

## 2. Ecological Assessment

---

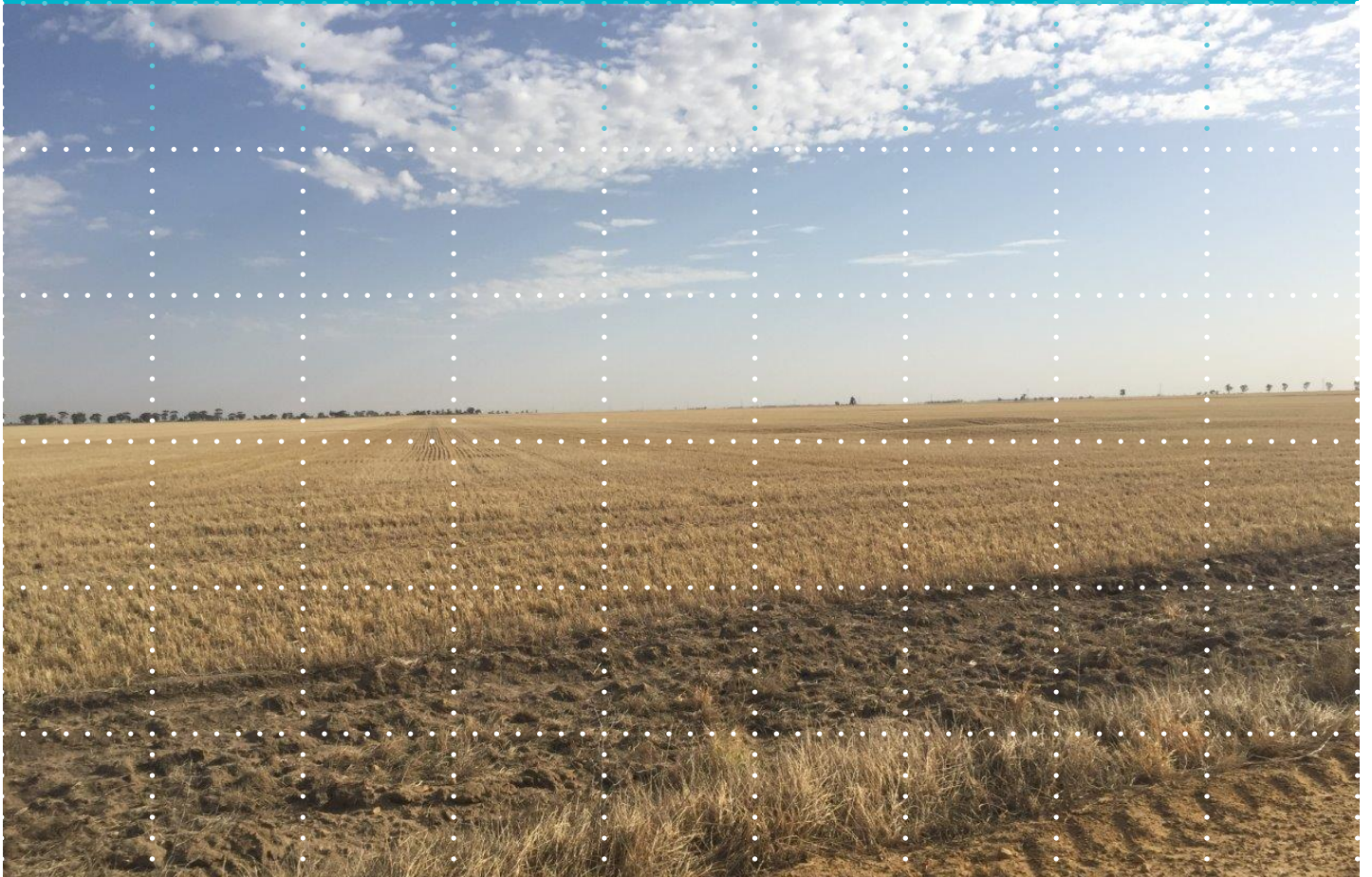
Final Report

# Ecological Assessment: Wimmera Plains Energy Facility: Wimmera Plains Energy Facility, Jung, Victoria

Prepared for

BayWa r.e Wind Pty Ltd

April 2020



Ecology and Heritage Partners Pty Ltd

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

MELBOURNE: 207 The Alexander Road, Ascot Vale VIC 3032  
BRISBANE: Level 5, 27 Creek Street, Brisbane QLD 4000  
CANBERRA: PO Box 6067, O'Connor ACT 2602  
GEELONG: 230 Latrobe Terrace, Geelong West Vic 3218  
ADELAIDE: 22 Greenhill Road, Wayville SA 5034  
SYDNEY: Level 5, 616 Harris Street, Ultimo, NSW, 2007  
[www.ehpartners.com.au](http://www.ehpartners.com.au) | (03) 9377 0100

**ADVERTISED  
PLAN**

## DOCUMENT CONTROL

Assessment	Ecological Assessment: Wimmera Plains Energy Facility
Address	BayWa r.e Wind Pty Ltd, Jung, Victoria
Project number	11997
Project manager	Shannon LeBel (Senior Ecologist)
Report reviewer	Aaron Organ (Director /Principal Ecologist)
Other EHP staff	Nicole Hansen (Senior Ecologist), Jordan Whitmore (Consultant Botanist), Claire Ranyard (Consultant Botanist), Alex Wilkinson (Zoologist), Andrea Fullagar (Zoologist).
Mapping	Monique Elsley (GIS Coordinator)
File name	11997_EHP_EA_WPEF_Finalv2_21042020
Client	BayWa r.e Wind Pty Ltd
Bioregion	Wimmera
CMA	Wimmera
Council	Horsham Rural City

Report versions	Comments	Comments updated by	Date submitted
Draft v1	Draft submitted to client for review		03/03/2020
Final v1	Comments provided by BayWa r.e Wind. Inclusion of intersection and impact assessment.	SLB	01/04/2020
Final v2	Minor amendments and clarifications based on comments b BayWa r.e.	SLB	21/02/2020

### Acknowledgements

- We thank the following people for their contribution to the project:
- The landowners who provided access to the study area;
- Pete Lausberg, Tiago Brandao, Milan Bartusek and Pete Higgins (BayWa r.e Wind Pty Ltd) for project and site information;
- Rob Gration (EcoAerial Environmental Services) for Anabat call analysis.
- BirdLife Australia for the use of the data available on the Bird Atlas pertaining to the study area and immediate surrounds.
- The Victorian Department of Environment, Land, Water and Planning for access to ecological databases, and assistance in refining the scope of the ecological assessment program.
- The Commonwealth Department of Agriculture, Water and the Environment for access to ecological databases.

**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**

## 2. Ecological Assessment

---



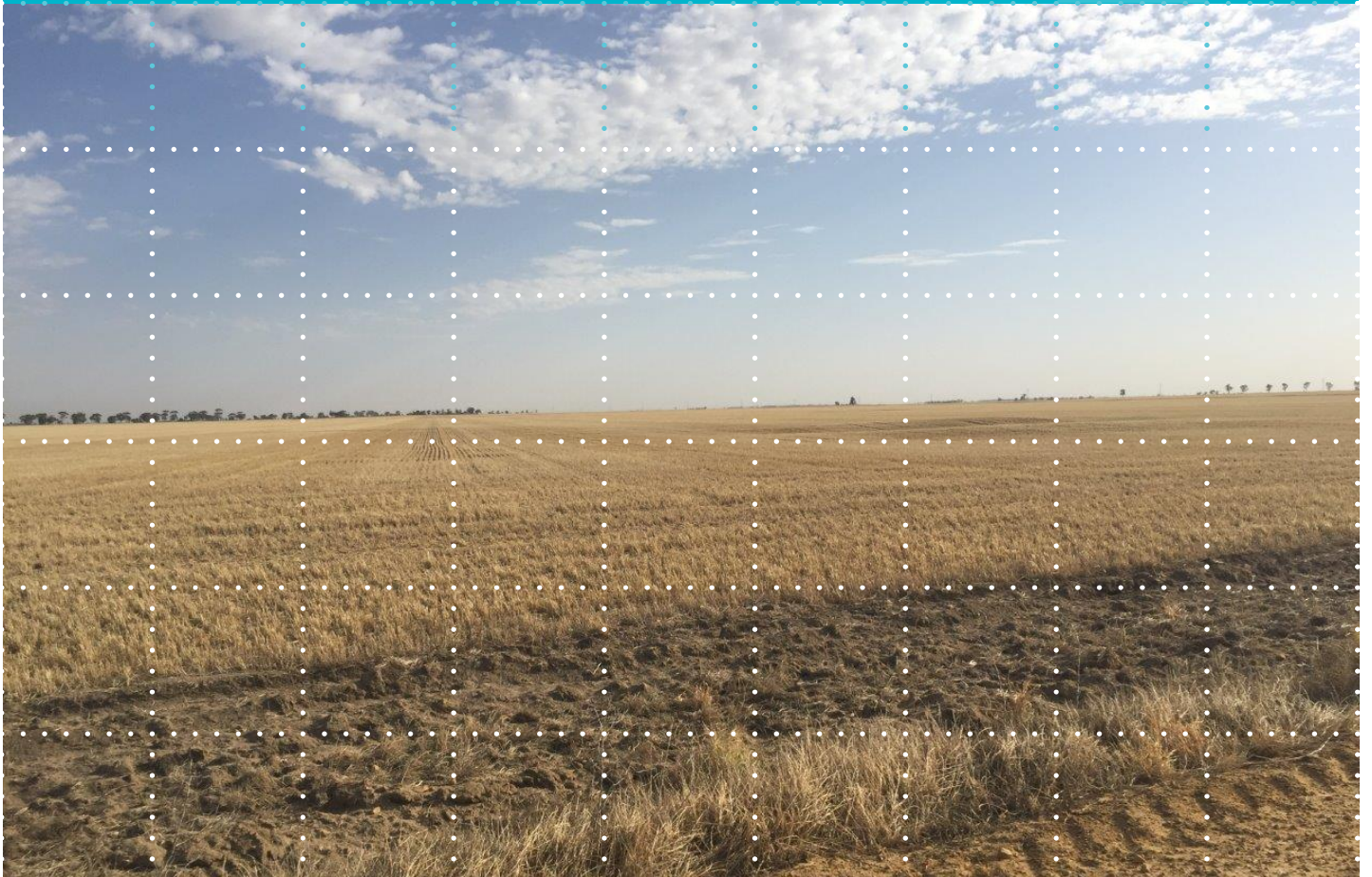
Final Report

# Ecological Assessment: Wimmera Plains Energy Facility: Wimmera Plains Energy Facility, Jung, Victoria

Prepared for

BayWa r.e Wind Pty Ltd

April 2020



Ecology and Heritage Partners Pty Ltd

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

MELBOURNE: 207 The Alexander Road, Ascot Vale VIC 3032  
BRISBANE: Level 10, 27 Creek Street, Brisbane QLD 4000  
CANBERRA: PO Box 6067, O'Connor ACT 2602  
GEELONG: 230 Latrobe Terrace, Geelong West Vic 3218  
ADELAIDE: 22 Greenhill Road, Wayville SA 5034  
SYDNEY: Level 5, 616 Harris Street, Ultimo, NSW, 2007  
[www.ehpartners.com.au](http://www.ehpartners.com.au) | (03) 9377 0100

**ADVERTISED  
PLAN**

## DOCUMENT CONTROL

Assessment	Ecological Assessment: Wimmera Plains Energy Facility
Address	BayWa r.e Wind Pty Ltd, Jung, Victoria
Project number	11997
Project manager	Shannon LeBel (Senior Ecologist)
Report reviewer	Aaron Organ (Director /Principal Ecologist)
Other EHP staff	Nicole Hansen (Senior Ecologist), Jordan Whitmore (Consultant Botanist), Claire Ranyard (Consultant Botanist), Alex Wilkinson (Zoologist), Andrea Fullagar (Zoologist).
Mapping	Monique Elsley (GIS Coordinator)
File name	11997_EHP_EA_WPEF_Finalv2_21042020
Client	BayWa r.e Wind Pty Ltd
Bioregion	Wimmera
CMA	Wimmera
Council	Horsham Rural City

Report versions	Comments	Comments updated by	Date submitted
Draft v1	Draft submitted to client for review		03/03/2020
Final v1	Comments provided by BayWa r.e Wind. Inclusion of intersection and impact assessment.	SLB	01/04/2020
Final v2	Minor amendments and clarifications based on comments b BayWa r.e.	SLB	21/02/2020

### Acknowledgements

- We thank the following people for their contribution to the project:
- The landowners who provided access to the study area;
- Pete Lausberg, Tiago Brandao, Milan Bartusek and Pete Higgins (BayWa r.e Wind Pty Ltd) for project and site information;
- Rob Gration (EcoAerial Environmental Services) for Anabat call analysis.
- BirdLife Australia for the use of the data available on the Bird Atlas pertaining to the study area and immediate surrounds.
- The Victorian Department of Environment, Land, Water and Planning for access to ecological databases, and assistance in refining the scope of the ecological assessment program.
- The Commonwealth Department of Agriculture, Water and the Environment for access to ecological databases.

**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**

**Copyright © Ecology and Heritage Partners Pty Ltd**

This document is subject to copyright and may only be used for the purposes for which it was commissioned. The use or copying of this document in whole or part without the permission of Ecology and Heritage Partners Pty Ltd is an infringement of copyright.

**Disclaimer**

Although Ecology and Heritage Partners Pty Ltd have taken all the necessary steps to ensure that an accurate document has been prepared, the company accepts no liability for any damages or loss incurred as a result of reliance placed upon the report and its contents.

**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**

## SUMMARY

---

### Introduction

Ecology and Heritage Partners Pty Ltd was commissioned by BayWa r.e. Wind Pty Ltd (herein referred to as BayWa r.e.) to undertake a suite of ecological assessments to determine the ecological sensitivity of, and inform the planning application for the proposed Wimmera Plains Wind Farm, located in Jung, Victoria. BayWa r.e. have received a planning permit to construct two turbines within the broader study area, and as part of the future planning application, an additional 54 Wind Turbine Generators (WTGs) are proposed, with a hub and tip height of 166 and 247 metres, respectively, and a Rotor Swept Area (RSA) between 85 metres and 247 metres height.

