ground in grassy areas. The species has previously been shown to fly consistently below turbine height, with no collision mortalities published in Victoria (ARI 2019).

Yellow-bellied Sheathtail Bat, recorded at one location within the Project Site (BS34; Figure 7), is a cavity-roosting species that are generally reliant on old-growth forest hollows, though the species may also opportunistically use abandoned animal burrows and human structures, and roost under dry clay and rock. The species exhibits a flight behaviour characterised by swift, direct flight paths and slow wing beats, being distinguishable in flight due to its light-coloured ventral side. Due to its size, the species is well-adapted for rapid flight but with low manoeuvrability, primarily suited for flight at canopy levels and open spaces. No collision mortalities have been published in Victoria (ARI 2019).

However, both Eastern Bent-wing Bat and Yellow-bellied Sheathtail Bat are listed as 'Probable Species of Concern' (DEECA 2024a). In this context, turbines are unlikely to cause significant impacts to threatened bat populations recorded in the Project Site, however some residual impacts are possible.

5.3 Cumulative Biodiversity Impacts

The largest impact to biodiversity in the locality and encompassing bioregion is likely to have stemmed from increased European settlement around the 1940s and the subsequent land clearance for agriculture. The Victorian Volcanic Plain bioregion is one of Victoria's most cleared bioregions, with less than 2% of remnant NTGVVP remaining. Future disturbance associated with human activities in these bioregions is likely to be associated with ongoing agricultural activities and development.

The impacts from the project must be considered together with the biodiversity impacts that have resulted from historic and predicted future human disturbances.

In addition to cumulative impacts associated with construction of the Tall Tree Wind Farm, operational activities have the potential to lead to incremental and cumulative impacts (e.g. barrier effects, changes to bird/bat behaviour etc.). Nearby operating wind farms within the vicinity of the Project Site include:

- Yaloak South (operational 2019); 28.7MW – located 23 kilometres north-east;
- Moorabool (operational 2021); 312MW – located 18 kilometres north-east;
- Mount Mercer (operational 2014); 131MW - located 12 kilometres north-west;
- Golden Plains (under construction); 756MW (Stage 1), 1,330MW (Total) located 21 kilometres west;
- Berrybank (operational 2022); 180MW located 43 kilometres west; and,
- Mount Gellibrand (operational 2018); 132MW located 32 kilometres south-west.

Although in proximity to Moorabool and Mount Mercer Wind Farms, operation of the proposed Tall Tree Wind Farm is considered unlikely to significantly increase cumulative pressures within the broader landscape, particularly in relation to significant flora and fauna species and ecological communities, due to the development footprint largely being located in a setting within a predominantly cleared and uniform landscape, outside the likely common distribution range of key species potentially impacted by wind farm developments (e.g. Southern Bent-wing Bat, migratory shorebirds).

Despite this, ongoing monitoring of bird populations following commissioning of the Project will enable the proponent to identify and mitigate cumulative impacts as other renewable energy projects are brought on-line.

5.4 The Impact of Climate Change

Climate change is likely to have an impact on both the flora and fauna of the Project Site. There has been recent speculation about the movement of wetlands south as the interior of Australia becomes increasingly arid. This conjecture is not supported by empirical data and it is likely that changes in Australia's climate will have unpredictable impacts on Australia's biodiversity, including birds (Pittock 2003). Changes that have already occurred as a result of the effect of climate change on birds include changes to distribution, phenology, morphology and physiology, behaviour, and abundance and population dynamics (Chambers *et al.* 2005).

As climate change is better understood it may be that developments such as wind farms need to be mindful of the impacts of this phenomenon, however at present, this is not possible. It should also be noted that wind farms are a clean energy source with very low carbon emissions.

6 LEGISLATIVE AND POLICY IMPLICATIONS

6.1 *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)

The EPBC Act establishes a Commonwealth process for the assessment of proposed actions (i.e. project, development, undertaking, activity, or series of activities) that are likely to have a significant impact on Matters of National Environmental Significance (MNES), or on Commonwealth land. An action, unless otherwise exempt, requires approval from the Commonwealth Environment Minister if it is considered likely to have an impact on any MNES. A summary of potential impacts to matter is NES is provided in Table 26.

Table 26. Potential impacts to MNES.

Matter of NES	Potential Impacts
World Heritage properties	No. The proposed action will not impact any properties listed for World Heritage.
National Heritage places	No. The proposed action will not impact any places listed for national heritage.
Ramsar wetlands of international significance	No. There are no Ramsar wetlands occurring within or surrounding the Project Site. The closest Ramsar wetlands are Port Phillip Bay (Western Shoreline) and Bellarine Peninsula (approximately 40 kilometres south-east), Western Lakes District (approximately 37 kilometres south-west). The Project Site is located well upstream of the nearest Ramsar wetlands.
Threatened species and ecological communities	No nationally significant flora species and four nationally significant fauna species (Blue-winged Parrot, Striped Legless Lizard, Growling Grass Frog and Golden Sun Moth) were recorded within the Project Site. There is suitable habitat within the Study Area for Brown Treecreeper, Blue-winged Parrot, Latham's Snipe, Diamond Firetail, Gang-gang Cockatoo, Hooded Robin, Striped Legless Lizard and Golden Sun Moth (refer to Section 3.5.2). The NTGVVP ecological community was recorded within the Study Area (Section 3.5.3).
Migratory and marine species	There is highly unlikely to be marine habitat within the Project Site and the Project Site would not be classed as an 'important habitat' as defined under the EPBC Act Policy Statement 1.1 Principal Significant Impact Guidelines (DoE 2013), in that it does not contain: • Habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species; • Habitat utilised by a migratory species which is at the limit of the species range; or, • Habitat within an area where the species is declining. It is considered that the likelihood of migratory bird mortality through turbine collisions is low and that the proposed wind farm is unlikely to have a significant impact on any migratory species
Commonwealth marine area	No. The proposed action will not impact any Commonwealth marine areas.
Nuclear actions (including uranium mining)	No. The proposed action is not a nuclear action.
Great Barrier Reef Marine Park	No. The proposed action will not impact the Great Barrier Reef Marine Park.
Water resources impacted by coal seam gas or mining development	No. The proposed action is not a coal seam gas or mining development.

The following implications are based on the current preliminary impact assessment and are considered to be conservative. Further impact minimisation demonstrated via micro siting of infrastructure will be undertaken during the detailed design phase of the project.

6.1.1 Natural Temperate Grassland of the Victorian Volcanic Plain

A total of 171.75 hectares of the NTGVVP ecological community is present within the Study Area. Based on the Preliminary Impact Assessment, there is a proposed impact to 16.31 hectares of the NTGVVP ecological community through removal to accommodate project infrastructure.

An assessment of the development footprint against the significant impact guidelines for Critically Endangered ecological communities (DoE 2013) is provided below in Table 27.

Table 27. Assessment against the Significant Impact Guidelines for Endangered or Critically Endangered Ecological Communities: NTGVVP ecological community.

Significant Impact Guidelines 1.1 – Significant Impact Criteria for Endangered or Critically Endangered Ecological Communities (NTGVVP)	
Significant impact Criteria	**Comment**
1. Reduce the extent of an ecological community.	The proposed action will result in a reduction in extent of the ecological community, with the proposed removal of a maximum of 16.31 hectares out of more than 170 hectares of the community recorded within the Study Area. The 16.31 hectares is located in largely within paddocks and typically in the form of large contiguous patches. The impacted 16.31 hectares is due to construction of hard stands as well as assumed impacts within the buffer areas associated with the construction of access tracks and installation of reticulation. Impacts to the ecological community cannot be entirely avoided due to the requirement to construct infrastructure associated with the Project. Based on the Preliminary Impact Assessment, the extent of the community will be reduced by approximately 16.31 hectares.
2. Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines.	The overall NTGVVP community is present within paddocks and is largely surrounded by a modified agricultural landscape as well as lower quality native vegetation patches. Much of 16.31 hectares proposed to be removed is likely to significantly increase fragmentation of large contiguous patches of NTGVVP. As such, the proposed action will likely result in increased fragmentation of the ecological community, given that sections within large, contiguous areas of the community are proposed to be impacted.
3. Adversely affect habitat critical to the survival of an ecological community.	The proposed action is not likely to adversely affect the long-term survival of the ecological community, given that the majority of the community is being avoided by the proposed action (Figure 2).
4. Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns.	The proposed action will result in the removal of surface soil within the development footprint required to construct access tracks and install reticulation. Soil and rock removal will only be taken to the extent necessary to level the ground to facilitate construction works. Soil will not be stockpiled outside of the activity area and will be reinstated as soon as possible. Given the nature of works within the ecological community and the existing presence of roads, groundwater levels, water drainage patterns and nutrient loads are unlikely to be significantly affected by the proposed action.

Significant Impact Guidelines 1.1 – Significant Impact Criteria for Endangered or Critically Endangered Ecological Communities (NTGVVP)	
5. Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting.	The overall functionality of the community may be affected by the proposed action given the large extent of proposed impacts within large contiguous patches of NTGVVP, despite the presence of existing roads located within and adjacent to the community, as well as the retention of the remainder of the community adjacent to the infrastructure footprint.
6. Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:	The overall quality of the ecological community may be negatively affected by the proposed action given the extent of proposed removals. Edge-effects may increase given the substantial reduction in size of the community in some large patches. Weed incursion may also occur. However a CEMP is proposed to mitigate impacts due to weeds and other pathogens that contribute to edge effects. Appropriate management of the construction process and machinery will be used to ensure that any weed species, pollutants and/or pathogens are not inadvertently spread into areas supporting the ecological community.
a. assisting invasive species, that are harmful to the listed ecological community, to become established or;	
b. causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community.	
7. Interfere with the recovery of an ecological community.	The proposed action may interfere with the ecological processes or recovery of the ecological community, due to the removal of large, contiguous patches of the ecological community.

Implications

The proposed action will result in the direct and indirect impact to 16.31 hectares of the NTGVVP ecological community through removal to accommodate project infrastructure.

Based on a 'self-assessment' against the Commonwealth significant impact guidelines (DoE 2013), it is considered that the proposed action has the potential to result in a significant impact to the NTGVVP ecological community, given that the removal of 16.31 hectares will result in the substantial reduction in the extent of a Critically Endangered ecological community.

6.1.2 Avian Fauna

An assessment of the potential impacts to nationally-listed avian species against the *EPBC Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* is included below (Table 28 and Table 29). Nationally-listed birds that were recorded within or adjacent to the Project Site, or where some habitat values were recorded (i.e. Swift Parrot) were included in the assessment.

An important concept for determining the potential significance of an impact under the EPBC Act is that of 'habitat critical to the survival' of a species. The EPBC Act Significant impact guidelines 1.1 (Commonwealth of Australia 2013) provides the following guidance for determining whether an action may affect habitat critical to the survival of a species:

- Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal;
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);
- to maintain genetic diversity and long-term evolutionary development; or,
- for the reintroduction of populations or recovery of the species or ecological community.

Table 28. Significant Impact Assessment for the Critically Endangered Swift Parrot.

Significant Impact Criteria	Comment
An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
1. Lead to a long term decrease in the size of a population.	The vegetation on site is not identified as priority habitat for the species. As such, it is considered unlikely that the proposed vegetation removal, which will be undertaken in a manner that maintains broader connectivity within the landscape, would lead to a long-term decrease in the population. Any impacts to Swift Parrot through turbine collision, though very unlikely, would potentially represent a significant impact to the species due to the ongoing decline in the known population size of Swift Parrot.
2. Reduce the area of occupancy of the species.	Swift Parrot have not been recorded within the Project Site. While the vegetation on site may provide opportunistic foraging habitat on very rare occasions, its connectivity will be maintained, so the area of occupancy will not be reduced.
3. Fragment an existing population into two or more populations.	Swift Parrot is a migratory species that breeds in Tasmania and overwinters in Victoria. The proposed action will not fragment an existing population.
4. Adversely affect habitat critical to the survival of a species.	The vegetation within the Project Site is not identified as one of the high priority sites with which Swift Parrot shows a high level of fidelity. While it may very rarely provide opportunistic foraging habitat, proposed impacts to habitat are highly unlikely to be habitat critical to the species' survival.
5. Disrupt the breeding cycle of a population.	The entire population of Swift Parrot breeds in Tasmania, so the proposed vegetation removal would not disrupt its breeding cycle.
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Some vegetation on site is considered to be opportunistic secondary foraging habitat. It's connectivity will be maintained. The removal of some vegetation on site is therefore highly unlikely to cause the species to decline.
7. Result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat.	The Project Site is within a matrix of highly modified agricultural land already subject to weed and pest invasion. Nevertheless, mitigation measures (see Section 7.1) will be put in place to ensure appropriate pest plant and animal management is in place, including the development of a CEMP. The proposed works are unlikely to assist the establishment of an invasive species that would prevent the use of the site by Swift Parrot.
8. Introduce disease that may cause the species to decline.	While the introduction of disease is unlikely, mitigation measures (see section 7.1) will be put in place to ensure appropriate pathogen management.
9. Interfere substantially with the recovery of the species.	The site has not been identified as priority habitat for Swift Parrot. The removal of vegetation in a way that maintains connectivity is unlikely to interfere with the recovery of the species. However, the species population numbers are known to be in decline, and any impacts to Swift Parrot through turbine collision, though unlikely, could potentially represent a significant impact to the species. While turbines have been configured to reduce the risk

Significant Impact Criteria	Comment
	of collision to the species, overall there is a low risk that turbine strike will occur and interfere with the recovery of the species population.

Implications

Although not recognised as supporting any high priority sites, the proposed development footprint will impact on potential secondary foraging habitat for Swift Parrot. Any impacts to Swift Parrot through turbine collision could potentially represent a significant impact to the species due to the low numbers and ongoing decline of the existing population. While turbines have been configured to reduce the risk of collision to the species, it is not possible to predict exactly where (direction and height) individuals will fly. However, a low risk to the species from turbine collision is present as the species is likely to access foraging habitat within the Project Site very rarely.

However, it is noted that the risk of turbine collision for Swift Parrot is higher in close proximity to foraging resources, and that Swift Parrot would, due to their accurate flying ability, show a 95-100% avoidance of turbines (Biosis 2005).

Table 29. Significant Impact Assessment for the Vulnerable Brown Treecreeper and Blue-winged Parrot.

Significant Impact Criteria	Blue-winged Parrot	Brown Treecreeper
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1. Disrupt the breeding cycle of an 'important population'	Blue-winged Parrot is likely to fly within the RSA on occasion, the loss of occasional individuals due to turbine collision is not expected to disrupt the breeding cycle of the population. Further, Blue-winged Parrot is not currently listed as a 'Species of Concern' for wind farms (DEECA 2024a).	Brown Treecreeper is unlikely to fly within the RSA and the unlikely event of turbine collision will not to disrupt the breeding cycle of the population. Further, Brown Treecreeper is not currently listed as a 'Species of Concern' for wind farms (DEECA 2024a).
2. Lead to a long-term decrease in the size of an important population of a species	The loss of occasional individuals due to collision is not expected to result in the long-term decrease in the population of either species given their current populations sizes.	
3. Reduce the area of occupancy of an important population	Given the wide distribution of both species, the Project will not reduce their area of occupancy.	
4. Fragment an existing important population into two or more populations	The project will not fragment the existing population as the species is highly mobile. Although the species may fly through the site, the species is also able to pass over or between turbines or go around the windfarm infrastructure.	The project will not fragment the existing population. Most of the impacts associated with the proposed action are to grassland areas not suitable for the species. Impacts to woodland areas suitable for Brown Treecreeper are not likely to lead to fragmentation of existing habitat.
5. Adversely affect habitat critical to the survival of a species	Habitat critical to the survival of both Brown Treecreeper and Blue-winged Parrot includes relatively undisturbed grassy woodland with native understorey, open habitat structure (i.e. from moderate levels of disturbance by fire and/or grazing) at ground level (so birds are able to feed on or near the ground and maintain vigilance against predators), large living and dead trees (essential for roosting and nesting sites), fallen timber which provides essential foraging habitat for Brown Treecreeper, and hollows in standing dead or live trees (for nesting). While the proposed action will impact grassy woodland suitable for both species, impacts are not to the scale that would lead to adverse impacts to habitat critical to survival of each species.	

Significant Impact Criteria	Blue-winged Parrot	Brown Treecreeper
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Although approximately 11.4 hectares of woodland vegetation is proposed to be removed, both species are widely distributed, and the Project will not result in the species population numbers to decline.	
7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The Project Site is within a matrix of highly modified agricultural land already subject to weed and pest invasion. Nevertheless, mitigation measures (see Section 7.1) will be put in place to ensure appropriate pest plant and animal management is in place, including the development of a CEMP. The proposed works are unlikely to assist the establishment of an invasive species that would prevent the use of the site by either species.	
8. Introduce disease that may cause the species to decline, or	While the introduction of disease is unlikely, mitigation measures (see section 7.1) will be put in place to ensure appropriate pathogen management.	
9. Interfere substantially with the recovery of the species.	Given the wide distribution of both species, and large population numbers, the proposed action will not interfere with the recovery of either species.	

Implications

Given the wide distribution of both species, and large population numbers, the proposed action will not interfere with the recovery of either species. However, it is noted that the risk of turbine collision for Blue-winged Parrot is higher in close proximity to foraging resources.

6.1.3 Striped Legless Lizard

Based on the recorded presence of Striped Legless Lizard, a total of 38.79 hectares of confirmed Striped Legless Lizard habitat is present within the Study Area (Figure 5). Based on the Preliminary Impact Assessment, there is a proposed impact to 3.46 hectares of confirmed Striped Legless Lizard habitat to enable construction and siting of the proposed wind farm and associated access tracks and reticulation infrastructure.

An assessment of the potential impacts to the vulnerable Striped Legless Lizard against the *EPBC Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* is included below (Table 31).

Table 30. Assessment against the Significant Impact Guidelines for the vulnerable Striped Legless Lizard (DoE 2013).

Significant Impact Criteria	Comment
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
1. Disrupt the breeding cycle of an 'important population'	The Project Site is considered to support an 'important population' as a key source population for breeding or dispersal is present. Given the presence of over 38.79 hectares of confirmed habitat, the potential impact to 3.46 hectares may disrupt the breeding cycle, given the impacts to large contiguous areas of high-quality Striped Legless Lizard habitat, and likely direct impacts to individuals due the species' inability to disperse long distances. Therefore, the breeding and dispersal capabilities of this population may be affected or compromised by the proposed development, given the proposed impacts to high-quality areas of SLL habitat.

Significant Impact Criteria	Comment
2. Lead to a long-term decrease in the size of an important population of a species	The Project Site is considered to support an 'important population' as the population is a key source population for breeding and dispersal given the large number of individuals recorded and large size of contiguous habitat areas. Given the proposed disturbance is limited to one large and one small area of confirmed habitat, it is unlikely that the action will lead to a long-term decrease in the size of the population. However, loss of eggs may also occur during habitat removal.
3. Reduce the area of occupancy of an important population	The Project Site is considered to support an 'important population'. The 3.46 hectares of impact to confirmed habitat occurs within a mixed agricultural and remnant grassland landscape. The narrow, linear impact footprints are likely to fragment large contiguous areas of habitat for SLL, and may near Grid 41 form a permanent, long-term barrier to SLL movement between adjacent areas of suitable habitat, likely creating two separate populations instead. The overall area of occupancy within the infrastructure footprint is likely to be reduced due to proposed impacts to 3.46 hectares of confirmed SLL habitat.
4. Fragment an existing important population into two or more populations	
5. Adversely affect habitat critical to the survival of a species	The proposed action will not adversely affect habitat critical to the survival of the species. The proposed action will result in the removal of surface soil and preferred tussock forming grasses to facilitate the construction of Project infrastructure. Although impacted habitat is largely high-quality, similar quality habitat, which – in part – contributes to a minimum 38.79 hectares of confirmed habitat for the species, is present within the Study Area.
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Although 3.46 hectares of confirmed habitat is proposed to be removed as a result of the proposed action, the extent and overall quality of surrounding areas of SLL habitat is not likely to be affected by the proposed action. Appropriate management during the construction process will ensure weed species, pollutants and/or pathogens are not inadvertently spread into areas supporting known habitat.
7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed action is not likely to interfere with the ecological processes or recovery of areas considered to be habitat for SLL, due to the retention of larger, adjacent areas of suitable habitat. Appropriate management during the construction process will ensure weed species, pollutants and/or pathogens/diseases are not inadvertently spread into areas supporting known habitat.
8. Introduce disease that may cause the species to decline, or	
9. Interfere substantially with the recovery of the species.	

Implications

Based on the recorded presence of Striped Legless Lizard, a total of 38.79 hectares of confirmed Striped Legless Lizard habitat is present within the Study Area (Figure 5). Based on the Preliminary Impact Assessment, there is a proposed impact to 3.46 hectares of confirmed Striped Legless Lizard habitat.

It is considered that the proposed action may result in a significant impact to the vulnerable Striped Legless Lizard given that the area of occupancy will be potentially reduced by up to 3.46 hectares. The Project Site is considered to support an 'important population' as it contains key source populations for breeding and dispersal (DAWE 2021).

Given the discrete nature of the proposed disturbance (narrow, linear impact areas), it is highly unlikely that the action will lead to a long-term decrease in the size of the population. However, given the species limited ability to disperse, the proposed impacts may lead to fragmentation of Striped Legless Lizard populations.

6.1.4 Golden Sun Moth

Based on the recorded presence of Golden Sun Moth, a total of 375.40 hectares of confirmed Golden Sun Moth habitat is present within the Study Area (Figure 12). Based on the Preliminary Impact Assessment, there is a proposed impact to 84.31 hectares of confirmed Golden Sun Moth habitat to enable construction and siting of the proposed wind farm and associated access tracks and reticulation infrastructure. An assessment of the potential impacts to the vulnerable Golden Sun Moth against the *EPBC Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* is included below (Table 31).

Table 31. Assessment against the Significant Impact Guidelines for the vulnerable Golden Sun Moth (DoE 2013).

Significant Impact Criteria	Comment
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
1. Disrupt the breeding cycle of an 'important population',	The Project Site is considered to support an 'important population' as a key source population for breeding or dispersal is present. Given the presence of over 375.40 hectares of confirmed habitat, the potential impact to 84.31 hectares may disrupt the breeding cycle. The breeding cycle may be impacted in areas where higher quality habitat – relative to the surrounding habitat – is proposed for removal. For example, at T44. Therefore, the breeding and dispersal capabilities of this population may be affected or compromised by the proposed development, given the proposed impacts to high-quality areas of GSM habitat.
2. Lead to a long-term decrease in the size of an important population of a species	The Project Site is considered to support an 'important population' as the population is a key source population for breeding and dispersal given the large number of individuals recorded and large size of contiguous habitat areas. Given the proposed disturbance of large areas of confirmed habitat, across multiple populations, it is highly likely that the action will lead to a long-term decrease in the size of the population. The loss of larvae may also occur during habitat removal.
3. Reduce the area of occupancy of an important population	The Project Site is considered to support an 'important population'. The 84.31 hectares of impact to confirmed habitat occurs within a mixed agricultural and remnant grassland landscape. The narrow, linear impact footprints are likely to divide large contiguous areas of habitat for GSM, and may at some sites form a permanent, long-term barrier to Golden Sun Moth movement between adjacent areas of suitable habitat. The overall area of occupancy within the infrastructure footprint is likely to be reduced due to proposed impacts to 84.31 hectares of confirmed GSM habitat.
4. Fragment an existing important population into two or more populations	
5. Adversely affect habitat critical to the survival of a species	The proposed action will not adversely affect habitat critical to the survival of the species. The proposed action will result in the removal of surface soil and known food plants to facilitate the construction of Project infrastructure. Similar or higher quality habitat (a minimum 291 hectares of confirmed habitat) for the species to be retained is present within the Study Area and Project Site.

Significant Impact Criteria	Comment
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Although 84.31 hectares of confirmed habitat is proposed to be removed as a result of the proposed action, the extent and overall quality of surrounding areas of GSM habitat is not likely to be affected by the proposed action. Appropriate management during the construction process will ensure weed species, pollutants and/or pathogens are not inadvertently spread into areas supporting known habitat.
7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed action is not likely to interfere with the ecological processes or recovery of areas considered to be habitat for GSM, due to the retention of larger, adjacent areas of suitable habitat. Appropriate management during the construction process will ensure weed species, pollutants and/or pathogens/diseases are not inadvertently spread into areas supporting known habitat.
8. Introduce disease that may cause the species to decline, or	
9. Interfere substantially with the recovery of the species.	

Implications

Based on the recorded presence of Golden Sun Moth, a total of 375.40 hectares of confirmed Golden Sun Moth habitat is present within the Study Area (Figure 12). Based on the Preliminary Impact Assessment, there is a proposed impact to 84.31 hectares of confirmed Golden Sun Moth habitat.

It is considered that the proposed action will result in a significant impact to the vulnerable Golden Sun Moth given that the area of occupancy will be potentially reduced by up to 84.31 hectares. The Project Site is considered to support an 'important population' as a key source population for breeding or dispersal is present (DAWE 2021).

Given the proposed disturbance of large areas of confirmed habitat, across multiple populations, it is likely that the action will lead to a long-term decrease in the size of this important population. The loss of larvae may also occur during habitat removal.

6.1.5 Implications

The following implications are based on the current preliminary impact assessment and are conservative. Further impact minimisation will be demonstrated via micro siting of infrastructure during the detailed design phase of the project.

Based on the Preliminary Impact Assessment, there is a proposed impact to 84.31 hectares of confirmed Golden Sun Moth habitat, 3.46 hectares of confirmed Striped Legless Lizard habitat, and 16.31 hectares of the Natural Temperate Grassland of the Victorian Volcanic Plain ecological community. One Growling Grass Frog was recorded within the Study Area, however there are no proposed impacts to potential aquatic habitat for the species.

The Project Site also contains suitable foraging habitat for Brown Treecreeper, Diamond Firetail, Hooded Robin, and Gang-gang Cockatoo, with the latter known to fly in the Rotor Swept Area. While turbines have been configured to reduce the risk of collision to the species, it is not possible to predict exactly where (direction and height) individuals will fly and therefore a low to moderate risk to these species from turbine collision remains.

No EPBC-Act listed flora were recorded within the Study Area, however targeted surveys are proposed to occur for several nationally significant flora species with a moderate-high likelihood of occurrence within the Project Site.

The Project is being referred under the EPBC Act for further assessment.

6.2 *Environment Effects Act 1978* (Victoria)

The *Environment Effects Act 1978* (EE Act) provides for assessment of proposed actions that can have a significant effect on the environment via the preparation of an Environment Effects Statement (EES). A project with potential adverse environmental effects that, individually or in combination, could be significant in a regional or State context should be referred. Actions that may be referred for an EES decision are discussed in Table 32.

The following implications are based on the current preliminary impact assessment and are considered to be conservative. Further impact minimisation will be demonstrated via micro siting of infrastructure during the detailed design phase of the project.

