

VEGETATION ASSESSMENT

PROPOSED SOLAR AND STORAGE FACILITY

126 BIDDLESTONES ROAD, CHARLTON

PREPARED FOR: TETRIS ENERGY PTY LTD



**ADVERTISED
PLAN**

**This copied document to be made available
for the sole purpose of enabling
its consideration and review as
part of a planning process under the
Planning and Environment Act 1987.
The document must not be used for any
purpose which may breach any
copyright**



ÖKOLOGIE CONSULTING



Table of Contents

Table of Contents	2
Document Information	3
Document Control	3
Summary	4
1 Introduction	5
1.1 Project Background	5
1.2 Objectives	5
1.3 Site Description	5
Figure 1 – Site Location	7
2 Methodology	8
2.1 Species Information	8
2.2 Desktop Assessment	8
2.3 Field Assessment	8
2.4 Assessment Guidelines	9
2.5 Limitations	10
3 Results	11
3.1 Ecological Vegetation Classes	11
3.2 Vegetation Condition	11
3.6 Threatened Fauna Species	13
3.7 Threatened Ecological Communities	13
Figure 2 – Ecological Values	19
4 Environmental Legislation and Policy Implications	20
4.1 Environment Protection and Biodiversity Conservation Act 1999	20
4.2 Flora and Fauna Guarantee Act 1988	20
4.4 Planning and Environment Act 1987	22
5 Potential Impacts and Mitigation Measures	25
6 Conclusion	26
7 References	27
Appendices	28
Appendix 1 – Likelihood of Occurrence	28
Appendix 2 – Native Vegetation Value Criteria	29
Appendix 3 – Flora Species Recorded	31
Appendix 4 – Fauna Species Recorded	34
Appendix 5 – Threatened Flora Records	35
Appendix 6 – Threatened Fauna Records	36
Figure 4 – Threatened Flora Species Records within 5km	37
Figure 5 – Threatened Fauna Species Records within 5km	38



Document Information

Vegetation assessment for the proposed solar and storage facility at 126 Biddlestones Road, Charlton

Report prepared by Okologie Consulting Pty Ltd for Tetris Energy

Okologie Consulting Pty Ltd
32 Nicholson Crescent
Jan Juc, Victoria, 3228

ACN: 618 785 336

Web: www.okologie.com.au

Email: mark@okologie.com.au

Phone: 0419 786 533

Document Control

Version	Author	Review	Approval	Date
M916_CharltonSolarFarm_VegetationAssessment_Report_16122021_V1	Mark Stockdale	Luke Hynes		16/12/2021

Acknowledgements

Okologie Consulting acknowledges the following people in their contribution to this project:

- Frank Boland (Tetris Energy) for project information.

© Okologie Consulting

This document was prepared for the sole use of the party identified on the cover sheet and may only be used for the purposes for which it was commissioned in accordance with the Terms of the Engagement. This document is subject to copyright and no section or element of this document may be removed, reproduced, electronically stored or transmitted in any form without the prior written permission of Okologie Consulting.

Disclaimer

Okologie Consulting has taken all necessary steps to ensure that an accurate document has been prepared in accordance with relevant legislation and current industry best practice. Okologie Consulting accepts no liability for any damages or loss incurred as a result of reliance placed upon the report content or for any purpose other than that for which it was intended.



Summary

Okologie Consulting Pty Ltd was engaged by Tetris Energy to undertake a vegetation assessment for the proposed solar and storage facility at 126 Biddlestones Road, Charlton.

The assessment was undertaken to determine the extent of native vegetation and ascertain the presence of any threatened flora or fauna species or associated habitats within the project area. The outcome of the assessment informs the approval requirements in accordance with the *Solar Energy Facilities Design and Development Guideline*.

The project area was highly modified from agricultural use (cropping, grazing), with a modified landform and substrate from cultivation and water supply. It was characterised by exotic dominated pasture, with an extensive cover of native vegetation in the southern section of the site.

One threatened species, Buloke *Allocasuarina luehmannii*, listed as critically endangered in Victoria, was recorded in Plains Woodland to the south of the facility. No listed threatened fauna species or associated habitats were recorded within the project area, and none are considered likely to occur due to the absence of suitable habitat. The solar and storage facility footprint has been extensively modified from agricultural use, which reduces or eliminates the habitat potential for many species.

The project area supports 6.4 hectares of Plains Woodland that meets the criteria for the *Grey Box Grassy Woodlands* ecological community listed as endangered under the *Environment Protection Biodiversity Conservation Act 1999*. The facility has been designed to avoid impacting this ecological community; therefore, a referral to the Commonwealth Environment Minister will not be required in this instance.

One *Flora and Fauna Guarantee Act 1988* listed threatened species (Buloke) and two protected flora species (Umbrella Wattle and Gold Dust Wattle) were recorded in the project area (outside the facility footprint). A *Flora and Fauna Guarantee Act 1988* permit is generally not required for private land.

The principles of avoid and minimise were applied during the planning phase of the project. The proposed solar and storage facility was designed to avoid impacts to native vegetation and is sited in a highly modified area, dominated by exotic grassland, and will not require the removal of Plains Woodland or scattered native trees. Tree Protection Zones as specified in *AS 4970 – 2009 Protection of Trees on Development Sites*, have been identified around the scattered native tree and patch of Plains Woodland to the immediate south of the facility footprint.

Scattered native grasses (<5% overall perennial cover) in areas of exotic pasture have colonised disturbed (cultivated) ground are less than 10 years old, which meet the permit exemption under Clause 52.17-7 *Regrowth* under the Buloke Planning Scheme. A permit is not required for removal of exotic vegetation under Clause 52.17.



1 Introduction

1.1 Project Background

Okologie Consulting Pty Ltd was engaged by Tetris Energy to undertake a vegetation assessment for the proposed solar and storage facility at 126 Biddlestones Road, Charlton.

The vegetation assessment was undertaken to determine the extent of native vegetation and ascertain the presence of any threatened flora or fauna species or associated habitats within the project area. The outcome of the assessment informs the approval requirements in accordance with the *Solar Energy Facilities Design and Development Guideline* (DELWP 2019).

The proposed removal of native vegetation requires a permit under Clause 52.17 (Native Vegetation) (unless exempt) and an application under the *Guidelines for the removal, destruction or lopping of native vegetation* (the Guidelines) (DELWP 2017).

This report summarises the findings of the assessment and discusses environmental legislation and policy implications associated with future development.

1.2 Objectives

The objectives of the assessment were to:

- Assess terrestrial ecological values (vegetation communities, flora and fauna species and associated habitats) within the project area.
- Ensure ecological values are identified in the early planning phase.
- Identify environmental legislation and policy requirements.

1.3 Site Description

The project area comprises a parcel of land within the property at 126 Biddlestones Road, Charlton (Lot 2 PS403054). It covers approximately 75 hectares and is bound by a railway easement to the north, Calder Highway to the south, Howells Hill Scenic Reserve and private property to the east, and Biddlestones Road to the west. The proposed solar and storage facility is located in the southern section of the property (Figure 1). An existing solar facility is located on the southwestern section of the property.

The topography comprises low undulating slopes towards the northwest. The project area is used for agriculture (cropping, grazing) and consists of exotic dominated pasture, with remnant native vegetation in the southern section to Calder Highway.



Wychetella Channel intersects the project area. The surrounding land use is predominantly agriculture and conservation (Howells Hill Scenic Reserve).

The project area occurs within the Goldfields bioregion, the North Central Catchment Management Authority boundary, and the Buloke Shire municipality (DELWP 2021a). The Native Vegetation Location mapping shows the project area occurs within Location 1 and 2 (DELWP 2021b). The project area is zoned Farming Zone (FZ) and is not subject to any environmental overlays under the Buloke Planning Scheme (DELWP 2021c).

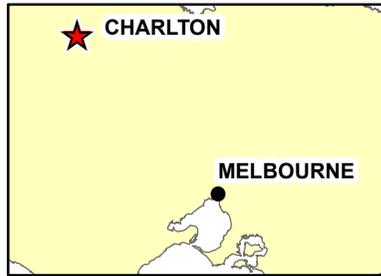
Figure 1

Site Location

126 Biddlestones Road,
Charlton

Legend

 Subject Site



0 40 80 160

Metres

Coordinate System: GDA 1994 MGA Zone 55
Map Scale when printed @ A4 1:5,000



ÖKOLOGIE CONSULTING

VicMap Data: The state of Victoria does not warrant the accuracy or correctness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.