The purpose of this report is to identify the extent and type of native vegetation present within the study area, determine the presence of significant flora and fauna species and/or ecological communities as determined through the recent on-site flora and fauna assessments, and determine potential impacts to ecological values based on the number, location and Rotor Swept Area (RSA) of the turbines.

### Study Area

The study area encompasses approximately 3,806 hectares of land at Jung, approximately 20 kilometres north-east of Horsham, and is dominated by highly modified land, subjected to vegetation clearance for the purposes of agriculture.

### Methods

#### *Flora surveys*

The flora assessment was undertaken over 13 days in January, March and October 2019. Additional assessments were undertaken on 16 March 2020 and 26 March 2020 at two intersections that were identified by BayWa r.e. as having the potential to impact native vegetation as part of the swept path assessment.

The flora assessment was only undertaken within the project area, with all observed vascular plants recorded, any significant records mapped and the overall condition of vegetation noted. Vegetation outside of the survey area was not assessed in detail. Native vegetation in the local area was reviewed to assist in determining the original vegetation within the study area.

The surveys sought primarily to assess the extent and condition of native vegetation communities and potential flora and fauna habitat, with particular consideration given to significant ecological communities and species of conservation concern, such as threatened and migratory species.

A habitat hectare assessment was undertaken in conjunction with the flora survey.

#### *Fauna Surveys*

Initial general fauna surveys were undertaken concurrently with the vegetation assessment undertaken in January 2019, as well as during the bird utilisation surveys.

A desktop review of significant species recorded within 10 kilometres of the proposed study site was undertaken using the Victorian Biodiversity Atlas, the South-west Victorian Flocking Site Database and Birds Australia New Atlas Data.

Additional fauna surveys included:

- Bird Utilisation Surveys;
- Microbat surveys using Anabat detector units; and,
- Level 1 Brolga Assessment.

## Results

### Flora

Forty-six (46) flora species (24 indigenous and 22 non-indigenous or introduced) were recorded within the study area during the field assessment. Two State significant flora species; Buloke *Allocasuarina luehmannii* and Buloke Mistletoe *Amyema linophylla* subsp. *orientalis* were recorded within the study area during the field survey. Scattered occurrences of Fuzzy New Holland Daisy *Vittadinia cuneata* and Lemon Beauty-heads *Calocephalus citroides* are present within the road reserves. Both Fuzzy New Holland Daisy and Lemon Beauty-heads area protected under the FFG Act as a member of the Asteraceae (daisy) family.

Native vegetation in the study area is representative of three EVCs within the project area; Plains Savannah (EVC 826), Plains Woodland (EVC 803) and Plains Grassland (EVC 132).

A total of 11.03 hectares of native vegetation patches, and 439 scattered trees, comprising 158 Large scattered trees and 281 Small scattered trees occur throughout the project area (Table S1; Table S2).

**Table S1.** Summary of the extent of native vegetation within the project area.

EVC	Bioregional Conservation status	Area (hectares) or total	Comments
Plains Savannah (EVC 826)	Endangered	7.64 ha	Dominated by native grasses, including Wallaby-grass <i>Rytidosperma</i> sp. and Spear-grass <i>Austrostipa</i> sp. Occasional presence of herbs and/or chenopods.
Plains Woodland (EVC 803)	Endangered	2.70 ha	Exhibited low diversity and within the study area, was characterised by a canopy of Buloke and understory of exotic grasses.
Plains Grassland (EVC 132)	Endangered	0.69 ha	Typically exhibited a low diversity native grassland with (Spear-grass and and/or Wallaby-grass) with few to no herbs.

**Table S2.** Summary of scattered trees within the project area.

Common Name	Species Name	Large Tree	Small Tree	Total
Buloke	<i>Allocasuarina luehmannii</i>	149	255	<b>404</b>
Grey Box	<i>Eucalyptus microcarpa</i>	5	13	<b>18</b>
Slender Cypress-Pine	<i>Callitris gracilis</i> spp. <i>murrayensis</i>	0	1	<b>1</b>
River Red-gum	<i>Eucalyptus camaldulensis</i>	0	10	<b>10</b>
Stag		4	2	<b>6</b>
<b>Total</b>		<b>158</b>	<b>281</b>	<b>439</b>

The native vegetation present was primarily restricted to the road reserves within the project area, in the form of native grasses and shrubs. Scattered trees were recorded across the study area, with some larger clusters

This copied document to be made available for the sole purpose of funding 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



present. The dominant tree species recorded was Buloke *Allocasuarina luehmannii*, which is Listed under the *Flora and Fauna Guarantee Act 1988*.

No nationally significant flora was recorded, or considered likely to occur. The State significant Buloke and Buloke Mistletoe *Amyema linophylla* subsp. *orientalis* were recorded within the study area during the field surveys.

#### Fauna

Ninety-three (93) bird species were recorded, consisting of 799 individuals, during the fixed point bird counts. The majority of bird species observed (99%) during the point counts were either recorded on the ground or flying below the RSA. Only 0.25% of bird species were in the RSA, including raptors Brown Falcon *Falco berigora* and Black Falcon *Falco subniger*.

No nationally significant fauna species were recorded within the study area during the field surveys. However, the State significant Black Falcon was recorded. No other national or State significant fauna are considered likely to occur due to the highly modified condition of habitats present.

On ground assessment of historical records and potential Brolga habitats failed to positively identify potential breeding or flocking Brolga sites. The nearest flocking site is located near Marnoo, approximately 34 kilometres east of the study area. Due to the absence of breeding or flocking habitat within the locality, any potential impact to Brolga is considered to be low to negligible.

Six bat species were 'positively identified' based on echolocation call analysis. No significant bat species were positively recorded.

The potential impacts to bats during operation of the wind farm are expected to be low due to the RSA height (85 metres) and the location 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.

#### Communities

No national or State significant ecological communities are present within the project area.

### Legislative and Policy Implications

#### *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act - Commonwealth)*

The proposed activity is considered highly unlikely to significantly impact any EPBC Act listed species (threatened or migratory), ecological communities or any other matters of National Environmental Significance. As such, an EPBC Act referral regarding these matters is considered unwarranted.

#### *Flora and Fauna Guarantee Act 1988 (FFG Act - Victoria)*

There are no impacts to Buloke. However, there is an impact in one location to Fuzzy New Holland Daisy (comprising 6 individual plants) (Figure 2e) due to the road upgrade works, and as such, an FFG Act permit will be required for the removal of this protected species.

BayWa r.e. should allow approximately four weeks to obtain the permit through DELWP.

#### *Environment Effects Act 1978 (Victoria)*

Based on a review of the Ministerial guidelines for assessment of environmental effects under the 'Environment Effects Act 1978' and the associated ecological impacts associated with the proposed

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

development, it is Ecology and Heritage Partners' position that a referral under the EES Act is not required based on ecological impacts alone, as:

- None of the individual thresholds relating to the ecological criteria identified in the 'Ministerial guidelines for assessment of environmental effects under the *Environment Effects Act 1978*' have been exceeded; and,
- None of the thresholds relating to a combination of ecological effects criteria identified in the 'Ministerial guidelines for assessment of environmental effects under the *Environment Effects Act 1978*' have been exceeded.

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

#### *Planning and Environment Act 1987*

In accordance with Clause 61.01 of the Horsham Rural City Planning Scheme, the Minister for Planning is the Responsible Authority for the use and development of land for a Wind Energy facility or Solar facility.

A permit is required under Clause 52.17 of the Horsham Rural City Planning Scheme to remove any native vegetation, including scattered native grasses and/or herbs.

A permit is required under Clause 52.32 of the Horsham Rural City Planning Scheme to use and develop a wind energy facility. This report satisfies the relevant ecological application requirements listed in Clause 52.32-4.

A permit is required under Clause 53.13 of the Horsham Rural City Planning Scheme to use or develop a renewable energy facility (other than a wind energy facility). This report satisfies the relevant ecological application requirements listed in Clause 53.13-2.

#### *Guidelines for the Removal, Lopping or Destruction of Native Vegetation*

The study area is within Location Category 2, with 0.288 hectares of native vegetation proposed to be removed (in addition to the previously approved 0.009 hectares). As such, the permit application falls under the Intermediate assessment pathway.

The offset requirement for native vegetation removal is 0.034 General Habitat Units (HUs). No Specific HUs are generated by the proposed development.

#### *Other Legislation and Policy*

Implications relating to other local and State policy (*Wildlife Act 1975*, *Catchment and Land Protection Act 1994*, local government authorities) as well as additional studies or reporting that may be required (targeted surveys, Conservation Management Plan, Weed Management Plan, Construction Environment Management Plan) are provided in Section 4 and Section 6.

### **Recommendations**

It is recommended that BayWa r.e Wind:

1. Avoid impacts to Buloke and other scattered trees where possible;
2. Prior to construction, develop a Construction Environmental Management Plan (CEMP) with specific management actions to mitigate against potential impacts to areas of ecological value;
3. Develop a Weed Management Plan, which should be incorporated into the CEMP;

4. Before commencement of construction, the preparation of a Bat and Avifauna Management Plan to the satisfaction of the responsible authority, in consultation with the DELWP. 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 energy facility 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 to birds and bat populations caused by the wind farm. This procedure must provide that the operator of the wind energy facility immediately investigates the possible causes of any significant impacts on bird and bat populations, and thereafter designs and implements measures to mitigate those impacts in consultation with the responsible authority and DELWP;
  - c) A monitoring period of not less than one year 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.
5. If there are changes to the layout through the process of preparing the final development plan, confirmation of any potential impacts (or lack thereof) to native vegetation must be undertaken.

**Table S3.** Application requirements for a permit to remove native vegetation under the Intermediate Assessment Pathway (*Victoria Planning Provisions* Clause 52.17 -3; DELWP 2017b).

No.	Application Requirement	Response within this report
1	Information about the native vegetation to be removed, including: <ul style="list-style-type: none"> <li>The assessment pathway and reason for the assessment pathway.</li> <li>A description of the native vegetation to be removed.</li> <li>Maps showing the native vegetation and property in context.</li> <li>The offset requirements that will apply if the native vegetation is approved to be removed.</li> </ul>	Details provided in Section 3.5 and Appendix 5
2	Topographic and land information relating to the native vegetation to be removed.	Refer to Section 1.3 and Figure 2 of this report.
3	Recent dated photographs of the native vegetation to be removed.	Refer to Section 3 of this report.
4	Details of any other native vegetation that was permitted to be removed on the same property with the same ownership as the native vegetation to be removed, where the removal occurred in the five-year period before the application to remove native vegetation is lodged.	0.009 hectares was previously approved to be removed under permit PA 1800346
5	An avoidance and minimise statement.	Section 6.2
6	A copy of any property vegetation plan that applies to the site.	Not applicable.
7	Where the removal of native vegetation is to create defensible space, a written statement explaining why the removal of native vegetation is necessary. This is not required when the creation of defensible space is in conjunction with an application under the Bushfire Management Overlay	Not applicable
8	If the application is under Clause 52.16, a statement that explains how the proposal responds to the Native Vegetation Precinct Plan	Not applicable
9	An offset statement explaining that an offset that meets the offset requirements for the native vegetation to be removed has been identified and how it will be secured	Section 6.3

# CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>12</b>
1.1	Background .....	12
1.2	Objectives .....	12
1.3	Study Area.....	13
<b>2</b>	<b>METHODS .....</b>	<b>14</b>
2.1	Relevant State and Commonwealth Legislation.....	14
2.2	Desktop Assessment .....	14
2.3	Field Assessment.....	16
2.4	Consultation.....	23
2.5	Likelihood of Occurrence Assessment .....	24
2.6	Assessment Qualifications and Limitations .....	25
<b>3</b>	<b>RESULTS .....</b>	<b>27</b>
3.1	Vegetation Condition .....	27
3.2	Fauna Survey Results .....	34
3.3	National Significance Assessment.....	44
3.4	State Significant Assessment.....	47
3.5	Removal of Native Vegetation (the Guidelines) .....	49
<b>4</b>	<b>LEGISLATIVE AND POLICY IMPLICATIONS.....</b>	<b>51</b>
4.1	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth) .....	51
4.2	<i>Environment Effects Act 1978</i> (Victoria) .....	51
4.3	<i>Flora and Fauna Guarantee Act 1988</i> (Victoria).....	54
4.4	<i>Planning and Environment Act 1987</i> (Victoria) .....	55
4.5	<i>Wildlife Act 1975</i> and <i>Wildlife Regulations 2013</i> (Victoria).....	56
4.6	<i>Catchment and Land Protection Act 1994</i> (Victoria).....	56
4.7	Policy and Planning Guidelines – Development of Wind Energy Facilities in Victoria .....	56
<b>5</b>	<b>POTENTIAL IMPACTS.....</b>	<b>58</b>
5.1	Potential Impacts on Flora .....	58
5.2	Potential Impacts on Birds .....	58
5.3	Potential Impacts on Brolgas .....	59
5.4	Potential Impacts to Bats .....	60

**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**



5.5	Cumulative Biodiversity Impacts .....	61
5.6	The Impact of Climate Change .....	62
<b>6</b>	<b>MITIGATION MEASURES .....</b>	<b>63</b>
6.1	Best Practice Mitigation Measures .....	63
6.2	Avoid and Minimise Statement .....	64
6.3	Offset Impacts .....	65
<b>7</b>	<b>RECOMMENDATIONS .....</b>	<b>66</b>
<b>8</b>	<b>FURTHER REQUIREMENTS .....</b>	<b>67</b>
	REFERENCES .....	69
	FIGURES .....	75
	APPENDICES .....	94
	APPENDIX 1 .....	95
	Appendix 1.1 – Rare or Threatened Categories for Listed Victorian Taxa .....	95
	Appendix 1.2 – Defining Ecological Significance .....	96
	Appendix 1.3 – Defining Site Significance .....	97
	Appendix 1.4 – Vegetation Condition and Habitat Quality .....	98
	Appendix 1.5 – <i>Flora and Fauna Guarantee Act 1988</i> Protected Species .....	99
	APPENDIX 2 - FLORA .....	100
	Appendix 2.1 – Flora Results .....	100
	Appendix 2.2 – Significant Flora Species .....	102
	Appendix 2.3 – Habitat Hectares .....	105
	Appendix 2.4 – Scattered Trees .....	106
	APPENDIX 3 - FAUNA .....	118
	Appendix 3.1 – Significant Fauna Species .....	118
	APPENDIX 4 – MICROBAT CALL ANALYSIS .....	122
	Appendix 4.1 – February Call Images .....	122
	Appendix 4.2 – October Call Images .....	128
	APPENDIX 5 - NATIVE VEGETATION REMOVAL (NVR) REPORT .....	134
	APPENDIX 6 - OFFSET AVAILABILITY .....	142

# 1 INTRODUCTION

---

## 1.1 Background

Ecology and Heritage Partners Pty Ltd was commissioned by BayWa r.e. Wind Pty Ltd (herein referred to as BayWa r.e.) to undertake a suite of ecological assessments to determine the ecological sensitivity of, and inform the planning application for, the proposed Wimmera Plains Wind Farm, located in Jung, Victoria. BayWa r.e. have received a planning permit to construct two turbines within the broader study area, and as part of the future planning application, an additional 54 Wind Turbine Generators (WTGs) are proposed.