Table 32. Referral criteria under the EE Act.

Referral criteria	Potential Impacts
Individual potential environment effects Individual types of potential effects on the environment that might be of regional or State significance, and therefore warrant referral of a project, are:	
Potential clearing of 10 hectares or more of native vegetation from an area that: • is of an EVC identified as endangered by DEECA in accordance with Appendix 2 of Victoria's Native Vegetation Management – A Framework for Action (DSE 2002); • is of Very High conservation significance (as defined in accordance with Appendix 3 of Victoria's Native Vegetation Management – A Framework for Action (DSE 2002); or, • is not authorised under an approved Forest Management Plan or Fire Protection Plan	Yes. A total area of 67.793 hectares of native vegetation patches are proposed to be impacted. This comprises: • 50.154 hectares of native vegetation from five endangered EVCs: o 1.427 hectares of CGW; o 39.069 hectares of PG; o 6.777 hectares of PGW; o 2.837 hectares of GW; and, o 0.045 hectares of PGWe. • 12.114 hectares of native vegetation from two vulnerable EVCs: o 11.750 hectares of VGF; and, o 0.364 hectares of CHrW. • 5.525 hectares of native vegetation from one depleted EVC: o 5.525 hectares of GDF.

Referral criteria	Potential Impacts
Potential long-term loss of a significant proportion (1-5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria	No. Flora: 2 specimens of the State significant Small Scurf-pea, and 2 FFG-Act Protected Jersey Cudweed are proposed to be impacted. The State significant Western (Basalt) Plains Grassland Community is also proposed to be impacted. The loss of these plants will not exceed 1-5% of the overall population within Victoria. The loss of 16.31 hectares of NTGVVP is not likely to constitute a loss of 1-5% of the overall extent of this community within Victoria. Fauna: A total of 84.31 hectares of confirmed habitat for the Golden Sun Moth and 3.46 hectares of confirmed habitat for Striped Legless Lizard is proposed to be impacted. However, the loss of vegetation as part of this proposal will not result in the long-term loss of a significant proportion of these species' habitat (i.e. 1-5%) given these species occupy a large habitat range across much of the Victorian Volcanic Plain north and west of Melbourne. Eastern Bent-wing Bat, Yellow-bellied Sheathtail Bat, Platypus, Brown Treecreeper, Blue-winged Parrot, Eastern Great Egret, Growling Grass Frog were also recorded during the ecological assessments. State-listed Eastern Great Egret, Eastern Bent-wing Bat, and Yellow-bellied Sheathtail Bat are 'Species of Concern' according to the updated list (DEECA 2024a). Although these species, as well as other Nationally and State significant fauna are likely to utilise the site (Gang-gang Cockatoo, Powerful Owl), among the bat and avifauna species there is, at best, a low-moderate likelihood to be impacted due to turbine strike, and the construction of the wind farm will not result in the loss of a significant proportion of habitat for these species. Eastern Bent-wing Bat is a cave dwelling bat that forages at and around canopy height in treed areas, and close to the ground in grassy areas. The species has previously been shown to fly consistently below turbine height, with no collision mortalities published in Victoria. Swift Parrot is likely to utilise habitat within the locality on very rare occasions when moving between large tracts of preferred nearby habitat (e.g. Brisbane Ranges). Foraging habitat for the species within Victoria ranges from Horsham (west) to Wodonga (east), as well as habitat located around Greater Melbourne and Orbost to the east. Impacts to secondary foraging habitat will not result in the loss of a critical habitat for the species.
Potential long-term change to the ecological character of a wetland listed under the Ramsar Convention or in 'A Dictionary of Important Wetlands in Australia'	No. The impact area is not listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia'.
Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long time	Highly unlikely. Any construction of creek crossings will not result in adverse impacts of aquatic waterways within the Project Site.
Potential extensive or major effect on the health, safety or well-being of a human community, due to emissions to air or water or chemical hazards or displacement of residents	Unknown. Outside the scope of this report.
Potential greenhouse gas emissions exceeding 200,000 tonnes of carbon dioxide equivalent per annum, directly attributable to the operation of the facility	Unknown. Outside the scope of this report.

Referral criteria	Potential Impacts
A combination of potential environmental effects A combination or two or more of the following types of potential effects on the environment that might be of regional or State significance, and therefore warrant referral of a project, are:	
Potential clearing of 10 hectares or more of native vegetation, unless authorised under an approved Forest Management Act or Fire Protection Plan	Yes. A total area of 67.793 hectares of native vegetation patches is proposed to be removed.
Potential extensive or major effects on landscape values of regional importance, especially where recognised by a planning scheme overlay or within or adjoining land reserved under the *National Parks Act 1975*	Unlikely. The impact footprint is not within or adjoining a National Park. Five turbines are located within an area covered by an Significant Landscape Overlay – Schedule 16 (SLO16), including three turbines that are also located within a Environmental Significance Overlay – Schedule 1 (ESO1). This overlay protects 'significant ridges on the highest land in the municipality' with one of its main objectives being to protect waterway banks from development which may accentuate erosion and water quality issues. It is considered unlikely that turbines in this location will result in potential extensive or major effects on landscape values of regional importance. A CEMP is proposed to ensure mitigation of potential impacts to adjacent values, including waterways. Significant Landscape Overlay – Schedule 16 (SLO16). This overlay largely protects the waterways from overshadowing, visual impacts and stormwater impacts. Turbine locations are setback from the riparian corridor and due to their shape are unlikely to significantly overshadow any waterways. A CEMP is proposed to ensure mitigation of potential impacts to adjacent values, including waterways.
Matters listed under the FFG Act: • Potential loss of a significant area of a listed ecological community; • Potential loss of a genetically important population of an endangered or threatened species; • Potential loss of critical habitat; or, • Potential significant effects on habitat values of a wetland supporting migratory birds.	Eastern Bent-wing Bat, Yellow-bellied Sheathtail Bat, Platypus (deceased), Eastern Great Egret were recorded during the ecological assessments. These species, as well as other State significant fauna are likely to utilise the site (Hairy or Western Burrowing Crayfish, Powerful Owl), with bat and bird FFG Act listed species recorded within, or considered likely to use the Project Site having a low-moderate risk of impact due to turbine strike. However, the construction of the wind farm will not result in the loss of a genetically important population of these species. Two specimens of the State significant Small Scurf-pea and 2 FFG-Act Protected Jersey Cudweed are proposed to be impacted. The State significant Western (Basalt) Plains Grassland Community is also proposed to be impacted. However, no state significant flora or communities proposed to be impacted represent the potential loss of critical habitat or a genetically important population. No loss of a genetically important population of an endangered or threatened species, loss of critical habitat or significant effects on habitat values of a wetland supporting migratory birds is likely to occur as a result of the Project.
Potential extensive or major effects on land stability, acid sulphate soils or highly erodible soils over the short of long term	Unknown. Outside the scope of this report.
Potential extensive or major effects on beneficial uses of waterbodies over the long term due to changes in water quality, streamflows or regional groundwater levels	Unknown. Outside the scope of this report.

Referral criteria	Potential Impacts
Potential extensive or major effects on social or economic well-being due to direct or indirect displacement of non-residential land use activities	Unknown. Outside the scope of this report.
Potential for extensive displacement of residences or severance or residential access to community resources due to infrastructure development	Unknown. Outside the scope of this report.
Potential significant effects on the amenity of a substantial number of residents, due to extensive or major, long-term changes in visual, noise and traffic conditions	Unknown. Outside the scope of this report.
Potential exposure of a human community to severe or chronic health or safety hazards over the short or long term, due to emissions to air or water or noise chemical hazards or associated transport	Unknown. Outside the scope of this report.
Potential extensive or major effects on Aboriginal cultural heritage	Unknown. Outside the scope of this report.
Potential extensive or major effects on cultural heritage places listed on the Heritage Register of the Archaeological Inventory under the *Heritage Act 1995*.	Unknown. Outside the scope of this report.

6.2.1 Implications

Based on an assessment of ecological thresholds, an EES is likely to be triggered by the Project based on ecological impacts alone as greater than 10 hectares of native vegetation is proposed for removal.

It should be noted that Ecology and Heritage Partners' have not undertaken a detailed assessment of other non-ecological referral criteria detailed in DSE (2006).

6.3 *Flora and Fauna Guarantee Act 1988* (Victoria)

The FFG Act is the primary legislation dealing with biodiversity conservation and sustainable use of native flora and fauna in Victoria. Proponents are required to apply for an FFG Act Permit to 'take' threatened and/or protected flora species, listed vegetation communities and listed fish species in areas of public land (e.g. within road reserves, drainage lines and public reserves/parks). An FFG Act permit is generally not required for removal of species or communities on private land, or for the removal of habitat for a listed terrestrial fauna species. However, the Flora and Fauna Guarantee Amendment Act 2019 came into effect on 1 June 2020 and now applies the FFG Act to Crown land and private/freehold land that is managed by a public authority.

6.3.1 *Implications*

In relation to flora, 2 specimens of the State significant Small Scurf-pea and 2 FFG-Act Protected Jersey Cudweed are proposed to be impacted. Five fauna species (Platypus, Eastern Great Egret, Eastern Bent-wing Bat, Yellow-bellied Sheathtail Bat, Tussock Skink), five flora species (Tough Scurf-pea, Small Scurf-pea, Small-flowered Wallaby-grass, Fragrant Saltbush, Austral Tobacco) and one ecological community (Western (Basalt) Plains Grassland Community) listed as threatened under the FFG Act were recorded within the Study Area during the field surveys. Where impacts to these species or communities occur on private land, a permit under the FFG Act is not required. Where impacts are proposed on public land (i.e. road reserves), an FFG Act permit will be required.

6.4 *Planning and Environment Act 1987* (Victoria)

The *Planning and Environment Act 1987* outlines the legislative framework for planning in Victoria and for the development and administration of planning schemes. All planning schemes contain native vegetation provisions at Clause 52.17, which requires a planning permit from the relevant local Council to remove, destroy or lop native vegetation, unless an exemption at Clause 52.17-7 of the Victoria Planning Provisions applies.

6.4.1 *Local Planning Scheme*

The Project Site is located within the Golden Plains Shire, and lies predominantly within Farming Zone (FZ), with some small areas zoned Rural Conservation Zone (RCZ) and Special Use Zone (SUZ) (DEECA 2025a). The following overlays, relevant to ecological values, are summarised below (DEECA 2025a):

Farming Zone (FZ)

Permit required for Wind energy facility. Must meet the requirements of 52.32.

Clause 52.32 – Wind Energy Facility

A permit is required under Clause 52.32 of the Golden Plains Shire Planning Scheme to use and develop a wind energy facility.

Site and context analysis ecological application requirements in relation to the site:

- Existing vegetation types, condition and coverage (see Section 3.1);
- The landscape of the site (see Section 1.3);
- The impact of the proposal on any species listed under the FFG Act or EPBC Act (see Section 3 and Section 5); and,
- Any other notable features, constraints or other characteristics of the site.

Site and context analysis ecological application requirements in relation to the surrounding area:

- Direction to significant conservation and recreation areas, and water features (see Section 1.3);
- Sites of flora and fauna listed under the FFG Act or EPBC Act, including significant habitat corridors, and movement corridors for these fauna (See Section 3);

- National Parks, State Parks, Coastal Reserves and other land subject to the *National Parks Act 1975* (see Section 1.3);
- Land declared a Ramsar wetland as defined under section 17 of the EPBC Act (see Section 3.5.4); and,
- Bushfire risks.

Design response ecological application requirements:

- A rehabilitation plan for the site;
- A description of how the proposal responds to any significant landscape features for the area identified in the planning scheme;
- An assessment of the impact of the proposal on any species (including birds and bats) listed under the FFG Act or EPBC Act (see Section 5.1 and Section 5.2); and,
- An environmental management plan including any rehabilitation and monitoring requirements.

Rural Conservation Zone – Schedule 2 (RCZ2) (partial)

This Zone covers rural landscape characterised by undulating plains and significant remnant native vegetation and farming activities.

A permit is required for any earthworks which change the rate of flow or the discharge point of water across a property boundary, or increase the discharge of saline groundwater.

Special Use Zone – Schedule 1 (RCZ) (partial)

This Zone provides for the use of land for refuse disposal and to ensure that the refuse disposal is developed in an orderly and proper manner having regard to land capability and environmental impact.

A permit is required to construct or carry out any of the following:

- Excavation or land fill works which are in excess of the depth or height of 1 metre;
- Land forming where any change to the natural or existing topography of land increases the flow of water or changes the discharge point of water across any adjoining or neighbouring properties;
- A building which is within any of the following setbacks: 20 metres from a road; 5 metres from a boundary; 100 metres from a dwelling not in the same ownership; 100 metres from a watercourse or designated flood plain. A dam which is any of the following: more than 3000 cubic metres; on a permanent watercourse; diverts water from a permanent watercourse.

Environmental Significance Overlay – Schedule 1 (ESO1)

Development and subdivision within the Moorabool River (Sheoaks and Stony Creek Special Water Supply Catchment Areas) shall be undertaken in accordance with the environmental objectives of this schedule.

Development and subdivision of land will be consistent with the physical capability of the land, so that degradation of water quality and quantity does not occur.

Any applications to develop or subdivide may be referred for comment to DEECA and must be referred for comment to the relevant water board or water supply authority.

The following decision guidelines apply to an application for a permit under Clause 42.01, in addition to those specified in Clause 42.01 and elsewhere in the scheme which must be considered, as appropriate, by the responsible authority:

- The potential for the proposed development or subdivision to degrade water quality or quantity.
- Whether the proposal will:
    - Erode banks, streambeds and adjoining land and the siltation of watercourses, drains and other features.
    - Pollute, add increased nutrient levels and cause increased turbidity of water in watercourses, drains and other features.
    - Cause increased runoff of concentration of surface water leading to erosion, siltation, pollution of water in watercourses, drains and other features.
- The need to maintain or plant vegetation along water ways to protect water quality.
- Any management plan prepared by the relevant water board or water supply authority.

In assessing an application for the use and development of a cattle feedlot which is located within a special water supply catchment area, consider as relevant:

- Whether any new point source discharges are avoided or support the rationalisation of existing discharge points.
- Whether waste water discharges to the environment are reduced to the maximum extent that is reasonable and practicable, and in accordance with the following hierarchy of waste management:
    - Waste avoidance.
    - Recycling and reclamation.
    - Waste reuse.
    - Waste treatment to reduce potentially degrading impacts.
    - Waste disposal.
- The need for a management plan to be prepared as part of an application to prevent the pollution of waterways and groundwater, and manage the consequences of any pollution which does occur for uses which use, produce, convey or store significant quantities of materials which could cause substantial pollution of waters if released through accidents, malfunctions or spillage.
- Whether sources of pollution are reduced and managed through the development and implementation of best practice land and water management.
- Any need to include as a condition of approval that a stormwater management plan be prepared to address safeguards to reduce the transportation of pollutants off-site.
- How storm water strategies address both the construction phase and continued use of developments.

Significant Landscape Overlay – Schedule 16 (SLO16)

Landscape character objectives to be achieved:

- To enhance the continuous riparian corridor landscape.
- To retain indigenous riparian vegetation and canopy trees as a dominant landscape feature, ensuring it responds to the bushfire risk of a location.
- To ensure buildings and works are not visually dominant when viewed from the waterway corridor.
- To encourage buildings and works to be set back from the banks of the river to avoid overshadowing and visual intrusion within the landscape and maintain an open waterway corridor.
- To ensure the location and size of earthworks minimises alterations to natural topography and is consistent with the landscape character.

A permit is required to:

- Construct a building or construct or carry out works. This does not apply if the buildings and works are:
    - sited more than 30 metres from the bank of the waterway,
    - with a height less than 6 metres above ground level, and
    - changing the ground level less than 600mm; or
    - carried out by, or on behalf of, a public land manager to sustain the form and stability of stream beds and banks, regulate or control the flow of water in a watercourse; construct stream habitat works; maintain the landscape quality, health or bank stability of areas that have been restored or revegetated; or maintain or repair a pathway or trail.

The following application requirements apply to an application for a permit under Clause 42.03, in addition to those specified elsewhere in the scheme and must accompany an application, as appropriate, to the satisfaction of the responsible authority:

- For an application to remove, destroy or lop native vegetation:
    - An assessment and justification of the proposed removal of the vegetation against the landscape character objectives of this schedule prepared by a suitably qualified person.
    - A description and accurate site plan denoting the position, height, number, trunk circumference, branch spread, slope of land and species of any vegetation to be removed.
    - A plan detailing the location of any new and replacement planting and proposed maintenance plan to reduce bushfire risk.
- For any other application:
    - A site survey plan certified by a qualified surveyor clearly showing the location and the distance of all buildings and works from the top of the banks of the waterway.
    - A site context plan and elevations showing building heights using Australian Height Datum measured from ground level, areas of cut and fill, site coverage and permeability, location and proposed material for fences.
    - A schedule of materials and finishes.

- A visual impact assessment of proposed buildings and works from public viewing points along the waterway.
- A landscape plan which includes the type, location, quantity, height at maturity and botanical names of any proposed plants and details of any proposed tree protection zones. As well as maintenance/weed/erosion control plan for all proposed revegetated areas for areas immediately adjacent to the banks of the Leigh River. The maintenance plan is to include proposed measures to reduce the risk of bushfire.
- Measures for how natural landforms will be protected, including appropriate approaches to vegetation retention and planting, ground preparation and minimising ground disturbance.
- The rate and quantity of stormwater leaving a property and measures to control and filter pollutants.
- A report that identifies values, threats and undertakes a risk assessment for the river corridor.

6.4.2 The Guidelines

The State Planning Policy Framework and the decision guidelines at Clause 52.17 (Native Vegetation) and Clause 12.01 require Planning and Responsible Authorities to have regard for 'Guidelines for the removal, destruction or lopping of native vegetation' (Guidelines) (DELWP 2017). Where the clearing of native vegetation is permitted, the quantity and type of vegetation to be offset is determined using methodology specified in the Guidelines. The primary objective of the regulations is '*no net loss in the contribution made by native vegetation to Victoria's biodiversity*'.

6.4.3 Implications

The Project Site is within Location 3, with 74.263 hectares of native vegetation proposed to be removed, comprising 67.79 hectares of native vegetation patches, 225 Large Trees in patches, and 128 scattered trees (96 Large and 32 Small). As such, the permit application falls under the Detailed assessment pathway.

The offset requirement for native vegetation removal is 2.743 General Habitat Units, Species Habitat Units (Table 25), and 304 Large Trees.

A planning permit from the Golden Plains Shire is required to remove, destroy or lop any native vegetation under Clause 52.17, Clause 42.01 (ESO1), and Clause 42.03 (SLO16) of the Planning Scheme.

A permit is required under Clause 52.32 of the Planning Scheme to develop and use a Wind energy facility. The ecological application requirements are outlined in Section 6.4.1.

A permit will be referred to DEECA as a 'recommending authority' as the applications is being assessed under the Detailed Assessment pathway.

6.5 *Catchment and Land Protection Act 1994* (Victoria)

The *Catchment and Land Protection Act 1994* (CaLP Act) contains provisions relating to catchment planning, land management, noxious weeds and pest animals. Landowners are responsible for the control of any infestation of noxious weeds and pest fauna species to minimise their spread and impact on ecological values.

13 weed species listed under CaLP act were recorded over the assessments (Spear Thistle *Cirsium vulgare,* Wild Teasel *Dipsacus fullonum,* Spiny Rush *Juncus acutus,* Horehound *Marrubium vulgare,* Sweet Briar *Rosa rubiginosa,* Variegated Thistle *Silybum marianum,* Great Mullein *Verbascum Thapsus,* Bathurst Burr *Xanthium spinosum,* African boxthorn *Lycium ferocissimum,* Chilean Needle Grass *Nassella neesiana,* Serrated Tussock *Nassella trichotoma,* Blackberry *Rubus fruticosus* spp. agg. and Gorse *Ulex europaeus*).

African boxthorn, Chilean Needle Grass, Serrated Tussock, Blackberry and Gorse are also listed as weeds of national significance (WoNS).

6.5.1 Implications

A Weed and Pest Management Plan will be required to be incorporated in the Environment Management Plan prepared for the project.

6.6 *Wildlife Act 1975* and Wildlife Regulations 2013 (Victoria)

The *Wildlife Act 1975* (and associated Wildlife Regulations 2013) is the primary legislation in Victoria providing for protection and management of wildlife. Authorisation for habitat removal may be obtained under the *Wildlife Act 1975* through a licence granted under the *Forests Act 1958*, or under any other Act such as the *Planning and Environment Act 1987*. Any persons engaged to remove, salvage, hold or relocate native fauna during construction must hold a current Management Authorisation under the *Wildlife Act 1975*, issued by DEECA (formerly DELWP).

6.7 Policy and Planning Guidelines – Development of Wind Energy Facilities in Victoria

Wind energy facilities should not lead to unacceptable impacts on critical environmental, cultural or landscape values (DTP 2023). These values include those protected under Commonwealth and State legislation and those recognised through planning schemes such as the State Planning Policy Framework.

Responsible authorities and applicants must consider a range of environmental values (for example: flora, vegetation and fauna) and risks when identifying suitable sites for wind energy facility development.

6.7.1 Implications

Impacts on flora and fauna species and habitats from wind energy facilities and associated infrastructure can be minimised through facility placement and design measures at the project planning stage. Minimisation of impacts to native vegetation patches, scattered trees, and significant impacts to environmental values at the site can be further achieved by focusing construction and other project activity in agricultural areas.

An Environmental Management Plan (EMP) will be required to detail how the site will be managed throughout the life of the Project, and across all environmental components. The EMP should include a bat and avifauna management plan (DELWP 2017b). The project must consider impacts on birds and bats, which are known to collide with wind turbines. Research by the Arthur Rylah Institute has improved knowledge of wind turbine impact on bats and birds (DELWP 2020b), and DEECA is developing risk assessment and mitigation guidelines

specifically for Southern Bent-wing Bat, Red-tailed Black Cockatoo, Black Falcon and White-bellied Sea Eagle (DEECA 2025).

7 MITIGATION MEASURES

7.1 General Mitigation Measures

Recommended measures to mitigate impacts upon terrestrial and aquatic values present within the Project Site include:

- Avoidance and minimisation of impacts to native vegetation – particularly NTGVVP – and habitats through construction and micro-siting techniques, including fencing retained areas of native vegetation. If indeed necessary, trees should be lopped or trimmed rather than removed. Similarly, soil disturbance and sedimentation within wetlands should be avoided or kept to a minimum, to avoid, or minimise impacts to fauna habitats;
- All contractors should be aware of ecologically sensitive areas to minimise the likelihood of inadvertent disturbance to areas marked for retention. Native vegetation (areas of sensitivity) should be included as a mapping overlay on any construction plans;
- Tree Protection Zones (TPZs) should be implemented to prevent indirect losses of native vegetation during construction activities (DSE 2011a). A TPZ applies to a tree and is a specific area above and below the ground, with a radius 12 x the Diameter at Breast Height (DBH). At a minimum standard a TPZ should consider the following:
    - A TPZ of trees should be a radius no less than two metres or greater than 15 metres;
    - Construction, related activities and encroachment (i.e. earthworks such as trenching that disturb the root zone) should be excluded from the TPZ;
    - Where encroachment is 10% or more of the total area of the TPZ, the tree should be considered as lost and offset accordingly (unless an arboricultural report specifies otherwise);
    - Directional drilling may be used for works within the TPZ without being considered encroachment. The directional bore should be at least 600 millimetres deep;
    - The above guidelines may be varied if a qualified arborist confirms the works will not significantly damage the tree (including stags / dead trees). In this case the tree would be retained, and no offset would be required; and,
    - Where the minimum standard for a TPZ has not been met an offset may be required.
- Removal of any habitat trees or shrubs (particularly hollow-bearing trees or trees/shrubs with nests) should be undertaken between February and September to avoid the breeding season for most fauna species. If any habitat trees or shrubs are proposed to be removed, this should be undertaken under the supervision of an appropriately qualified zoologist to salvage and relocate any displaced fauna. A Fauna Management Plan will be required to guide the salvage and relocation process;
- Where possible, construction stockpiles, machinery, roads, and other infrastructure should be placed away from areas supporting native vegetation, Large Trees and/or wetlands; and,

- Ensure that best practice sedimentation and pollution control measures are undertaken at all times, in accordance with Environment Protection Authority guidelines (EPA 2020a; EPA 2020b; Victorian Stormwater Committee 1999) to prevent offsite impacts to waterways and wetlands; and,
- As indigenous flora provides valuable habitat for indigenous fauna, it is recommended that any landscape plantings that are undertaken as part of the proposed works are conducted using indigenous species sourced from a local provenance, rather than exotic deciduous trees and shrubs.

In addition to these measures, the following documents should be prepared and implemented prior to any construction activities:

- Construction Environmental Management Plan (CEMP). The CEMP should include specific species/vegetation conservation strategies, daily monitoring, sedimentation management, site specific rehabilitation plans, weed, pest and pathogen management measures, etc.; and,
- Fauna Management Plan. This will be required to ensure the removal of habitat for common fauna species is undertaken under supervision of a qualified ecologist. Salvage and relocation of fauna must be undertaken to minimise the risk of injury or death to those species.

7.2 Species Mitigation Measures

7.2.1 Golden Sun Moth

A series of mitigation actions have been identified, and will be implemented to further minimise the impact of the proposed action on the known Golden Sun Moth population and associated habitat. These measures follow those recommended under the Significant Impact Guidelines for Golden Sun Moth (DEWHA 2009b).

Detailed Design Phase

The following mitigation measures will be implemented during the detailed design phase:

- Further minor adjustments to the infrastructure layout (at the detailed design level) will, where possible, be undertaken to reduce the area of impact. This may be through the use of micro-sited track routes or configuration of construction areas on a case-by-case basis to minimise the overall impact of 84.31 hectares of disturbance;
- Where possible, access track widths may be further reduced;
- Reduction in turbine construction area footprints may be achieved within proposed offset properties (if onsite offset sites are proposed) and this will be investigated; and
- Golden Sun Moth Offset Management Strategy will be developed and implemented for the site.

Construction Phase

The following mitigation measures will be implemented during the construction phase:

- Prior to construction, a CEMP (or similar document) will be developed. This will include particular provisions for the protection of Golden Sun Moth and its retained habitat;

- The CEMP will also include a Construction and Site Works Management Plan with specific requirements for the Golden Sun Moth and associated grassland habitat;
- Fencing and/or bunting will be erected around works areas in proximity to known populations to restrict impacts on habitat;
- Golden Sun Moth information, highlighting the importance of the local population and habitats, together with the actions that will be implemented to avoid and minimise impacts, will be included in site inductions; and
- Signs highlighting the importance and significance of the Golden Sun Moth will be erected at the entrance to works areas in proximity to Golden Sun Moth populations, and in the site offices.