2 Methodology

2.1 Species Information

Scientific and common names of flora species and terrestrial vertebrate fauna follow the Victorian Biodiversity Atlas (VBA) (DELWP 2021d). Vegetation communities follow the Ecological Vegetation Class (EVC) bioregion benchmarks (DELWP 2021b).

Native (terrestrial) flora and fauna species and vegetation communities referred to as 'threatened' include:

- Listed as critically endangered, endangered or vulnerable under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) (DAWE 2021).
- Listed as Threatened with a threat category of extinct; extinct in the wild; critically endangered; endangered or vulnerable under the *Flora and Fauna Guarantee Act 1988 – Threatened List* (FFG Act) (DELWP 2021e).

2.2 Desktop Assessment

A desktop assessment was undertaken of relevant databases and other resources, including:

- NatureKit 2.0 for modelled biodiversity data (DELWP 2021a).
- Native Vegetation Information Management system tool (DELWP 2021b).
- Planning Schemes Online for planning information (DELWP 2021c).
- The VBA for threatened flora and fauna species records (DELWP 2021d).
- The Protected Matters Search Tool (PMST) for information relating to Matters of National Environmental Significance (MNES) under the EPBC Act (Department of Agriculture, Water and the Environment 2021).
- Relevant environmental legislation, policies and strategies.

2.3 Field Assessment

The field assessment was undertaken on 25 November 2021. The project area was traversed on foot to determine the extent of native vegetation and ascertain the presence of any listed threatened flora or fauna species or associated habitats. The extent of native vegetation was mapped using a Trimble Catalyst DA1 differential GPS (sub-metre accuracy post-processing) and recorded to MGA 94, Zone 55 coordinate system. EVCs were determined by reference to the relevant bioregion mapping and benchmarks descriptions (DELWP 2021b), and review of remnant vegetation in the local area.



2.4 Assessment Guidelines

The Guidelines (DELWP 2017) has been incorporated into the Victoria Planning Provisions and all planning schemes in Victoria. The purpose of the Guidelines is to set out and describe the application of Victoria's statewide policy in relation to assessing and compensating for the removal of native vegetation in response to permit applications under Clause 52.17.

Native vegetation is defined in Clause 72 of the Victoria Planning Provisions as *plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses*. Plants from other states or overseas are not native and the permitted clearing regulations do not apply if they are being removed (DELWP 2017).

The Guidelines considers the biodiversity value of native vegetation by measuring the following two components:

- Site-based information that can be measured or observed at a site.
- Landscape scale information that cannot be measured or observed at the site and is included in maps and models (DELWP 2017).

Under the Guidelines native vegetation is classified as a *patch* or *scattered tree*.

A patch of native vegetation is:

- An area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native¹; or
- Any area with three or more native canopy trees² where the drip line³ 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.

A scattered tree is:

- A native canopy tree that does not form part of a patch (DELWP 2017).

The assessment pathway for an application to remove native vegetation reflects its potential impact on biodiversity and is determined from the location and extent of the native vegetation to be removed.

¹ Plant cover is the proportion of the ground that is shaded by vegetation foliage when lit from directly above. Areas that include non-vascular vegetation (such as mosses and lichens) but otherwise support no native vascular vegetation are not considered to be a patch for the purposes of the Guidelines. However, when non-vascular vegetation is present with vascular vegetation, it does contribute to cover when determining the percentage of perennial understorey plant cover.

² A native canopy tree is a mature tree (i.e. it is able to flower) that is greater than 3 metres in height and is normally found in the upper layer of the relevant vegetation type.

³ The drip line is the outermost boundary of a tree canopy (leaves and/or branches) where the water drips on to the ground (DELWP 2017).



The three assessment pathways are:

- Basic – limited impacts on biodiversity.
- Intermediate – could impact on large trees, endangered EVCs, and sensitive wetlands and coastal areas.
- Detailed – could impact on large trees, endangered EVCs, sensitive wetlands and coastal areas, and could significantly impact on habitat for rare or threatened species.

The assessment pathway of an application is determined in accordance with the requirements in Table 1.

Table 1: Assessment pathways

Extent of native vegetation	Location Category		
	Location 1	Location 2	Location 3
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

Source: DELWP (2017).

2.5 Limitations

The preferred survey period for undertaking vegetation assessments in Victoria is spring, which maximises the likelihood of detecting all flora species within a site. Flora surveys provide a valuable ‘snapshot’ of vegetation at a point in time; however, the limitations of seasonal influence on the presence/absence of flora species (particularly annuals or cryptic species) must be considered. The short duration of the assessment limited the opportunity to observe migratory, transitory or uncommon fauna species.

The information outlined in this report relies on the accuracy of ecological database information, GIS layers and spatial imagery. To minimise potential errors, the most current available data was obtained from relevant sources.

The Department of Environment, Land, Water and Planning (DELWP) bioregion and EVC mapping are subject to inherently broad environmental and ecological parameters used in the mapping process. Where the observed EVC was not reflective of what would be expected from EVC mapping and classification, it was attributed to the most appropriate EVC based on combination of its floristic, life form and ecological characteristics, and particular environmental conditions.



3 Results

3.1 Ecological Vegetation Classes

NatureKit pre-1750 EVC modelling for the project area predominantly comprised of Grassy Woodland (EVC 175) and Plains Woodland (EVC 803). Extant EVC modelling shows a scattered cover of Grassy Woodland and Plains Woodland (DELWP 2021a).

Remnant vegetation within the project area was attributed to Plains Woodland based on floristic, life form and ecological characteristics, and soil type (Figure 2).

3.2 Vegetation Condition

The project area was highly modified from agricultural use (cropping, grazing), with a modified landform and substrate from cultivation and water supply from Wychetella Channel. It was characterised by exotic dominated pasture, with an extensive cover of Plains Woodland in the southern section of the site. A description of vegetation condition is outlined below.

Plains Woodland

Plains Woodland is described as *grassy or sedgy woodland to 15 metres tall supporting a range of annual or geophytic herbs adapted to low summer rainfall. Occurs on terrain of low relief in areas receiving <600 mm rainfall per annum* (DELWP 2021a).

The southern section of the property comprises an extensive cover of Plains Woodland that was fenced off from open pasture and extends south to Calder Highway (Plate 1). The vegetation was dominated by Grey Box *Eucalyptus macrocarpa* to 15 metres tall, with Yellow Box *Eucalyptus melliodora*, Yellow-gum *Eucalyptus leucoxylon*, River Red-gum *Eucalyptus camaldulensis* and Buloke *Allocasuarina luehmannii* and planted *Eucalyptus* spp., also present. The shrub layer included a sparse cover of Umbrella Wattle *Acacia oswaldii*, Gold-dust Wattle *Acacia acinacea*, Hairy Bursaria *Bursaria spinosa* subsp. *lasiophylla* and emergent Buloke and Grey Box saplings.

The ground layer comprised a modified cover of native Rough Spear-grass *Austrostipa scabra*, Supple Spear-grass *Austrostipa mollis*, Common Wallaby-grass *Rytidosperma caespitosum*, Feather Spear-grass *Austrostipa elegantissima*, Spider Grass *Enteropogon acicularis*, Bristly Wallaby-grass *Rytidosperma setaceum*, Wattle Mat-rush *Lomandra filiformis*, Pale Flax-lily *Dianella longifolia*, Nodding Saltbush *Einadia nutans*, Ruby Saltbush *Enchylaena tomentosa*, Common Everlasting *Chrysocephalum apiculatum*, Variable Daisy *Brachyscome ciliaris*, Yellow Rush-lily *Tricoryne elatior*, Chocolate Lily *Arthropodium strictum*, Trailing Speedwell *Veronica plebeia* and Tall Bluebell *Wahlenbergia stricta*. Exotic species included Horehound *Marrubium vulgare*, Cocksfoot *Dactylis glomerata*, Toowoomba Canary-grass *Phalaris aquatica*, Great



Brome *Bromus diandrus*, Barley-grass *Critesion murinum*, Large Quaking-grass *Briza maxima*, Soft Brome *Bromus hordeaceus* ssp. *hordeaceus*, Squirrel-tail Fescue *Vulpia bromoides*, Spear Thistle *Cirsium vulgare*, Cape Weed *Arctotheca calendula*, Burr Medic *Medicago polymorpha* and Rough Sow-thistle *Sochus asper* (Plates 2 and 3).