Each turbine is proposed to comprise a 162 metre rotor diameter at a hub height of 166 metres, resulting in a 247 metre tip height and 85 metre ground clearance. Therefore, the Rotor Swept Area (RSA) is between 85 metres and 247 metres in height.

The purpose of this report is to identify the extent and type of native vegetation present within the study area, determine the presence of significant flora and fauna species and/or ecological communities as determined through the recent on-site flora and fauna assessments, and determine potential impacts to ecological values based on the number, location and Rotor Swept Area (RSA) of the turbines.

## 1.2 Objectives

The objectives of the ecological assessments were to:

- Identify flora and fauna values within the study area;
- Review the relevant flora and fauna databases, and available literature;
- Conduct field assessments to identify the extent and quality of native vegetation within the study area;
- Provide maps showing any areas of native vegetation and locations of any significant flora and fauna species, and/or fauna habitat (if present);
- Classify any flora and fauna species, and vegetation communities identified or considered likely to occur within the study area in accordance with Commonwealth and State legislation;
- Document relevant environmental legislation and policy; and,
- Document any opportunities and constraints associated with the proposed works.

Where areas of remnant vegetation were present, the following tasks were completed to address requirements under the 'Guidelines for the removal, destruction or lopping of native vegetation' (Guidelines) (DELWP 2017a):

- A habitat hectare assessment of any areas of remnant native vegetation within the study area;
- Recommendations to address requirements under the Guidelines to minimise impacts to remnant vegetation; and,
- Provision of offset targets for any native vegetation, scattered trees and habitat for rare or threatened species proposed to be lost because of the proposed works.

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

### 1.3 Study Area

The study area encompasses approximately 3,806 hectares of land at Jung, approximately located between 11 and 20 kilometres north-east of Horsham (Figure 1).

The study area is dominated by highly modified land, subjected to vegetation clearance for the purposes of agriculture. Privately owned land within the study area has been subjected to cropping activities, and aside from the presence of canopy trees and discrete, narrow, linear strips of native vegetation within road reserves, the study area does not support any patches of native vegetation (Figure 2).

Surrounding land use is consistent with the study area, being predominately agricultural, with scattered dams, sheds and rural dwellings present. The study area is relatively flat, with an elevation of approximately 140 metres above sea level across the site.

There are no natural waterbodies within the study area. Significant waterbodies within the broader region include:

- Yarriambiack Creek - located approximately 3.5 kilometres east;
- Darlot Swamp - located approximately 6.7 kilometres south-east; and,
- Dooen Swamp - located approximately 8.9 kilometres south-west.

There are no conservation reserves, significant wetlands (Ramsar or nationally-listed) or DELWP-modelled wetlands located within the study area or its immediate surrounds.

According to the Victorian Department of Environment, Land, Water and Planning (DELWP) NatureKit Map (DELWP 2020a), the study area lies within the Wimmera bioregion. It is located within the jurisdiction of the Wimmera Catchment Management Authority (CMA) and the Horsham Rural City municipality. Under the Horsham Planning Scheme, the majority of the study area is encompassed by the Farming Zone (FZ), with Road Zone 1 (RDZ1) applied to the Henty Highway carriageway. No Planning Overlays have been applied to the study area (DELWP 2020b).

## 2 METHODS

### 2.1 Relevant State and Commonwealth Legislation

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);
- *Environmental 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 (DELWP 2017a);
- Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria (DELWP 2017b);
- Solar Energy Facilities Design and Development Guidelines (DELWP 2019a);
- Interim Guidelines for the Assessment, Avoidance, Mitigation and Offsetting of Potential Wind Farm Impacts on the Victorian Brolga Population (DSE 2012);
- Horsham Rural City Planning Scheme; including,
  - Clause 52.17 Native Vegetation;
  - Clause 53.13 Renewable Energy Facility (Other Than Wind Energy Facility); and,
  - Clause 52.32 Wind Energy Facility.
- *Wildlife Act 1975* (Wildlife Act); and,
- *Catchment and Land Protection Act 1994* (CaLP Act).

### 2.2 Desktop Assessment

Ecology and Heritage Partners has undertaken a detailed desktop assessment to inform the potential presence of significant ecological features. These resources interrogated include:

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

- The DELWP NatureKit Map (DELWP 2020a) and NVIM Tool (DELWP 2020c) for:
  - Modelled data for location risk, remnant vegetation patches, scattered trees and habitat for rare or threatened species;
  - The extent of historic and current Ecological Vegetation Classes (EVCs);
  - Previously documented flora and fauna records within the project locality
- EVC benchmarks (DELWP 2020d) for descriptions of EVCs within the Wimmera bioregion;

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

- The Victorian Biodiversity Atlas (VBA) for previously documented flora and fauna records within the project locality (DELWP 2018a);
- BirdLife New Atlas Bird Data for significant birds within 20 kilometres of the study area (BirdLife 2019);
- The Illustrated Flora Information System of Victoria (IFLISV) (Gullan 2017) for assistance with the distribution and identification of flora species;
- The Commonwealth Department of Agriculture, Water and the Environment (DAWE) Protected Matters Search Tool (PMST) for matters of National Environmental Significance (NES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (DAWE 2020a);
- Relevant listings under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act), including the latest Threatened and Protected Lists (DELWP 2018b; DELWP 2019d; DELWP 2017a);
- Relevant environmental legislation and policies pertaining to target species including: EPBC Act Policy Statements; FFG Act Action Statements, National Recovery Plans, Advisory Lists;
- VicPlan (DELWP 2020b) to ascertain current zoning and environmental overlays in the study area;
- Aerial photography of the study area; and,
- Previous ecological or other relevant assessments in close proximity to the study area, including:
  - Ecology Australia 2018. Desktop Assessment of Significant Flora and Fauna Values of the Avonbank Mineral Sands Project;
  - Ecology Australia 2018. Ecology Australia 2018: Survey Findings 2018;
  - Okologie 2017. Preliminary Ecological Assessment - Avonbank Mineral Sands Project; and,
  - Ecology and Heritage Partners 2018. Biodiversity Assessment for the Jung Wind, Solar and Battery Farm.
- Any relevant legislation and policy, including:
  - National Species Recovery Plans;
  - Conservation advice;

This review was used to prepare a list of significant species and ecological communities that required further consideration as part of the planning process related to the Wimmera Plains Wind Farm. These species include the nationally significant South-eastern Red-tailed Black Cockatoo *Calyptorhynchus banksia graptogyne*, and the State significant Black Falcon *Falco subniger*, Brolga *Grus rubicunda* and Masked Owl *Tyto novaehollandiae*.

The South-eastern Red-tailed Black Cockatoo only occurs in south-east South Australia and south-west Victoria. Red-tails rely on Stringybark, Buloke and Eucalypt gum woodland habitats and scattered trees throughout the range for feeding and nesting. Although the study area contains a large number of Buloke, with scattered eucalypts present, the range of the species is acknowledged as being limited to the western aspect of Horsham, rather than the east and north (Commonwealth of Australia 2007). Consultation with DELWP on 30 April 2019 confirmed that the study area was considered to be located outside the species acknowledged range (Section 2.4). Although no targeted surveys were undertaken for the species, the summer/autumn bird utilisation surveys undertaken in February/March 2019 (Table 4) were conducted at an appropriate time to detect the species within the study area should it be present seasonally feeding on Buloke fruit.

**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**



The potential use of habitat within the study area for Black Falcon and Masked Owl was ascertained as part of the bird utilisation surveys, while a Level 1 Brolga Assessment was undertaken to determine whether further investigations are required regarding the species.

Database searches covered a minimum search radius of 10 kilometers from the project area boundaries, with Brolga and BirdLife data interrogations being undertaken over a 20 kilometre radius.

## 2.3 Field Assessment

### 2.3.1 Habitat Hectare Assessment

Several detailed flora and habitat hectare assessments have been undertaken by Ecology and Heritage Partners, with the aim of determining native vegetation quality and extent within the study area.

Field assessments were undertaken within the project area (Figures 2a – 2h) on the following dates:

- 22 – 25 January 2019;
- 12 – 15 March 2019; and,
- 22 – 25 October 2019.

Additional assessments were undertaken at two intersections identified by BayWa r.e. as having the potential to impact native vegetation as part of the swept path assessment. These intersections are located at:

- Henty Highway and Dimboola-Minyip Road (Figure 2i). Assessment undertaken on 26 March 2020; and,
- Glenelg Highway and Portland-Casterton Road, Casterton (Figure 2j). Assessment undertaken on 16 March 2020

Vegetation assessments were undertaken in order to obtain information on flora and fauna values within the study area. The study area was walked and/or driven, with all observed vascular flora (and fauna) species recorded, any significant records mapped and the overall condition of vegetation and habitats noted. Native vegetation in the local area was also investigated to assist in determining the pre-European vegetation within the study area. Ecological Vegetation Classes were determined with reference to DELWP pre-1750 and extant EVC mapping and their published descriptions (DELWP 2020d).

Where native vegetation was identified a habitat hectare assessment was undertaken following methodology described in the Vegetation Quality Assessment Manual (DSE 2004).

The surveys sought primarily to assess the extent and condition of native vegetation communities and potential flora and fauna habitat, with particular consideration given to significant ecological communities and species of conservation concern, such as threatened and migratory species.

All fieldwork was carried out under the appropriate licences, including a Research Permit (10006893) and Scientific Procedures Fieldwork Licence (SPFL 410) issued by DELWP under the *Wildlife Act 1975*, and an Animal Research permit issued by the Wildlife and Small Institutions Animal Ethics Committee (22.13).

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

Under the *Planning and Environment Act 1987*, Clause 52.17 of the Planning Schemes requires a planning permit from the Responsible Authority 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' (Guidelines)

(DELWP 2017b). The 'Assessor's handbook – applications to remove, destroy or lop native vegetation' (Assessor's handbook) (DELWP 2017c) provides clarification regarding the application of the Guidelines.

### 2.3.2.1 Assessment Pathway

The Guidelines manage the impacts on biodiversity from native vegetation removal (DELWP 2017a). 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. The location category (1, 2 or 3) has been determined for all areas in Victoria and is available on DELWP's Native Vegetation Information Management (NVIM) Tool (DELWP 2020c). Determination of assessment pathway is summarised in Table 1.

**Table 1.** Assessment pathways for applications to remove native vegetation (DELWP 2017b)

Extent		Location		
		1	2	3
Native Vegetation	< 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.

### 2.3.2.2 Vegetation Assessment

Native vegetation (as defined in Table 2) is assessed using two key parameters: extent (in hectares) and condition. For the purposes of this assessment, both extent and condition were determined as part of the habitat hectare assessment (Section 2.3.1).

In addition, all mapped wetlands (based on the DELWP 'Current Wetlands' layer) must be included as native vegetation, with the modelled condition score assigned to them (DELWP 2017b).

**Table 2.** Determination of remnant native vegetation (DELWP 2017a)

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.	Measured in hectares. Based on hectare area of the native patch.	Vegetation Quality Assessment Manual (DSE 2004). OR Modelled condition for Current Wetlands
	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 <i>Current Wetlands map</i> , available in DELWP systems and tools		

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

Category	Definition	Extent	Condition
Scattered tree	A native canopy tree that does not form part of a patch.	Measured in hectares. Each Large scattered tree is assigned an extent of 0.071 hectares (30m diameter). Each Small scattered tree is assigned a default extent of 0.31 hectares (10 metre diameter)	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.

### 2.3.2.3 Tree Assessment

The Guidelines recognises that Large Trees are important environmental assets, and these can be found in habitat zones, or as relicts of vegetation that formerly occupied the site (scattered trees). Small trees (i.e. not Large trees) are also considered to be environmental assets. The following benchmark Diameter at Breast Height (DBH) measurements apply to Large and Small trees within the EVCs present within the site (Table 3).

**Table 3.** Large and Small Tree benchmark measurements for EVCs within the study area

Bioregion	Ecological Vegetation Class	Large Tree DBH (cm)	Small Tree DBH (cm)
Wimmera	Plains Woodland (EVC 803) – Eucalypt sp.	≥ 70	< 70
Wimmera	Plains Woodland (EVC 803) - Buloke	≥ 40	< 40
Wimmera	Plains Savannah (EVC 826)	≥ 40	< 40

### 2.3.2.4 Impact Avoidance and Minimisation

All applications to remove native vegetation must demonstrate the three step approach of avoid, minimise and offset. This is a precautionary approach that aims to ensure that the removal of native vegetation is restricted to what is reasonably necessary, and that biodiversity is appropriately compensated for any native vegetation removal that is approved.

### 2.3.2.5 Offsets

Offsets are required to compensate for the permitted removal of native vegetation.

The offset requirements for native vegetation removal are calculated by DELWP, based on the vegetation condition scores as determined by the habitat hectare assessment. Details regarding the offset requirements for the Wimmera Plains Energy Facility are provided in Section 3.5, and Appendix 5.

### 2.3.3 Targeted Flora Surveys

Based on the outcomes of the desktop assessment, targeted surveys for significant flora species, and species listed or protected under the FFG Act (aside from Buloke *Allocasuarina leuhmannii*) were undertaken during the habitat hectare assessments conducted between 22 – 25 January 2019 and 22 – 25 October 2019 to determine their presence or absence within the study area.