Operational Phase

The following mitigation measures will be implemented during the operational phase:

- Where areas are designed for rehabilitation after construction, this will include reseeding of disturbed areas with known food species (i.e. Wallaby-grass, Spear Grass); and
- Implement all aspects associated within this Golden Sun Moth Offset Management Strategy during the operational phase.

7.2.2 Striped Legless Lizard

A series of mitigation actions have been identified, and will be implemented to further minimise the impact of the proposed action on the known Striped Legless Lizard population and associated habitat. These measures follow those recommended under the Referral Guidelines for Striped Legless Lizard (DEWHA 2011).

Detailed Design Phase

The following mitigation measures will be implemented during the detailed design phase:

- Further minor adjustments to the infrastructure layout (at the detailed design level) will, where possible, be undertaken to reduce the area of impact. This may be through the use of micro-sited track routes or configuration of construction areas on a case-by-case basis to minimise the overall impact of 3.46 hectares of disturbance;
- Where possible, trenchless installation of cables by subterranean tunnelling at a depth of >0.5 metres.
- Where possible, access track widths may be further reduced; and,
- Reduction in turbine construction area footprints may be achieved within proposed offset properties (if onsite offset sites are proposed) and this will be investigated.

Construction Phase

The following mitigation measures will be implemented during the construction phase:

- Prior to construction, a CEMP (or similar document) will be developed. This will include particular provisions for the protection of Striped Legless Lizard and its retained habitat;

- The CEMP will also include a Construction and Site Works Management Plan with specific requirements for the Striped Legless Lizard and associated grassland habitat;
- Minimise weed spread into retained Striped Legless Lizard habitat by establishing vehicle and machinery hygiene protocols and preparing a Weed Management Plan for these areas;
- Application of a minimum 30 metre buffer zone around known Striped Legless Lizard habitat, where feasible;
- Fencing and/or bunting will be erected around works areas in proximity to known populations to restrict impacts on habitat. Fencing will only be installed where works are within 40 metres of known habitat;
- Striped Legless Lizard information, highlighting the importance of the local population and habitats, together with the actions that will be implemented to avoid and minimise impacts, will be included in site inductions; and
- Signs highlighting the importance and significance of the Striped Legless Lizard will be erected at the entrance to works areas in proximity to species populations, and in the site offices.
- Preparation of a Striped Legless Lizard Conservation Management Plan (CMP) and Offset Management Strategy.

A CMP may be required by DEECA and/or DCCEEW to manage the removal of Striped Legless Lizard individuals and habitat. Any translocation (relocation greater than 100 metres from source site) of Striped Legless Lizard will need to adhere to the species conservation advice (Reynolds 2015) and the DEECA Translocation Evaluation Panel (TEP). Striped Legless Lizard individuals would be relocated or translocated to a suitable recipient site within the Project Site.

7.2.3 Birds and Bats

A range of measures are proposed to mitigate against potential impacts to birds and bats. Mitigation measures are proposed to take a conservative approach to mitigate the risk for species by turbine collision and include specific triggers for monitoring for the species and curtailment of turbine operation at the Tall Tree Wind Farm. These measures will be detailed in a Bird and Avifauna Management (BAM) Plan.

The Plan will incorporate the following scope of works:

An Impact Risk Assessment will be undertaken to assess the potential risks and impacts to target species due to the proposed action, and is proposed to include the following:

- A description of the relevant components of the Tall Tree Wind Farm;
- An assessment of the potential impacts (including direct mortality) to all target species during the construction and operational phases of the Project, with consideration for potential changes to their utilisation of the site; and,
- Consideration of listing advice, conservation advice, recovery plans, and threat abatement plans for each target species to inform their potential impacts.

A statement of the long-term objectives and strategy for minimising bird and bat strike risk within the Tall Tree Wind Farm Project Site will be prepared, including but not limited to objectives such as:

- An improved understanding of site utilisation changes for target species throughout Project phases; and,
- The development of corrective actions to promote a long-term reduction in turbine collision risk (e.g. via a Bird and Bat adaptive management framework).

Standards for post-commissioning monitoring and mitigation will be prepared, responding to the scale and environmental risks of the proposed renewable energy project, including:

- A long-term bat and avifauna site utilisation monitoring program (e.g. five years) informed by the Before and After Control-Impact (BACI) monitoring framework and consistent with pre-commissioning site utilisation survey methodology;
- A long-term bat and avifauna mortality monitoring program, including carcass persistence and searcher efficiency trials that will be submitted for the approval of DEECA and DCCEEW;
- Procedural instruction of the requirement for ongoing reporting compliance to DEECA, including to report any fauna strikes, annual mortality rates for target species, and species occurrence records; and;
- Procedures for the regular removal of carcasses likely to attract raptors; and,
- Ongoing reporting commitments and timeframes for the provision of site-specific information to the relevant authorities.

An Adaptive Management Framework will be prepared to ensure achievement of environmental outcomes. The Adaptive Management Framework is intended to provide a dynamic approach to mitigation for target species through all project phases, and will deliver corrective actions, informed by site-utilisation data (where appropriate), monitoring and existing mitigation measures, to ensure environmental outcomes are achieved.

7.2.4 Significant Flora and Ecological Communities

Detailed Design Phase

Further adjustments to the infrastructure layout (at the detailed design level) will, where possible, be undertaken to reduce the area of impact during the detailed design phase. This may be through the use of micro-sited track routes or reticulation on a case-by-case basis to minimise the overall impact of 16.31 hectares of disturbance to NTGVVP community and 2 FFG Act-listed flora species individuals.

Construction Phase

The following mitigation measures will be implemented during the construction phase:

- Prior to construction, a Construction Environmental Management Plan (CEMP) (or similar document) will be developed. This will include particular provisions for the protection of retained areas of the NTGVVP community and significant flora;

- The CEMP will also include a Construction and Site Works Management Plan with specific requirements for the NTGVVP community and significant flora;
- Fencing and/or bunting will be erected around works areas in proximity to known areas of the NTGVVP community and significant flora;
- Signs highlighting the importance and significance of the NTGVVP community and significant flora will be erected at the entrance to works areas in proximity the NTGVVP community and significant flora, and in the site offices; and,
- Where possible, individuals would be relocated or translocated to a suitable recipient site within the Project Site.

Operational Phase

The following mitigation measures will be implemented during the operational phase:

- Where areas are designed for rehabilitation after construction, this will include reseeding of disturbed areas with locally indigenous flora.

8 RECOMMENDATIONS

Based on the quality and extent of ecological values known to, or considered likely to occur, it is recommended that ACCIONA Energía:

1. Commission additional ecological assessments to be undertaken in areas where the development footprint is located outside of areas previously assessed, and for all threatened species with a moderate to high likelihood of occurrence yet to receive targeted surveys, to ensure all on-ground ecological values with the potential to be impacted are quantified;
2. Avoid and/or minimise impacts to the NTGVVP community where possible;
3. Avoid impacts to River Red-gum and other scattered trees where possible;
4. Investigate trenching methods which minimise disturbance to the vegetation on the road verges as roadside vegetation provides important habitat for a range of fauna species;
5. Maximise, where possible, the turbine-free buffer distance around turbines within and in proximity to forested areas to reduce potential impacts to birds and bats;
6. Prior to construction, develop a Construction Environmental Management Plan (CEMP) with specific management actions to mitigate against potential impacts to areas of ecological value;
7. Develop a Weed Management Plan, which should be incorporated into the CEMP;
8. Before commencement of construction, the preparation of a Bat and Avifauna Management Plan to the satisfaction of the Responsible Authority, in consultation with the DEECA. When approved, the BAM Plan must be endorsed by the responsible authority. The BAM Plan must include:
    a) A strategy for managing and mitigating bird and bat strike arising from the wind farm operation. The strategy must include procedures for the regular removal of carcasses likely to attract raptors to areas near wind turbines;
    b) A procedure for addressing significant impacts of birds and bat populations caused by the wind farm. This procedure must provide that the operator of the wind farm immediately investigates the possible causes of any significant impacts on bird and bat populations, and thereafter designs and implement measures to mitigate those impacts in consultation with the responsible authority and DEECA;
    c) A monitoring period of at least two years to record, by species, any bird and bat strikes; and,
    d) A strategy to manage and/or monitor the wind farm beyond the designated period depending upon the results of the monitoring period referred to above. The strategy must include provisions to take account of any changes to weather patterns during the initial two-year monitoring period.
9. If there are changes to the layout through the process of preparing the final development plans, confirmation of any potential impacts (or lack thereof) to native vegetation and fauna habitat must be undertaken.

9 FURTHER REQUIREMENTS

Further requirements associated with development of the Project Site, as well as additional studies or reporting that may be required, are provided in Table 33.

Table 33. Further requirements associated with development of the Project Site.

Relevant Legislation	Implications	Further Action
Environment Protection and Biodiversity Conservation Act 1999	Based on the Preliminary Impact Assessment, there is a proposed impact 84.31 hectares of confirmed Golden Sun Moth habitat, 3.46 hectares of confirmed Striped Legless Lizard habitat, and 16.31 hectares of the Natural Temperate Grassland of the Victorian Volcanic Plain ecological community. The Project Site also contains suitable foraging habitat for Brown Treecreeper, Diamond Firetail, Hooded Robin, Blue-winged Parrot, and Gang-gang Cockatoo, with the latter two known to fly in the Rotor Swept Area. While turbines have been configured to reduce the risk of collision to the species, it is not possible to predict exactly where (direction and height) individuals will fly and therefore a low to moderate risk to these species from turbine collision remains. No EPBC-Act listed flora were recorded within the Study Area, however targeted surveys are recommended to occur for several nationally significant flora species with a moderate-high likelihood of occurrence within the Project Site.	A referral under the EPBC Act to the Commonwealth Environment Minister is currently in preparation.
Flora and Fauna Guarantee Act 1988	In relation to flora, 2 specimens of the State significant Small Scurf-pea, 2 FFG Act protected Jersey Cudweed are proposed to be impacted. Five fauna species (Platypus, Eastern Great Egret, Eastern Bent-wing Bat, Tussock Skink, Yellow-bellied Sheathtail Bat), four flora species (Tough Scurf-pea, Small Scurf-pea, Small-flowered Wallaby-grass, Fragrant Saltbush) and one ecological community (Western (Basalt) Plains Grassland Community) listed as threatened under the FFG Act were recorded within the Study Area during the field surveys. Where impacts to these species or communities occur on private land, a permit under the FFG Act is not required. Where impacts are proposed on public land (i.e. road reserves), an FFG Act permit will be required.	Where impacts are proposed on public land (i.e. road reserves), an FFG Act permit will be required.
Environment Effects Act 1978	Based on the current review of ecological impacts associated with the proposed development, it is likely that an EES will be triggered based on ecological impacts alone due to the proposed removal of over ten hectares (74.263 ha) of native vegetation.	A referral under the EES Act to the State Environment Minister is currently in preparation.
Planning and Environment Act 1987	A planning permit from the Golden Plains Shire is required to remove, destroy or lop any native vegetation under Clauses 52.17, 42.01, and 42.03 of the Planning Scheme.	Prepare and submit a Planning Permit application.
Catchment and Land Protection Act 1994	13 weed species listed under the CaLP Act were recorded within the Project Site.	A Weed and Pest Management Plan will be required to be incorporated in the Environment Management Plan prepared for the project
Wildlife Act 1975	Any persons engaged to conduct salvage and relocation or general handling of terrestrial fauna species must hold a current Management Authorisation.	Ensure wildlife specialists hold a current Management Authorisation.

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FIGURES

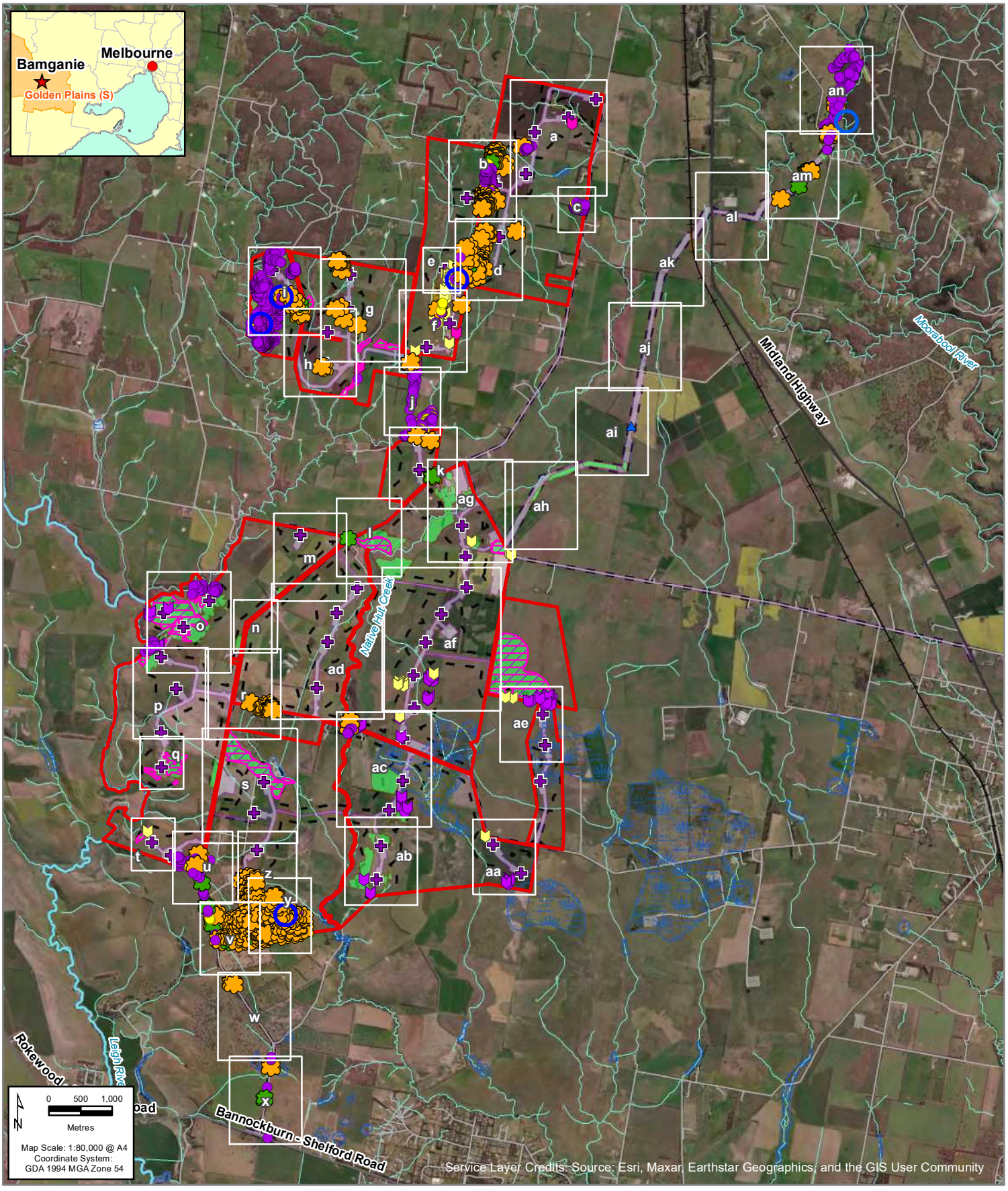

Figure 2 Overview

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

16925_Fig02_EcoFeatPOV 19/05/2025 dvaladares

Legend

- Wind Farm boundary
- Current Wetlands
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Scattered Large Tree
- Scattered Small Tree
- Large Tree in patch
- Small Tree in patch
- FFG Act Listed Flora
- FFG Act Protected Flora
- Flora
- WoNS
- Raptor nest

EPBC Act Listed Community

- Natural Temperate Grassland of the Victorian Volcanic Plain

FFG Act Listed Community

- Western (Basalt) Plains Grasslands Community

Ecological Vegetation Classes

- Creekline Grassy Woodland (EVC 68)
- Creekline Herb-rich Woodland (EVC 164)
- Escarpment Shrubland (EVC 895)
- Grassy Dry Forest (EVC 22)
- Grassy Woodland (EVC 175)
- Lowland Forest (EVC 16)
- Plains Grassland (EVC 132)
- Plains Grassy Wetland (EVC 125)
- Plains Grassy Woodland (EVC 55)
- Stream Bank Shrubland (EVC 851)
- Valley Grassy Forest (EVC 47)

Figure 2a

Ecological features

Proposed Tall Tree Wind Farm

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Legend

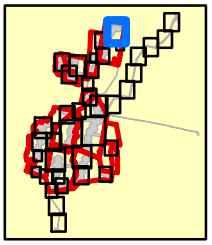
- Wind Farm boundary
- Current Wetlands
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Scattered Large Tree
- Large Tree in patch
- Tree Protection Zone
- Impacted vegetation

Flora Species

- *Helichrysum luteoalbum*

Ecological Vegetation Classes

- Grassy Woodland (EVC 175)



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Metres

Map Scale: 1:7,700 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 2b

Ecological features

Proposed Tall Tree Wind Farm

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Scattered Large Tree
- Scattered Small Tree
- Large Tree in patch
- Small Tree in patch
- Tree - Direct Impact
- Tree - TPZ Impacted
- Tree Protection Zone

FFG Act Listed Flora

- *Rytidosperma monticola*

Flora Species

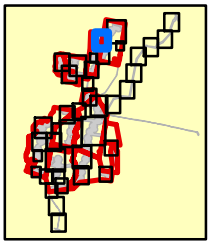
- *Helichrysum luteoalbum*

Ecological Vegetation Classes

- Grassy Woodland (EVC 175)
- Impacted vegetation

DRAFT

ecology & heritage partners



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Metres

Map Scale: 1:5,400 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 2c

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

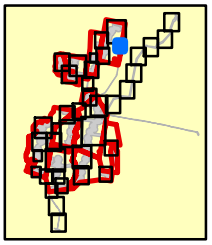
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Large Tree in patch
- Small Tree in patch
- Tree - Direct Impact
- Tree - TPZ Impacted
- Tree Protection Zone

Ecological Vegetation Classes

- Grassy Woodland (EVC 175)
- Impacted vegetation



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Coordinate System:
GDA 1994 MGA Zone 54

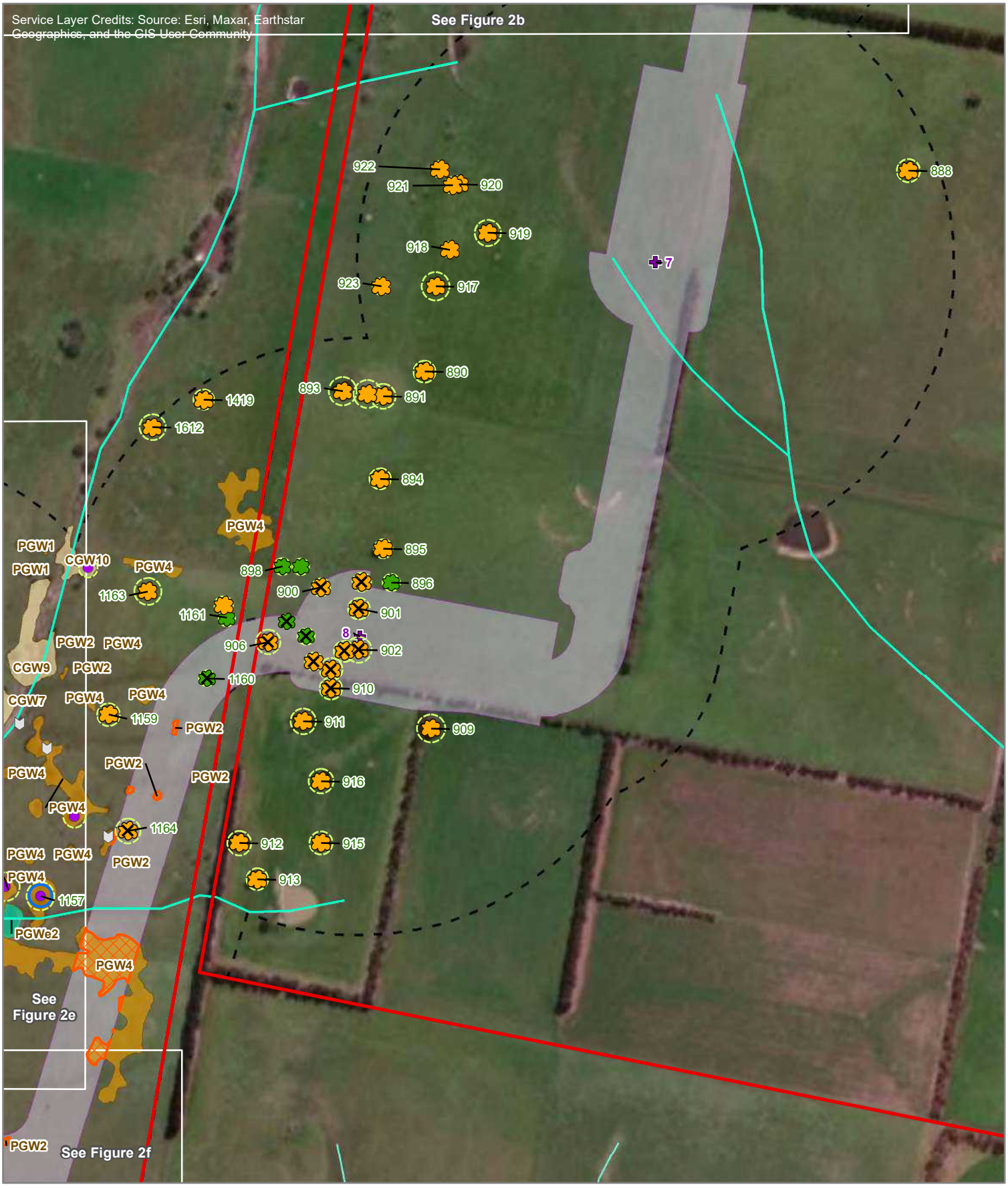


Figure 2d

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Scattered Large Tree
- Scattered Small Tree
- Large Tree in patch
- Tree - Direct Impact
- Tree Protection Zone

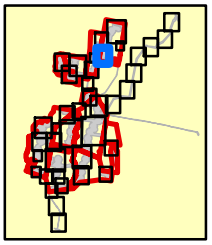
Flora Species

- *Acacia mearnsii*

- Raptor nest

Ecological Vegetation Classes

- Creekline Grassy Woodland (EVC 68)
- Plains Grassy Wetland (EVC 125)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



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Metres

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Coordinate System: GDA 1994 MGA Zone 54

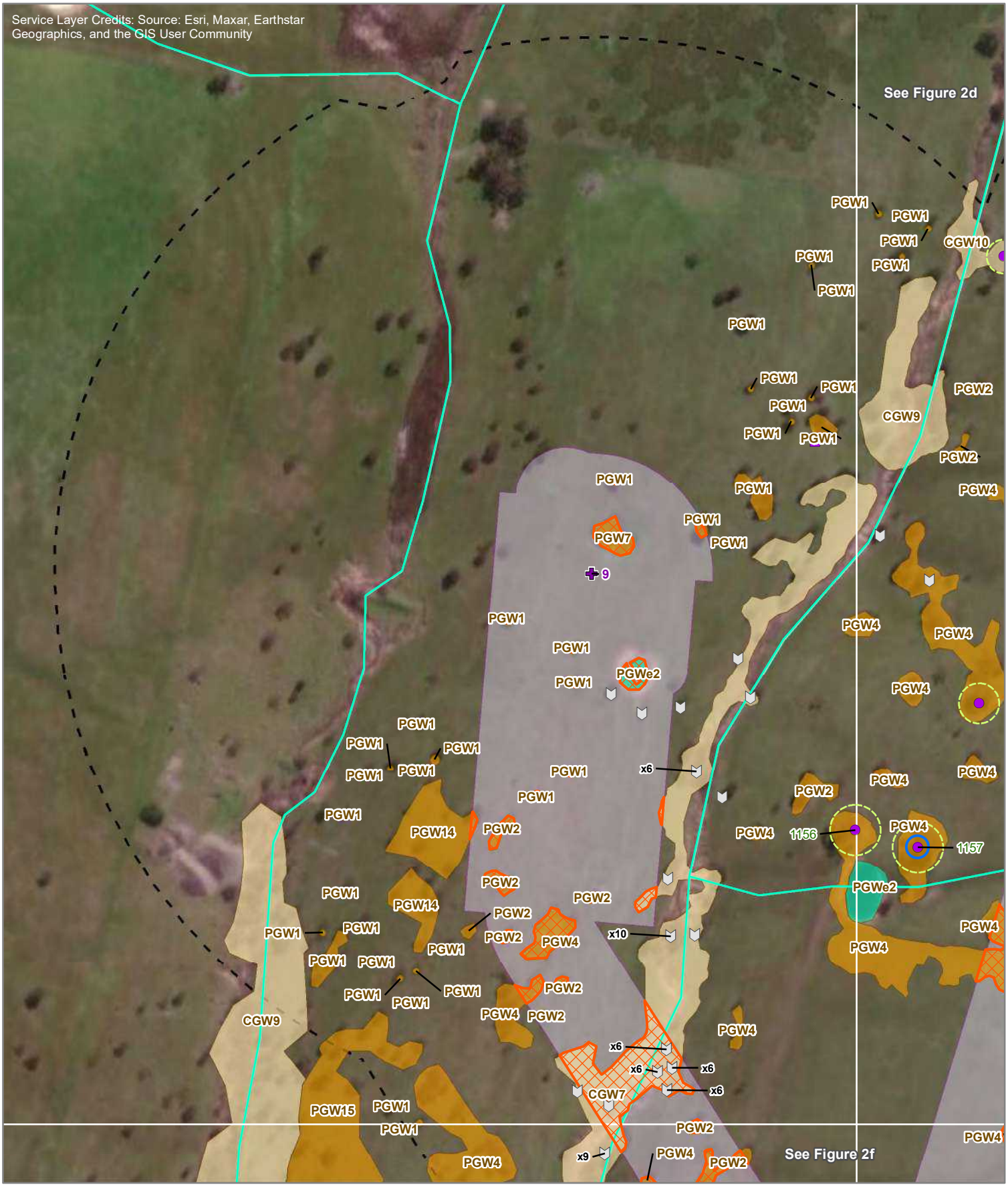


Figure 2e

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

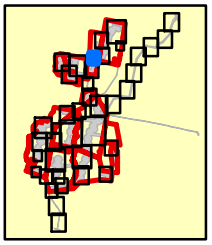
- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Large Tree in patch
- Tree Protection Zone

Flora Species

- *Acacia mearnsii*
- *Glycine sp.*
- Raptor nest

Ecological Vegetation Classes

- Creekline Grassy Woodland (EVC 68)
- Plains Grassy Wetland (EVC 125)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