A highly modified patch of Plains Woodland occurs the southern section of open pasture and was dominated by Yellow Box and Grey Box, with the ground layer dominated by exotic African Boxthorn *Lycium ferrocissimum*, Horehound, Wild Radish *Raphanus raphanistrum*, Black Nightshade *Solanum nigrum*, Barley Grass *Hordeum murinum*, Cocksfoot, Great Brome, Barley-grass. Native vegetation was limited to scattered Nodding Saltbush and Ruby Saltbush shrubs (Plate 4). One small-scattered Grey Box tree was also present in open pasture (Plate 5).

Predominantly Introduced Vegetation

Exotic dominated grassland (mapped as predominantly introduced vegetation) comprised areas of pasture previously subject to cultivation and grazing. The vegetation was dominated by exotic Wimmera Rye-grass *Lolium rigidum*, Bearded Oat *Avena barbata*, Yorkshire Fog-grass *Holcus lanatus*, Perennial Veldt-grass *Ehrharta calycina*, Prairie Grass *Bromus catharticus*, Wheat *Triticum* spp., Paspalum *Paspalum dilatatum*, Rats-tail Fescue *Vulpia myuros*, Brown-top Bent *Agrostis capillaris*, Soft Brome *Bromus hordeaceus*, Cocksfoot, Rough Sow-thistle *Sonchus asper*, Long Storksbill *Erodium botrys*, Sheep sorrel *Acetosella vulgaris*, Ribwort *Plantago lanceolata*, Hares-foot Clover *Trifolium arvense*, Curled Dock *Rumex crispus* and Winged Sea-lavender *Limonium lobatum*. Native vegetation in open pasture was limited to a scattered cover (<5% overall perennial cover) of Common Blown-grass *Lachnagrostis filiformis*, Spider Grass and Windmill Grass *Chloris truncata* that has colonised disturbed ground (Plates 6 to 8).

3.3 Fauna Survey Results

Nine fauna species were recorded during the field assessment, comprising 10 native species (all birds). Species observed included Sulphur-crested Cockatoo *Cacatua galerita*, Australian Raven *Corvus coronoides*, Black-shouldered Kite *Elanus axillaris*, Galah *Eolophus roseicapilla*, Australian Magpie *Cracticus tibicen*, Magpie-lark *Grallina cyanoleuca*, Welcome Swallow *Hirundo neoxena*, Willie Wagtail *Rhipidura leucophrys* and Grey Shrike-thrush *Colluricincla harmonica*.

The paucity of fauna species recorded during the assessment was attributed to the modified condition of habitat from agricultural use.

3.4 Fauna Habitat

The project area supports two habitat types: remnant woodland and exotic grassland.

The project area supports woodland habitat (Plains Woodland) that contains numerous mature trees (Grey Box, Yellow Gum and Yellow Box) with hollows that



provide habitat for hollow dependent birds Crimson Rosella *Platycercus elegans*, Sulphur-crested Cockatoos *Cacatua galarita* and Rainbow Lorikeet *Trichoglossus moluccanus*, and mammals such as Eastern Ring-tailed Possum *Pseudocheirus peregrinus*. A range of common bird species woodland may utilise this habitat including Black-shouldered Kite *Elanus axillaris*, Nankeen Kestrel *Falco cenchroides*, Brown Falcon *Falco berigora*, Little Raven *Corvus mellori*, Laughing Kookaburra *Dacelo novaeguineae*, Red Wattlebird *Anthochaera carunculata*, Common Bronzewing *Phaps chalcoptera* White-plumed Honeyeater *Ptilotula penicillata* and Grey Shrike-thrush *Colluricincla harmonica*.

Exotic grassland provides habitat for birds adapted to modified habitats such as Galah, Australian Magpie, Magpie Lark, Welcome Swallow and Willie Wagtail.

3.5 Threatened Flora Species

The VBA (DELWP 2021d) contains records of nine listed threatened flora species in local area (within a five-kilometre radius of the project area). The PMST (DAWE 2021) identified 12 EPBC Act listed flora species or species habitats as likely to occur within the local area (Appendix 4).

One threatened species (Buloke) listed as critically endangered in Victoria (DELWP 2021e) was recorded in Plains Woodland to the south of the solar and storage facility. The VBA (DELWP 2021d) contains two records for Buloke within the immediate vicinity of the project area (Figure 3).

No additional listed threatened flora species are considered likely to occur due to the absence of suitable habitat resulting from agricultural use (grazing, cultivation) which reduces or eliminates the habitat potential for many species.

3.6 Threatened Fauna Species

No listed threatened fauna species were recorded during the field assessment. The VBA (DELWP 2020d) contains records of five listed threatened fauna species in the local area. The PMST (DAWE 2021) identified 20 EPBC Act listed fauna species or species habitats (terrestrial) as likely to occur within the local area (Appendix 5).

There is a low likelihood of occurrence for any listed threatened fauna species due to the absence of suitable habitat from agricultural use (grazing, cultivation), which limits habitat availability to generalist species adapted to modified habitats.

3.7 Threatened Ecological Communities

Commonwealth Listed Ecological Communities



Review of the PMST (DAWE 2021) identified five EPBC Act listed ecological communities may or are known to occur within the local area:

- *Natural Grasslands of the Murray Valley Plains* (Critically Endangered).
- *Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions* (Critically Endangered).
- *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (Critically Endangered).
- *Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions* (Endangered).
- *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia* (Endangered).

The project area supports approximately 6.4 hectares of Plains Woodland (Figure 2) that meets the characteristics and condition thresholds for the *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia* ecological community (*Grey Box Grassy Woodlands*) (Threatened Species Scientific Committee 2010) (Tables 2 and 3). The other EPBC Act ecological communities listed above do not occur within the project area.

Table 2: Key Diagnostic Characteristics for Grey Box Grassy Woodlands

Key Diagnostic Characteristics	Response
The ecological community occurs on low slopes and plains from central NSW, through northern and central Victoria into South Australia. Disjunct occurrences are known from near Melbourne and in the Flinders-Lofty Block Bioregion of South Australia	The project area comprises low slopes in central Victoria which occurs in the distribution area for this community.
The vegetation structure of the ecological community is typically a woodland to open forest	The vegetation structure is woodland that occurs in Plains Woodland EVC.
The tree canopy is dominated ($\geq 50\%$ canopy crown cover) by <i>Eucalyptus microcarpa</i> (Grey Box). Other tree species may be present in the canopy and, in certain circumstances may be co-dominant with Grey Box but are never dominant on their own	<ul style="list-style-type: none"> • The overstorey trees in Plains Woodland is dominant by Grey Box ($>50\%$ canopy cover), with Yellow Box and Yellow Gum occasionally present.
The mid layer comprises shrubs of variable composition and cover, from absent to moderately dense. The mid layer usually has a crown cover of less than 30% with local patches up to 40% crown cover	<ul style="list-style-type: none"> • The mid layer of shrubs in Plains Woodland comprised a sparse cover (~5%) of Umbrella Wattle and Gold-dust Wattle.
The ground layer also is highly variable in development and composition, ranging from almost absent to mostly grassy to forb-rich. Ground layer flora commonly present include one or more of the graminoid genera: <i>Austrodanthonia</i> , <i>Austrostipa</i> , <i>Elymus</i> , <i>Enteropogon</i> , <i>Dianella</i> and <i>Lomandra</i> ; and one or more of the chenopod genera: <i>Atriplex</i> , <i>Chenopodium</i> , <i>Einadia</i> , <i>Enchylaena</i> , <i>Maireana</i> , <i>Salsola</i> and <i>Sclerolaena</i> .	<ul style="list-style-type: none"> • The ground layer in Plains Woodland typically comprised <i>Austrostipa scabra</i>, <i>Austrostipa mollis</i>, <i>Rytidosperma caespitosum</i>, <i>Rytidosperma setaceum</i>, <i>Elymus scaber</i>, <i>Dianella longifolia</i>, and <i>Lomandra filiformis</i>.
Derived grasslands are a special state of the ecological	The derived grassland community was



Key Diagnostic Characteristics	Response
community, whereby the canopy and mid layers have been mostly removed to <10% crown cover but the native ground layer remains largely intact, with 50% or more of the total vegetation cover being native.	not present in the project area.