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

### 2.3.4 General Fauna Assessment

Initial fauna surveys were undertaken concurrently with the vegetation assessment undertaken in January 2019, as well as during the bird utilisation surveys.

The study area was visually assessed and active searching under and around ground debris for reptiles, frogs and small mammals was undertaken. Binoculars were also used to scan the area for birds, and observers listened for calls and searched for other signs of fauna such as nests, remains of dead animals, droppings and footprints. Potential habitat for fauna was assessed, with a particular emphasis on waterbodies and other habitats that may provide shelter, food or other resources for significant species.

At most locations, assessment was made on foot by walking into the areas considered likely to support the highest-quality and representative habitat (judgement based on aerial imagery and prior field experience). Zoologists remained adaptable in the field, and opportunistically included other nearby areas in the investigation if those areas were thought to provide higher quality habitat or help provide information on fauna that might use the project boundary. Photographs were taken at locations as a record of the habitats encountered. Observations of threatened species were recorded at locations if seen/heard.

### 2.3.5 Avifauna and Bat Assessments

#### 2.3.5.1 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 methods employed for the proposed Wimmera Plains Wind Farm bird utilisation surveys have been 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 study area;
- The frequency with which each of those species use the study area;
- The height at which each of these species fly in the study area; and,
- The distribution of these species across the landscape.

Bird utilisation surveys are a minimum requirement for all wind farm sites and are used to inform the design of higher-level investigations, if required.

Fixed point bird counts were initially undertaken in late February/early March 2019, June and August 2019, and October 2019 with eight fixed locations (six within the study area and two outside the study area) (Figure 6).

#### 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:

**ADVERTISED  
PLAN**

- 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, and indicative bird utilisation surveys 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.

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. 10 × 42 binoculars were used to identify the bird to species, or for some species, generic level (e.g. non-calling Raven species).

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

- Eight locations were established at which to undertake fixed point counts, with two of these located outside of the study area. The locations chosen were to ensure that the entire study area was sampled and that a range of habitat types represented in that sample (Figure 6a and Figure 6b);
- 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 eight times over the course of 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 study area were also recorded. Where suitable habitat for wading birds and other waterbirds was observed, this habitat was surveyed for these species as per the "Significant Impact Guidelines for 36 Migratory Shorebird Species" (DEWHA 2009).



This approach will also enable the detection of rare and threatened species and species with specialised habitat requirements. Parts of the study area that have potentially suitable habitat for these rare or threatened species will be targeted to ensure that these species were not overlooked.

As agreed with DELWP, (see Table 5) a total of three Bird Utilisation surveys were conducted at Wimmera Plains Wind Farm (Table 4).

**Table 4.** Bird utilisation survey dates

Survey #	Survey dates
Survey #1 (Summer/Autumn)	February 13-15 2019
	March 12-14 2019
Survey #2 (Winter)	June 11-13 2019
	August 14-16 2019
Survey #3 (Spring)	October 2-5 2019

### 2.3.5.2 Statistical Analyses

Species accumulation curves were generated from the point count data and are 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 study area.

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 with the EstimateS 9.1.0 program, using the Michaelis–Menten richness estimator (MMMeans) using 1000 runs and estimates of 85, which uses the ratio of species seen once (singletons) to the species seen more than once (doubletons) to predict species richness (Raaijmakers 1987; Colwell 2004; Colwell 2013).

Two bird count locations from the Summer/Autumn surveys (Site 7 and 8), and Site 1 from the Winter and Spring surveys were excluded from the analysis given their locations were outside the study area and within habitat not representative of the study area (e.g. riparian area along Yarriambiack Creek). Adding these records may increase variation across samples due to the differences in substantial differences in habitat quality. Therefore, the analysis was based on 85 bird point counts and 83 bird species.

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

- ground;
- Below RSA (1–84 metres);
- Within RSA (between 85 - 247 metres); and,
- Above RSA (> 247 metres).

### 2.3.5.3 Brolga Surveys

The *Interim Guidelines for the Assessment of Potential Windfarm Impacts on the Brolga* (DSE 2012) establish a stepped approach to determining the use of a proposed wind farm site by Brolga to assess the likely impact of the development on this species. Level 1 Assessments are triggered by the presence of Brolgas or their habitat

within the proposed area (DSE 2012). Level 2 Assessments are triggered by the use of the proposed site by Brolgas for nesting or flocking or an assessment that the development may create a barrier between such areas (DSE 2012). The final step is a Level 3 Assessment, which if triggered, should mitigation measures, based on the findings of the Level 2 Assessment, not satisfy the DELWP's goal of a "zero net impact" on Victorian Brolga populations (DSE 2012).

### **2.3.5.3.1 Consultation with landowners**

Landholders within the study area were contacted by Ecology and Heritage Partner staff to seek further information about Brolga habitat and confirm past records within the local area. Where potential habitat was identified, an assessment of habitat was conducted within these properties to its potential to support Brolgas in the future.

### **2.3.5.4 Microbat Surveys**

Anabat bat detectors linked to CF Storage Zcaims (Titley Electronics, Ballina NSW) are the standard equipment used to survey microbat species. These instruments record the high frequency echolocation calls produced by microbats when they are in flight, and save these calls directly to a memory card. Different bat species produce distinguishable calls; therefore, detectors can be used to identify the species present in a given area. However, there is considerable variation within and between species, and all call identification needs to be undertaken by qualified personnel who have access to reference calls for that region and experience in identifying call characteristics.

Depending on the bat species and how far it projects its call, Anabat detectors can typically detect bat echolocation calls at between five and 20 metres. 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 emitting the calls is not known.

It is noted that the canopy height throughout most of the study area is less than 20 metres in height meaning that the detection of some species of bats may not be possible using Anabat technology. However, given that no known populations of significant bat species are known to occur within the broader locality, it is likely that only common bat species that fly at a height outside the detectability range were not captured, rather than any significant species.

AnaBat bat detectors were deployed throughout the study area during the following two survey periods:

- Survey 1: between 14 and 21 February 2019 - six units – data recorded for between five (5) and eight (8) nights; and,
- Survey 2:- between 10 and 18 October 2019 (five units – data recorded for between two (2) and nine (9) nights.

Units were placed in area likely to be utilised by foraging bats, for example adjacent to farm dams, near remnant native vegetation (e.g. along waterways) and planted wind rows. Where possible, they were placed within the forks of trees or branches at a height of at least 1.4 metres to allow call detectability over a greater height.

Locations of survey sites are provided in Figure 7.

A total of 56 bat detector nights (i.e. the total number of detectors by the total number of nights, excluding nights where detectors malfunctioned) were undertaken during the current surveys.

**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**

## Call Analysis

Identification of bat calls collected throughout the Wimmera Plains Wind Farm site 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 Southern Bent-Wing Bat and/or Yellow-bellied Sheath-tail Bat.

If one of the call complex cohorts (Little Forest Bat *Vespadelus vulturnus* or Chocolate Wattled Bat *Chalinolobus morio*) was positively identified it was recorded as present once only. A filter was also run for calls in the frequency range of Yellow-bellied Sheath-tail Bat.

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 Anabat call analysis is provided in Section 3.2.3 and Appendix 4.

## 2.4 Consultation

DELWP was consulted throughout 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.

Table 5 summarises the stakeholder liaison activities that occurred during the pre-application process in relation to ecology, and a summary of the outcomes of each meeting.

**Table 5.** Stakeholder engagement activities undertaken in relation to ecological investigations.

Activity	Date	Matters Discussed	Outcomes
Meeting with DELWP (Ballarat)	13/02/2019	<ul style="list-style-type: none"> <li>Proposed development options;</li> <li>Broad planning framework;</li> <li>Potential ecological survey requirements;</li> <li>Potential requirement for additional studies (noise, CH, visual impact).</li> </ul>	<ul style="list-style-type: none"> <li>DELWP keen to ensure bird utilisation surveys capture potential presence of Masked Owl and Black Falcon;</li> <li>Presence of Spiny Rice-flower and/or Turnip Copperburr;</li> <li>Proposed retention of all Buloke within the study area;</li> <li>Requirement to undertake an additional habitat hectare survey in Spring to capture the presence of additional native vegetation.</li> </ul>

Activity	Date	Matters Discussed	Outcomes
Meeting with DELWP (Ballarat)	30/04/2019	<ul style="list-style-type: none"> <li>Ecological survey findings to date;</li> <li>Proposed timing and frequency of additional ecological surveys to be undertaken;</li> </ul>	<ul style="list-style-type: none"> <li>DELWP generally happy with proposed survey timing and schedule;</li> <li>Additional Spring habitat hectare survey (after rain) to be conducted;</li> <li>All parties acknowledge that Spiny Rice-flower and Wimmera Rice-flower unlikely to be present;</li> <li>DELWP agreement that 3 bird utilisation surveys are sufficient (summer not necessary);</li> <li>Acknowledge presence of potential habitat for Masked Owl and Black Falcon along Yarriambiack Creek corridor;</li> <li>All parties acknowledge that study area outside range of Red-tail Black Cockatoo.</li> </ul>

## 2.5 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 area. 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 area) were considered to determine a species' likelihood of occurrence within the project area.

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 6 and Table 7 respectively.

The results of the likelihood of occurrence assessment for listed flora and fauna species are provided in Appendices 1.2 and 2.2, respectively.

**Table 6.** Decision guidelines for determining a flora species likelihood of occurrence within the study area.

Likelihood of occurrence	Decision guidelines
<b>1 – Known occurrence</b>	Recorded within the project area recently (i.e. within 10 years).
<b>2 - High</b>	Previous records of the species in the local vicinity; and/or, the project area contains areas of high-quality habitat.
<b>3 – Moderate</b>	Limited previous records of the species in the local vicinity; and/or, the project area contains some characteristics of the species' preferred habitat.
<b>4 – Low</b>	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.
<b>5 – Unlikely</b>	No potential habitat and/or outside the species range.

**Table 7.** Decision guidelines for determining a fauna species likelihood of occurrence within the study area.

Likely presence or use of the project area	Decision guidelines
<b>1 – Known occurrence</b>	Recorded within the project area recently (i.e. within 10 years).
<b>2 - High</b>	Likely resident in the project area 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 area contains the species' preferred habitat.
<b>3 - Moderate</b>	The species is likely to visit the project area regularly (i.e. at least seasonally); and/or, previous records of the species in the local area; and/or, the project area contains some characteristics of the species' preferred habitat.
<b>4 - Low</b>	The species may visit the project area 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 area contains few or no characteristics of the species' preferred habitat.
<b>5 - Unlikely</b>	No previous records of the species in the local area; and/or, the species may fly over the project area when moving between areas of more suitable habitat; and/or, out of the species' range; and/or, no suitable habitat present.

## 2.6 Assessment Qualifications and Limitations

### 2.6.1 Vegetation Surveys

Data and information held within the ecological databases and mapping programs reviewed in the desktop assessment (e.g. VBA, PMST, Nature Kit Maps etc.) are unlikely to represent all flora and fauna observations within, and surrounding, the study area. It is therefore important to acknowledge that a lack of documented records does not necessarily indicate that a species or community is absent.

Ecological values identified on site are recorded using a hand-held GPS or tablet with an accuracy of +/-5 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.

Only the land identified as 'Study Area' as shown in Figure 2 was assessed as part of the field assessments.

The field assessments were undertaken over multiple seasons during 2019 to maximise the likelihood of detection for patches of native vegetation, and significant flora and fauna species. As such, it is considered that sufficient effort has been employed to determine the likelihood of significant species occurring within the study area, and to accurately characterise the flora and faunal values present.

Therefore, it is considered that 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.

### 2.6.2 Bird Utilisation Surveys

Although the surveys were undertaken during an optimal time of year (late spring/early summer) and during suitable weather conditions, it is possible that vagrant and rare species were overlooked due to the limited nature of the surveys. The calculation of completeness provides an indication that a high proportion of the species available to be detected. Weather during the study varied from hot and humid, to cold and windy.

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.

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.

#### **2.6.2.1 Study Area boundary changes**

In July 2019, Ecology and Heritage Partners were notified by BayWa r.e. Wind that the study area was being expanded to an area west of the Henty Highway. This resulted in some bird utilisation survey points established during the February/March 2019 surveys being relocated from existing points east of the Henry Highway into areas of similar habitat type further west to account for the change in area during the Winter and Spring 2019 bird utilisation surveys (Figure 6a and 6b).

#### **2.6.3 Microbat Surveys**

A total of six Anabat units were deployed for the February 2019 microbat survey with all units recording data over multiple nights. During the October 2019 Anabat survey, a total of five Anabat units were deployed, with one unit malfunctioning (Site 5), Site 1 unit not recording any data, and the Site 3 unit recording very little data.

Where possible, Anabat detectors were placed in trees above ground. However, some detectors were located at ground level. The placement of detectors directly on the ground created some complications for analysis as the location of Anabats might also have resulted in fewer calls than if the detectors were mounted closer to the height at which the bats fly. Weller and Zabel (2002) found detectors placed at a height of 1.4 metres recorded 30% more calls than those placed on the ground. However, placement of detectors at ground-level is common practice, and was considered appropriate in this instance, given the limited options for raising detectors closer to the height of bat flight during the remote surveys.

Despite the above limitations it is considered that the methodologies applied during the current surveys, and the duration and intensity of the surveys were sufficient to provide an accurate assessment of the microbat species utilising the wind farm area.



## 3 RESULTS

Forty-six (46) flora species (24 indigenous and 22 non-indigenous or introduced) were recorded within the project area during the field assessment. Two State significant flora species; Buloke *Allocasuarina luehmannii* and Buloke Mistletoe *Amyema linophylla* subsp. *orientalis* were recorded during the field survey. Scattered occurrences of Fuzzy New Holland Daisy *Vittadinia cuneata* and Lemon Beauty-heads *Calocephalus citroides* are present within the road reserves. Both Fuzzy New Holland Daisy and Lemon Beauty-heads area protected under the FFG Act as a member of the Asteraceae (daisy) family.

Native vegetation in the study area is representative of three EVCs within the project area; Plains Savannah (EVC 826), Plains Woodland (EVC 803) and Plains Grassland (EVC 132).