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Metres

Map Scale: 1:3,000 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

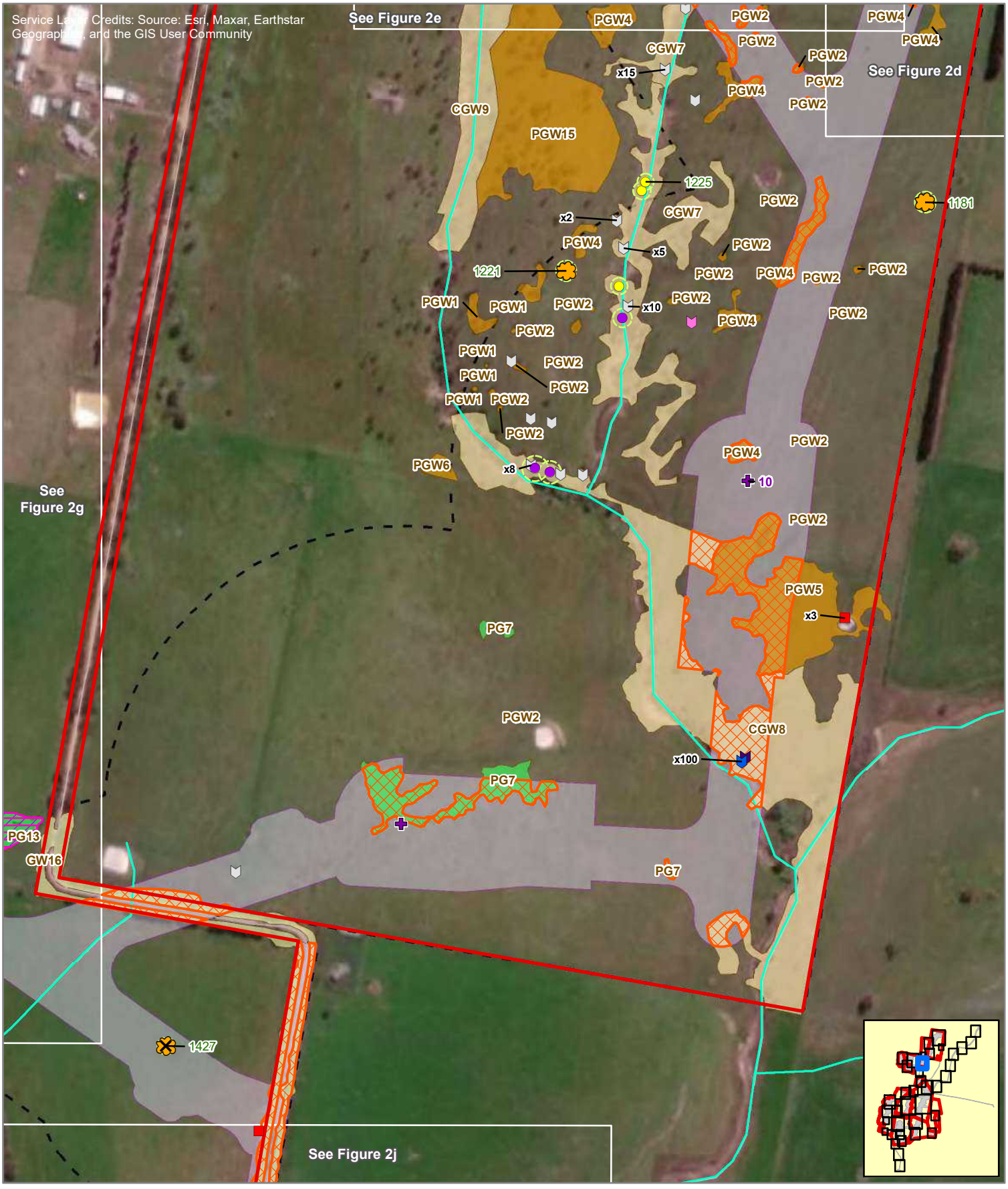

Figure 2f

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Scattered Large Tree
- Large Tree in patch
- Small Tree in patch
- Tree - Direct Impact
- Tree Protection Zone

Flora Species

- *Acacia mearnsii*
- *Cichorieae sp.*
- *Chrysocephalum sp.*
- *Coronidium sp.*
- *Helichrysum luteoalbum*

EPBC Act Listed Community

- Natural Temperate Grassland of the Victorian Volcanic Plain

FFG Act Listed Community

- Western (Basalt) Plains Grasslands Community

Ecological Vegetation Classes

- Creekline Grassy Woodland (EVC 68)
- Grassy Woodland (EVC 175)
- Plains Grassland (EVC 132)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation

N

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Metres

Map Scale: 1:5,400 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

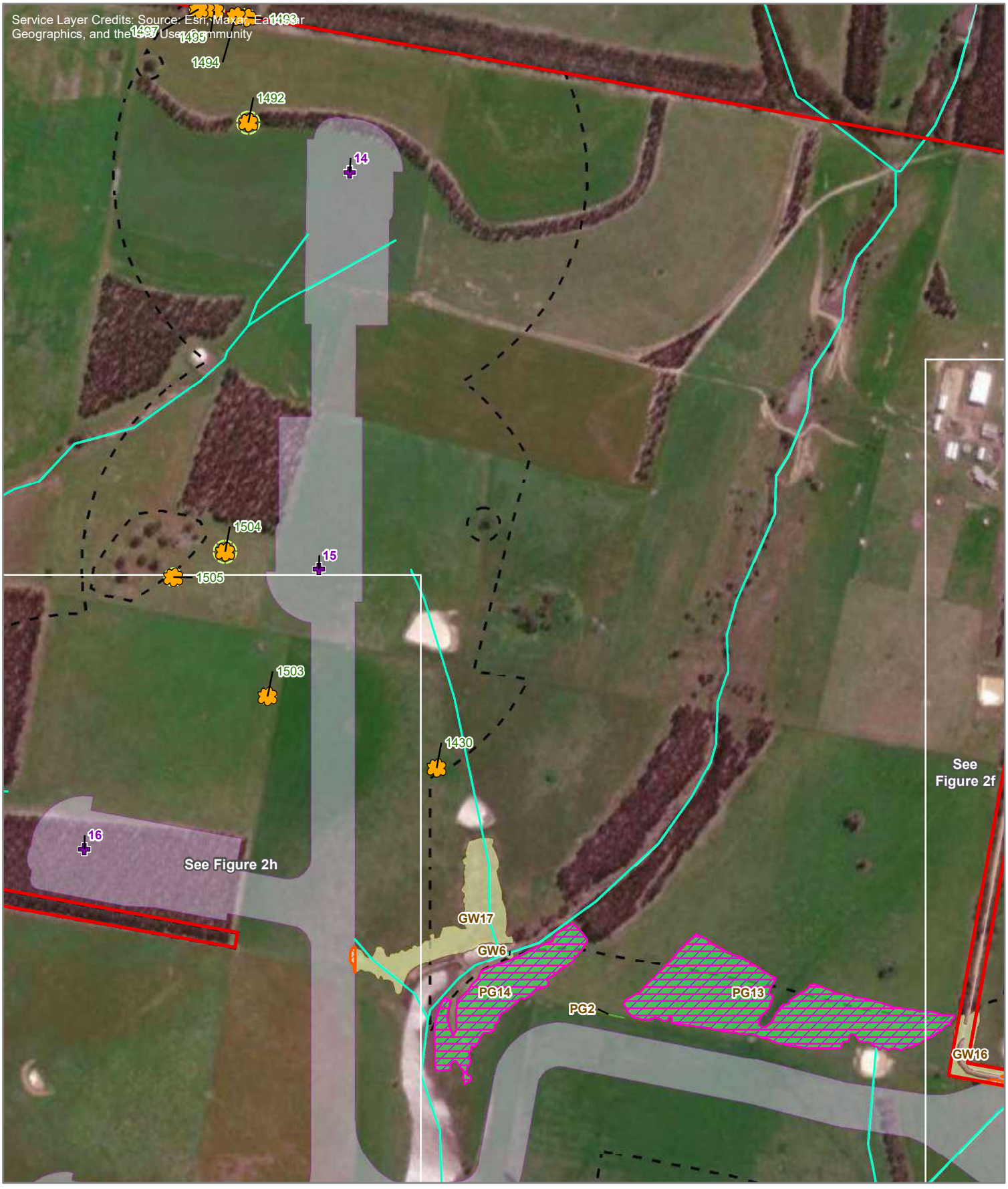

Figure 2g

Ecological features

Proposed Tall Tree Wind Farm

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ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Scattered Large Tree
- Tree Protection Zone

EPBC Act Listed Community

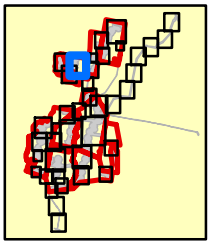
- Natural Temperate Grassland of the Victorian Volcanic Plain

FFG Act Listed Community

- Western (Basalt) Plains Grasslands Community

Ecological Vegetation Classes

- Grassy Woodland (EVC 175)
- Plains Grassland (EVC 132)
- Impacted vegetation



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Metres

Map Scale: 1:6,800 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 2h

Ecological features

Proposed Tall Tree Wind Farm

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Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Scattered Large Tree
- Tree - Direct Impact
- Tree - TPZ Impacted
- Tree Protection Zone

EPBC Act Listed Community

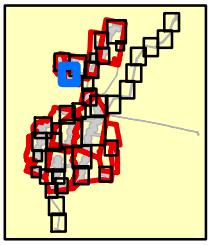
- Natural Temperate Grassland of the Victorian Volcanic Plain

FFG Act Listed Community

- Western (Basalt) Plains Grasslands Community

Ecological Vegetation Classes

- Creekline Grassy Woodland (EVC 68)
- Grassy Dry Forest (EVC 22)
- Grassy Woodland (EVC 175)
- Impacted vegetation



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Metres

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Coordinate System:
GDA 1994 MGA Zone 54

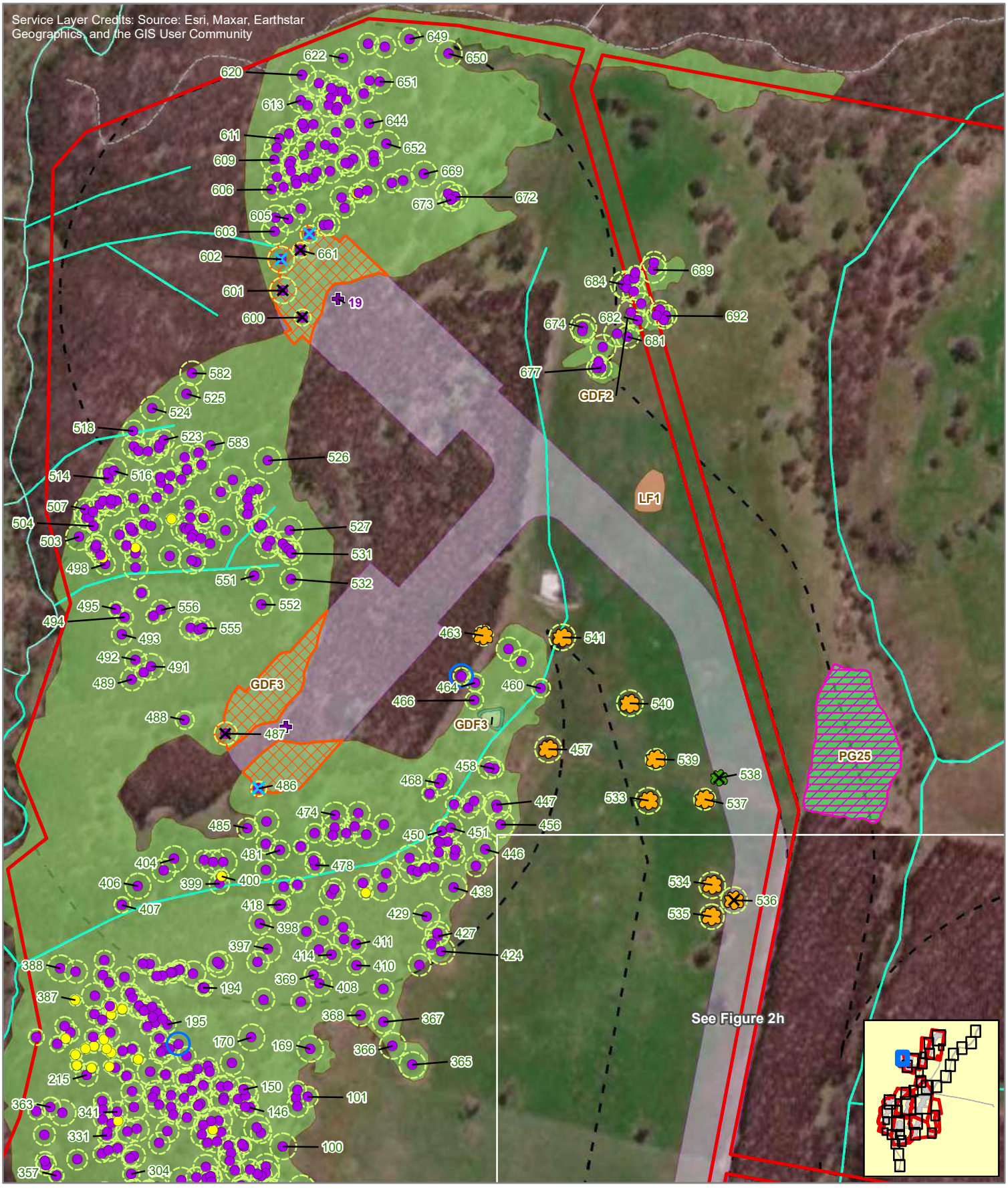

Figure 2i

Ecological features

Proposed Tall Tree Wind Farm

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Scattered Large Tree
- Scattered Small Tree
- Large Tree in patch
- Small Tree in patch
- Tree - Direct Impact
- Tree - TPZ Impacted
- Tree Protection Zone
- Raptor nest

EPBC Act Listed Community

- Natural Temperate Grassland of the Victorian Volcanic Plain

FFG Act Listed Community

- Western (Basalt) Plains Grasslands Community

Ecological Vegetation Classes

- Grassy Dry Forest (EVC 22)
- Lowland Forest (EVC 16)
- Plains Grassland (EVC 132)
- Plains Grassy Wetland (EVC 125)
- Impacted vegetation

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Metres

Map Scale: 1:5,800 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

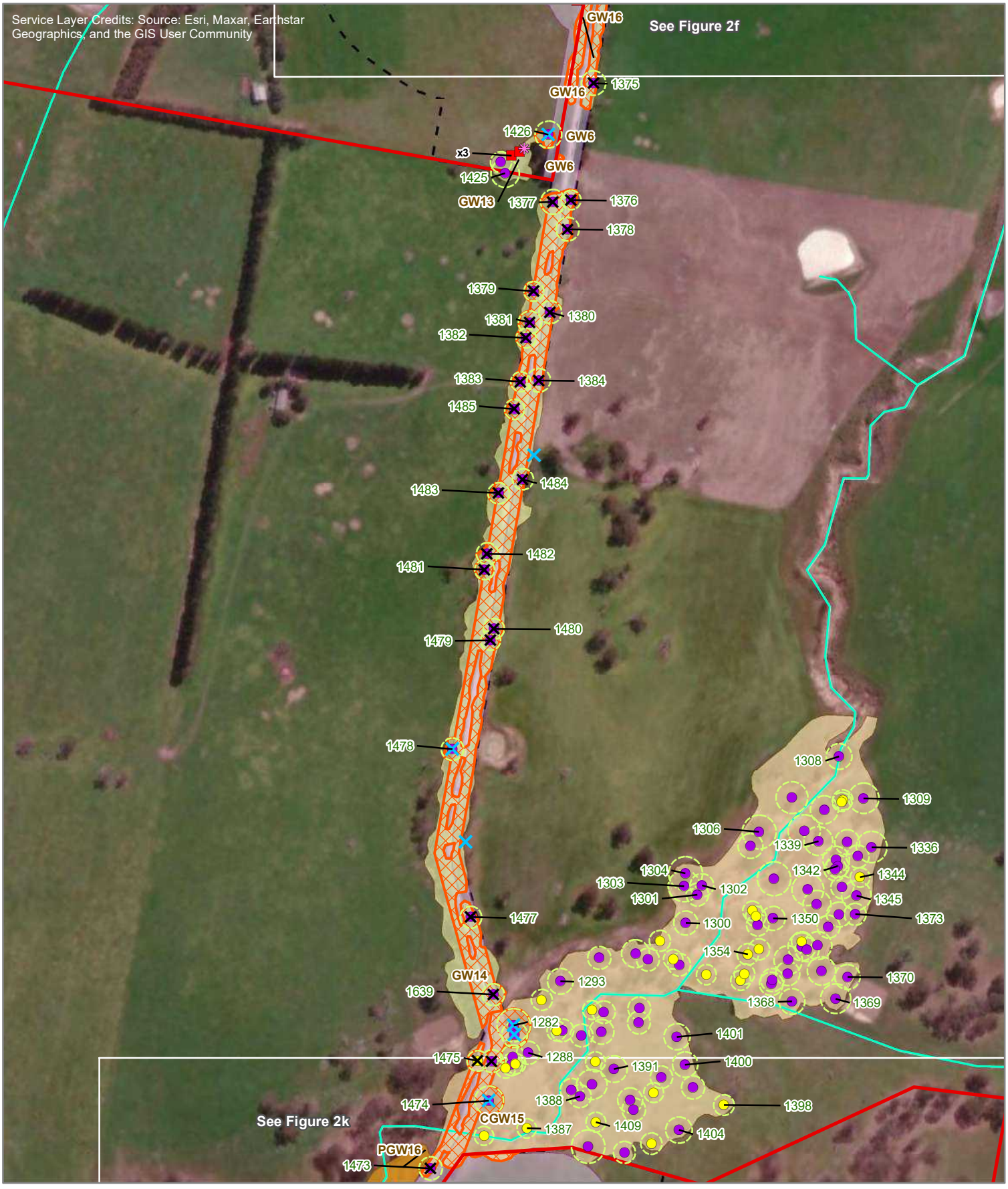

Figure 2j

Ecological features

Proposed Tall Tree Wind Farm

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Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Large Tree in patch
- Small Tree in patch
- Tree - Direct Impact
- Tree - TPZ Impacted
- Tree Protection Zone

FFG Act Listed Flora

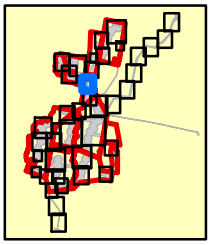
- *Rytidosperma monticola*

Flora Species

- *Helichrysum luteoalbum*

Ecological Vegetation Classes

- Creekline Grassy Woodland (EVC 68)
- Grassy Woodland (EVC 175)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



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Metres

Map Scale: 1:4,500 @ A4
Coordinate System: GDA 1994 MGA Zone 54

Figure 2k

Ecological features

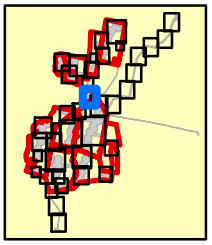
Proposed Tall Tree Wind Farm

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Scattered Large Tree
- Scattered Small Tree
- Large Tree in patch
- Small Tree in patch
- Tree - Direct Impact
- Tree - TPZ Impacted
- Tree Protection Zone

Ecological Vegetation Classes

- Creekline Grassy Woodland (EVC 68)
- Plains Grassland (EVC 132)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



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Metres

Map Scale: 1:5,400 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

DRAFT

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Figure 2l

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Scattered Small Tree
- Tree - Direct Impact
- Tree Protection Zone

EPBC Act Listed Community

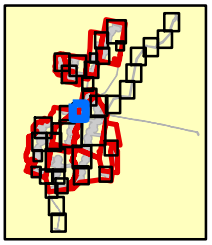
- Natural Temperate Grassland of the Victorian Volcanic Plain

FFG Act Listed Community

- Western (Basalt) Plains Grasslands Community

Ecological Vegetation Classes

- Plains Grassland (EVC 132)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



N

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Metres

Map Scale: 1:5,200 @ A4
Coordinate System: GDA 1994 MGA Zone 54

Figure 2m

Ecological features

Proposed Tall Tree Wind Farm

Legend

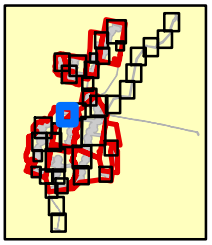
- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines

Ecological Vegetation Classes

- Grassy Woodland (EVC 175)
- Plains Grassland (EVC 132)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation

DRAFT

ecology & heritage partners



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Metres

Map Scale: 1:5,800 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 2n

Ecological features

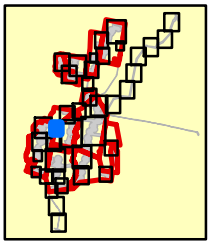
Proposed Tall Tree Wind Farm

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint

Ecological Vegetation Classes

- Plains Grassland (EVC 132)
- Impacted vegetation



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Metres

Map Scale: 1:3,500 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

DRAFT

ecology & heritage partners

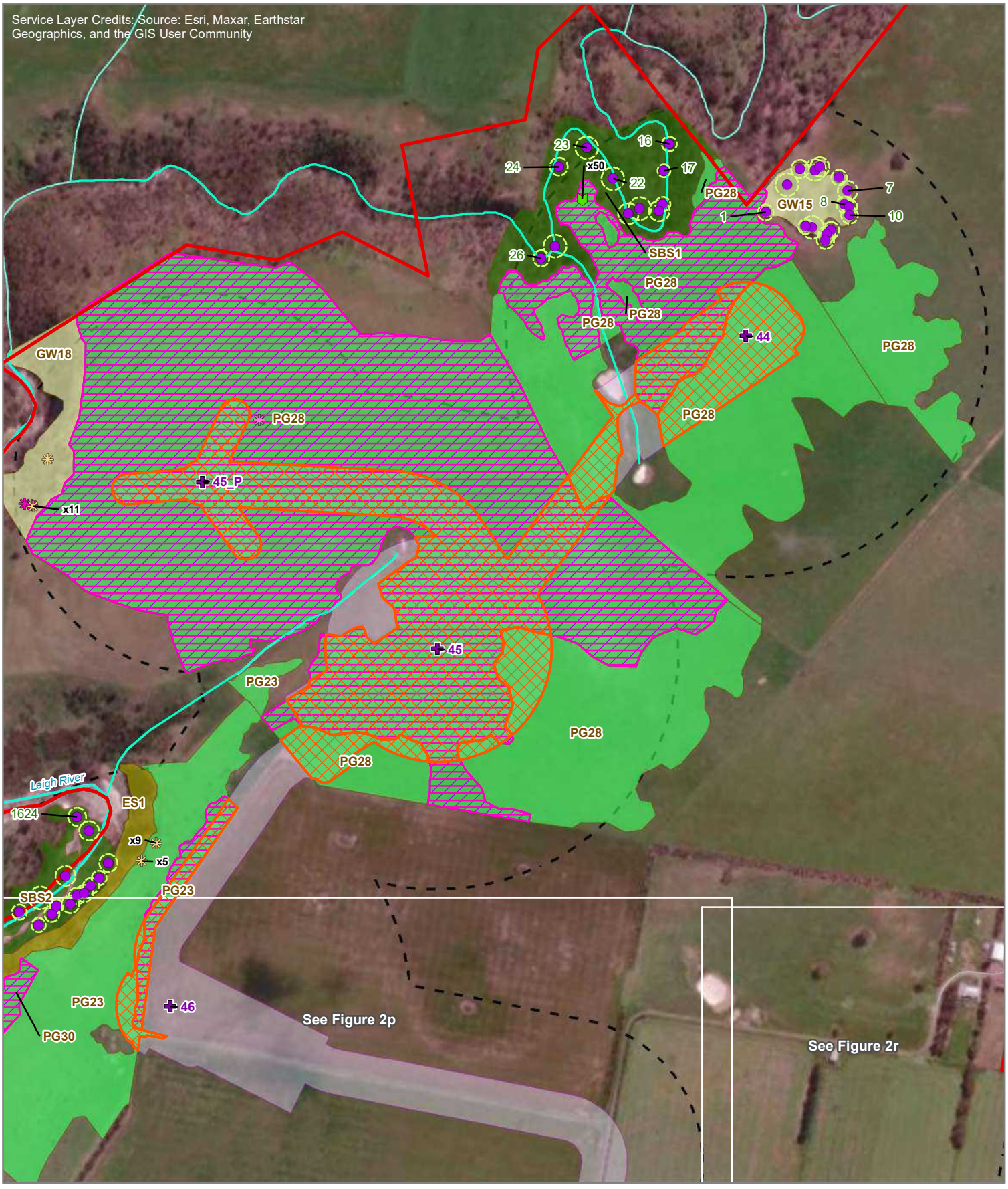


Figure 2o

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Large Tree in patch
- Tree Protection Zone

FFG Act Listed Flora

- *Fragrant saltbush*
- *Nicotiana suaveolens*
- *Rytidosperma monticola*

Flora Species

- *Chrysocephalum apiculatum*

EPBC Act Listed Community

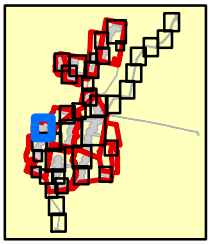
- Natural Temperate Grassland of the Victorian Volcanic Plain

FFG Act Listed Community

- Western (Basalt) Plains Grasslands Community

Ecological Vegetation Classes

- Escarpment Shrubland (EVC 895)
- Grassy Woodland (EVC 175)
- Plains Grassland (EVC 132)
- Stream Bank Shrubland (EVC 851)
- Impacted vegetation



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Metres

Map Scale: 1:6,700 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 2p

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Large Tree in patch
- Tree Protection Zone

EPBC Act Listed Community

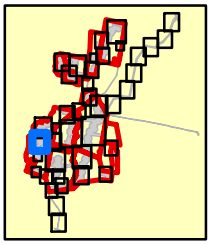
- Natural Temperate Grassland of the Victorian Volcanic Plain

FFG Act Listed Community

- Western (Basalt) Plains Grasslands Community

Ecological Vegetation Classes

- Escarpment Shrubland (EVC 895)
- Plains Grassland (EVC 132)
- Plains Grassy Woodland (EVC 55)
- Stream Bank Shrubland (EVC 851)
- Impacted vegetation