Source: Threatened Species Scientific Committee (2010)

Table 3: Condition Thresholds for Grey Box Grassy Woodlands

Category and rationale	Thresholds	Response
Criteria that are broadly applicable	1a. The minimum patch size is 0.5 hectare; AND 1b. The canopy layer contains Grey Box as the dominant or co-dominant tree species; AND 1c. The vegetative cover ⁷ of non-grass weed species in the ground layer is less than 30% at any time of the year.	<ul style="list-style-type: none"> • Areas of Plains Woodland covered >6 hectares and was contiguous with vegetation in the surrounding area. • Grey Box is the dominant tree in Plains Woodland. • The overall perennial weed cover was less than 30% in Plains Woodland.
Additional criteria that apply to smaller woodland patches (0.5 to <2 ha in area) with tree crown cover >10%	2a. At least 50% of the vegetative cover in the ground layer comprises perennial native species at any time of the year; AND 2b. 8 or more perennial native species are present in the mid and ground layers at any time of the year.	Areas of Plains Woodland are >0.5 hectares being contiguous with vegetation in the surrounding area.
Additional criteria that apply to larger woodland patches with a well-developed canopy (2 ha or more in area)	3a. At least 8 trees/ha are hollow bearing or have a diameter at breast height of 60 cm or more; AND 3b. at least 10% of the vegetative ground cover comprises perennial native grasses at any time of the year; OR 4a. At least 20 trees/ha have a diameter at breast height of 12 cm or more; AND 4b. at least 50% of the vegetative cover in the ground layer comprises perennial native species.	Areas of Plains Woodland comprise: <ul style="list-style-type: none"> • >8trees/hectare are hollow bearing with a DBH of >60cm. • The perennial ground layer comprises >10% native cover at any time of the year.
Additional criteria that apply to patches where the canopy is less developed or absent (derived grassland) (≥0.5 ha in area)	5a. Woodland density does not meet criteria 3a or 4a, or is a derived grassland with clear evidence that the site formerly was a woodland with a tree canopy dominated or co-dominated by E.	<ul style="list-style-type: none"> • Areas of Plains Woodland contain an intact canopy dominated by Grey Box. • The ground layer was



Category and rationale	Thresholds	Response
	microcarpa; AND 5b. At least 50% of the vegetative cover in the ground layer is made up of perennial native species at any time of the year; AND 5c. 12 or more native species are present in the ground layer at any time of the year.	dominated by perennial native species (>70% cover) • The ground layer comprised 15 perennial native species.

Source: Threatened Species Scientific Committee (2010)

3.8 Summary of Biodiversity Values

The summary of the biodiversity values within the project area is as follows:

- The project area supports 6.4 hectares of Plains Woodland listed as endangered in the Goldfields bioregion.
- One threatened species, Buloke, listed as critically endangered in Victoria was recorded in Plains Woodland to the south of the solar and storage facility area.
- The native vegetation condition modelling indicates the southern section of the project area contains areas of moderate to high value vegetation with condition scores of between 0.41-0.60 and 0.61-0.80.
- The strategic biodiversity value modelling indicates the project area supports moderate to high value vegetation/habitat values with scores of between 0.41-0.60 and 0.61-0.80 (DELWP 2021a).

The criteria for determining native vegetation value indicates the project area comprises moderate to high value vegetation based the vegetation condition, strategic biodiversity value, threatened species habitat, EVC conservation status and landscape value (Appendix 2) (DELWP 2018). However, the solar and storage footprint is highly modified from historic and current agricultural use and is devoid of remnant native vegetation, and comprises very low value vegetation.



Plate 1: Plains Woodland to the south of the solar facility



Plate 2: Plains Woodland to the south of the solar facility



Plate 3: Plains Woodland south of the solar facility



Plate 4: Modified Plains Woodland south of the solar facility



Plate 5: Scattered tree (Grey Box) south of the solar facility



Plate 6: Exotic dominated vegetation on the facility footprint



Plate 7: Exotic dominated vegetation on the facility footprint

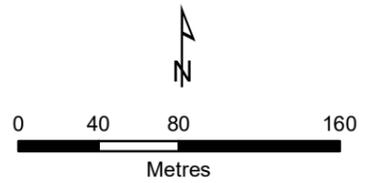


Plate 8: Exotic dominated vegetation within the access track

Figure 2
Ecological Features
 126 Biddlestones Road, Charlton

Legend

- Subject Site
- Plains Woodland
- Predominantly Introduced Vegetation
- Tree Protection Zone
- ▲ Large Tree in Patch
- Small Scattered Tree



Coordinate System: GDA 1994 MGA Zone 55
 Map Scale when printed @ A4 1:3,516



ÖKOLOGIE CONSULTING

VicMap Data: The state of Victoria does not warrant the accuracy or correctness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



4 Environmental Legislation and Policy Implications

4.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act provides a process for assessment of proposed actions that may have a significant impact on a MNES, which includes EPBC Act listed flora, fauna and ecological communities (DoE 2013).

The EPBC Act affects any group or individual (including companies) whose actions (i.e. proposal or project) are assessed for environmental impacts under the EPBC Act. An action requires approval from the Commonwealth Environment Minister if it is considered likely to have a significant impact on a MNES (DoE 2013).

The project area supports approximately 6.4 hectares of Plains Woodland that meets the criteria for the *Grey Box Grassy Woodlands* ecological community listed as endangered under the EPBC Act. The proposed solar and storage facility has been designed to avoid impacting *Grey Box Grassy Woodlands*; therefore, an EPBC Act referral will not be required in this instance.

4.2 Flora and Fauna Guarantee Act 1988

The FFG Act is the key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes.

A permit is required from DELWP to 'take' (kill, injure, disturb or collect) listed flora species, flora species that are members of listed communities or protected flora from public land. Protected flora species includes all members of the following plant families Asteraceae (Daisies), Epacridaceae (Heaths) and Orchidaceae (Orchids), all clubmosses, ferns and fern allies (excluding *Pteridium esculentum*). All species of the following genera are also protected: *Acacia* (excluding *Acacia dealbata*, *Acacia decurrens*, *Acacia implexa*, *Acacia melanoxylon* and *Acacia paradoxa*), *Baeckea*, *Calytrix*, *Correa*, *Darwinia*, *Eremophila*, *Eriostemon*, *Gompholobium*, *Grevillea*, *Prostanthera*, *Sphagnum*, *Thryptomene*, *Thysanotus* and *Xanthorrhoea* (Grass-trees) (DELWP 2021e).

One threatened species (Buloke) listed as critically endangered in Victoria and two protected flora species (Umbrella Wattle and Gold Dust Wattle) was recorded in the project area (outside the solar and storage facility footprint). An FFG Act permit is generally not required for private land.

4.3 Environmental Effects Act 1978



The *Environment Effects Act 1978* provides for assessment of proposed projects that are capable of having a significant effect on the environment. The 'environment' in this context comprises *the physical, biological, heritage, cultural, social, health, safety and economic aspects of human surroundings, including the wider ecological and physical systems within which humans live* (DSE 2006).

A project with potential adverse environmental effects that, individually or in combination, could be significant in a regional or State context should be referred. The criteria for referral under the Act are focused on the potential for a significant effect on the environment.

The relevant ecological referral criteria for this project comprises individual types of potential effects on the environment of regional or State significance that may warrant referral, including:

- Potential clearing of 10 ha or more of native vegetation from an area that:
 - Is an Endangered EVC;
 - Of very high conservation significance; or,
 - Is not authorised under an approved Forest Management Plan or Fire Protection Plan.
- Potential long-term loss of a significant proportion (e.g. 1 to 5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria.
- Potential long-term change to the ecological character of a wetland listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia'.
- Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term (DSE 2006).