A total of 11.03 hectares of native vegetation patches, and 439 scattered trees, comprising 158 Large scattered trees and 281 Small scattered trees occur throughout the project area.

### 3.1 Vegetation Condition

#### 3.1.1 Native Patches within the Project Area

Though the landscape has been heavily cleared for agricultural production, numerous stands of trees remain scattered throughout paddocks, within the roadside reserves and, along rivers, creek lines and property boundaries. Native vegetation in the study area is representative of three EVCs within the project area; Plains Savannah (EVC 826), Plains Woodland (EVC 803) and Plains Grassland (EVC 132), along with native scattered trees.

A total of 11.03 hectares of native vegetation is present within the project area (Table 8).

The native vegetation present was primarily restricted to the road reserves within the study area, in the form of a native grass understory. Scattered trees were recorded across the study area, with some larger clusters present (Figure 2). The main tree species recorded was Buloke *Allocasuarina luehmannii*, which is a Listed species under the FFG Act and requires a permit for removal from public land (e.g. road reserves).

A summary of the results of the vegetation assessments are given in Table 8 and Table 9, which outlines the type and extent of each EVC recorded, and scattered native trees (large and small) within the project area.

**Table 8.** Summary of the extent of native vegetation within the project area

EVC	Conservation status	Area (hectares) or total	Comments
Plains Savannah (EVC 826)	Endangered	7.64 ha	Dominated by native grasses, including wallaby-grass <i>Rytidosperma</i> sp. and spear-grass <i>Austrostipa</i> sp. Occasional presence of herbs and/or chenopods.
Plains Woodland (EVC 803)	Endangered	2.70 ha	Exhibited low diversity and within the study area, was characterised by a canopy of Buloke and understory of exotic grasses.
Plains Grassland (EVC 132)	Endangered	0.69 ha	Typically exhibited a low diversity native grassland with (Spear-grass and/or Wallaby-grass) with few to no herbs.

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

## Plain Savannah

This EVC is generally associated with structurally diverse vegetation which includes ‘grassy openings’ of a few to many hundreds of hectares, with a variable tree density ranging from a very sparse savanna to woodland (DELWP 2020d).

Plains Savannah was recorded within the road reserves throughout the study area (Figure 2). Habitat zones were similar in structure to Plains Grassland patches (see below) supporting a 25-40% cover of indigenous perennial grasses, in particular wallaby Grass *Rytidosperma* spp. and Plump Spear-grass *Austrostipa aristiglumis*, with minor occurrences of Rough Spear-grass *Austrostipa scabra* (Plate 1). A higher diversity of herbs and chenopods was generally present including Wingless Bluebush *Maireana enchylaenoides*, Berry Saltbush *Atriplex semibaccata*, Grey Copperburr *Sclerolaena diacantha*, Grey Germander *Teucrium racemosum* and Fuzzy New Holland Daisy *Vittadinia cuneata* (Plate 2). No shrub or tree layer was present.

All habitat zones were highly modified and generally of low quality due to agricultural disturbance (ploughing) which was evident within the road reserves.

The study area contains 37 small, discrete patches of Plains Savannah, encompassing an area of approximately 7.64 hectares (Figure 2; Table 8).



**Plate 1.** Thin strip of Plains Savannah within the study area (Ecology and Heritage Partners Pty Ltd 22/01/2019).



**Plate 2.** Specimen of Grey Germander (Ecology and Heritage Partners Pty Ltd 23/01/2019).

## Plains Woodland

Plains Woodland is characterised by a Buloke and/or eucalypt canopy to 15 metres tall, with a grassy or sedgy understory in areas receiving <600 millimetres of rainfall per annum. The soils, sometimes seasonally waterlogged, are fertile with silty, loamy or clay topsoils, with heavy subsoils. A benchmark example of this EVC can support a range of annual or geophytic herbs adapted to low summer rainfall (DELWP 2020d).

Typically, patches of Plains Woodland recorded within the study area are defined by a young Buloke dominated canopy often in small (<1 hectare) isolated patches within paddocks and roadsides. The understory lacks diversity evidently caused by farming and grazing, and is typically dominated by Barley Grass *Hordeum* sp., Wild Oat *Avena fatua*, Common Millet *Panicum capillare* var. *occidentale*, Perennial Rye-grass *Lolium perenne* and Squirrel-tail Fescue *Vulpia bromoides*. Some patches supported occasional, scattered specimens of native grasses such as Bristly Wallaby-grass *Rytidosperma setacea* and Rough Spear-grass *Austrostipa scabra*. These

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

**ADVERTISED  
PLAN**

areas are identified as PW1 (Figure 2; Plate 3; Plate 4. However, the majority of patches were almost entirely comprised of exotic grasses in the understory with no natives observed.



**Plate 3.** Patch of Plains Woodland (PW<sub>1</sub>) within the study area (Ecology and Heritage Partners Pty Ltd 25/01/2019).



**Plate 4.** Patch of Plains Woodland (PW<sub>1</sub>) within the study area (Ecology and Heritage Partners Pty Ltd 25/01/2019).

### Plains Grassland

Plains Grassland is a typically treeless EVC dominated by a diversity of (predominantly) grasses, and herbs (DELWP 2020d).

Due to the intensity of agricultural practices throughout the region and study area, patches of Plains Grassland are highly modified and typically represented by a monoculture of grass likely to have recruited from seed after agricultural disturbance in small isolated patches. Often, these patches were defined by a cover of 25-40% cover of Spear grasses intermixed through weedy crop species such as Barley grass and Wild Oat, and weedy herbs such as Ox-tongue *Helminthotheca echoides*, Cape Weed *Arctotheca calendula*, Paterson's curse *Echium plantagineum* and Milk thistle *Silybum marianum*. All patches within the study area were of poor quality. However, a high quality remnant is present outside the study area in the road reserve of Greenhills Rd (Figure 2h).





**Plate 5.** Plains Grassland within Greenhills Road (Ecology and Heritage Partners Pty Ltd 25/01/2019).



**Plate 6.** Plains Grassland within Greenhills Road (Ecology and Heritage Partners Pty Ltd 25/01/2019).

### 3.1.2 Scattered Trees and Large Trees in patches

A total of 439 scattered trees, comprising 158 Large scattered trees and 281 Small scattered trees occur throughout the project area (Table 9). These trees would once have been part of the Plains Woodland or Plains Savannah EVC, although the understorey vegetation consists of predominantly introduced species (mainly exotic pasture grasses) and the trees no longer form a patch of native vegetation.

A total of two Large Trees (Buloke) in patches were also recorded. However, these were the exception, with the remaining specimens observed consisting of young Buloke with an average diameter at breast height (DBH) of 25 centimetres.

**Table 9.** Summary of scattered trees within the project area.

Common Name	Species Name	Large Tree	Small Tree	Total
Buloke	<i>Allocasuarina luehmannii</i>	149	255	<b>404</b>
Grey Box	<i>Eucalyptus microcarpa</i>	5	13	<b>18</b>
Slender Cypress-Pine	<i>Callitris gracilis</i> spp. <i>murrayensis</i>	0	1	<b>1</b>
River Red-gum	<i>Eucalyptus camaldulensis</i>	0	10	<b>10</b>
Stag		4	2	<b>6</b>
<b>Total</b>		<b>158</b>	<b>281</b>	<b>439</b>



**Plate 7.** Scattered Buloke within the study area (Ecology and Heritage Partners Pty Ltd 23/10/2019).



**Plate 8.** Scattered Buloke within the study area (Ecology and Heritage Partners Pty Ltd 22/10/2019).

### 3.1.3 Introduced and Planted Vegetation

#### Introduced Vegetation

Areas not supporting remnant native vegetation had a high cover (>98%) of exotic grass species, many of which had been direct-seeded for use as cereal crop (Plate 9; Plate 10; Plate 11). Scattered native grasses were occasionally present on the periphery of these cropped areas (i.e. road reserves), however they did not have the required 25% cover to be considered a native patch (except where mapped in Figure 2). Disturbed areas were dominated by environmental weeds such as Barley *Hordeum* spp., Rye-grass *Lolium* spp., Brome *Bromus* spp., Fescue *Vulpia* spp., Oat *Avena* spp., Wild Turnip *Brassica* spp., Sow Thistle *Sonchus oleraceus* Silverleaf Nightshade *Solanum elaeagnifolium* and Wild Sage *Salvia verbenaca* (Plate 11 ;Plate 12). The noxious weed Horehound was present within the study area, with scattered occurrences primarily located within the road reserve.



## Planted Vegetation



**Plate 9.** Paddock dominated by cereal crop (Ecology and Heritage Partners Pty Ltd 23/01/2019).



**Plate 10.** Degraded roadside vegetation dominated by Oat and Sow Thistle (Ecology and Heritage Partners Pty Ltd 24/01/2019).



**Plate 11.** Wild Sage dominating the ground layer within the project area (Ecology and Heritage Partners Pty Ltd 23/10/2019).



**Plate 12.** Silverleaf Nightshade in the road reserve (Ecology and Heritage Partners Pty Ltd 25/01/2019).

Planted vegetation in the study area consisted of exotic and non-Victorian tree species, commonly Sugar Gum *Eucalyptus cladocalyx*, Swamp Mallet *Eucalyptus spathulata* subsp. *spathulata*, Yate *Eucalyptus megacornuta*, Black Box *Eucalyptus largiflorens*, Sheoak *Allocasuarina* spp., Bottlebrush *Callistemon* spp. and Wattle *Acacia* spp. in windrows within the Henty Highway road reserve, road reserve of Greenhills Road, as well as around dwelling and outbuildings.

### 3.1.4 Native Vegetation as the Swept Path Intersections

#### 3.1.4.1 Henty Highway and Dimboola-Minyip Road

Moderate to high quality Plains Savannah was recorded immediately south of the Dimboola-Minyip Road (Figure 2i)). In contrast to the Plains Savannah within the project area, these patches supported an overstory of River Red Gum, Buloke and Grey Box throughout, and a diverse understory of indigenous perennial grasses including Wingless Bluebush, Berry Saltbush, Grey Germander and Fuzzy New Holland Daisy (Plate 13).



Several Large Trees and scattered trees were also present (Figure 2i).

The Henty Highway road reserve north of Dimboola-Minyip Road was degraded and exhibited evidence of previous ground disturbance (Plate 14).



**Plate 13.** Fuzzy New Holland Daisy in the road reserve study area (Ecology and Heritage Partners Pty Ltd 26/03/2020).



**Plate 14.** Disturbed roadside with overstorey present in the background (Ecology and Heritage Partners Pty Ltd 26/03/2020).

#### 3.1.4.2 **Glenelg Highway and Portland – Casterton Road**

No native vegetation was present within the immediate road reserve at the Glenelg Highway and Portland – Casterton Road intersection. The groundlayer was dominated by exotic grass including Couch *Cenchrus clandestinus* and Caterpillar Grass *Paspalum dilatatum* and planted native and non-native trees including Yate *Eucalyptus cornuta*, Cherry Blossom *Prunus* sp., and Bottle Bush *Callistemon* sp. (Plate 15; Plate 16).



**Plate 15.** Exotic grass within the road reserve (Ecology and Heritage Partners Pty Ltd 16/03/2020).



**Plate 16.** Exotic grass and planted trees within the road reserve (Ecology and Heritage Partners Pty Ltd 16/03/2020).

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

## 3.2 Fauna Survey Results

### 3.2.1 Fixed Point Bird Counts (and incidental observations)

#### Overview

Ninety-three (93) bird species were recorded, consisting of 799 individuals, during the fixed point bird counts. Two other species were identified to generic level (i.e. Raven species, either Little Raven *Corvus mellori* or Australian Raven *C. coronoides* and Raptor species). Six introduced species were recorded, including Blackbirds, House Sparrows and Starlings. No nationally significant species were recorded within the study area which includes the Level 1 assessment for Brolgas, with no Brolgas observed to date (see Section 3.2.2). However, it is noteworthy to mention the Black Falcon *Falco subniger* was recorded twice within the study area. This species has been assessed as nationally data deficient by the Threatened Species Scientific Committee and is listed under the *Flora and Fauna Guarantee Act 1988*.

A number of other bird species, were also recorded (see Table 11 for full species list) including:

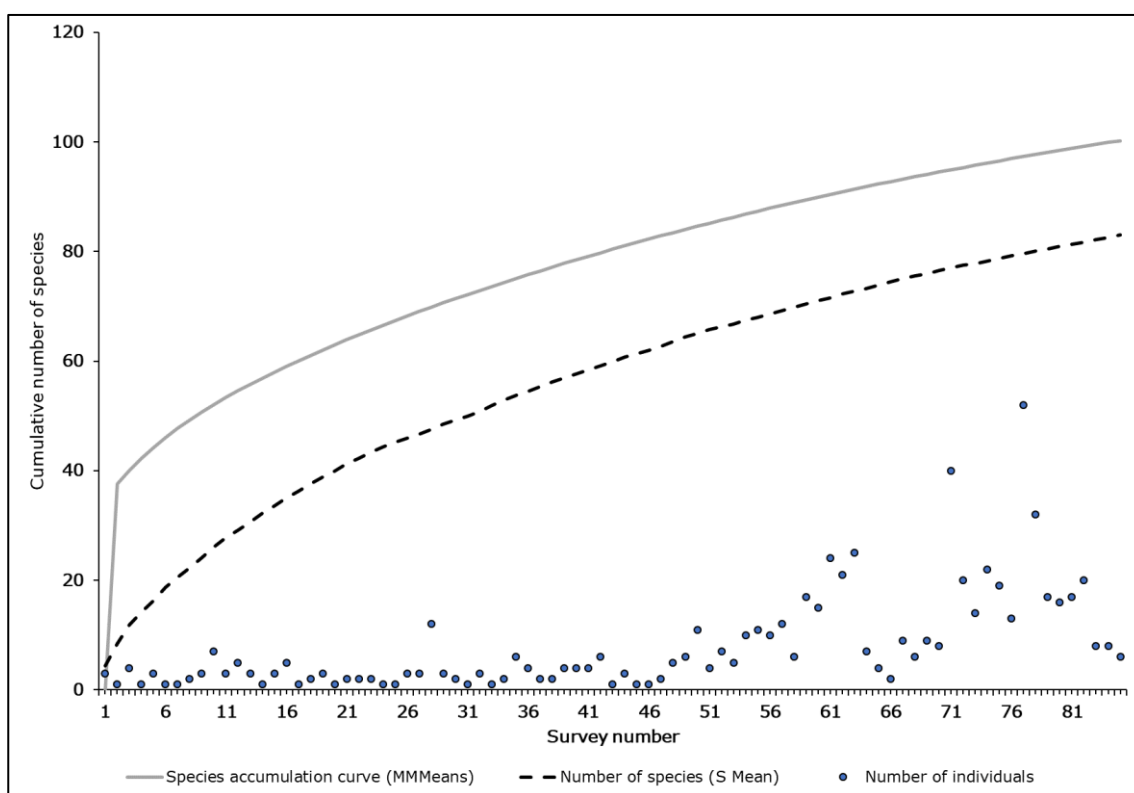
- Generalist bird species common in open, agricultural areas such as Sulphur-crested Cockatoo, Australian Magpie and Australian Raven;
- Woodland bird species using scattered trees and larger patches of native vegetation around the site such as Singing Honeyeaters, Australasian Pipits, Blue-winged Parrots, Gilberts Whistler, Black-faced Cuckoo-shrike, Yellow-tailed Black Cockatoo and thornbills;
- Open grassy-shrubland species using the swampy farmland within and near road verges including Crimson and White-fronted Chats;
- Water bird species using riparian areas along Yarriambiack Creek, inundated drainage lines along roadside and paddocks including Australian Shelduck and Australian Wood-ducks;
- Raptors foraging over open areas and along the vegetation within the creek line including Brown Falcon, Black-shouldered Kite, Wedge-tailed Eagle and Nankeen Kestrel; and,
- Exotic species including Starlings, House Sparrow and Eurasian Skylark which were widespread across the landscape.