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Metres

Map Scale: 1:6,000 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

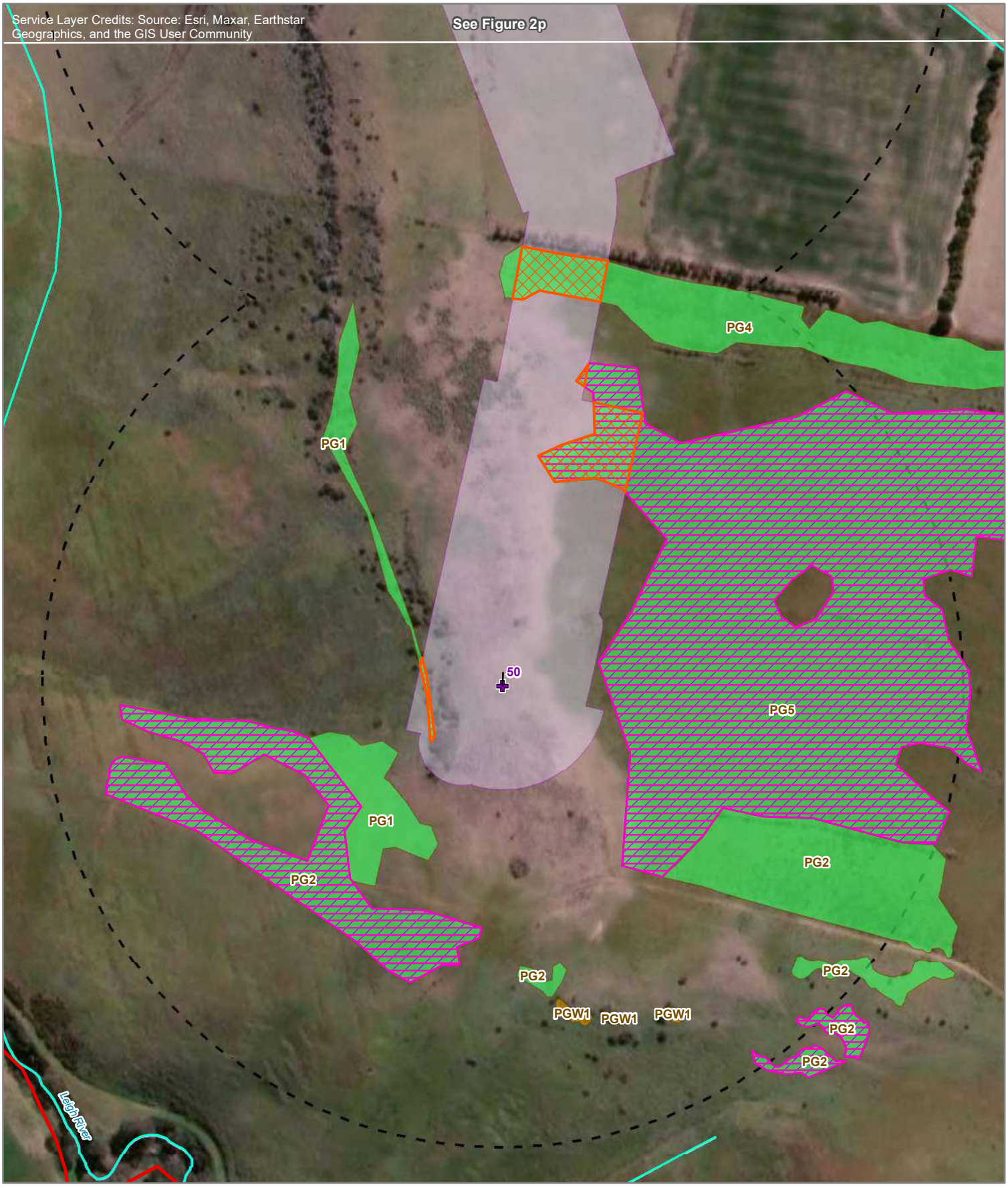


Figure 2q

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines

EPBC Act Listed Community

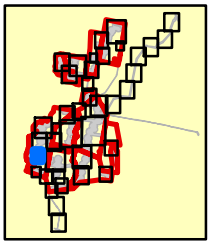
- Natural Temperate Grassland of the Victorian Volcanic Plain

FFG Act Listed Community

- Western (Basalt) Plains Grasslands Community

Ecological Vegetation Classes

- Plains Grassland (EVC 132)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



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Metres

Map Scale: 1:3,500 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 2r

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Scattered Large Tree
- Large Tree in patch
- Tree - Direct Impact
- Tree - TPZ Impacted
- Tree Protection Zone

EPBC Act Listed Community

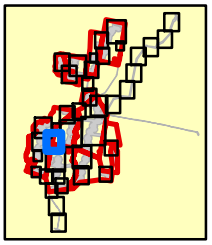
- Natural Temperate Grassland of the Victorian Volcanic Plain

FFG Act Listed Community

- Western (Basalt) Plains Grasslands Community

Ecological Vegetation Classes

- Plains Grassland (EVC 132)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



N

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Metres

Map Scale: 1:6,000 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

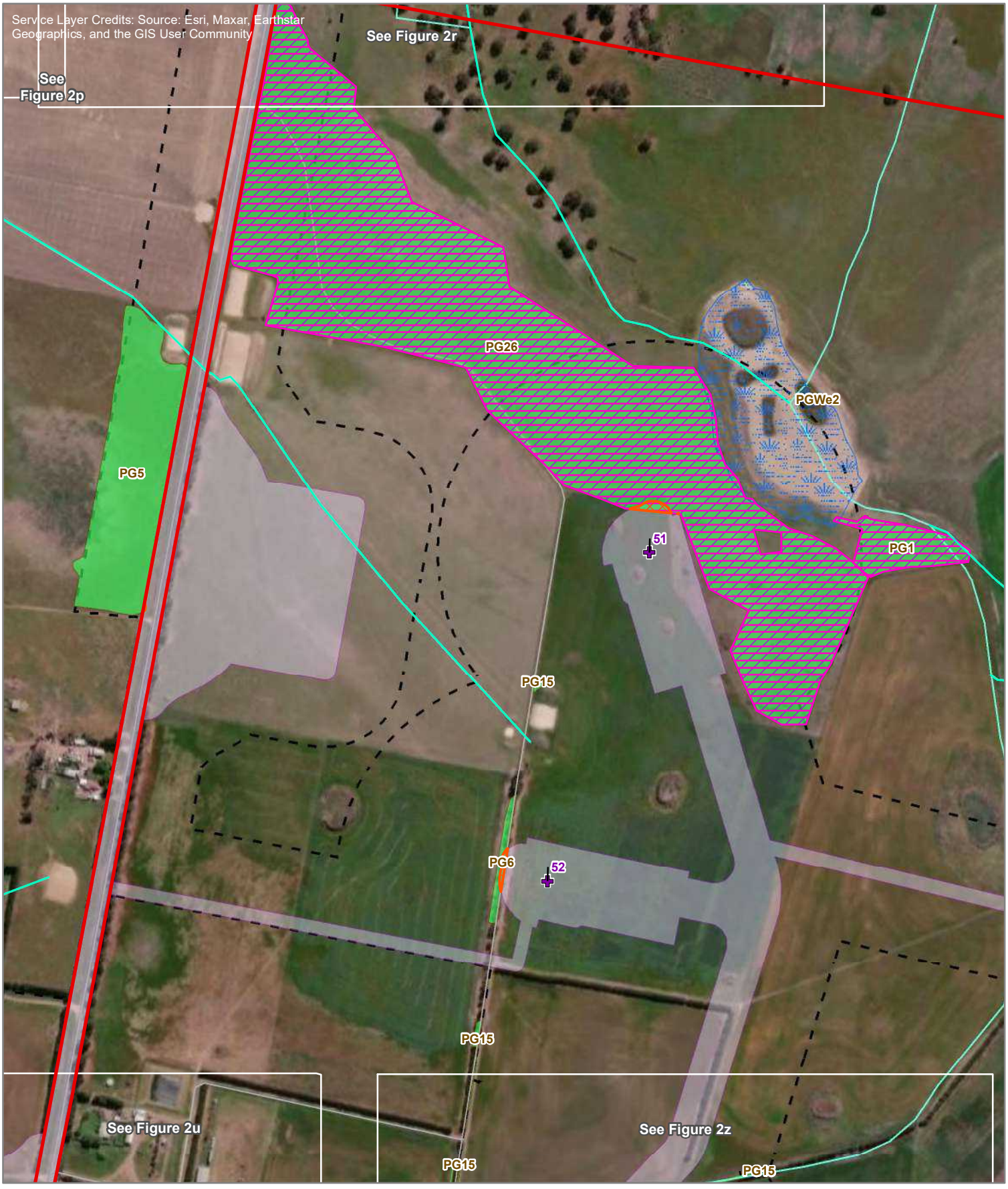


Figure 2s

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Current Wetlands
- Micrositing corridor
- Construction Footprint
- Wind turbines

EPBC Act Listed Community

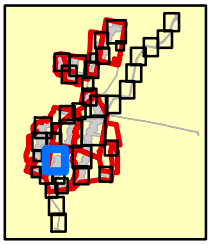
- Natural Temperate Grassland of the Victorian Volcanic Plain

FFG Act Listed Community

- Western (Basalt) Plains Grasslands Community

Ecological Vegetation Classes

- Plains Grassland (EVC 132)
- Plains Grassy Wetland (EVC 125)
- Impacted vegetation



N

0 60 120

Metres

Map Scale: 1:7,600 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 2t

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines

Flora Species

- *Ptilotus spathulatus*

EPBC Act Listed Community

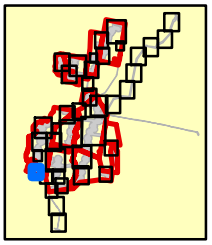
- Natural Temperate Grassland of the Victorian Volcanic Plain

FFG Act Listed Community

- Western (Basalt) Plains Grasslands Community

Ecological Vegetation Classes

- Plains Grassland (EVC 132)



N

0 25 50

Metres

Map Scale: 1:3,500 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

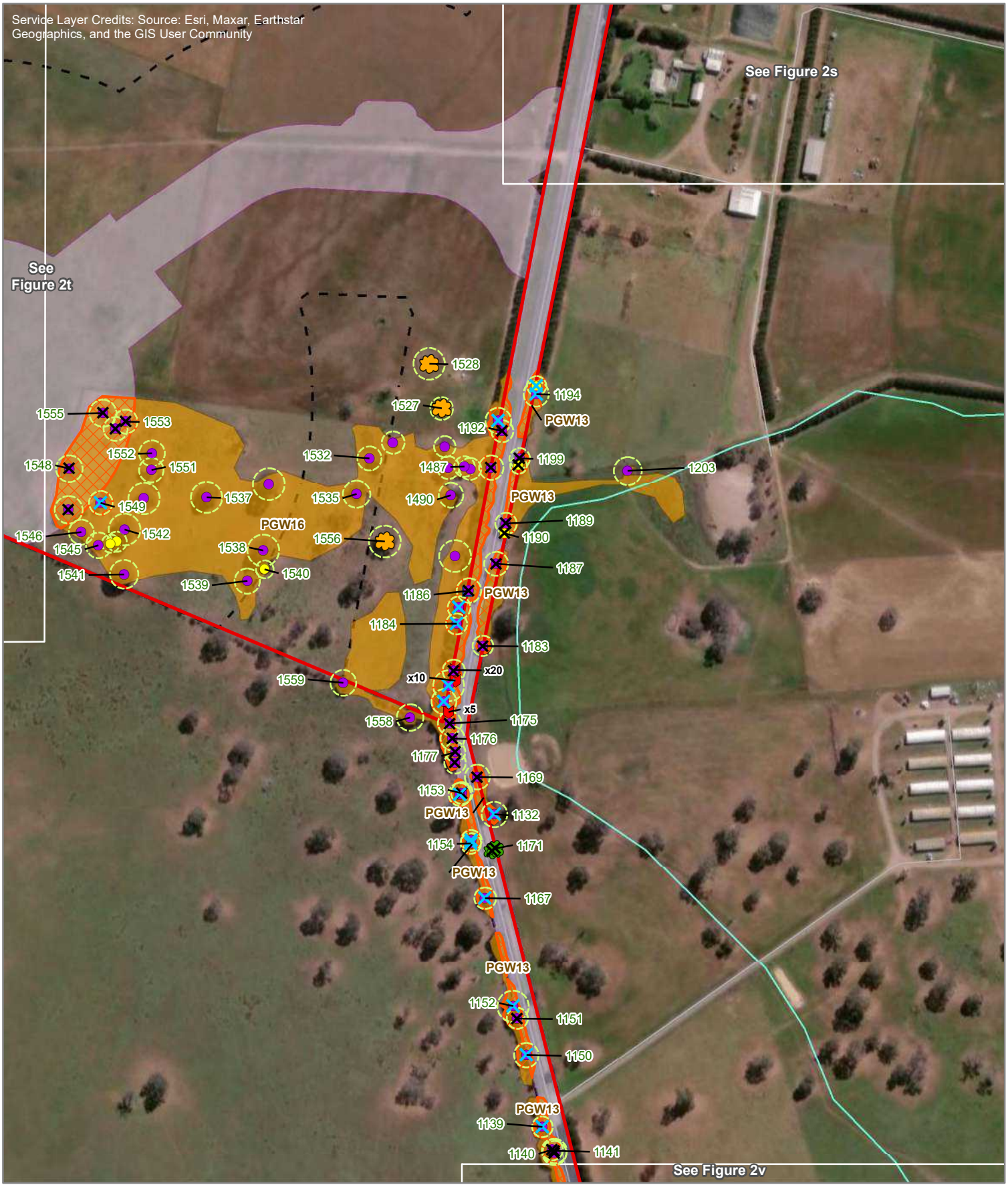


Figure 2u

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

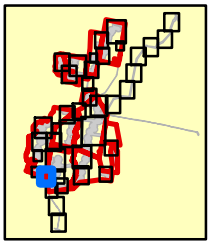
- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Scattered Large Tree
- Scattered Small Tree
- Large Tree in patch
- Small Tree in patch
- Tree - Direct Impact
- Tree - TPZ Impacted
- Tree Protection Zone

Flora Species

- *Acacia pycnantha*
- *Tricoryne elatior*

Ecological Vegetation Classes

- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



N

0 37.5 75

Metres

Map Scale: 1:4,800 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

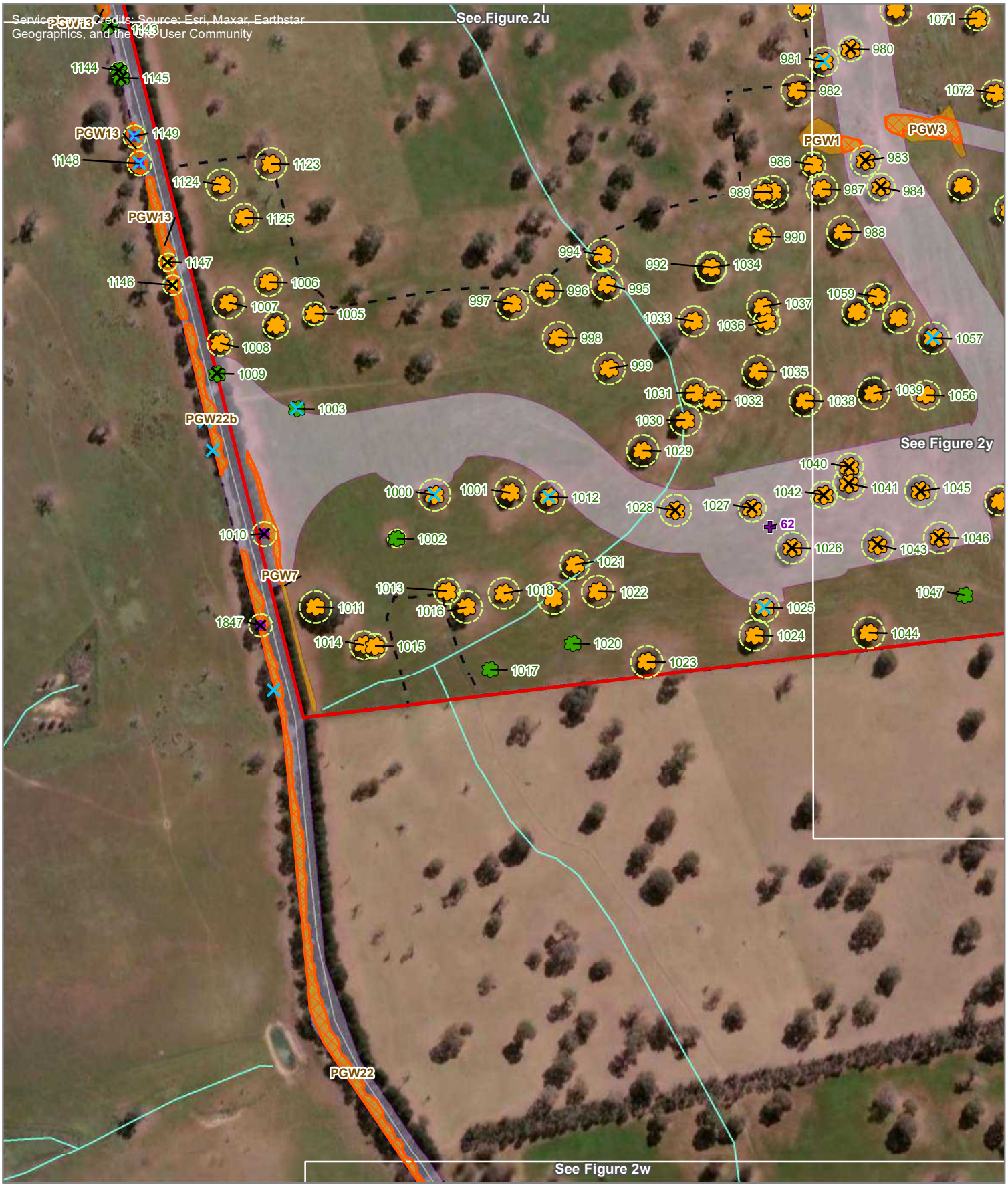


Figure 2v

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

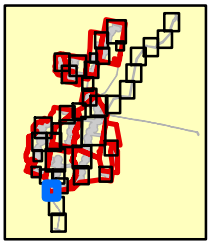
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Scattered Large Tree
- Scattered Small Tree
- Large Tree in patch
- Small Tree in patch
- Tree - Direct Impact
- Tree - TPZ Impacted
- Tree Protection Zone

Ecological Vegetation Classes

- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



N

0 37.5 75

Metres

Map Scale: 1:4,800 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 2w

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

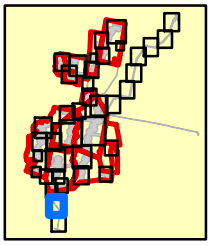
ecology & heritage partners

Legend

- Current Wetlands
- Micrositing corridor
- Construction Footprint
- Scattered Large Tree
- Large Tree in patch
- Tree - Direct Impact
- Tree Protection Zone

Ecological Vegetation Classes

- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



N

0 45 90

Metres

Map Scale: 1:5,800 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 2x

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

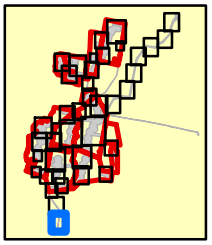
ecology & heritage partners

Legend

- Current Wetlands
- Micrositing corridor
- Construction Footprint
- Scattered Large Tree
- Scattered Small Tree
- Large Tree in patch
- Tree - Direct Impact
- Tree Protection Zone

Ecological Vegetation Classes

- Plains Grassland (EVC 132)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



N

0 45 90

Metres

Map Scale: 1:5,800 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

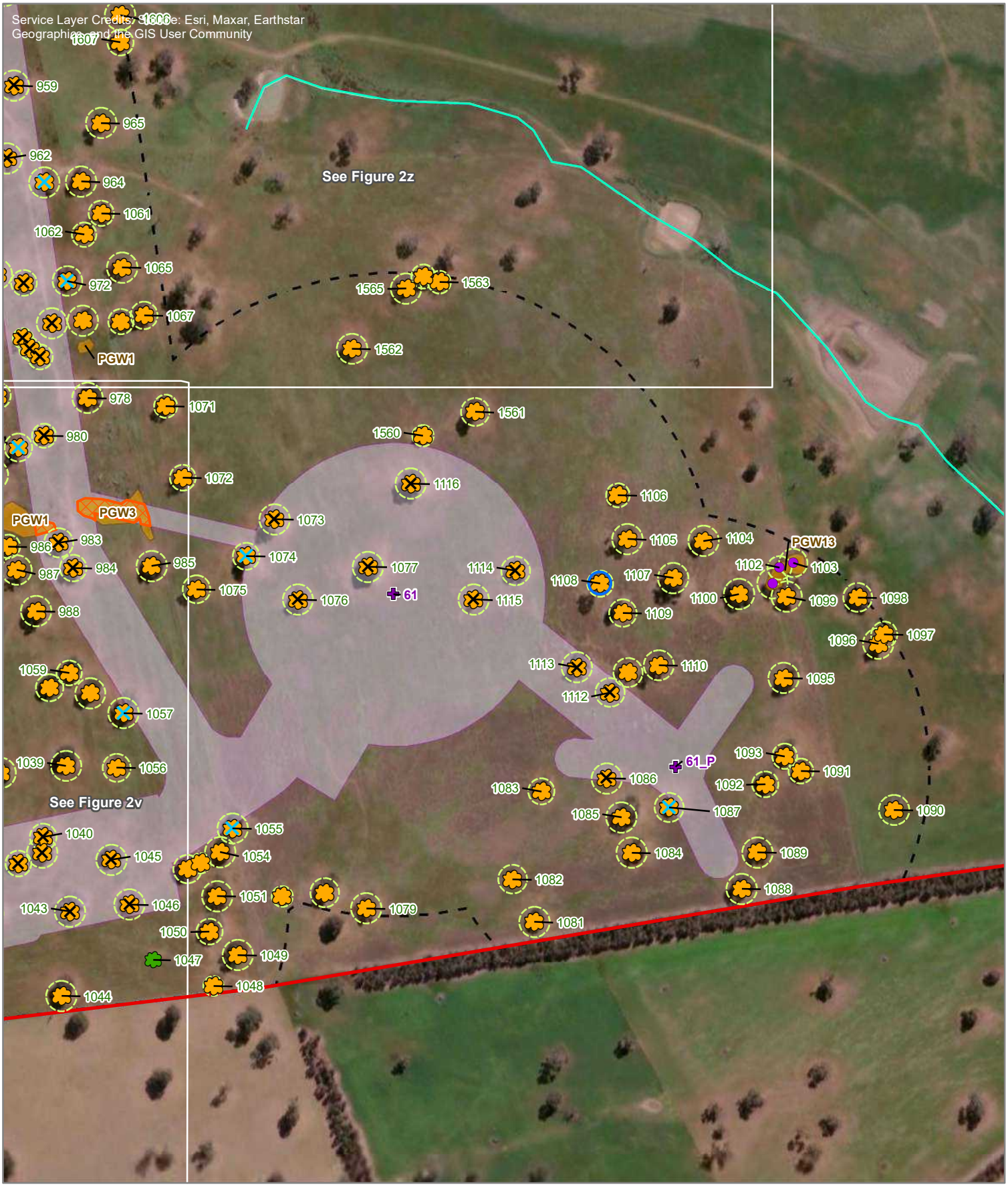


Figure 2y

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

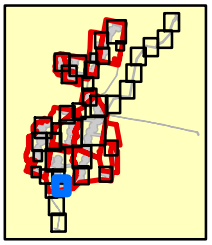
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Scattered Large Tree
- Scattered Small Tree
- Large Tree in patch
- Tree - Direct Impact
- Tree - TPZ Impacted
- Tree Protection Zone
- Raptor nest

Ecological Vegetation Classes

- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



N

0 40 80

Metres

Map Scale: 1:5,000 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

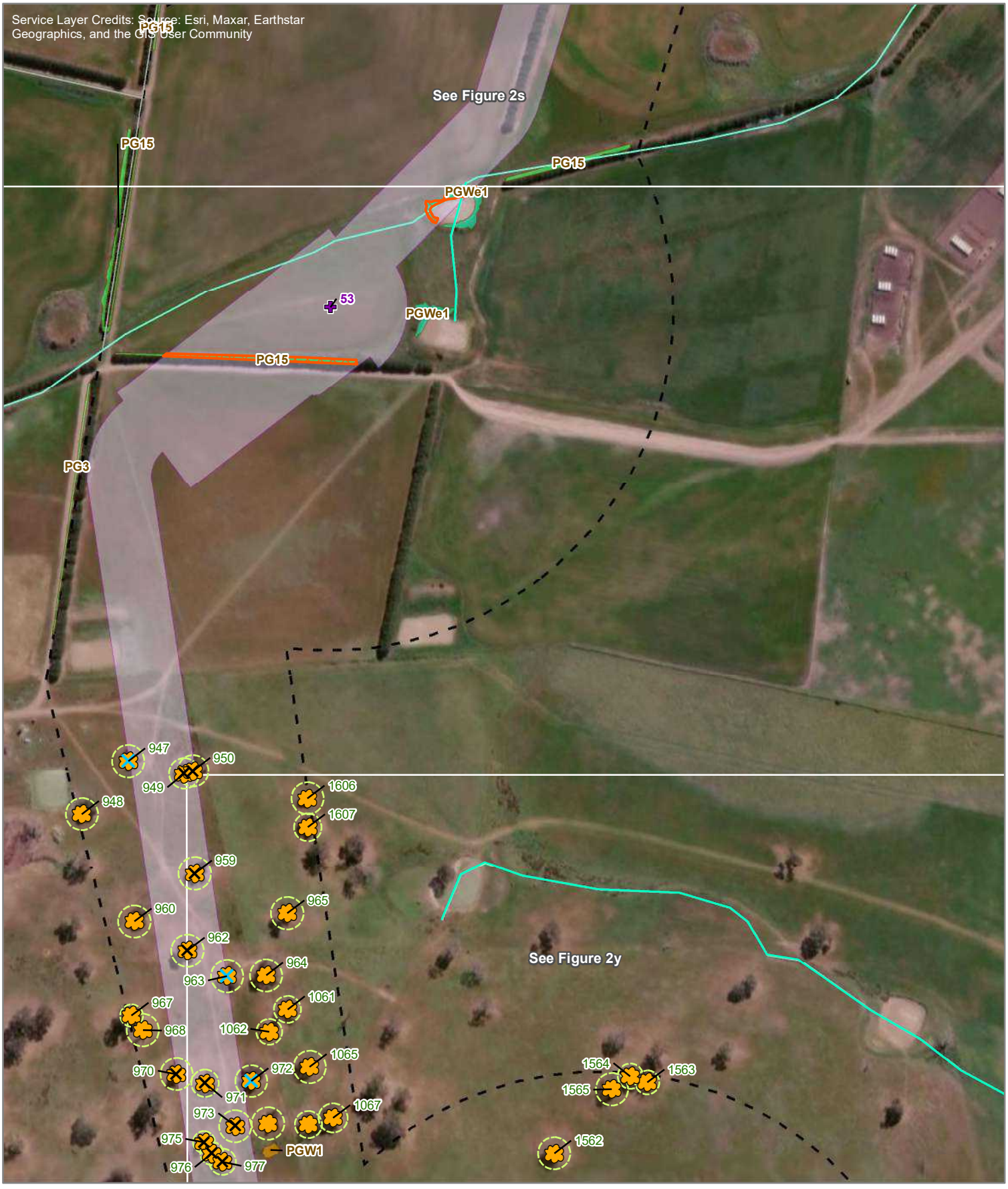


Figure 2z

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

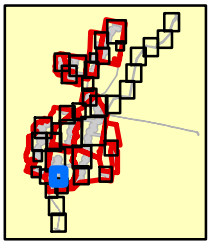
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Scattered Large Tree
- Tree - Direct Impact
- Tree - TPZ Impacted
- Tree Protection Zone