Review against the individual and combined criteria listed above following the Ministerial guidelines for assessment of environmental effects is outlined below:

- The project area supports an endangered EVC (6.4 hectares of Plains Woodland), however, this vegetation is located outside the facility footprint.
- One listed threatened flora species (Buloke) was recorded Plains Woodland to the south of the facility footprint.
- No listed threatened fauna species or associated habitats were observed or are considered likely to occur in the facility footprint due to the absence of suitable habitat.
- The project area does not support any listed wetlands.
- Future works are unlikely to impact aquatic ecosystems or any estuarine or marine ecosystems.

A referral or preparation of an Environmental Effects Statement under the *Environment Effects Act 1978* is not required as the proposed solar and storage facility will not result in a significant effect on the environment.



4.4 Planning and Environment Act 1987

The purpose of the *Planning and Environment Act 1987* is to establish a framework for planning the use, development and protection of land in Victoria. Native vegetation clearance is managed under the Act and through municipal planning schemes (DELWP 2021c).

A permit is required under Clause 52.17 (Native Vegetation) to remove, destroy or lop native vegetation, including dead vegetation, unless the action is exempt. To ensure that there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation, the following three step approach is applied in accordance with the Guidelines:

1. Avoid the removal, destruction or lopping of native vegetation.
2. Minimise impacts from the removal, destruction or lopping of native vegetation that cannot be avoided.
3. Provide an offset to compensate for the biodiversity impact if a permit is granted to remove, destroy or lop native vegetation.

If native vegetation removal is required, a permit application must be categorised as a basic, intermediate or detailed assessment pathway as specified in the Guidelines (DELWP 2017). Each assessment pathway has specific application requirements and decision guidelines that must be considered by the responsible authority.

Clause 66 (Referral and Notice Provisions) requires that the following applications to remove native vegetation be referred to the Secretary to DELWP:

- To remove, destroy or lop native vegetation in the Detailed Assessment Pathway
- To remove, destroy or lop native vegetation if a Property Vegetation Plan applies to the site.
- To remove, destroy or lop native vegetation on Crown land, which is occupied or managed by the responsible authority (DELWP 2021c).

Clause 52.17 – Native Vegetation

The project area was highly modified from agricultural use (cropping, grazing), with a modified landform and substrate from cultivation and water supply. It was characterised by exotic dominated pasture, with an extensive cover of Plains Woodland in the southern section of the site.

The principles of avoid and minimise were applied during the planning phase of the project. The proposed solar and storage facility was designed to avoid impacts to native vegetation and is sited in a highly modified area, dominated by exotic grassland, and will not require the removal of Plains Woodland or scattered native



trees. Tree Protection Zones⁴ (TPZ) as specified in AS4970-2009, have been identified around the scattered native tree and patch of Plains Woodland to the immediate south of the facility footprint (Figure 2). The TPZ's must meet the requirements of *AS4970-2009 Protection of Trees on Development Sites* (DELWP 2018) for the duration of the construction phase of the project.

The 6.4-hectare patch of Plains Woodland (Figure 2) located to the south of exotic grassland is currently fenced off and will not be impacted by the works. Access to the facility off Calder Highway is via an unmade road and extends through exotic dominated pasture (Figure 2).

Scattered native grasses (<5% overall perennial cover) in areas of exotic pasture have colonised disturbed (cultivated) ground are less than 10 years old, which meet the permit exemption under Clause 52.17-7 Regrowth: *Native vegetation that is to be removed, destroyed or lopped that has naturally established or regenerated on land lawfully cleared of naturally established native vegetation, and is less than 10 years old* (DELWP 2021c). Scattered native grasses do not meet the cover threshold for a remnant patch under the Guidelines (DELWP 2017). A permit is not required for removal of exotic vegetation under Clause 52.17.

4.5 Solar Energy Facilities Design and Development Guideline

The *Solar Energy Facilities Design and Development Guideline* (DELWP 2019) identifies the requirement for a solar energy facility proposal to avoid or minimise impacts on flora and fauna species and habitats through design considerations at the project planning stage. The relevant environmental legislative requirements identified under the Guideline include the EPBC Act, FFG Act, *Environment Effects Act 1978* and *Planning and Environment Act 1987*, which have been addressed in this report.

4.6 Catchment and Land Protection Act 1994

The *Catchment and Land Protection Act 1994* (CaLP Act) is the key legislation for management of noxious weeds in Victoria (Agriculture Victoria 2021). There are four categories of noxious weeds defined under the CaLP Act, including: State Prohibited, Regionally Prohibited, Regionally Controlled and Restricted weeds.

Under the CaLP Act landowners/managers have obligations regarding the management of declared noxious weeds on their land, and must take all reasonable steps to:

- Eradicate regionally prohibited weeds.
- Prevent the growth and spread of regionally controlled weeds.

⁴ Tree Protection Zone is an area around the trunk of the tree which has a radius of 12 × the diameter at breast height to a maximum of 15 metres but no less than 2 metres. Dead trees should be protected with a radius of 15 metres from the base (DELWP 2018).



- Prevent the spread of regionally controlled weeds on a roadside that adjoins the landowner's land (Agriculture Victoria 2021).

The project area supports several listed noxious weeds (Appendix 2). It is recommended that Tetris Energy implement weed control works to meet the obligations for the management of declared noxious weeds under the CaLP Act.



5 Potential Impacts and Mitigation Measures

The project area supports exotic dominated vegetation interspersed with a modified cover of Plains Woodland and scattered tree to the immediate south of the facility. If left unmanaged, construction works have the potential to impact ecological values within the project area.

The preparation of a Construction Environmental Management Plan (CEMP) is recommended and should include actions to ameliorate potential impacts to ecological values. The CEMP should include as a minimum:

- An induction for contractors regarding ecological values in the project area.
- Designated No Go Zones⁵ to avoid any disturbance or damage to native vegetation adjacent to construction areas. No go zones should be fenced with para-webbing or similar material prior to construction.
- TPZ's will be implemented in accordance with *AS4970 – 2009 Protection of Trees on Development Sites*.
- Access restrictions to prevent unauthorised access of the construction site.
- Standard best practice measures to minimise the spread of soil pathogens, and weeds from machinery or through movement of soil on and offsite.
- Best practice sedimentation and erosion control measures to minimise impacts to waterways (Wychetella Channel).
- The location of construction stockpiles, machinery, and other infrastructure should be away from areas of native vegetation.

⁵ A No Go Zone is defined as an area of native vegetation or habitat that requires protection from construction works



6 Conclusion

The project area was highly modified from agricultural use (cropping, grazing), with a modified landform and substrate from cultivation and water supply. It was characterised by exotic dominated pasture, with native vegetation in the southern section of the site.

One threatened species (Buloke) listed as critically endangered in Victoria was recorded in Plains Woodland to the south of the solar and storage facility. No listed threatened fauna species or associated habitats were recorded within the project area, and none are considered likely to occur due to the absence of suitable habitat. The facility footprint has been extensively modified from agricultural use, which reduces or eliminates the habitat potential for many species.

The project area supports 6.4 hectares of Plains Woodland that meets the criteria for the *Grey Box Grassy Woodlands* ecological community listed as endangered under the EPBC Act. The project works have been designed to avoid impacting this ecological community; therefore, an EPBC Act referral will not be required in this instance.

One FFG Act listed threatened species (Buloke) and two protected flora species (Umbrella Wattle and Gold Dust Wattle) was recorded in the project area (outside the facility footprint). An FFG Act permit is generally not required for private land.

The principles of avoid and minimise were applied during the planning phase of the project. The solar and storage facility was designed to avoid impacts to native vegetation and is sited in a highly modified area, dominated by exotic grassland, and will not require the removal of Plains Woodland or scattered native trees. TPZ's have been identified around the scattered native tree and patch of Plains Woodland to the immediate south of the facility footprint.

Scattered native grasses (<5% overall perennial cover) in areas of exotic pasture have colonised disturbed (cultivated) ground are less than 10 years old, which meet the permit exemption under Clause 52.17-7 Regrowth of the Southern Grampians Planning Scheme. A permit is not required under Clause 52.17 for removal of exotic vegetation.