The incidental records include a number of bird species of a similar diversity to species recorded in point bird counts with the addition of White-necked Heron and FFG Act listed Diamond Firetail (recorded outside the study area within Site 1 and Site 7, respectively). It is also noted that habitats adjacent to the study area (particularly Sites 7 and 8 – February/March 2019 surveys – Figure 6a) offer a variety of riparian and (extensive) woodland habitats which generally harboured highly diverse bird assemblages (e.g. waterbird, raptors, parrots, honeyeaters). These species, whilst typically habitat specialists, may utilise the additional foraging resources within the adjacent agricultural paddocks and/or utilising the scattered trees and habitat patches within the study area to move across the landscape.

Farmland specialists, typical of agricultural environments in Victoria, comprised most of the species observations during the survey period (Australian Magpie 14%, Eurasian Skylark 12%, Brown Songlark 11% and Ravens [Little and Australian] 11%). All of these species are common birds of agricultural environments in southern Victoria. These species made up a combined 47% of all birds recorded during the surveys.

## Species Richness

The predicted species richness estimate for the point count surveys was 105 species, which converts to a completeness of 89% and means that approximately 12 unknown species were present in the study area during the study period, but not recorded during this survey. Furthermore, the study area did not appear to reach asymptote (or plateau) after almost a year of survey. The results reflect the varied species richness, abundance of species, habitat type, time of year studied and potentially other factors (such as inclement weather reducing presence of species). Spill-over from species from the riparian and high-forested areas may contributed to the continued increase in species richness over time. Despite the variation in data, there is still a clear relationship between effort and the number of species detected (Graph 1).



**Graph 1.** Species accumulation curve across the entire survey period. Note that the two riparian locations from the February / March 2019 survey (Site 7 and 8), and site 1 (from the Winter and Spring surveys) were excluded from the analysis.

## Flight Heights

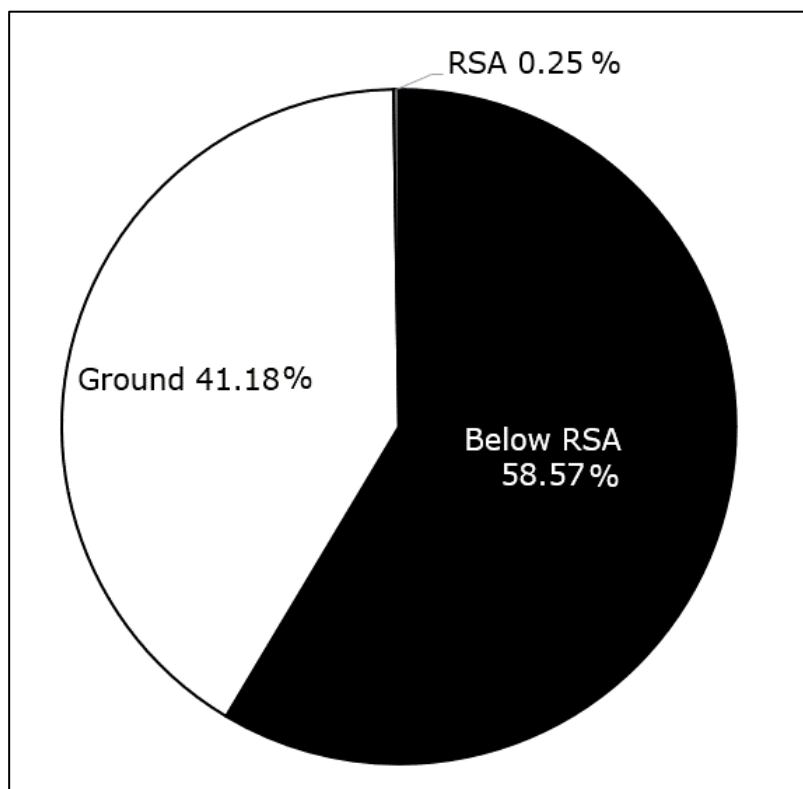
The majority of bird species observed (99%) during the point counts were either recorded on the ground or flying below the RSA (Graph 2; Table 10). Only 0.25% of bird species were in the RSA, including raptors Brown Falcon *Falco berigora* and Black Falcon *Falco subniger* (seen hovering over the study area, and perching in scattered paddock trees).

**Table 10.** Summary of birds recorded at the varying flight heights

Flight Height	# of birds	% of birds
Ground (0-1 metres)	329	41.18

**ADVERTISED  
PLAN**

Flight Height	# of birds	% of birds
Below RSA (1-84m)	468	58.57
RSA (85-257m)	2	0.25
Above RSA (>247m)	0	0



**Graph 2.** Percentage of birds recorded below (RSA), at or, above rotor swept area (RSA) height (85 – 247 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.

While not observed at RSA height, Wedge-tailed Eagles *Aquila audax* were recorded nesting within the study area in a Buloke patch and are likely to fly at and above RSA when foraging. Large parrots, including Yellow-tailed Black Cockatoo *Calyptorhynchus funereus* and Sulphur crested cockatoos *Cacatua galerita*, whilst recorded below RSA, may also fly in the RSA as they move daily between roosts and feeding areas.

Generally, non-passerine birds such as raptors, wetland/waterbirds and parrots generally 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 RSA is provided in Table 11.

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



**Table 11.** Number of instances of bird species recorded in Point Count Surveys classified according the RSA at which they were detected (excluding incidental records).

Species	Below RSA	Ground	RSA	Total
Australasian Pipit	14	19		33
Australian Hobby	2			2
Australian Magpie	65	43		108
Australian Magpie	15	10		25
Australian Raven	31	11		42
Australian Shelduck	1	1		2
Australian Wood Duck	1	1		2
Black-faced Cuckoo Shrike	3	1		4
Black Falcon	1		1	2
Blackbird	1			1
Black-eared Cuckoo	1	1		2
Black-Faced Woodswallow	3			3
Black-shouldered Kite	1			1
Blue Winged Parrot	2			2
Brown Falcon	16		1	17
Brown-headed Honeyeater	1			1
Brown Quail		1		1
Brown Songlark	51	34		85
Brown Thornbill	2			2
Brown Treecreeper	1			1
Buff-rumped Thornbill	2			2
Common Bronzewing		3		3
Common Starling	4			4
Common Starling	4	1		5
Crested Pigeon	9			9
Crested Shrike-tit	1			1
Crimson Chat	10	2		12
Crimson Rosella	3			3
Dusky Woodswallow	1			1
Eastern Rosella	1	1		2
Eurasian Skylark	7	92		99
Eurasian Tree Sparrow	2	1		3
Fantailed Cuckoo		1		1
Flame/Scarlet Robin	3			3
Ilsecocks Honeyeater		1		1

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

Species	Below RSA	Ground	RSA	Total
Galah	18	1		19
Gilbert's Whistler	1			1
Golden Whistler		2		2
Grey Fantail	1			1
Grey-Shrike Thrush	1	5		6
Horsefields Bushlark		2		2
House Sparrow	12	2		14
Jacky Winter	1			1
Kookaburra		5		5
Little Raven	30	13		43
Magpie Lark	1	5		6
Masked Lapwing		1		1
Masked Woodswallow	5	1		6
Musk Lorikeet	3	1		4
Nankeen Kestrel	12	1		13
Nankeen Kestrel	3			3
New Holland Honeyeater		1		1
Pacific Black Duck	1			1
Peaceful Dove		8		8
Pied Butcherbird	1			1
Pied Currawong	1			1
Rainbow Lorikeet	1			1
Raptor	1			1
Raven	1			1
Red-rumped Parrots		1		1
Red Wattlebird	10	1		11
Red-winged Parrots		1		1
Restless Flycatcher		1		1
Rufous Songlark	23	15		38
Rufous Whistler	1			1
Singing Honeyeater	5			5
Spotted Pardalote		1		1
Spotted Turtle Dove	1			1
Starling	13	1		14
Striated Pardalote	2	3		5
Stubble Quail	2	2		4
Stubble Quail		2		2

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



Species	Below RSA	Ground	RSA	Total
Sulphur Crested Cockatoo	1	1		2
Superb Fairy-wren		2		2
Wedge-tailed Eagle	2			2
Welcome Swallow	2			2
White-browed Woodswallow	5	2		7
White-eared Honeyeater	1			1
White-fronted Chat	11	3		14
White-necked Heron	1			1
White-plumed Honeyeater	3	2		5
White Throated Gerygone		2		2
White Winged Chough	2	2		4
White Winged Triller	1			1
White-eared Honeyeater	1			1
White-fronted Honeyeater	1			1
White-naped Honeyeater		4		4
Willy Wagtail	14	6		20
Yellow-rumped Thornbill	5	4		9
Yellow-tailed Black Cockatoo	2			2
Yellow-faced Honeyeater	5	1		6
Yellow-plumed Honeyeater	1			1

**Note.** Ground 0-1 metres; Below RSA – 1-84 metres; RSA 85-247 metres; Above RSA > 248 metres.

### Raptors

One specimen of both Black Falcon and Brown Falcon were recorded flying within RSA (Table 11). Other raptors observed include Black-shouldered Kite, Wedge-tailed Eagle, Australian Hobby and Nankeen Kestrel (Table 11). While not observed at RSA height, Wedge-tailed Eagle was recorded nesting within the study area in a stand of Buloke and are likely to fly at and above RSA when foraging. Based on the results of the bird utilisation surveys, it is concluded that the proposed wind farm footprint is located within the territory of at least one pair of Wedge-tailed Eagles.

Raptors in general accounted for a low percentage (5%) of birds recorded within and adjacent to the wind farm during the bird surveys, although it is noted that both birds recorded at RSA were raptors (one Black Falcon and one Brown Falcon).

## 3.2.2 Brolga Assessment

### 3.2.2.1 Desktop Interrogation

According to NatureKit (DELWP 2020a), and an interrogation of the Birdlife New Atlas dataset (Birdlife 2019), there is only one known record of Brolga within 20 kilometres of the study area (Figure 5). This record is from

1996 and is located approximately 6.7 kilometres south of the study area boundary at Darlot Swamp Wildlife Reserve.

The South-west Victoria Flocking Site Database shows the nearest flocking site that meets the DELWP criteria for a flocking site (sites where five or more Brolga have been observed during the flocking season (January–May) approximately 34 kilometres east of the development boundary (Figure 5). This site is well beyond the impact of the current development and is not considered further.

The study area is located on the far northern extent of the Victorian distribution range (as indicated in DSE 2012), limiting the likelihood of Brolgas flying across the site when moving between areas of suitable habitat. However, given the presence of a record within 10 kilometres of the development boundary (Figure 5), a Level One Brolga Assessment was undertaken.

### **3.2.2.2 Landholder Liaison**

Ecology and Heritage Partners engaged with a total of 13 landowners who own a combined 33 properties within and adjacent to the vicinity (three kilometres) of the windfarm development boundary. All landowners were contacted by telephone, and where no response was received, landowners were contacted via email.

All landowners indicated that they were not aware of any areas of potential habitat within the local area (aside from Darlot Swamp), nor provided information regarding any recent or historical incidental sightings of Brolga occurring within the local area. As such, no site visits to landowner properties were undertaken (aside from those located within the development boundary).

An assessment of recent aerial photography (NearMap), and a review of the Directory of Important Wetlands database (DAWE 2020b) determined that the local area is highly modified due to agricultural activity, and does not support any potential breeding or flocking Brolga habitat, or any important wetland habitat.

### **3.2.2.3 Field Assessment**

A field assessment was undertaken in February and October 2019 to inspect the quality of potential habitat for Brolga within and adjacent to the wind farm development boundary.

The February 2019 inspections focused on areas known to support previous Brolga records (i.e. Darlot Swamp Wildlife Reserve to the south, and the Wimmera River and Reedy Swamp to the west) (Figure 5), as well as other areas of potential habitat located within 10 kilometres of the study area that were publicly accessible (i.e. Kalkee Recreation Reserve). The October 2019 inspection revisited Darlot Swamp Wildlife Reserve to the south.

At the time of the assessments, no standing water was present at Darlot Swamp Wildlife Reserve, Kalkee Recreation Reserve or Reedy Swamp, and it is considered that no areas within the locality are likely to support moderate or high quality breeding or flocking habitat for Brolga.

### **3.2.2.4 Conclusion**

Based on the absence of potential Brolga breeding and flocking habitat, the paucity of historical Brolga records within the locality based on both a detailed desktop database interrogation, and liaison with local landowners, it is determined that a Level Two Assessment is not required as the risk of impact to Brolga due to the proposed wind farm is low.