Ecological Vegetation Classes

- Plains Grassland (EVC 132)
- Plains Grassy Wetland (EVC 125)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



N

0 37.5 75

Metres

Map Scale: 1:4,700 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 2aa

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Current Wetlands
- Micrositing corridor
- Construction Footprint
- Wind turbines

FFG Act Listed Flora

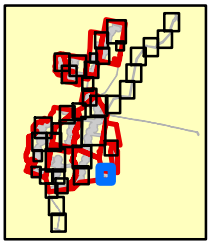
- *Cullen Parvum*

Flora Species

- *Euchiton sphaericus*

Ecological Vegetation Classes

- Plains Grassland (EVC 132)



N

0 40 80

Metres

Map Scale: 1:5,000 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

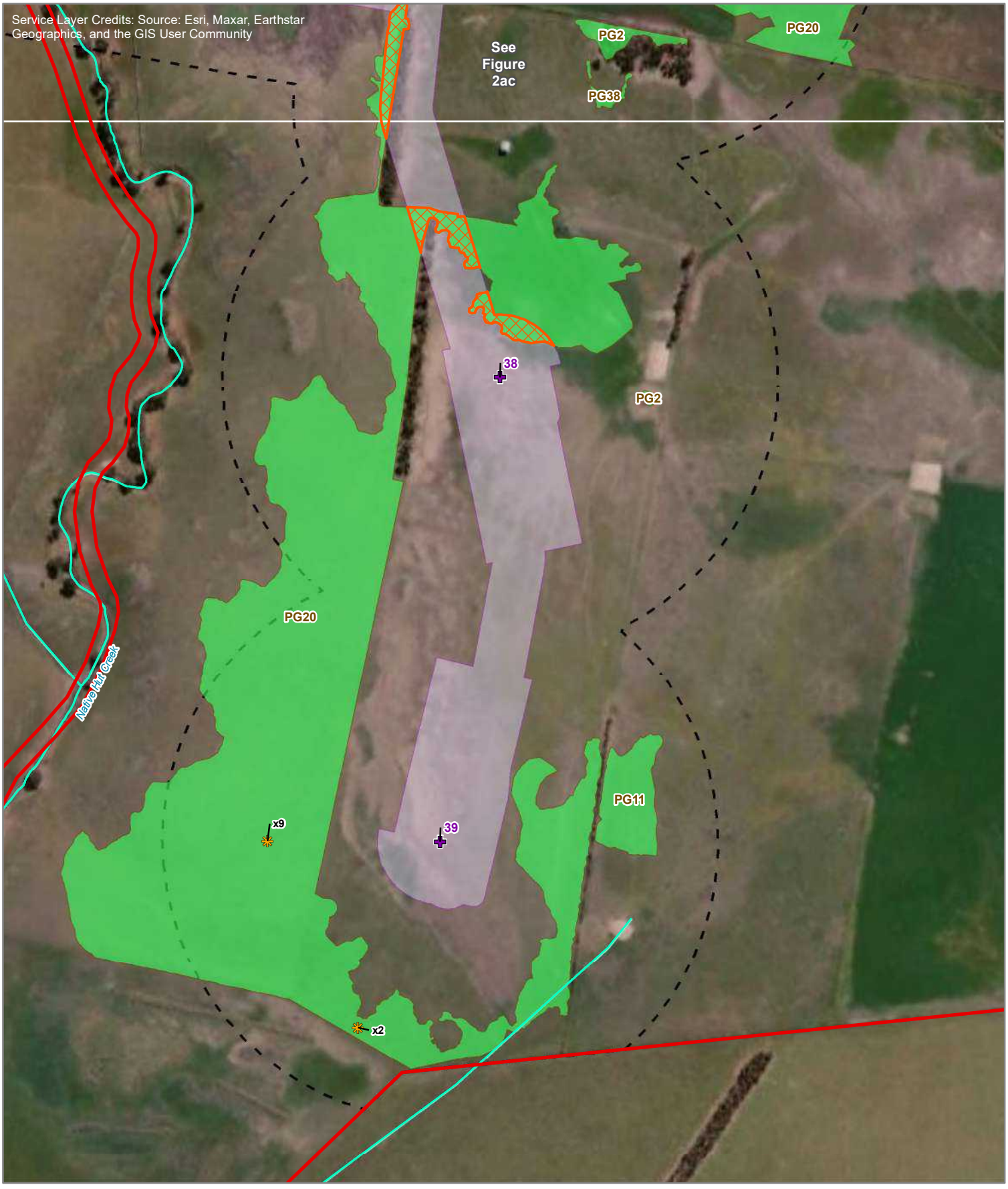


Figure 2ab

Ecological features

Proposed Tall Tree Wind Farm

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines

FFG Act Listed Flora

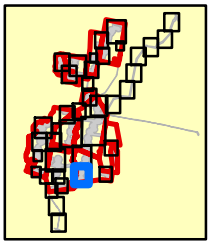
- *Cullen Parvum*

Ecological Vegetation Classes

- Plains Grassland (EVC 132)
- Impacted vegetation

DRAFT

ecology & heritage partners



N

0 45 90

Metres

Map Scale: 1:5,800 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 2ac

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Current Wetlands
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Scattered Large Tree
- Large Tree in patch
- Tree - Direct Impact
- Tree - TPZ Impacted
- Tree Protection Zone

FFG Act Listed Flora

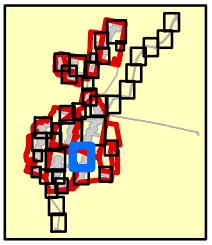
- *Cullen Parvum*
- *Cullen Tenax*

Flora Species

- *Laphangium luteoalbum*

Ecological Vegetation Classes

- Creekline Grassy Woodland (EVC 68)
- Plains Grassland (EVC 132)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



N

0 60 120

Metres

Map Scale: 1:7,600 @ A4
Coordinate System: GDA 1994 MGA Zone 54

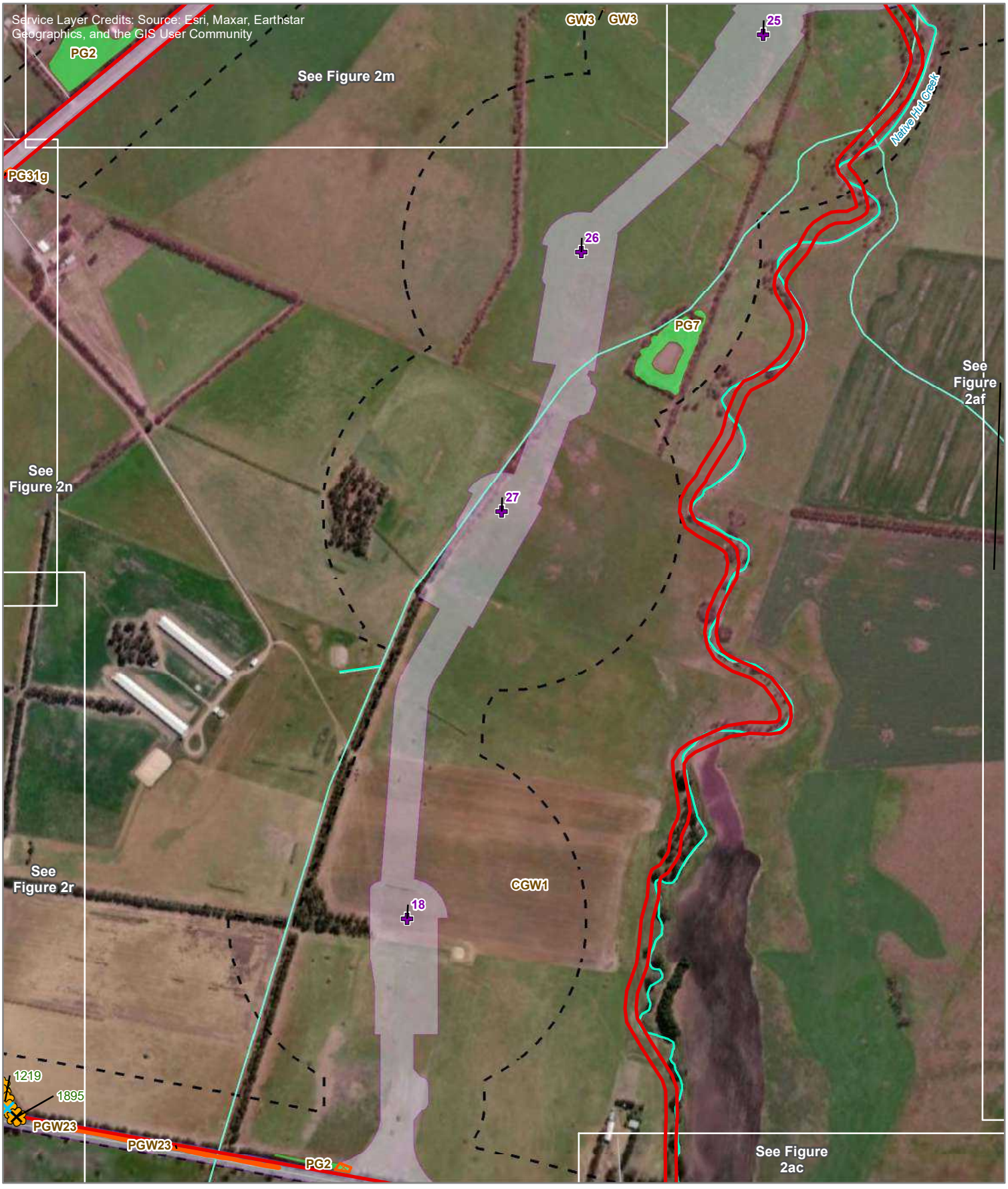


Figure 2ad

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

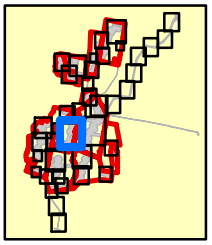
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Scattered Large Tree
- Tree - Direct Impact
- Tree - TPZ Impacted
- Tree Protection Zone

Ecological Vegetation Classes

- Creekline Grassy Woodland (EVC 68)
- Grassy Woodland (EVC 175)
- Plains Grassland (EVC 132)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



N

0 70 140

Metres

Map Scale: 1:9,000 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

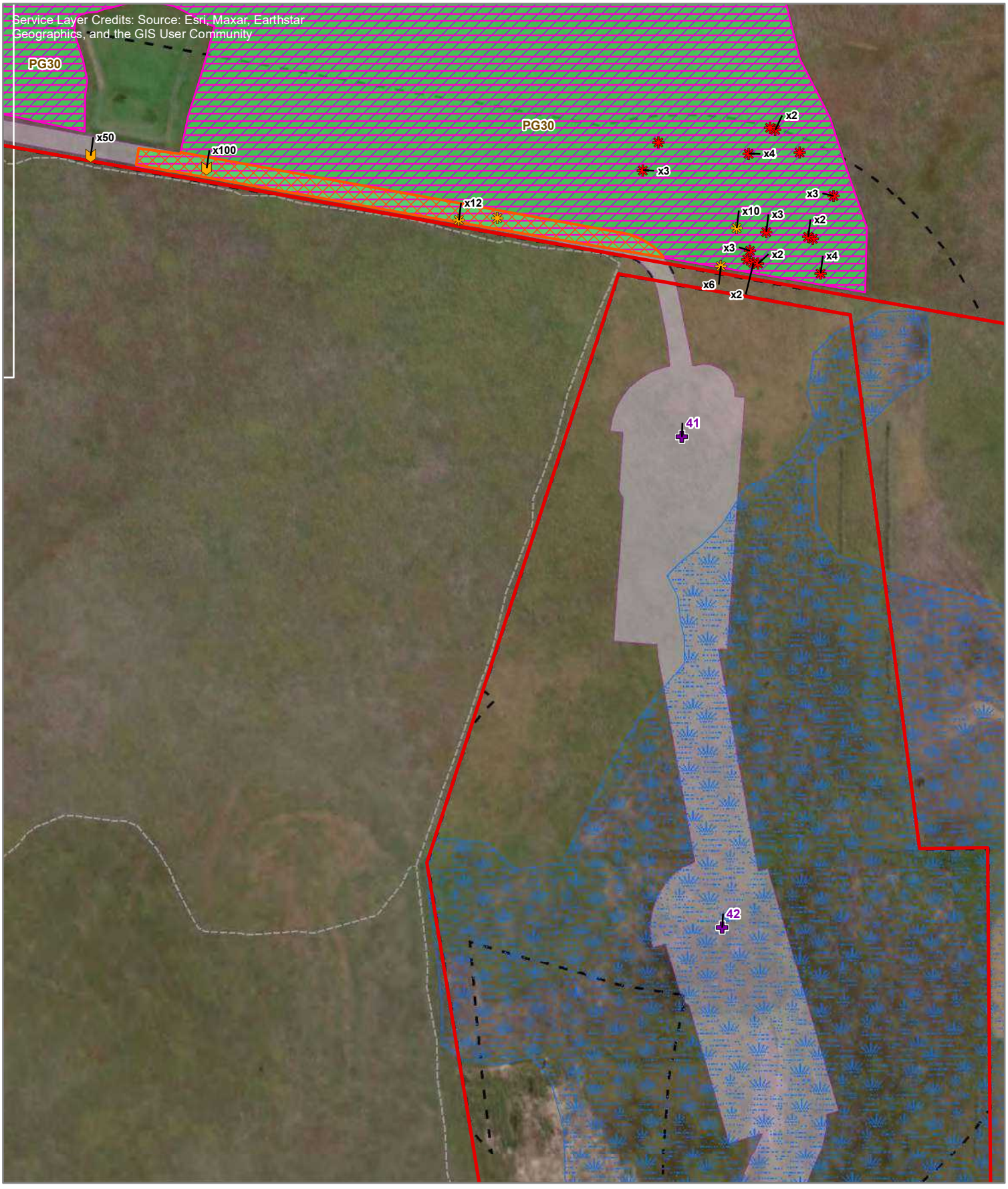


Figure 2ae

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Current Wetlands
- Micrositing corridor
- Construction Footprint
- Wind turbines

FFG Act Listed Flora

- *Cullen Parvum*
- *Cullen Tenax*

Flora Species

- *Calocephalus citreus*

EPBC Act Listed Community

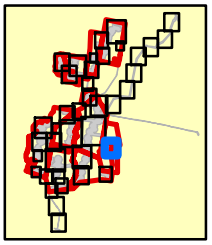
- Natural Temperate Grassland of the Victorian Volcanic Plain

FFG Act Listed Community

- Western (Basalt) Plains Grasslands Community

Ecological Vegetation Classes

- Plains Grassland (EVC 132)
- Impacted vegetation



N

0 40 80

Metres

Map Scale: 1:5,000 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 2af

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines

FFG Act Listed Flora

- *Cullen Parvum*

Flora Species

- *Calocephalus citreus*
- *Laphangium luteoalbum*

EPBC Act Listed Community

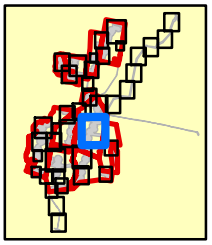
- Natural Temperate Grassland of the Victorian Volcanic Plain

FFG Act Listed Community

- Western (Basalt) Plains Grasslands Community

Ecological Vegetation Classes

- Plains Grassland (EVC 132)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



N

0 70 140

Metres

Map Scale: 1:9,500 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

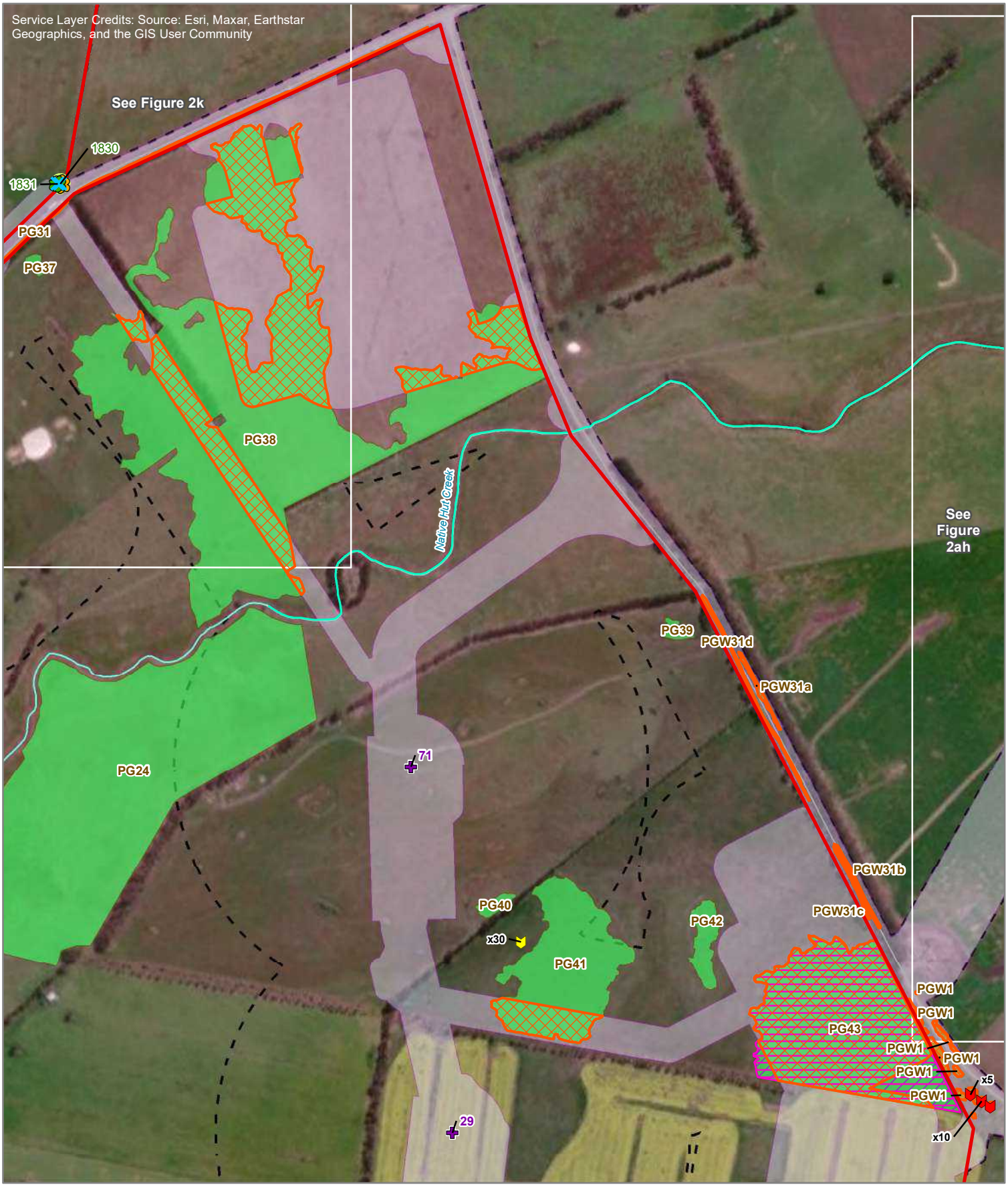


Figure 2ag

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint
- Wind turbines
- Scattered Large Tree
- Scattered Small Tree
- Tree - TPZ Impacted
- Tree Protection Zone

Flora Species

- *Acacia pycnantha*
- *Calocephalus sp.*

EPBC Act Listed Community

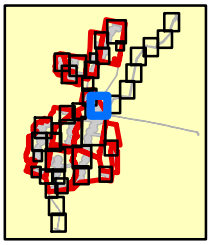
- Natural Temperate Grassland of the Victorian Volcanic Plain

FFG Act Listed Community

- Western (Basalt) Plains Grasslands Community

Ecological Vegetation Classes

- Plains Grassland (EVC 132)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



N

0 50 100

Metres

Map Scale: 1:6,800 @ A4
Coordinate System: GDA 1994 MGA Zone 54

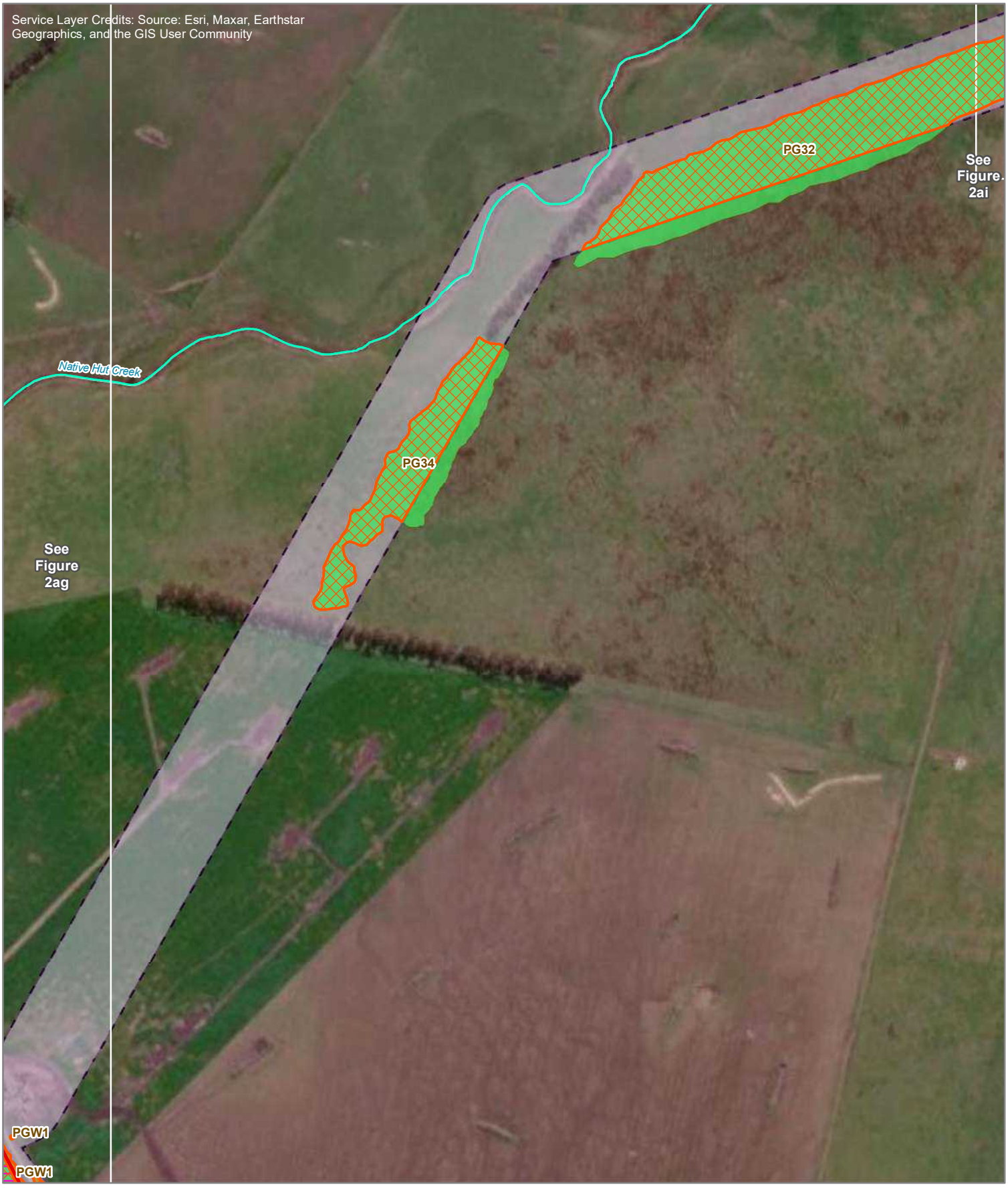


Figure 2ah

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Construction Footprint

EPBC Act Listed Community

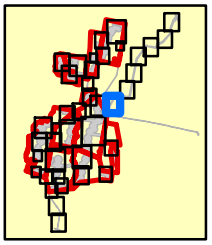
- Natural Temperate Grassland of the Victorian Volcanic Plain

FFG Act Listed Community

- Western (Basalt) Plains Grasslands Community

Ecological Vegetation Classes

- Plains Grassland (EVC 132)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



N

0 45 90

Metres

Map Scale: 1:5,800 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 2ai

Ecological features

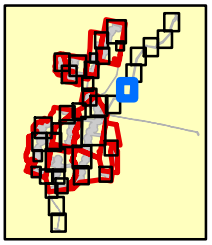
Proposed Tall Tree Wind Farm

Legend

- Micrositing corridor
- Construction Footprint

Ecological Vegetation Classes

- Plains Grassland (EVC 132)
- Impacted vegetation



N

0 45 90

Metres

Map Scale: 1:5,800 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

DRAFT

ecology & heritage partners

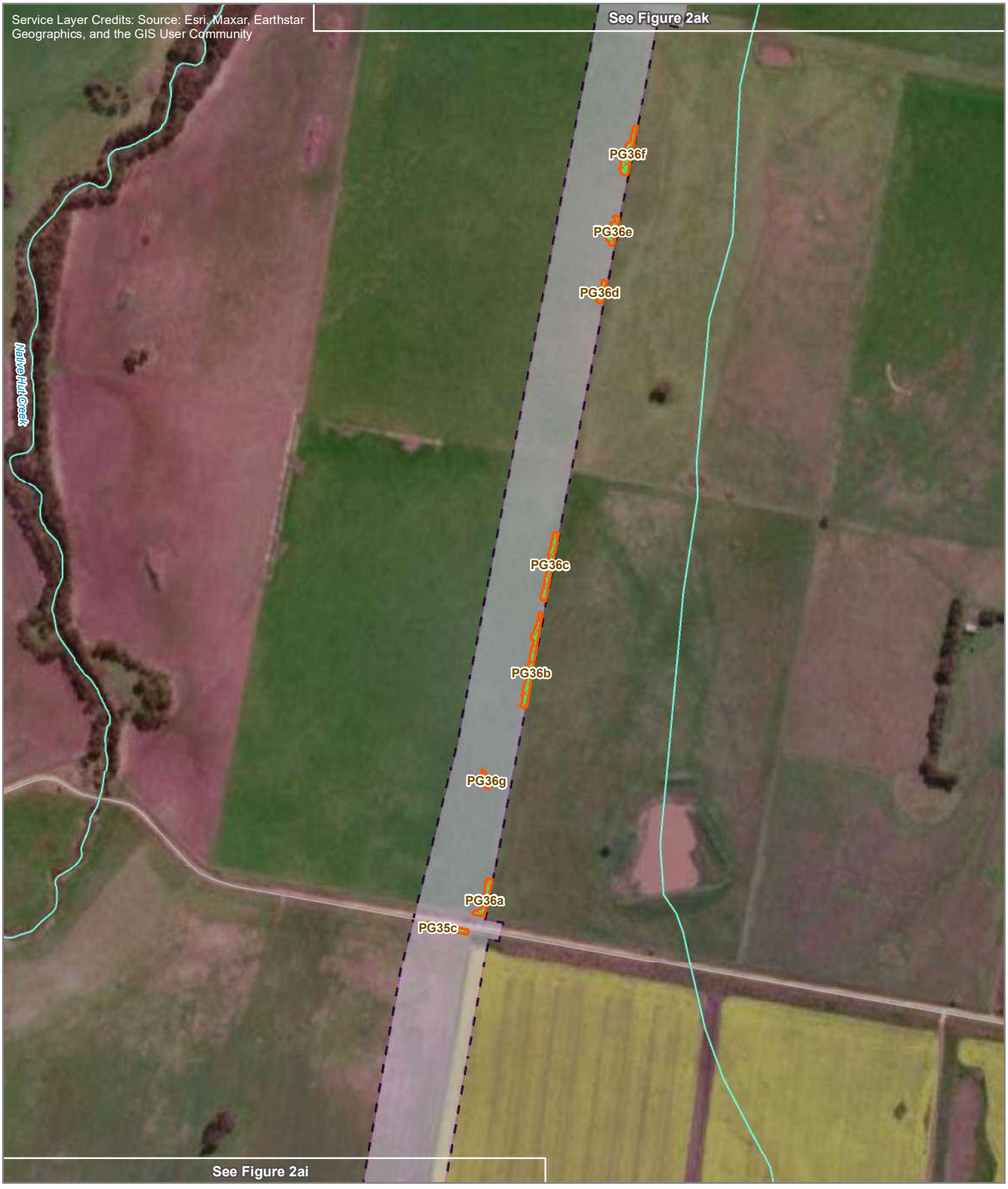


Figure 2aj

Ecological features

Proposed Tall Tree Wind Farm

Legend

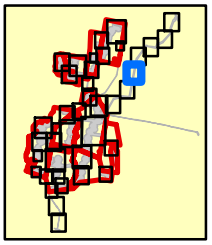
- Micrositing corridor
- Construction Footprint