7 References

Agriculture Victoria 2021. *Catchment and Land Protection Act 1994*. Department of Economic Development, Jobs, Transport and Resources: <http://agriculture.vic.gov.au>

DAWE 2021. Protected Matters Search Tool. Department of Agriculture, Water and the Environment: <http://www.environment.gov.au/epbc/pmst/>

DELWP 2017. *Guidelines for the removal, destruction or lopping of native vegetation*. Department of Environment, Land, Water and Planning.

DELWP 2018. *Assessor's handbook - Applications to remove, destroy or lop native vegetation. Version 1.1*. Department of Environment, Land, Water and Planning.

DELWP 2021a. NatureKit. Department of Environment, Land, Water and Planning: <http://maps.biodiversity.vic.gov.au>

DELWP 2021b. Native Vegetation Information Management System. Department of Environment, Land, Water and Planning: <https://nvm.delwp.vic.gov.au>

DELWP 2021c. Planning Schemes Online. Department of Environment, Land, Water and Planning: <http://planning-schemes.delwp.vic.gov.au>

DELWP 2021d. Victorian Biodiversity Atlas. Version 3.2.8. Publication date: 31 August 2021. Department of Environment, Land, Water and Planning.

DELWP 2021e. *Flora and Fauna Guarantee Act 1988 – Threatened List* (October 2021). Department of Environment, Land, Water and Planning.

DoE 2013. *Matters of National Environmental Significance – Significant Impact Guidelines. Significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999*. Department of the Environment, Canberra.

DSE 2006. *Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978*. Department of Sustainability and Environment.



Appendices

Appendix 1 – Likelihood of Occurrence

One or more of the following criteria was used to establish the likelihood of occurrence for threatened flora and fauna species within the project area.

Present: Recorded during the field survey.

High likelihood:

- Previously recorded within the site.
- Likely to visit the site during seasonal movements.
- Frequently recorded within the local area.
- Known or likely to maintain resident populations in the local area.
- Presence of preferred habitat within the site.

Moderate likelihood:

- May regularly move through or visit the site as a seasonal visitor.
- Previous records within the local area.
- Some characteristics of a species preferred habitat is present although in a modified condition.
- Unlikely to maintain a population within the site.

Low Likelihood:

- Species likely to occur as a rare or opportunistic visitor.
- Few previous records within the local area.
- Habitat within the site is highly modified and does not represent the species preferred habitat.

Unlikely:

- No suitable habitat present on the site or in the surrounding area.
- No species records in the local area.
- Beyond the species natural distribution or considered locally extinct.

The outcome of the assessment of likelihood of occurrence for threatened flora is Appendix 3 and Appendix 4 for threatened fauna.



Appendix 2 – Native Vegetation Value Criteria

Table 4. Values of Native Vegetation

Value	Lower value	Higher value
Extent		
The amount of native vegetation to be removed and the context it is being removed from	<ul style="list-style-type: none"> • Small extent (less than 0.5 hectares) with no long- term viability (it may be isolated or degraded by surrounding land uses). 	<ul style="list-style-type: none"> • Larger extent (more than 1 hectare).
	<ul style="list-style-type: none"> • Removal does not impact on viability of remaining vegetation (it does not result in fragmentation). 	<ul style="list-style-type: none"> • Smaller extent (less than 1 hectare) but with good viability in an otherwise cleared landscape.
	<ul style="list-style-type: none"> • Removal does not include large trees. 	<ul style="list-style-type: none"> • Smaller extent but from within a larger patch and the removal leads to fragmentation of the patch.
		<ul style="list-style-type: none"> • Removal includes large trees.
Condition		
The condition score of the vegetation to be removed. Scores range from 0.2 to 1.	Condition scores are in the low range when they are less than 0.3.	Condition scores are in the high range, when they are above 0.6, noting 1 means pristine, pre-settlement condition.
	Lower scores indicate the vegetation has experienced a fair amount of disturbance and as a result is in poor condition. Poorer conditions generally support a lower diversity of plants and animals.	Higher scores indicate that the vegetation has not experienced significant disturbance and is in fairly good condition. Good condition vegetation usually supports a higher diversity of plants and animals.
Strategic biodiversity value (SBV)		
The SBV score of the vegetation to be removed. Scores range from 0.1 to 1	SBV scores are in the low range when they are less than 0.3.	SBV scores are in the high range, when that are above 0.8.
	Lower scores indicate locations where either only a few values are found together, or areas where there are many other locations with the same values (and the other locations have better condition and connectivity).	A higher score indicates a location where many values, that are not widespread or common, are found together.
Habitat for rare or threatened species		
This includes those listed as critically endangered, endangered,	Few species' habitats are impacted.	Numerous species' habitats are impacted. With few to many species' offsets.



Value	Lower value	Higher value
vulnerable or rare	<ul style="list-style-type: none"> • Low proportional impact (less than 0.005%). 	<ul style="list-style-type: none"> • Proportional impact is relatively higher than the species threshold (proportional impact represents the percentage of the habitat affected).
	<ul style="list-style-type: none"> • No or few species offsets. 	<ul style="list-style-type: none"> • Species have higher conservation status (endangered or critically endangered).
	<ul style="list-style-type: none"> • Species have lower conservation status (rare or vulnerable). 	<ul style="list-style-type: none"> • The species' habitats are highly localised or an important area of habitat within a dispersed species or selected VBA records
	<ul style="list-style-type: none"> • The species' habitats are dispersed and not an important area of habitat within a dispersed species. 	
Ecological Vegetation Class (EVC)		
The Bioregional Conservation Status	<ul style="list-style-type: none"> • it is not an endangered EVC 	it is an endangered EVC (location category 2) in the Location map.
	<ul style="list-style-type: none"> • the EVC is well represented in existing protected areas 	<ul style="list-style-type: none"> • the EVC is not well represented in existing protected areas.
Sensitive wetland and coastal areas		
The land is nationally or internationally listed for its value	It is not mapped as a sensitive wetland or coastal area (location category 2) in the Location map.	it is mapped as a sensitive wetland or coastal area (location category 2) in the Location map.
Landscape values		
	The native vegetation or land where the native vegetation is to be removed does not have to be managed to preserve identified landscape values.	The native vegetation or land where the native vegetation is to be removed has to be managed to preserve identified landscape values.

Source: DELWP 2018



Appendix 3 – Flora Species Recorded

Table 5: Flora species recorded during the field assessment

<i>Scientific Name</i>	<i>Common Name</i>
<i>Acacia acinacea</i>	Gold-dust Wattle
<i>Acacia osswaldii</i>	Umbrella Wattle
<i>Acacia paradoxa</i>	Hedge Wattle
<i>Acaena echinata</i>	Sheep's Burr
<i>Agrostis capillaris</i>	Brown-top Bent*
<i>Aira caryophyllea subsp. caryophyllea</i>	Silvery Hair-grass*
<i>Aira elegantissima</i>	Delicate Hair-grass*
<i>Allocasuarina luehmannii</i>	Buloke (ce)
<i>Arctotheca calendula</i>	Cape Weed*
<i>Arthropodium strictum</i>	Chocolate Lily
<i>Asperula conferta</i>	Common Woodruff
<i>Austrostipa elegantissima</i>	Feather Spear-grass
<i>Austrostipa mollis</i>	Supple Spear-grass
<i>Austrostipa scabra</i>	Rough Spear-grass
<i>Avena barbata</i>	Bearded Oat*
<i>Avena fatua</i>	Wild Oat*
<i>Brachyscome ciliaris</i>	Variable Daisy
<i>Briza maxima</i>	Large Quaking-grass*
<i>Briza minor</i>	Lesser Quaking-grass*
<i>Bromus catharticus</i>	Prairie Grass*
<i>Bromus diandrus</i>	Great Brome*
<i>Bromus hordeaceus</i>	Soft Brome*
<i>Bursaria spinosa subsp. lasiophylla</i>	Hairy Bursaria
<i>Centaurium erythraea</i>	Common Centaury*
<i>Chloris truncata</i>	Windmill Grass
<i>Chrysocephalum apiculatum</i>	Common Everlasting
<i>Cirsium vulgare</i>	Spear Thistle**
<i>Cynosurus echinatus</i>	Rough Dog's-tail*
<i>Dactylis glomerata</i>	Cocksfoot*
<i>Dianella longifolia</i>	Pale Flax-lily
<i>Ehrharta calycina</i>	Perennial Veldt-grass*
<i>Ehrharta erecta</i>	Panic Veldt-grass*
<i>Ehrharta longiflora</i>	Annual Veldt-grass*
<i>Einadia nutans</i>	Nodding Saltbush