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

### 3.2.3 Microbat surveys

#### Desktop Review

The database search of the VBA (DELWP 2018a) contained records for six microbat species; Gould's Wattled Bat *Chalinolobus gouldii*, Chocolate Wattled Bat *Chalinolobus morio*, Southern Freetail Bat *Mormopterus planiceps*, White-striped Freetail Bat *Tadarida australis*, Lesser Long-eared Bat *Nyctophilus geoffroyi* and Little Forest Bat *Vespadelus vulturnus* within a 15 kilometre radius of the study area (Table 12). No significant bat species have previously been recorded within 10 kilometres of the study area (DELWP 2018a).

**Table 12.** Microbat species previously recorded within the wind farm locality (DELWP 2018a).

Microbat species	VBA	Location
White-striped Freetail Bat <i>Tadarida australis</i>	✓	Marma State Forest
Southern Freetail Bat <i>Mormopterus sp4</i>	✓	Barrabool Flora and Fauna Reserve
Gould's Wattled Bat <i>Chalinolobus gouldii</i>	✓	Barrabool Flora and Fauna Reserve
Chocolate Wattled Bat <i>Chalinolobus morio</i>	✓	Barrabool Flora and Fauna Reserve
Little Forest Bat <i>Vespadelus vulturnus</i>	✓	Barrabool Flora and Fauna Reserve
Lesser Long-eared Bat <i>Nyctophilus geoffroyi</i>	✓	Near Wail State Forest

#### Habitat Assessment

A summary of the survey point locations are provided in Figure 7. Attributes associated with habitat features and landscape position is provided in Table 12. Sites were chosen which represented a variety of habitat features and landscape positions that might attract foraging microbats. Many survey points were chosen to be adjacent to mature trees consisting predominantly of Buloke.

#### Anabat Results

No significant bat species were positively recorded. The filter to isolate Southern Bent-wing Bat calls also detected the presence of two other species that call in the same frequency range; Little Forest Bat and Chocolate Wattled Bat. Results of the call analyses for threatened species are presented in Table 14. Survey points where neither threatened species nor any of the call complex species were detected are not included in the table or discussion.

Six bat species were 'positively identified' based on echolocation call analysis (Table 14). These species were determined from analysis of the Anabat bat detector data by Rob Gration of Environmental Consulting Services. A further two groups were identified to complex level and could not be positively assigned to an individual species.

Southern Freetail Bat, followed closely by Gould's Wattled Bat, was the most commonly detected species within the call complex. This species was detected at all survey locations during the sampling period. Chocolate Wattled Bat was detected at nine locations across the sampling period whilst the White-striped Freetail bat, Southern Forest bat and Little Forest bat was only recorded in the Summer sampling period.

**Table 13.** Summary of Anabat survey point locations and habitat features (Figure 7).

Season	Survey point	Dates surveyed	Nights of Data	Habitat features	Landscape position
Feb-19	A2	14/02 - 19/02	5	Scattered Buloke. Unit placed in tree.	Surrounded by open paddock and scattered Buloke
	A3	14/02 - 20/02	6	Scattered Tree	Surrounded by open paddock
	A5	14/02 - 22/02	8	Scattered Buloke	Surrounded by open paddock and scattered Buloke
	A6	14/02 - 19/02	5	Scattered Buloke	Surrounded by open paddock and scattered Buloke
	A7	14/02 - 22/02	8	Scattered Buloke. Unit placed in tree	Surrounded by open paddock and scattered Buloke
	A8	14/02 - 20/02	6	Scattered Tree	Surrounded by open paddock
Oct-19	2	10/10 - 19-10	9	Edge of Eucalypt plantation. Unit placed in tree.	Surrounded by open paddock and scattered Buloke
	4	10/10 - 19-10	9	Scattered Tree	Surrounded by open paddock and scattered Buloke

**Note.** Units 1,3 and 5 from the October 2019 survey have been excluded due to malfunction and/or the paucity of data recorded.

**Table 14.** Summarised Anabat survey results.

Survey timing and location		February						October		
		A2	A3	A5	A6	A7	A8	Site 2	Site 4	Total
Scientific name	Common name	Positively identified								
Calls positively identified (%)		98.4	100	93.99	98.15	91.76	98.7	80	97.75	
Identified to species level		123	71	344	106	423	80	60	87	
Number of files		125	71	366	108	461	81	75	89	
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	45	8	219	13	116	20	22	23	466
<i>Chalinolobus morio</i>	Chocolate Wattled Bat	0	1	2	3	6	1	8	6	27
<i>Mormopterus planiceps</i>	Southern Freetail bat	77	61	121	87	301	59	27	16	749
<i>Tadarida australis</i>	White-striped Freetail Bat	0	1	0	0	0	0	2	2	5
<i>Vespadelus regulus</i>	Southern Forest Bat	-	-	-	-	-	-	0	38	38
<i>Vespadelus vulturnus</i>	Little Forest Bat	-	-	-	-	-	-	1	2	3
Species group identified										
Identified to call complex		2	0	22	2	38	1	15	2	
Percentage		1.6	0	6.01	1.85	8.24	1.23	20	2.25	
<i>Vespadelus darlingtoni</i>										
<i>V. Regulus</i> / <i>V. darlingtoni</i>	Forest Bat sp	0	0	12	2	7	0	6	1	28
<i>Nyctophilus sp</i>	Long-eared Bat	0	0	10	0	31	1	3	0	45

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

**ADVERTISED  
PLAN**

Survey timing and location		February						October		Total
		A2	A3	A5	A6	A7	A8	Site 2	Site 4	
<i>Chalinolobus gouldii</i> / <i>Mormopterus planiceps</i> & <i>ridei</i>	Goulds Watted Bat / <i>Mormopterus</i> sp	-	-	-	-	-	-	6	1	7

### 3.2.4 Fauna Habitats

The study area currently supports low quality habitat for a range of native fauna species, principally species adapted to modified agricultural environments. While native vegetation within the study area has been classified using EVCs, most fauna habitats can encompass a range of similar EVCs. As such, in the following section, habitat types located within the study area have been assigned a general designation by grouping similar EVCs. However, some habitat types do not relate to any EVC (e.g. exotic pasture), due to them not reaching native vegetation thresholds or being based on general habitat characteristics and not vegetation type.

The study area currently supports four broad habitat types: modified grassland; modified woodland/remnant trees; planted vegetation; and exotic pasture grass and crops.

#### 3.2.4.1 Modified Grassland (Corresponding EVC: Plains Grassland/Plains Savannah)

Overall habitat value – Native modified grasslands are of **low** habitat value for fauna. While the majority of remnants in the study area are floristically and structurally deficient, lacking key habitat components such as a diversity of flora species and suitable refuge sites, they are likely to act as ‘stepping stones’ of habitat for more mobile species (principally birds) adapted to modified environments.

Past extensive land clearing has resulted in fragmentation and isolation of this habitat type to mainly road reserves.

Description - This habitat type is largely restricted to road reserves. Characterised by the dominance of native grasses such as Spear Grass and Wallaby Grass, these areas provide key habitat attributes which are otherwise completely lacking in the surrounding area.

Fauna - Due to the highly modified and degraded nature of surrounding habitats, grassland remnants within road reserves are of low quality, and are unlikely to support ground dwelling fauna (i.e. reptiles and mammals) due to the ongoing ground disturbance (ploughing and vehicular movements) these areas are subjected to.

#### 3.2.4.2 Modified woodland and scattered remnant trees (Corresponding EVCs: Plains Savannah; Plains Woodland)

Overall habitat value - Remnant woodland patches are of **low to moderate** habitat value for fauna. While the majority of the remnants within the study area are structurally deficient, lacking key mid-storey and understorey components, they are likely to act as ‘stepping stones’ of habitat for more mobile species (principally birds). Patches of habitat are also likely to facilitate fauna movement between sites throughout the otherwise cleared landscape.

Description – This habitat type is generally located in paddocks. The overstorey generally consists of young Buloke specimens, with a highly modified understory with no shrubs and grazed understorey consisting of pastoral grasses and weeds.

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

**Fauna** – Given their isolation amongst a largely cleared and highly modified surrounding environment modified woodland and associated trees provide an important source of habitat.

For example, this habitat type provides habitat for diurnal raptors (e.g., Nankeen Kestrel *Falco cenchroides*, Black-shouldered Kite *Elanus axillaris*), which use trees for perching, roosting and foraging activities.

### 3.2.4.3 Planted vegetation/ Windrows (Corresponding EVC: None)

**Overall habitat value** – Habitat value for planted vegetation ranges from **low** for juvenile or immature plantings, to **moderate** for mature plantings.

**Description** – An assortment of native and exotic trees have been planted, principally around dwellings throughout the study area. Many of these trees are mature and reach a height of up to 20 metres. The midstorey is generally absent, with an understorey predominately consisting of introduced pasture grasses and bare ground.

**Fauna** – Many of these trees provide an important foraging resource, primarily for Australian Magpie *Gymnophiona tibicen*, Wattlebirds, Miners and Cockatoos. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills, and fantails for nesting and foraging purposes.

### 3.2.4.4 Exotic pasture and crops (Corresponding EVC: None)

**Overall habitat value** – This habitat is considered to be of **low** habitat value for fauna. The majority of the areas being grazed and providing very little in the way of potential refuge sites for ground dwelling reptiles, birds and mammals.

**Description** – This habitat occurs throughout much of the study area where native vegetation has been removed and land used for grazing livestock or crops. It comprises almost exclusively perennial pasture grass and grain crops, with a few isolated trees and windrow plantations scattered throughout.

**Fauna** – Few native species are known to use this habitat, principally birds adapted to modified habitats such as Australian Magpie and Galah *Eolophus roseicapilla*. Raptors (Brown Falcon, Nankeen Kestrel, Black-shouldered Kite) search for prey items over these areas, and introduced species (Common Starling *Sturnus vulgaris*, House Sparrow *Passer domesticus*) were also prevalent in this habitat during the survey.

Although introduced grass and crops does not provide important habitat for fauna, it does provide dispersal opportunities (cover) for reptiles, and other species into more optimal habitats throughout the local area.

## 3.3 National Significance Assessment

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

### 3.3.1 Flora

No nationally significant flora species were recorded within the study area during the field survey.

The VBA does not contain any records of EPBC Act listed flora species previously recorded within 10 kilometres of the study area (the project locality) (DELWP 2018a) (Appendix 2.2; Figure 3). The PMST nominated nine nationally significant species which have not been recorded in the locality but have the potential to occur (DAWE



The study area is highly modified, with the majority of the land subject to ground disturbance (ploughing) to facilitate agricultural use (i.e. planting of crops). As such, almost all potential habitat for nationally significant flora has been removed.

Based on absence of habitat present within the study area (including roadsides), landscape context and the proximity of previous records, nationally significant flora species are considered highly unlikely to occur within the study area (Appendix 2.2).

### 3.3.2 Fauna

No nationally significant fauna species were recorded within the study area during the field surveys.

The VBA contains records of five EPBC Act listed fauna species previously recorded within 10 kilometres of the study area (the project locality) (DELWP 2018a) (Appendix 3.1; Figure 4).

#### Australasian Bittern

Australasian Bittern has been recorded three times within the project locality and within 7.8 kilometres of the study area (1987). This species is known to inhabit freshwater wetlands, with heavy vegetation, flooded shrubbery, reed beds and sedges (Morcombe 2004). Owing to a lack of suitable habitat, Australasian Bittern is considered unlikely to inhabit or make significant use of the study area or its immediate surrounds.

#### Plains Wanderer

Plains-wanderer has been recorded five times, with one record from 1980 being approximately 500 metres from the study area (Figure 4). This species is known to inhabit natural open grassland with patches of open ground (Morcombe 2004). With the exception of the dissecting road reserves, the study area is dominated by cropped agricultural land, which is considered to provide poor quality habitat for Plains-wanderer. The road reserves support patches of remnant grassland; however, given their small, linear nature and relatively poor condition, the value of this habitat is considered to be limited. The proposed wind farm is unlikely to significantly impact Plains-wanderer given the lack of suitable habitat in the study area, the paucity of local records, the availability of higher quality habitat in the project locality

#### Swift Parrot

Important eucalypt species known to provide a food source for Swift Parrot in Victoria include Yellow Gum *Eucalyptus leucoxylon*, Red Ironbark *Eucalyptus tricarpa*, Mugga *Eucalyptus sideroxylon*, Yellow Box *Eucalyptus melliodora*, White Box *Eucalyptus alba*, and Grey Box *Eucalyptus macrocarpa*. There are limited records of these species present within, or in close proximity to the study area. Further, the species overwinters in habitat further south (i.e. Bendigo, Stawell) and east (i.e. Echuca) of the study area. As such, due to the absence of overwintering habitat, the species is highly unlikely to occur within the study area and will not be impacted by the development.

#### Striped Legless Lizard

There are three records of Striped Legless Lizard within the project locality (Figure 4). However, due to modification of the project area through agricultural activity (ploughing) to facilitate agricultural use (i.e. planting of crops) to facilitate agricultural use (i.e. planting of crops), the habitat characteristics for the species, such as cracking soils and surface rock are no longer present. Owing to a lack of suitable habitat, Striped Legless Lizard is considered highly unlikely to inhabit or make significant use of the study area or its immediate surrounds.

### Growling Grass Frog

There are two records of Growling Grass Frog within the project locality (Figure 4). Due to the absence of aquatic habitats within the study area, Growling Grass Frog is considered highly unlikely to inhabit or make significant use of the study area or its immediate surrounds.

The PMST nominated an additional seven nationally significant species which have not been recorded in the locality but have the potential to occur (DAWE 2020a). Based on absence of suitable habitats within the study area (including roadsides), landscape context and the proximity of previous records, nationally significant fauna species are considered highly unlikely to occur within the study area, or be impacted by the wind farm development (Appendix 3.1).

### 3.3.3 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 (DELWP 2018a) indicates that five migratory bird species have been recorded within the project locality (Appendix 2.2). The study area 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 close proximity to, either migratory bird feeding areas, or important, regularly used, feeding and roosting sites, hence the likelihood of migratory birds moving through the study area when moving between wetlands in the local area is low.

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). 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.