Ecological Vegetation Classes

- Plains Grassland (EVC 132)
- Impacted vegetation

DRAFT

ecology & heritage partners



N

0 45 90

Metres

Map Scale: 1:5,800 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 2ak

Ecological features

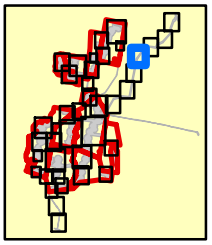
Proposed Tall Tree Wind Farm

Legend

- Micrositing corridor
- Construction Footprint

Ecological Vegetation Classes

- Plains Grassland (EVC 132)
- Plains Grassy Woodland (EVC 55)
- Impacted vegetation



N

0 45 90

Metres

Map Scale: 1:5,800 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

DRAFT

ecology & heritage partners

Figure 2al

Ecological features

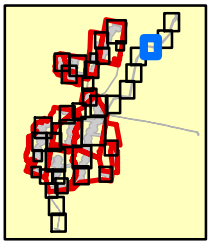
Proposed Tall Tree Wind Farm

Legend

- Micrositing corridor
- Construction Footprint

Ecological Vegetation Classes

- Plains Grassland (EVC 132)
- Impacted vegetation



N

0 45 90

Metres

Map Scale: 1:5,800 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

DRAFT

ecology & heritage partners

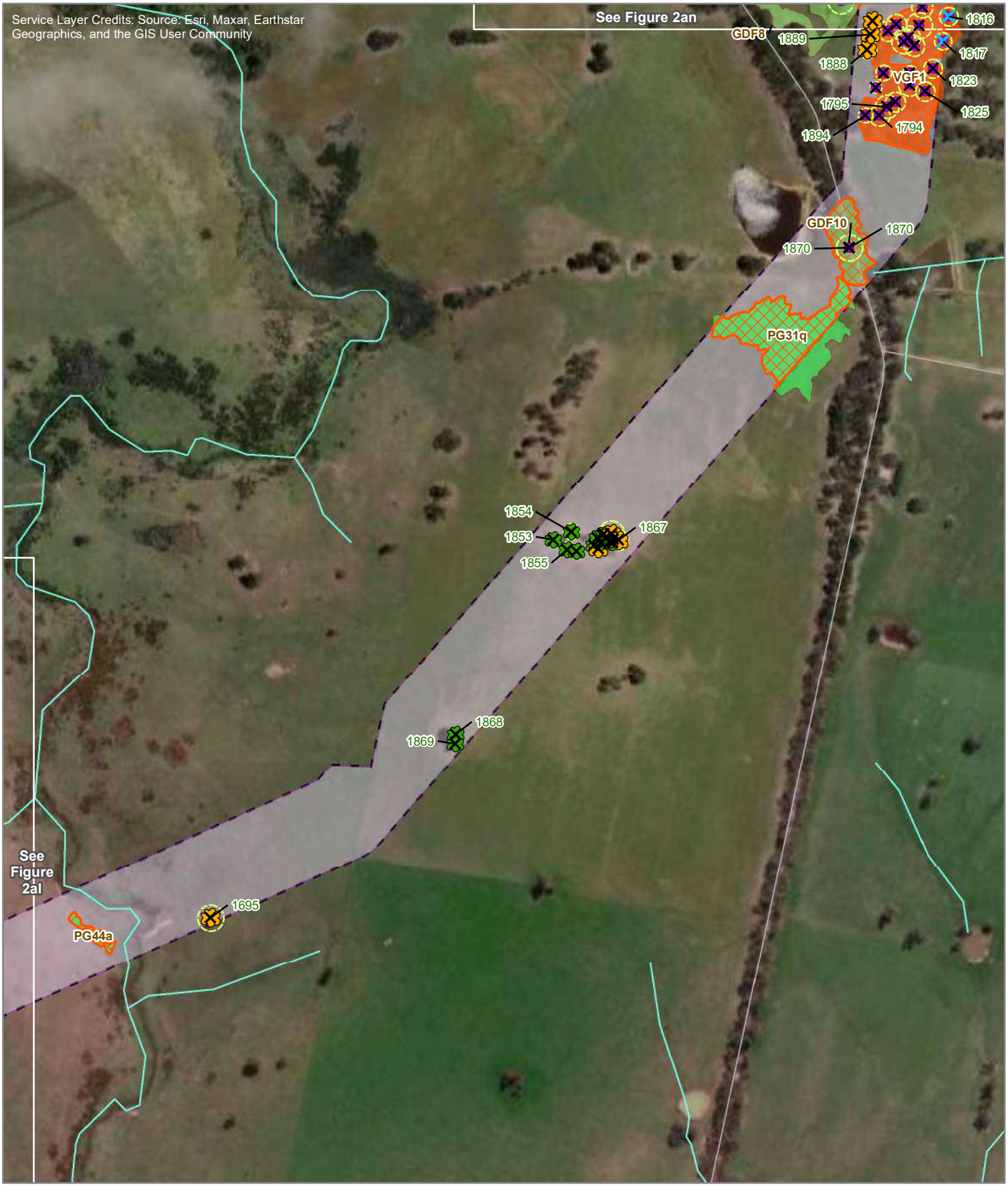


Figure 2am

Ecological features

Proposed Tall Tree Wind Farm

Legend

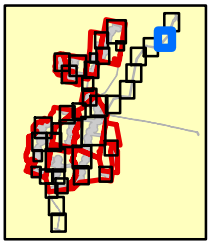
- Micrositing corridor
- Construction Footprint
- Scattered Large Tree
- Scattered Small Tree
- Large Tree in patch
- Tree - Direct Impact
- Tree - TPZ Impacted
- Tree Protection Zone

Ecological Vegetation Classes

- Grassy Dry Forest (EVC 22)
- Plains Grassland (EVC 132)
- Valley Grassy Forest (EVC 47)
- Impacted vegetation

DRAFT

ecology & heritage partners



N

0 45 90

Metres

Map Scale: 1:5,800 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

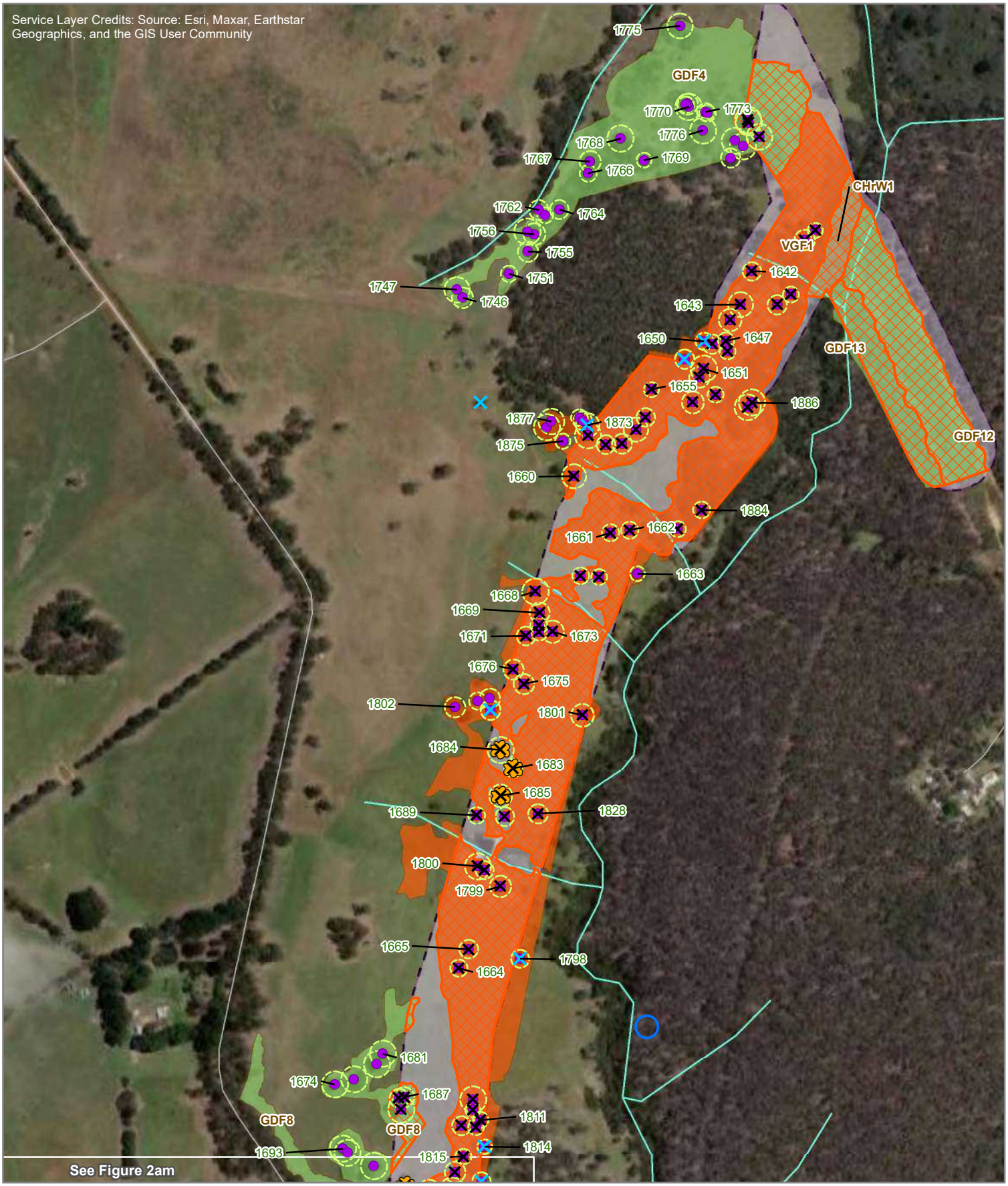


Figure 2an

Ecological features

Proposed Tall Tree Wind Farm

DRAFT

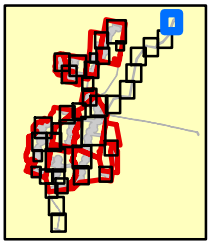
ecology & heritage partners

Legend

- Micrositing corridor
- Construction Footprint
- Scattered Large Tree
- Large Tree in patch
- Tree - Direct Impact
- Tree - TPZ Impacted
- Tree Protection Zone
- Raptor nest

Ecological Vegetation Classes

- Creekline Herb-rich Woodland (EVC 164)
- Grassy Dry Forest (EVC 22)
- Valley Grassy Forest (EVC 47)
- Impacted vegetation



N

0 45 90

Metres

Map Scale: 1:5,800 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

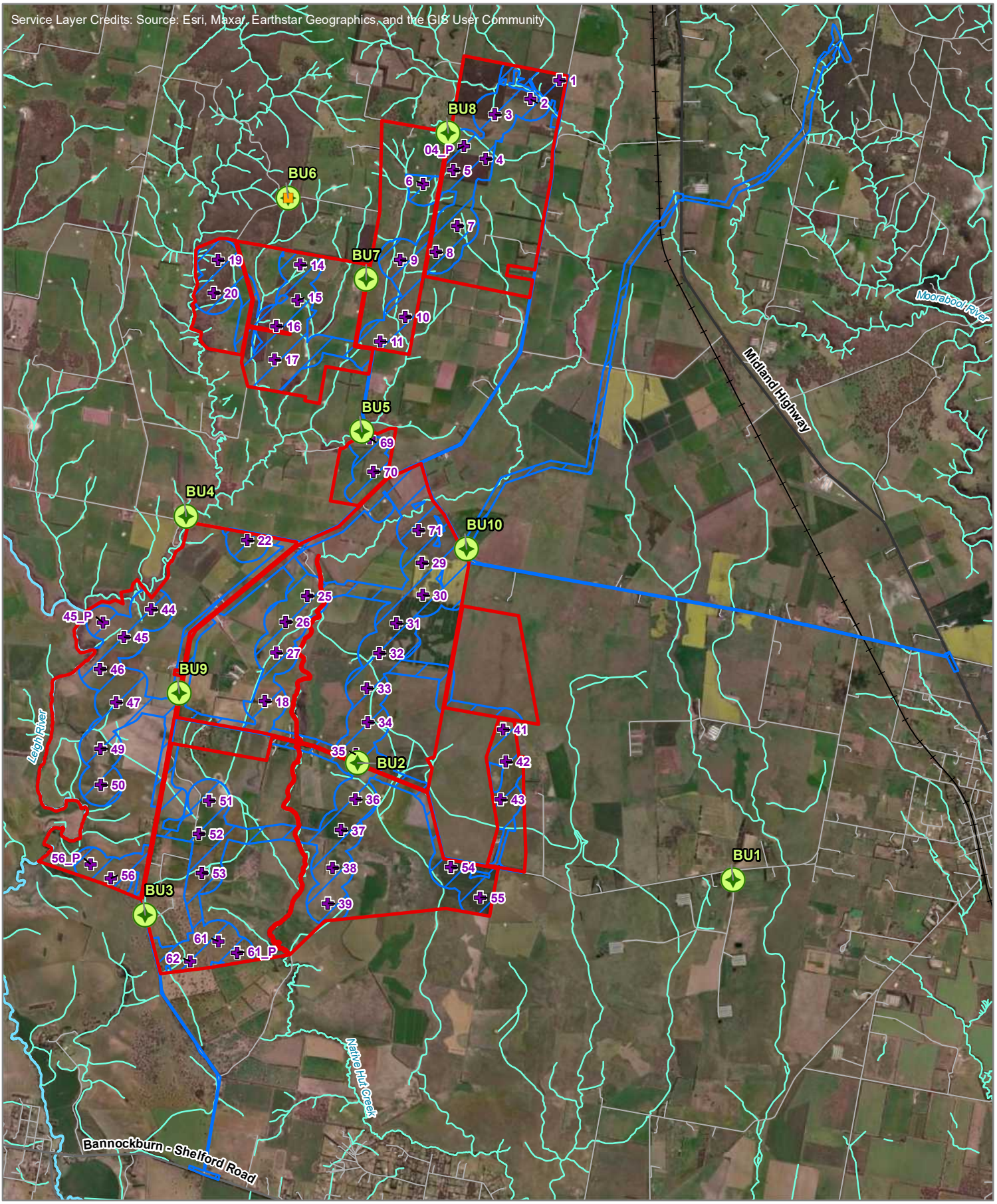


Figure 3

Bird utilisation survey sites

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Wind turbines
- Bird utilisation survey locations

EPBC Act Listed Fauna

- Brown Treecreeper (survey date: 24/08/2023)

N

0 500 1,000

Metres

Map Scale: 1:75,000 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

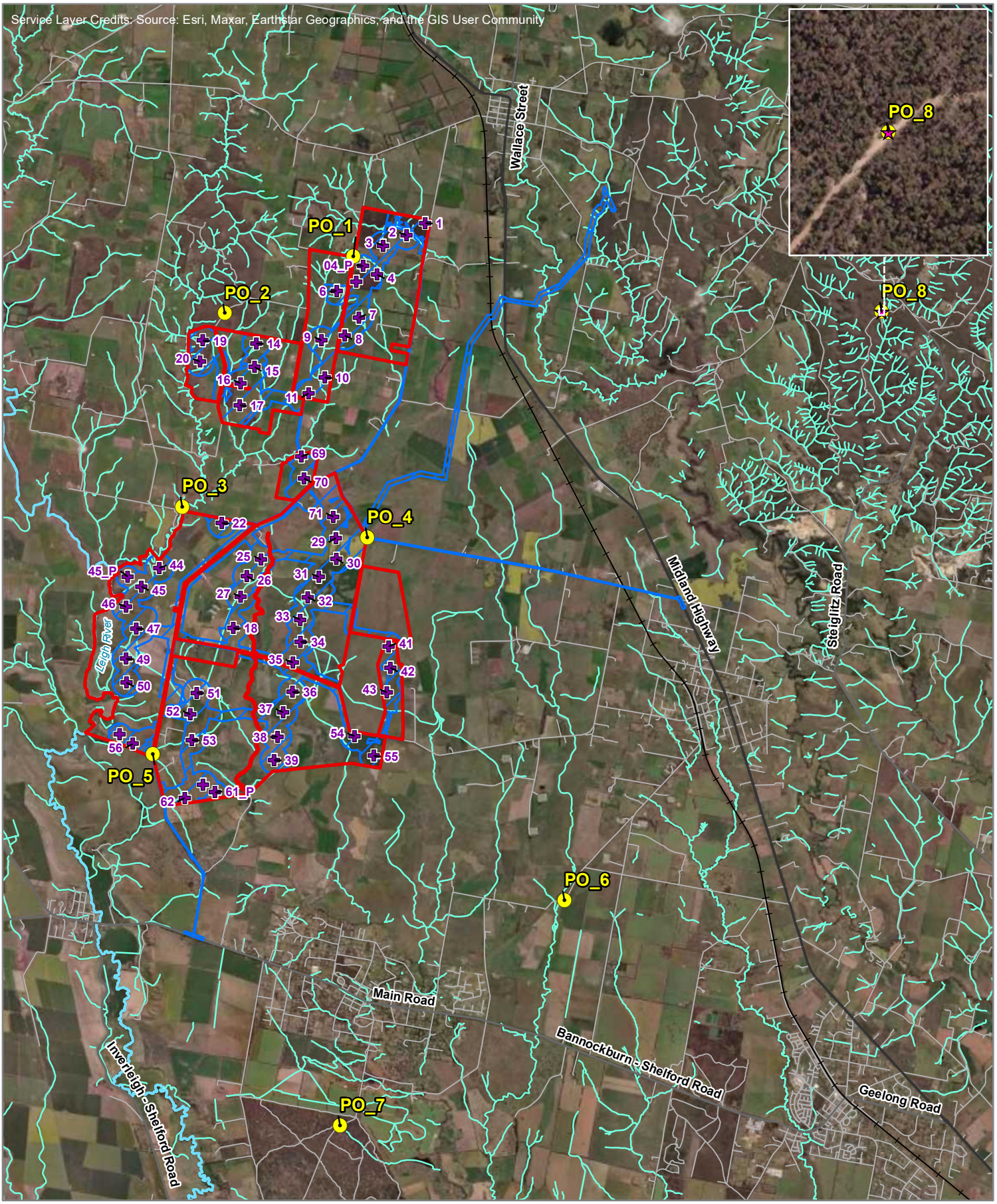


Figure 4

Forest Owl survey sites

Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Wind turbines

Survey locations

- Forest Owl call-playback

FFG Act Listed Fauna

- Powerful Owl (survey date: 11/09/2023)

N

0 1,000 2,000

Metres

Map Scale: 1:115,000 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

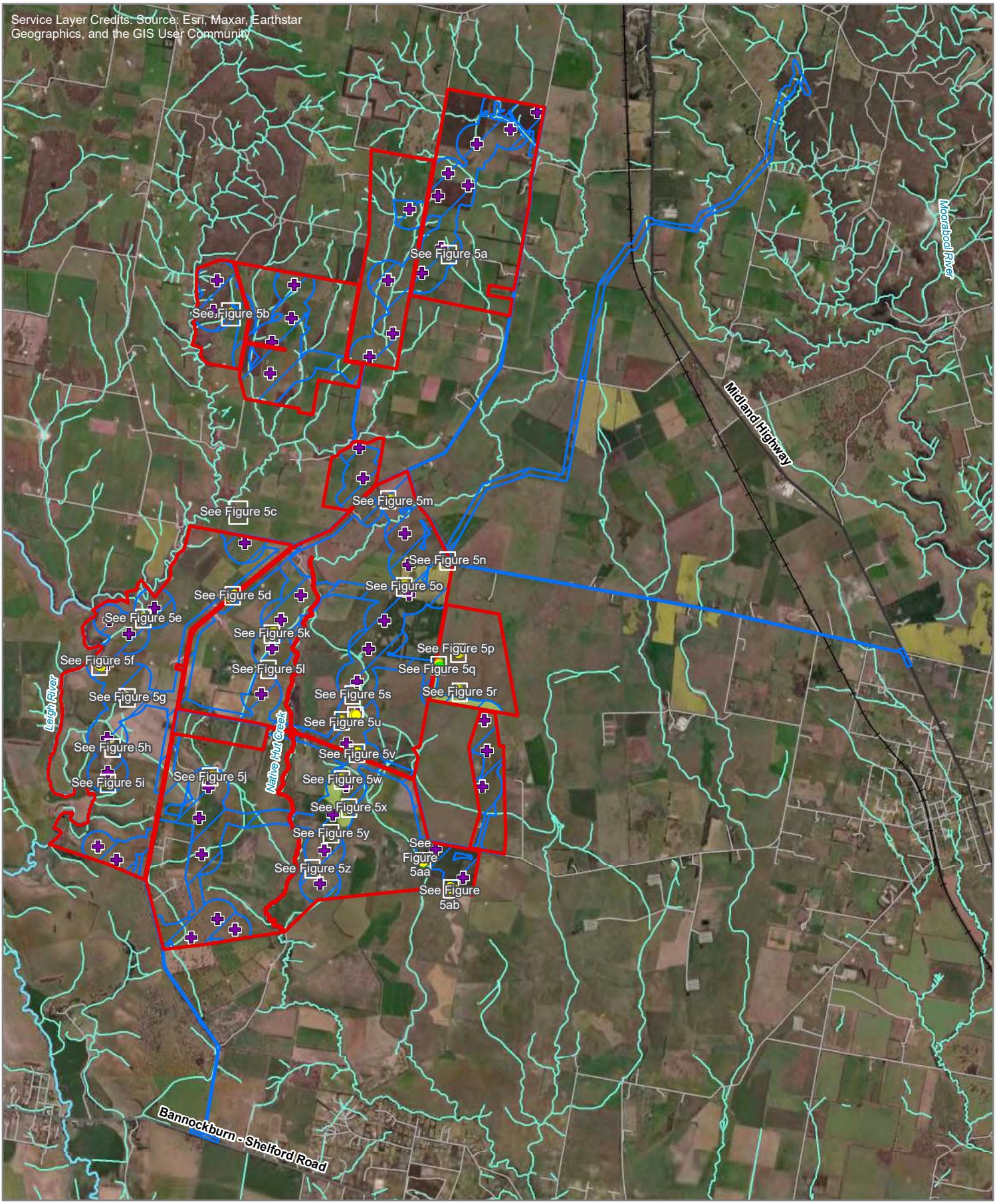


Figure 5 Overview

Striped Legless Lizard survey results

Proposed Tall Tree Wind Farm

DRAFT

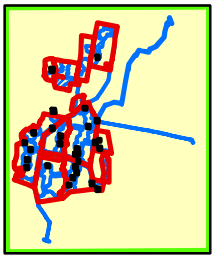
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Wind turbines
- Striped Legless Lizard habitat
- Striped Legless Lizard Tile Grids

Survey locations

- Striped Legless Lizard
- Incidental Species



N

0 650 1,300

Metres

Map Scale: 1:80,000 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 5a
Striped Legless Lizard survey results
Proposed Tall Tree Wind Farm

DRAFT

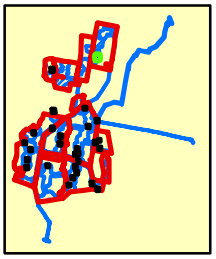
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

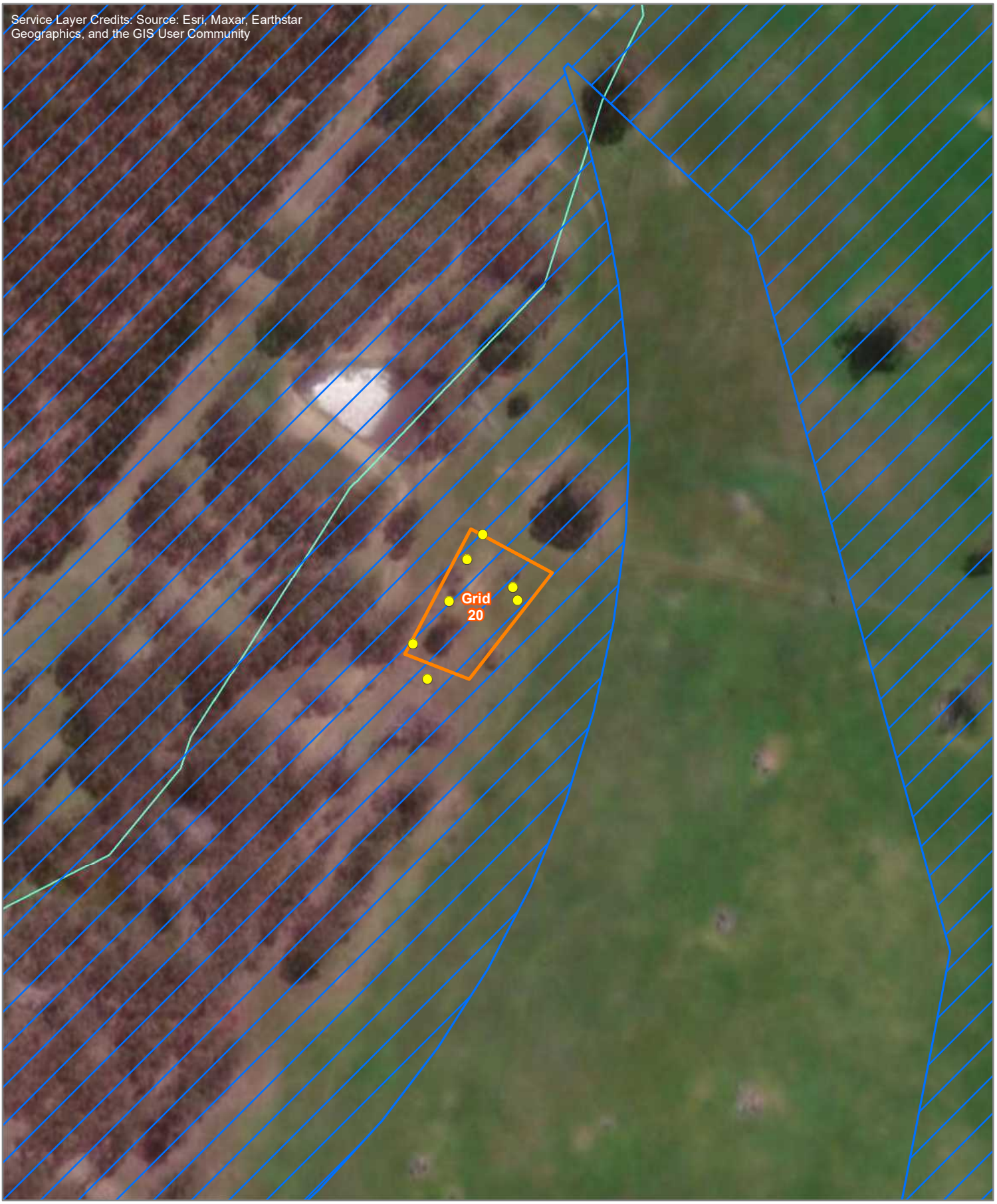


Figure 5b
Striped Legless Lizard survey results
Proposed Tall Tree Wind Farm

DRAFT

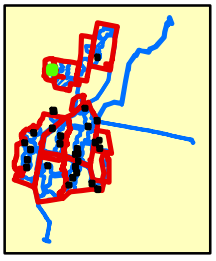
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 12.5 25