Scientific Name	Common Name
<i>Enchylaena tomentosa</i>	Ruby Saltbush
<i>Enteropogon acicularis</i>	Spider Grass
<i>Eucalyptus camaldulensis</i>	River Red-gum
<i>Eucalyptus leucoxylon</i>	Yellow Gum
<i>Eucalyptus melliodora</i>	Yellow Box
<i>Eucalyptus microcarpa</i>	Grey Box
<i>Eucalyptus</i> spp.	Eucalyptus#
<i>Exocarpos cupressiformis</i>	Cherry Ballart
<i>Gonocarpus tetragynus</i>	Common Raspwort
<i>Helminthotheca echioides</i>	Ox-tongue*
<i>Holcus lanatus</i>	Yorkshire Fog*
<i>Hordeum marinum</i>	Barley Grass*
<i>Hypochaeris glabra</i>	Smooth Cat's-ear*
<i>Hypochaeris radicata</i>	Flatweed*
<i>Juncus subsecundus</i>	Finger Rush
<i>Lachnagrostis filiformis</i>	Common Blown-grass
<i>Lepidium africanum</i>	Common Peppercreess*
<i>Limonium lobatum</i>	Winged Sea-lavender*
<i>Lolium rigidum</i>	Wimmera Rye-grass*
<i>Lomandra filiformis</i>	Wattle Mat-rush
<i>Lomandra sororia</i>	Small Mat-rush
<i>Lycium ferrocissimum</i>	African Boxthorn**
<i>Lysimachia arvensis</i>	Pimpernel*
<i>Marrubium vulgare</i>	Horehound**
<i>Oxalis perennans</i>	Grassland Wood-sorrel
<i>Phalaris aquatica</i>	Toowoomba Canary-grass*
<i>Phalaris minor</i>	Lesser Canary-grass*
<i>Pimelea humilis</i>	Common Rice-flower
<i>Plantago coronopus</i>	Buck's-horn Plantain*
<i>Plantago lanceolata</i>	Ribwort*
<i>Romulea rosea</i>	Onion Grass*
<i>Rumex crispus</i>	Curled Dock*
<i>Rytidosperma caespitosum</i>	Common Wallaby-grass
<i>Rytidosperma setaceum</i>	Bristly Wallaby-grass
<i>Sonchus asper</i> s.l.	Rough Sow-thistle*
<i>Sonchus oleraceus</i>	Common Sow-thistle*
<i>Tricoryne elatior</i>	Yellow Rush-lily
<i>Trifolium angustifolium</i> var. <i>angustifolium</i>	Narrow-leaf Clover*



Scientific Name	Common Name
<i>Trifolium arvense</i> var. <i>arvense</i>	Hare's-foot Clover*
<i>Trifolium campestre</i> var. <i>campestre</i>	Hop Clover*
<i>Trifolium repens</i> var. <i>repens</i>	White Clover*
<i>Trifolium subterraneum</i>	Subterranean Clover*
<i>Triticum</i> spp.	Wheat*
<i>Veronica gracilis</i>	Slender Speedwell
<i>Veronica plebeia</i>	Trailing Speedwell
<i>Vittadinia cuneata</i>	Fuzzy New Holland Daisy
<i>Vulpia bromoides</i>	Squirrel-tail Fescue*
<i>Vulpia myuros</i>	Rat's-tail Fescue*
<i>Wahlenbergia stricta</i>	Tall Bluebell

Notes: *Exotic species; **Listed noxious weed; #Planted; ce = Critically Endangered



Appendix 4 – Fauna Species Recorded

Table 6: Fauna species recorded during the field assessment

Scientific Name	Common Name
<i>Corvus coronoides</i>	Australian Raven
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo
<i>Cacatua tenuirostris</i>	Long-billed Corella
<i>Grallina cyanoleuca</i>	Magpie-lark
<i>Grallina cyanoleuca</i>	Australian Magpie
<i>Colluricincla harmonica</i>	Grey Shrike-thrush
<i>Hirundo neoxena</i>	Welcome Swallow
<i>Rhipidura leucophrys</i>	Willie Wagtail
<i>Eolophus roseicapilla</i>	Galah
<i>Elanus axillaris</i>	Black-shouldered Kite



Appendix 5 – Threatened Flora Records

Table 7. Threatened flora records

Scientific Name	Common Name	Status	Count of Sightings	Last Record	Likely Occurrence	Comments
<i>Allocasuarina luehmannii</i>	Buloke	vu	2	26/10/99	P	Numerous individuals recorded in Plains Grassland
<i>Digitaria ammophila</i>	Silky Umbrella-grass	en	2	1/3/87	U	Absence of suitable habitat
<i>Digitaria divaricatissima</i> var. <i>divaricatissima</i>	Umbrella Grass	en	2	1/3/87	U	Absence of suitable habitat
<i>Glycine canescens</i>	Silky Glycine	cr	1	4/5/11	U	Absence of suitable habitat
<i>Ptilotus erubescens</i>	Hairy Tails	cr	4	19/1/12	U	Absence of suitable habitat
<i>Dianella porracea</i>	Riverine Flax-lily	cr	1	4/5/11	P	One individual recorded in Plains Grassland
<i>Leucochrysum albicans</i> subsp. <i>tricolor</i>	White Sunray	EN en	1	23/9/92	U	Absence of suitable habitat
<i>Pterostylis valida</i>	Robust Greenhood	CR en	6	9/9/13	U	Absence of suitable habitat
<i>Diuris protena</i>	Northern Golden Moths	cr	1	11/9/14	U	Absence of suitable habitat

Notes: Threatened species records were sourced from the VBA (DELWP 2021d), within a 5 km radius of the project area. Likelihood of occurrence: P = Present; H = High likelihood; M = Moderate likelihood; L = Low likelihood; U = Unlikely to occur (Appendix 1).

EPBC Act listed species (DAWE 2021)

Cr Critically Endangered

En Endangered

V Vulnerable

FFG Act listed species (DELWP 2021e)

L Listed as Threatened

cr Critically endangered

e Endangered

v Vulnerable



Appendix 6 – Threatened Fauna Records

Table 8. Threatened fauna records

Scientific Name	Common Name	Status	Count of Sightings	Last Record	Likely Occurrence	Comments
<i>Aythya australis</i>	Hardhead	vu	1	25/12/00	U	Absence of suitable habitat
<i>Hieraaetus morphnoides</i>	Little Eagle	vu	2	25/12/00	L	May flyover occasionally
<i>Hirundapus caudacutus</i>	White-throated Needletail	VU vu	1	8/3/80	L	May flyover occasionally
<i>Stagonopleura guttata</i>	Diamond Firetail	vu	1	10/6/97	L	Potential suitable habitat in Plains Woodland
<i>Litoria raniformis</i>	Growling Grass Frog	VU vu	1	01/01/1788	U	Absence of suitable habitat

Notes: Threatened species records were sourced from the VBA (DELWP 2021d), within a 5 km radius of the project area. Likelihood of occurrence: P = Present; H = High likelihood; M = Moderate likelihood; L = Low likelihood; U = Unlikely to occur (Appendix 1).

EPBC Act listed species (DAWE 2021)

Cr Critically Endangered

En Endangered

V Vulnerable

FFG Act listed species (DELWP 2021e)

L Listed as Threatened

cr Critically endangered

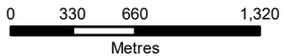
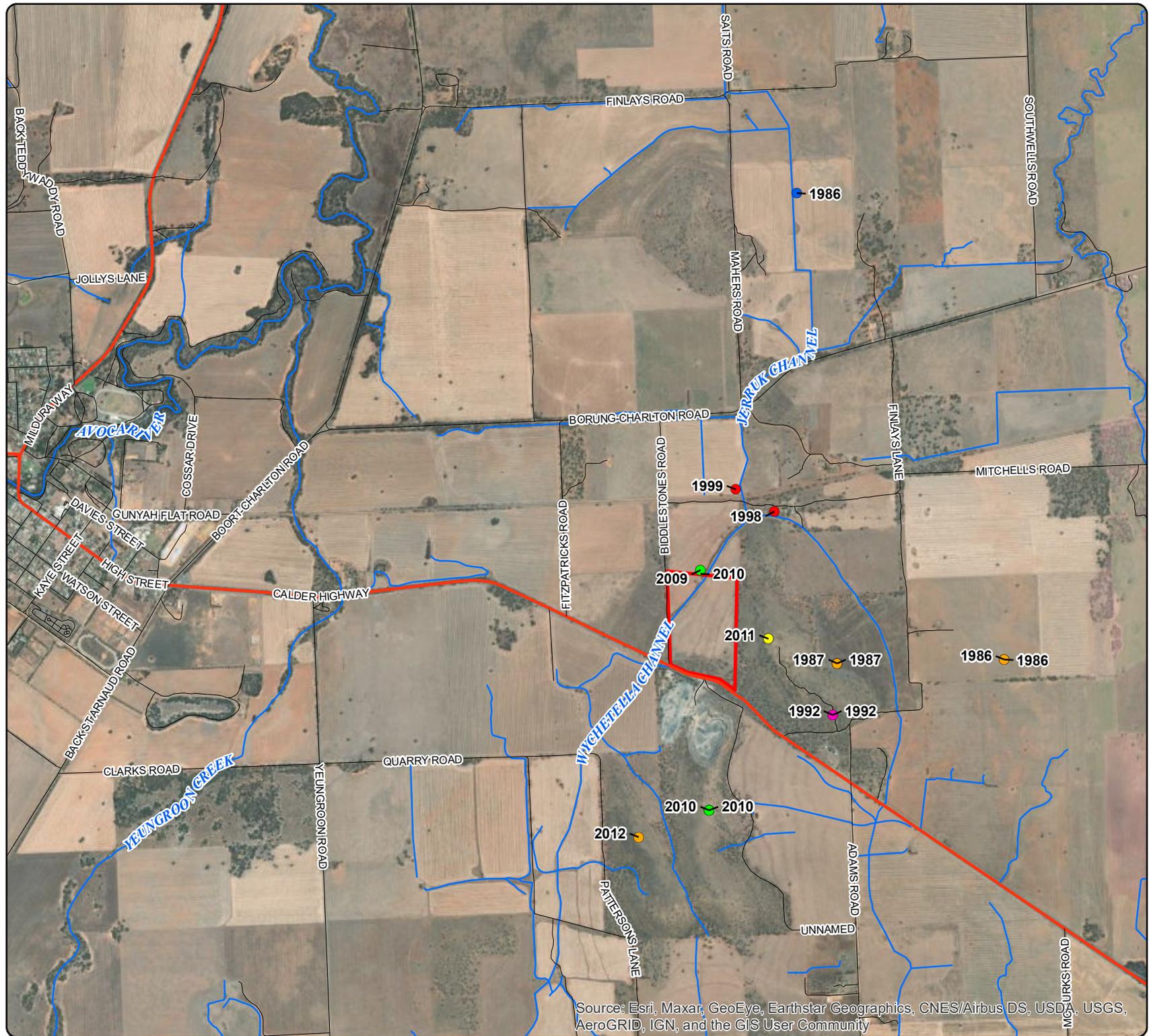
e Endangered

v Vulnerable

Figure 3
Significant Flora Species
 within 5km of the Subject Site
 126 Biddlestones Road,
 Charlton

Legend

- Subject Site
- Buloke
- Hairy Tails
- Riverine Flax-lily
- Robust Greenhood
- Silky Glycine
- Silky Umbrella-grass
- Umbrella Grass
- White Sunray



Metres
 Coordinate System: GDA 1994 MGA Zone 55
 Map Scale when printed @ A4 1:40,000



ÖKOLOGIE CONSULTING

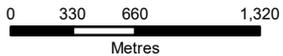
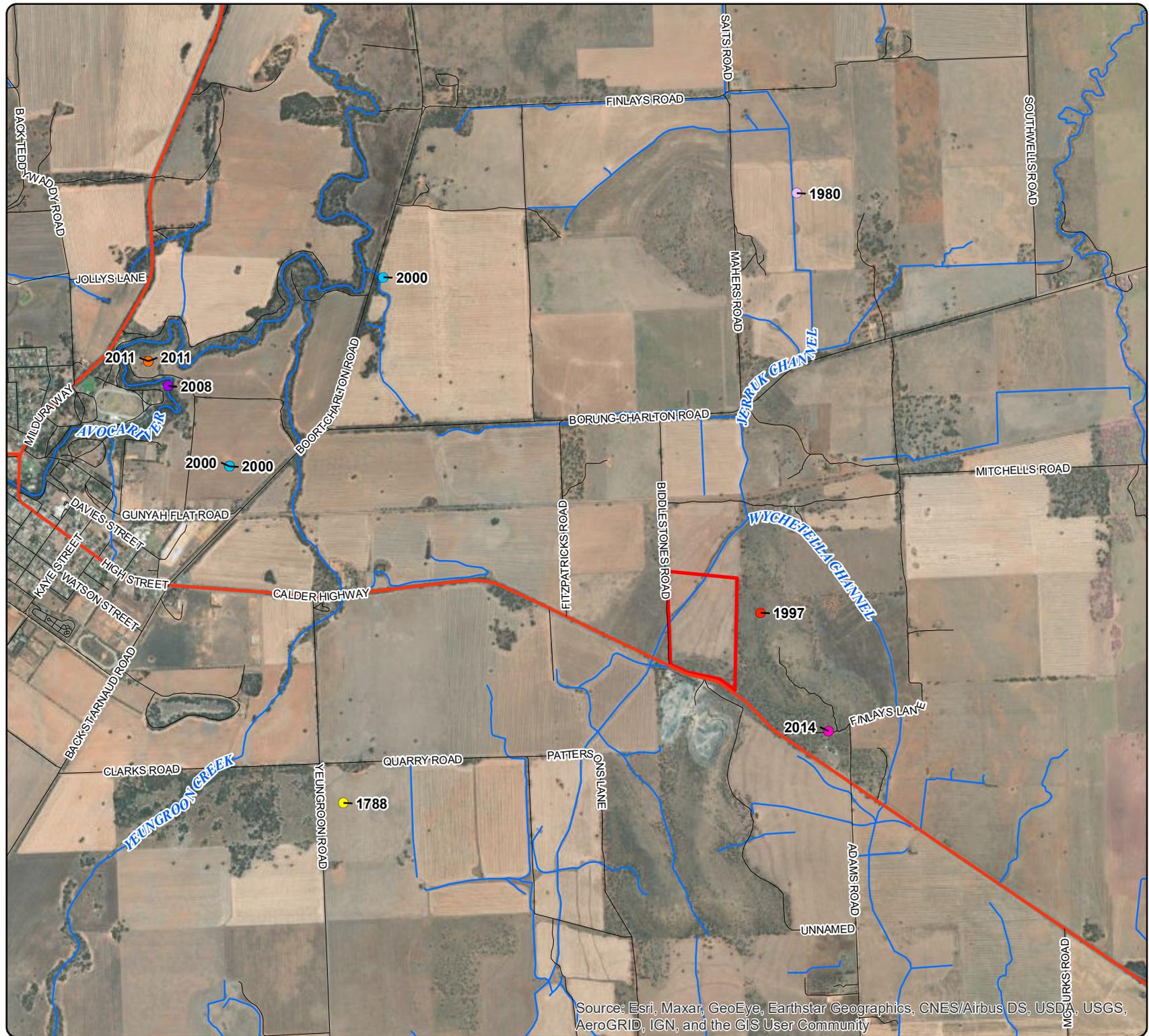
VicMap Data: The state of Victoria does not warrant the accuracy or correctness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 4
Significant Fauna Species
within 5km of the Subject Site
 126 Biddlestones Road,
 Charlton

Legend

- Subject Site
- Diamond Firetail
- Freshwater Catfish
- Growling Grass Frog
- Hardhead
- Little Eagle
- Murray Cod
- Northern Golden Moths
- White-throated Needletail



Metres
 Coordinate System: GDA 1994 MGA Zone 55
 Map Scale when printed @ A4 1:40,000



ÖKOLOGIE CONSULTING

VicMap Data: The state of Victoria does not warrant the accuracy or correctness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community