Metres

Map Scale: 1:1,500 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 5c

Striped Legless Lizard survey results

Proposed Tall Tree Wind Farm

DRAFT

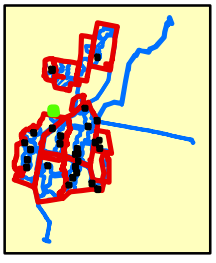
ecology & heritage partners

Legend

Striped Legless Lizard Tile Grids

Survey locations

Incidental Species



N

0 12.5 25

Metres

Map Scale: 1:1,500 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

16925_Fig05_SLLGridsMB 2/06/2025 melsley

Figure 5d
Striped Legless Lizard survey results
Proposed Tall Tree Wind Farm

DRAFT

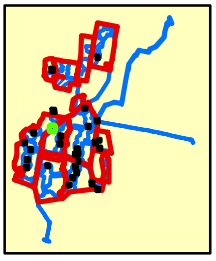
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 5e

Striped Legless Lizard survey results

Proposed Tall Tree Wind Farm

DRAFT

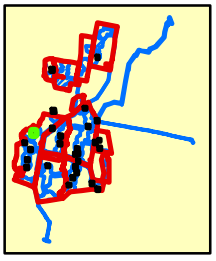
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

16925_Fig05_SLLGridsMB 2/06/2025 melsley

Figure 5f
Striped Legless Lizard survey results
Proposed Tall Tree Wind Farm

DRAFT

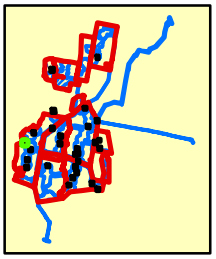
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Wind turbines
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 5g

Striped Legless Lizard survey results

Proposed Tall Tree Wind Farm

DRAFT

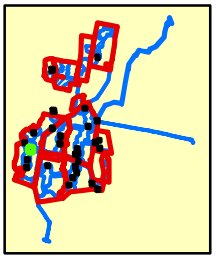
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Wind turbines
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

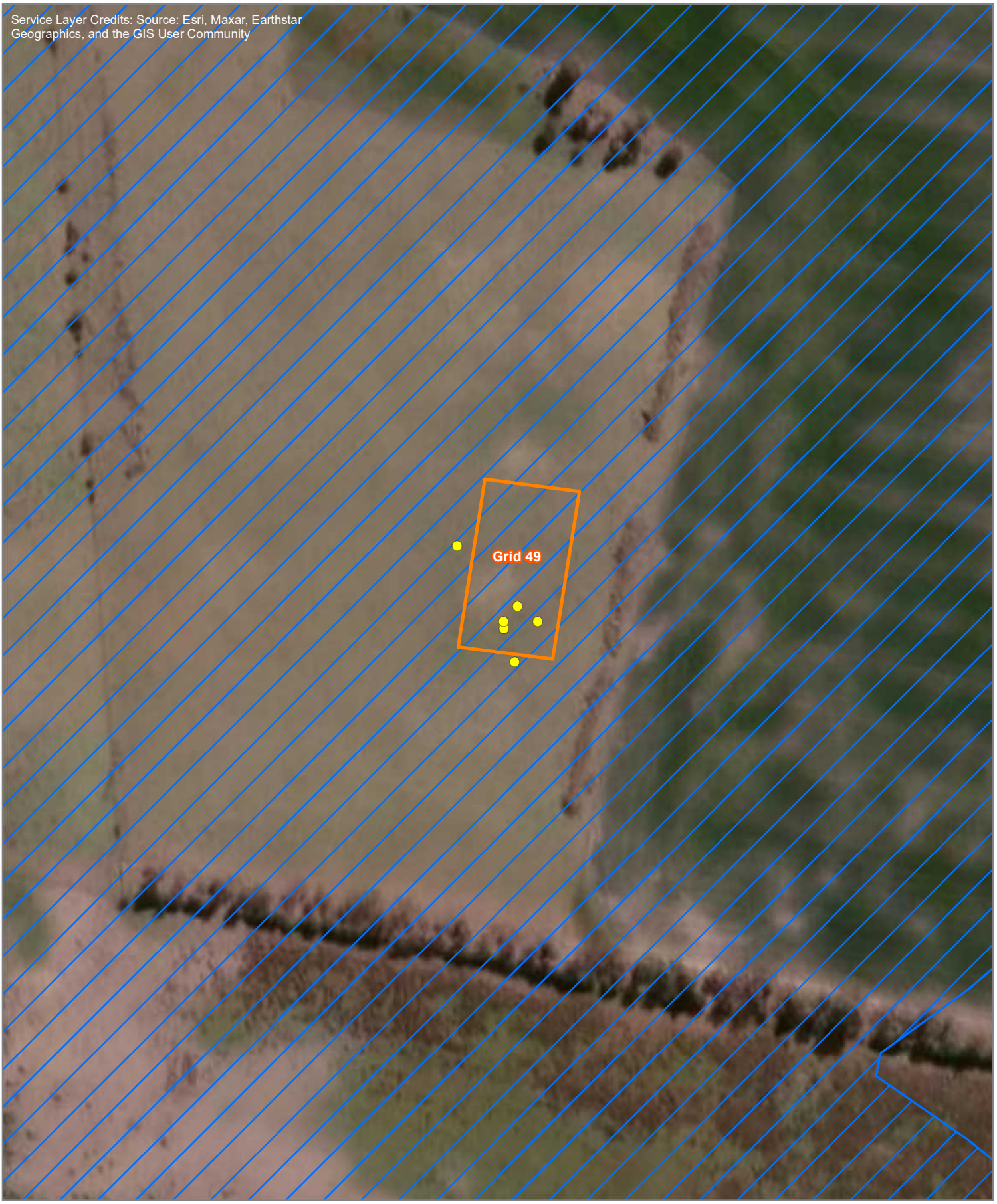


Figure 5h

Striped Legless Lizard survey results

Proposed Tall Tree Wind Farm

DRAFT

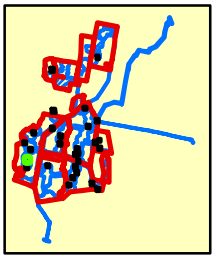
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

16925_Fig05_SLLGridsMB 2/06/2025 melsley

Figure 5i

Striped Legless Lizard survey results

Proposed Tall Tree Wind Farm

DRAFT

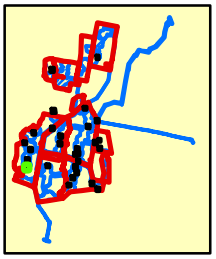
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 5j
Striped Legless Lizard survey results
Proposed Tall Tree Wind Farm

DRAFT

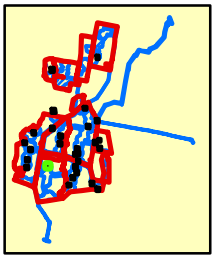
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 5k
Striped Legless Lizard survey results
Proposed Tall Tree Wind Farm

DRAFT

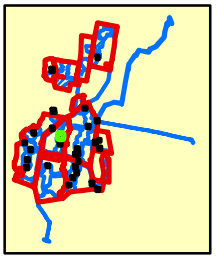
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

16925_Fig05_SLLGridsMB 2/06/2025 melsley

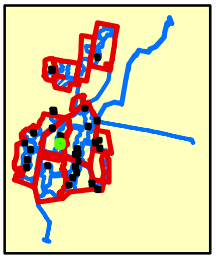
Figure 5l
Striped Legless Lizard survey results
Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

16925_Fig05_SLLGridsMB 2/06/2025 melsley

Figure 5m

Striped Legless Lizard survey results

Proposed Tall Tree Wind Farm

DRAFT

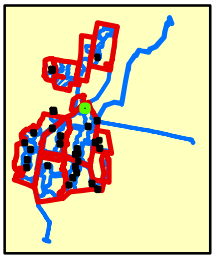
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

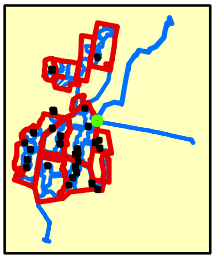
16925_Fig05_SLLGridsMB 2/06/2025 melsley

Figure 5n
Striped Legless Lizard survey results
Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend
- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids



N

0 10 20
Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 5o
Striped Legless Lizard survey results
Proposed Tall Tree Wind Farm

DRAFT

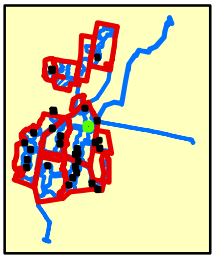
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Wind turbines
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 5p

Striped Legless Lizard survey results

Proposed Tall Tree Wind Farm

DRAFT

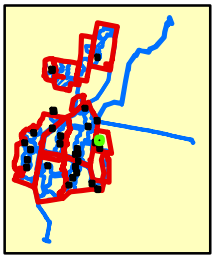
ecology & heritage partners

Legend

- Wind Farm boundary
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 5q
Striped Legless Lizard survey results
Proposed Tall Tree Wind Farm

DRAFT

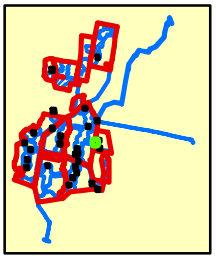
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard habitat
- Striped Legless Lizard Tile Grids

Survey locations

- Striped Legless Lizard
- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 5r

Striped Legless Lizard survey results

Proposed Tall Tree Wind Farm

DRAFT

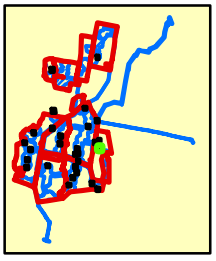
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard habitat
- Striped Legless Lizard Tile Grids

Survey locations

- Striped Legless Lizard
- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 5s

Striped Legless Lizard survey results

Proposed Tall Tree Wind Farm

DRAFT

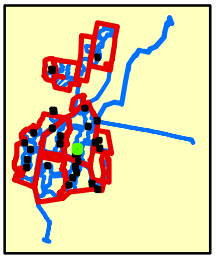
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

16925_Fig05_SLLGridsMB 2/06/2025 melsley

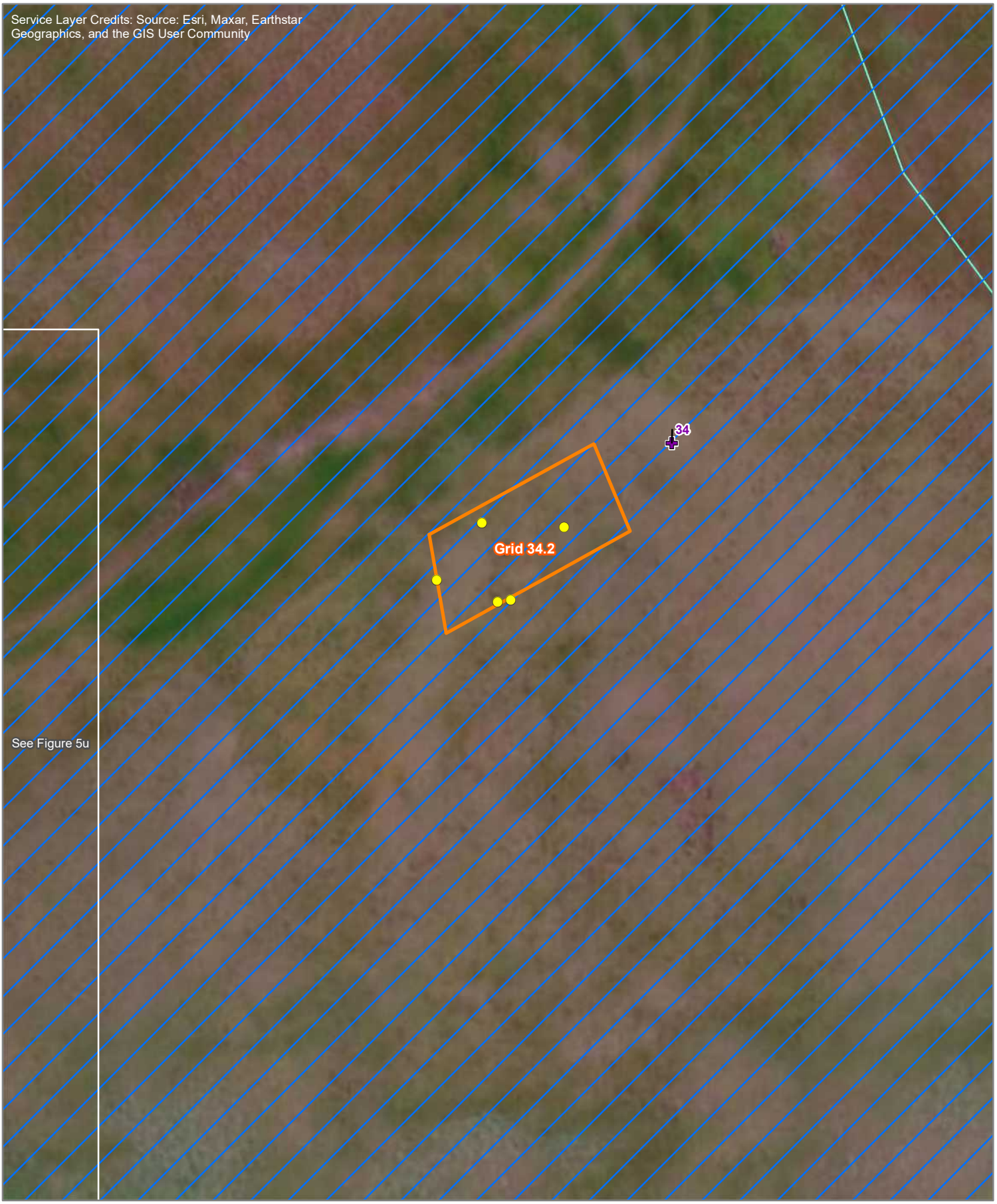


Figure 5t

Striped Legless Lizard survey results

Proposed Tall Tree Wind Farm

DRAFT

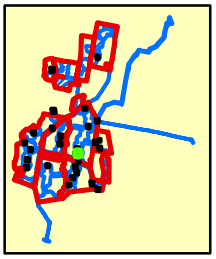
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Wind turbines
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

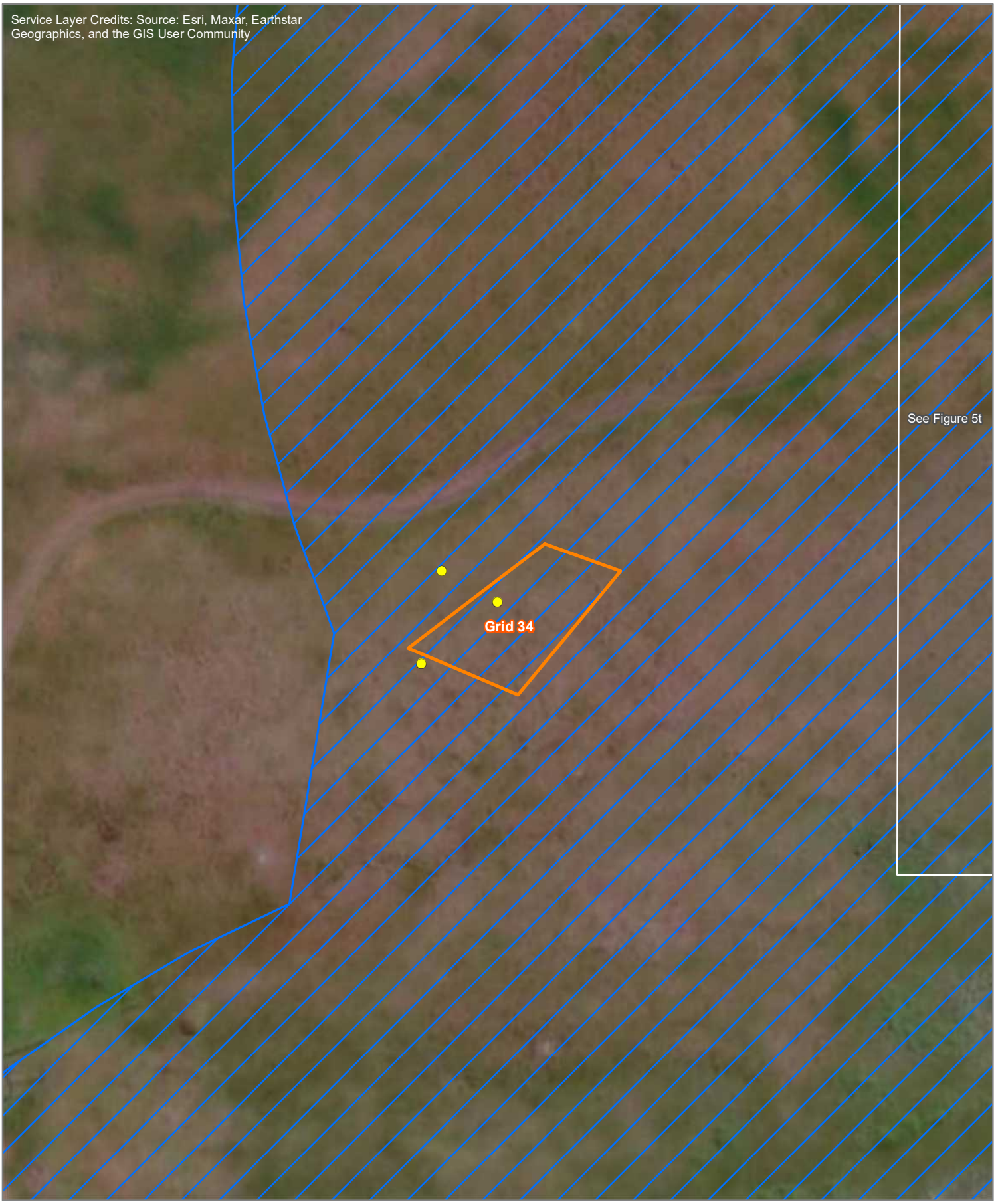


Figure 5u

Striped Legless Lizard survey results

Proposed Tall Tree Wind Farm

DRAFT

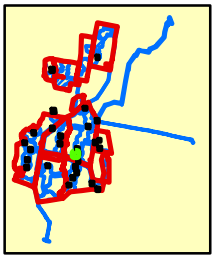
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

16925_Fig05_SLLGridsMB 2/06/2025 melsley

Figure 5v
Striped Legless Lizard survey results
Proposed Tall Tree Wind Farm

DRAFT

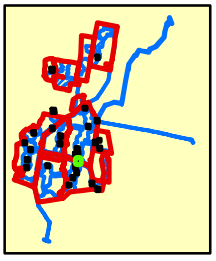
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

16925_Fig05_SLLGridsMB 2/06/2025 melsley

Figure 5w

Striped Legless Lizard survey results

Proposed Tall Tree Wind Farm

DRAFT

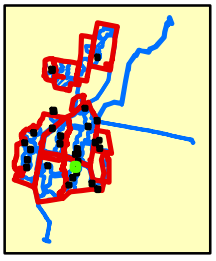
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Wind turbines
- Striped Legless Lizard habitat
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 5x
Striped Legless Lizard survey results
Proposed Tall Tree Wind Farm

DRAFT

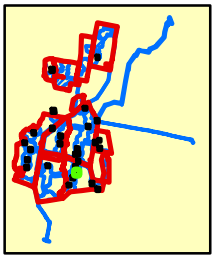
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard habitat
- Striped Legless Lizard Tile Grids

Survey locations

- Striped Legless Lizard
- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

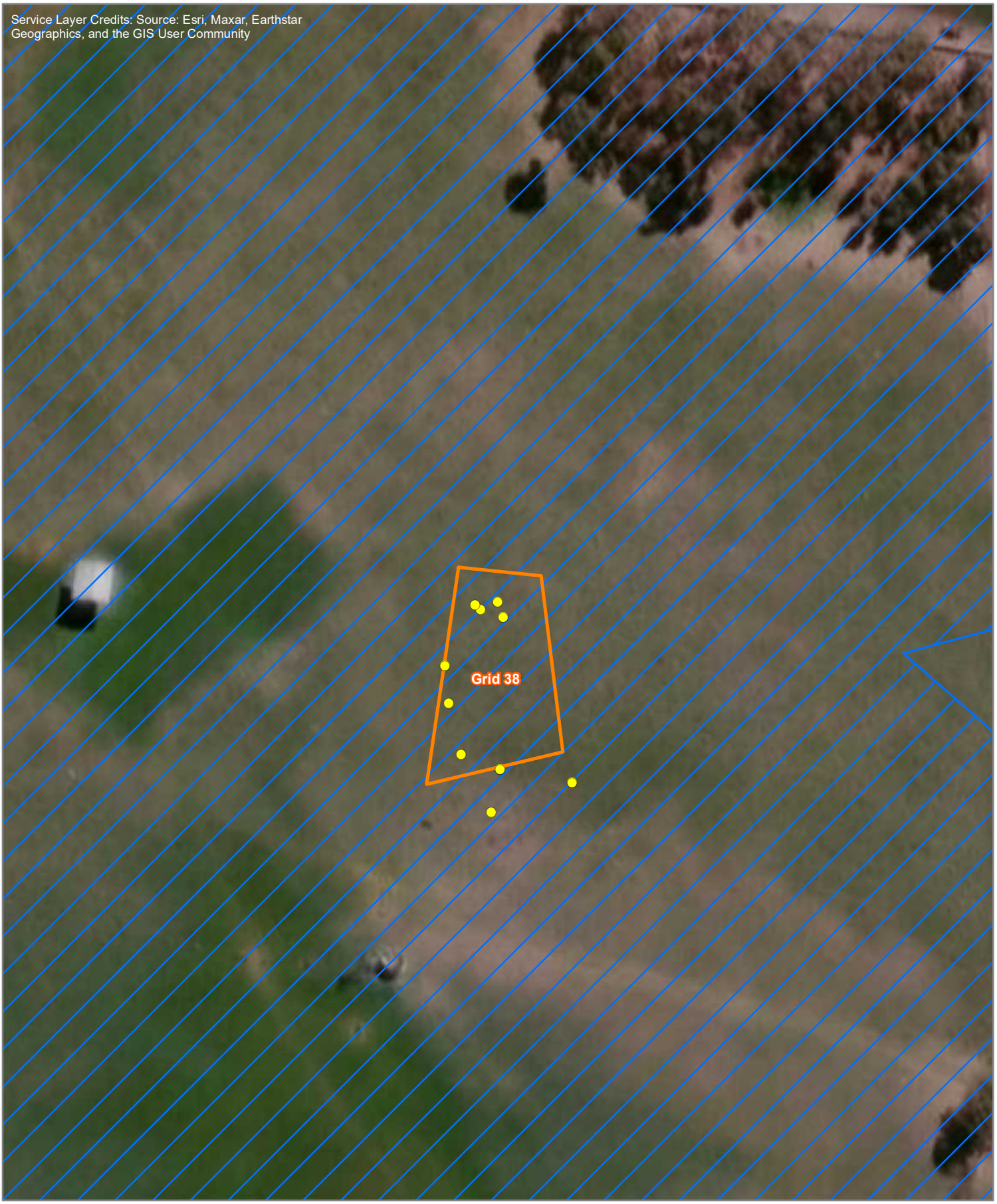


Figure 5y
Striped Legless Lizard survey results
Proposed Tall Tree Wind Farm

DRAFT

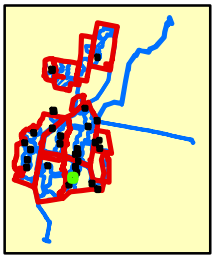
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

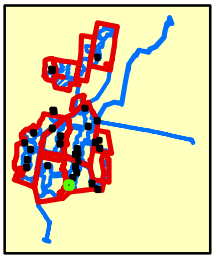
16925_Fig05_SLLGridsMB 2/06/2025 melsley

Figure 5z
Striped Legless Lizard survey results
Proposed Tall Tree Wind Farm

DRAFT

ecology & heritage partners

Legend
- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids



N

0 10 20
Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 5aa
Striped Legless Lizard survey results
Proposed Tall Tree Wind Farm

DRAFT

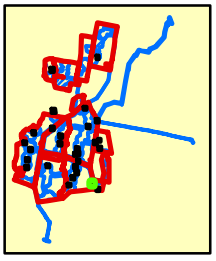
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard habitat
- Striped Legless Lizard Tile Grids

Survey locations

- Striped Legless Lizard
- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54

Figure 5ab

Striped Legless Lizard survey results

Proposed Tall Tree Wind Farm

DRAFT

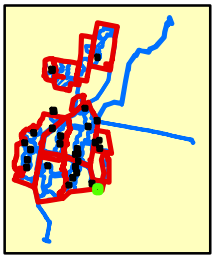
ecology & heritage partners

Legend

- Wind Farm boundary
- Micrositing corridor
- Striped Legless Lizard Tile Grids

Survey locations

- Incidental Species



N

0 10 20

Metres

Map Scale: 1:1,200 @ A4
Coordinate System:
GDA 1994 MGA Zone 54