### 3.3.4 Ecological Communities

Four nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DAWE 2020a):

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

#### Implications

Due to the high condition of native vegetation, and the low diversity of natives, and/or the absence of key indicator species, native vegetation present within the project area does not meet the condition

thresholds that define the Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia, Natural Grasslands of the Murray Valley Plains, and White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland communities.

#### *Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions*

The study area supports a large population of Buloke, which is the main feature of the Buloke Woodlands ecological community.

There is no condition threshold for this community, however, the nominated woodland's component communities are generally characterised as woodland or open woodland with a well developed ground stratum that is usually grassy, but also includes many subshrubs and herbs (DSE 2011). Some component communities have understoreys that are predominantly shrubby or herbaceous. Most component communities lack a well-developed tall shrub layer. Buloke is common to all component communities, but slender cypress-pine and grey box may be structurally dominant in some.

The composition of the ground stratum varies considerably among component communities. Native grasses often include Wallaby grasses and Spear Grasses. Exotic grasses, which are frequently abundant, include Wimmera Rye-grass *Lolium rigidum*, and several brome species. Native subshrubs and herbs may include Nodding Saltbush *Einadia nutans*, Variable Groundsel *Senecio pinnatifolius*, Variable Sida *Sida corrugata* and Wingless Bluebush. The community is also an important source of food for the endangered South-eastern Red-tailed Black-Cockatoo.

Patches of Plains Woodland, particularly PW1 and PW3 include components of the above description, with a Buloke overstory, and ground-layer dominated by the non-native Brome species and Rye-grass. Further, these patches lack a shrub layer, and did not support any herbs within the patches.

Based on the description of the ecological community contained in the National Recovery Plan (DSE 2012) and the listing advice (DAWE 2020c), it is considered that the ecological community is not present within the project area as patches PW1 and PW3 are almost entirely comprised of a Buloke overstory, with no other native values present.

It is noted that BayWa r.e. have committed to retaining all scattered Buloke and patches of Buloke within the development footprint, so it is not considered that there will be any impact to the nationally significant Buloke Woodland ecological community.

### 3.4 State Significant Assessment

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

#### 3.4.1 Flora

The VBA contains records of 23 state significant flora species from within the project locality (DELWP 2018a (Appendix 2.2; Figure 3). Based on habitat present within the study area, landscape context and the proximity of previous records, no additional State significant species are considered likely to occur on site.

Two State significant flora species; Buloke and Buloke Mistletoe *Amyema linophylla* subsp. *orientalis* were recorded within the study area during the field survey (Figure 2). Buloke is listed as Threatened under the FFG

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

Act, and is listed as endangered on the DELWP Advisory List (DEPI 2014). Buloke Mistletoe is listed as vulnerable on the DELWP Advisory List (DEPI 2014).

Scattered occurrences of Fuzzy New Holland Daisy *Vittadinia cuneata* and Lemon Beauty-heads *Calocephalus citroides* are present within the road reserves within the study area of Banyena Road. Both Fuzzy New Holland Daisy and Lemon Beauty-heads area protected under the FFG Act as a member of the Asteraceae (daisy) family (DELWP 2017c).

The current project footprint avoids all State significant specimens.

### 3.4.2 Fauna

The State significant Black Falcon was recorded during the field survey (Table 11; Appendix 3.1).

The VBA contains records of 21 State significant and 10 regionally significant fauna species within the project locality (DELWP 2018a) (Appendix 3.1; Figure 4).

Of these species, there is suitable habitat within the study area for Black Falcon *Falco subniger*. This species has been recorded two times within the project locality and within 7.3 kilometres of the study area (1992). Whilst the study area lacks core roosting and foraging habitat for Black Falcon, including tree-lined watercourses and wetlands (Morcombe 2004), foraging opportunities are provided within the grassland and cropped areas, which are likely to support key prey species, including rodents, rabbits, small birds and reptiles. Given the observations of Black Falcon during bird utilisation surveys, it is considered that Black Falcon forages within the study area on occasion; however, given the availability of similar and higher quality habitat in the project locality, this species is unlikely to make significant use of the site, or be significantly impacted by the proposed wind farm.

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

A Level 1 Brolga Assessment was undertaken as part this assessment due to the presence of an historical record within 10 kilometres of the project area (Section 3.2.2). The Level 1 Assessment determined that there is no suitable habitat for this species within the study area or the immediate surrounds. Furthermore, based on recorded observations of the species, the study area is located on the northern extent of the Victorian distribution range, limiting the likelihood of Brolgas flying across the site when moving between areas of suitable habitat.

Based on the absence of potential Brolga breeding and flocking habitat, the paucity of historical Brolga records within the locality based on both a detailed desktop database interrogation, and liaison with local landowners, it is determined that a Level Two Assessment is not required as the risk of impact to Brolga due to the proposed wind farm is low.

### 3.4.3 Ecological Communities

Patches of native vegetation within the project area share characteristics with several ecological communities listed as threatened under the FFG Act, including:

- Grey Box - Buloke Grassy Woodland Community;
- Semi-arid Northwest Plains Buloke Grassy Woodland Community; and,
- Semi-arid Herbaceous Pine-Buloke Woodland Community.

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

All three of these communities are described as having a shrub and/or ground layer that supports a variety of native shrubs, grasses and/or herbs.

As the patches of Plains Woodland are almost wholly comprised of Buloke over a predominantly exotic understory layer lacking shrubs, herbs and native grasses, it is considered that native vegetation within the project footprint does not meet the description that describes any FFG Act listed ecological communities (DELWP 2020e).

### 3.5 Removal of Native Vegetation (the Guidelines)

A total of 11.03 hectares of native vegetation (Table 8), and 439 scattered trees, comprising 158 Large scattered trees and 281 Small scattered trees occur throughout the project area (Table 9) (Figure 2).

The native vegetation impacts within this report are based on the infrastructure layout as provided by BayWa r.e. on 13 March 2020.

Impacts to native vegetation have been determined based on an analysis of the swept path assessment, proposed road upgrades, siting of access tracks, batching plants, substation, underground cabling, foundation and hardstand infrastructure. Specifically, impacts have been assessed based on the following specifications:

- Road upgrades have an impact area of 5.5 metres width (2.75 metres either side from the centre of the existing road) as well as a table drain of 1.5 metres width on one side;
- Underground cabling impact corridor of two metres width (to allow for construction impacts);
- No additional buffer around batching plants, substation, foundation or hardstand infrastructure;
- No impacts to native vegetation in the ground-layer (i.e. grass and herbs) associated with overhead cabling;
- No impacts to native vegetation in the ground-layer (i.e. grasses and herbs) associated with the swept path assessments; and,
- Tree #186 will be retained within the batching plant through the implementation of a 15 metre radius Tree Retention Zone (Figure 2e); and,
- Based on the habitat hectare assessments within the swept path area at the two intersections, no native vegetation will be directly or indirectly impacted (Figures 2i and 2j).

#### 3.5.1 Vegetation proposed to be removed

The study area is within Location Category 2, with 0.288 hectares of native vegetation proposed to be removed (in addition to the previously approved 0.009 hectares). As such, the permit application falls under the Intermediate assessment pathway. Vegetation impacts are summarised in Table 15.

Condition scores for vegetation proposed to be removed are based on the habitat hectare assessment completed by a qualified vegetation assessor and are provided in Appendix 2.3.

**Table 15.** Removal of native vegetation (the Guidelines)

Assessment pathway	Intermediate
Total Extent (ha) (past and proposed)	0.296
Extent of Past Removal (ha) *	0.009
Extent of Proposed Removal (ha)	0.288
EVC Bioregional Conservation Status	Plains Savannah (Endangered)
Large Trees (no.)	0
Location Category	2

**Note:** \* Past removals approved under Permit PA 1800346

### 3.5.2 Offset Targets

The offset requirement for native vegetation removal is 0.034 General Habitat Units (HUs). No Specific HUs are generated by the proposed development.

A summary of proposed vegetation losses and associated offset requirements is presented in Table 16 and the Native Vegetation Removal (NVR) Report is presented in Appendix 5.

**Table 16.** Offset targets

General Offsets Required	0.034 General HUs
Specific Offsets Required	N/A
Vicinity (catchment / LGA)	Wimmera CMA / Horsham Rural City
Minimum SBV	0.097

**Note:** HU = Habitat Units; SBV – Strategic Biodiversity Value.



## 4 LEGISLATIVE AND POLICY IMPLICATIONS

### 4.1 *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) establishes a Commonwealth process for the assessment of proposed actions likely to have a significant impact on any matters of National Environment Significance (NES), described in Table 17.

**Table 17.** Potential impacts to matters of National Environmental Significance (NES)

Matter of NES	Potential Impacts
World Heritage properties	The proposed action will not impact any properties listed for World Heritage.
National heritage places	The proposed action will not impact any places listed for national heritage.
Ramsar wetlands of international significance	The nearest Ramsar wetland is Lake Albacutya – approximately 90 kilometres upstream. Provided management practices and construction techniques are consistent with Construction Techniques for Sediment Pollution Control (EPA 1991) and Environmental Guidelines for Major Construction Sites (EPA 1996), the proposed action is unlikely to impact the ecological character of any Ramsar wetland, or other downstream waterbodies.
Threatened species and ecological communities	No nationally significant flora, fauna or ecological communities are present, or will be impacted by the proposed development.
Migratory and marine species	Five Migratory and/or Marine species have been recorded within 10 kilometres of the study area (DELWP 2018a; Appendix 3.1). However, the study area would not be classed as an ‘important habitat’ as defined under the EPBC Act Policy Statement 1.1 Principal Significant Impact Guidelines (DoE 2013).
Commonwealth marine area	The proposed action will not impact any Commonwealth marine areas.
Nuclear actions (including uranium mining)	The proposed action is not a nuclear action.
Great Barrier Reef Marine Park	The proposed action will not impact the Great Barrier Reef Marine Park.
Water resources impacted by coal seam gas or mining development	The proposed action is not a coal seam gas or mining development.

#### 4.1.1 Implications

The proposed activity is considered highly unlikely to significantly impact any EPBC Act listed species (threatened or migratory), ecological communities or any other matters of NES (Section 3.3). As such, an EPBC Act referral regarding these matters is considered unwarranted.

### 4.2 *Environment Effects Act 1978* (Victoria)

The *Environment Effects Act 1978* (EE Act) provides for assessment of proposed actions that are capable of having a significant effect on the environment via the preparation of an Environment Effects Statement (EES). A

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

project with potential adverse environmental effects that, individually or in combination, could be significant in a regional or State context should be referred (DSE 2006). An action may be referred for an EES decision where:

- one of the following occurs:
  - Potential clearing of 10 hectares or more of native vegetation from an area that:
    - is of an EVC identified as endangered by DELWP;
    - is, 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 (1-5% depending on conservation status of species) of known remaining habitat or population of a threatened species within Victoria.
- or where two or more of the following occur:
  - Potential clearing of 10 hectares or more of native vegetation, unless authorised under an approved Forest Management Act or Fire Protection Plan;
  - 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.

#### 4.2.1 Implications

Table 18 details individual environment effects that may warrant a referral, whilst Table 19 details criteria where a combination of two or more environmental effects may warrant a referral. These criteria are detailed in DSE (2006).

**Table 18.** Individual potential environmental effects that may warrant a referral

Item	Criteria	Response
1	<p>Potential clearing of 10 ha or more of native vegetation from an area that:</p> <ul style="list-style-type: none"> <li>• is of an Ecological Vegetation Class identified as <u>endangered</u> by the DELWP (in accordance with Appendix 2 of Victoria's Native Vegetation Management Framework); <u>or</u></li> <li>• is, or is likely to be, of <u>Very High</u> conservation significance (as defined in accordance with Appendix 3 of Victoria's Native Vegetation Management Framework); and,</li> <li>• is not authorised under an approved Forest Management Plan or Fire Protection Plan.</li> </ul>	<p>A total of 0.288 hectares of native vegetation is proposed to be impacted as part of the development (excluding 0.009 hectares of approved past removal).</p> <p>The vegetation proposed for removal consists of:</p> <ul style="list-style-type: none"> <li>• 0.288 hectares of EVCs classified as Endangered (Plains Savannah); and,</li> <li>• 0.00 hectares of Very High conservation significance vegetation.</li> </ul> <p>The total extent of native vegetation proposed to be removed is below the threshold that triggers a recommendation for referral under the EE Act.</p>

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

**ADVERTISED  
PLAN**

Item	Criteria	Response
2	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	<p><b>Flora</b></p> <p>Two State-significant flora were recorded during the site assessments (Buloke, and Buloke Mistletoe).</p> <p>There are no proposed impacts to either species.</p> <p>There is potential habitat for a range of State-significant flora within the study area. However, due to the highly modified, agricultural nature of the study area, landscape context and the proximity of previous records, additional State significant flora species listed on DELWP's advisory list are considered unlikely to occur within the study area.</p> <p>As such, it is considered that there will not be a long-term loss of known remaining habitat for any threatened flora species that will exceed 1-5% of overall habitat.</p> <p><b>Fauna</b></p> <p>The State significant Black Falcon was recorded during the field surveys. This species has been recorded two times within the project locality and within 7.3 kilometres of the study area.</p> <p>Whilst the study area lacks core roosting and foraging habitat for Black Falcon, including tree-lined watercourses and wetlands (Morcombe 2004), foraging opportunities are provided within the grassland and cropped areas, which are likely to support key prey species, including rodents, rabbits, small birds and reptiles. Given the observations of Black Falcon during bird utilisation surveys, it is considered that Black Falcon forages within the study area on occasion; however, given the availability of similar and higher quality habitat in the project locality, this species is unlikely to make significant use of the site, or be significantly impacted by the proposed wind farm.</p> <p>As such, it is considered that there will not be a long-term loss of known remaining habitat for any threatened fauna species that will exceed 1-5% of overall habitat.</p>
3	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'	<p>The nearest wetland listed under the Ramsar Convention is located 905 km north of the site (Lake Albacutya).</p> <p>The nearest wetland in the 'Directory of Important Wetlands' is the Wimmera River, located approximately 21 km west of the study area.</p> <p>Provided management practices and construction techniques are consistent with Construction Techniques for Sediment Pollution Control (EPA 1991) and Environmental Guidelines for Major Construction Sites (EPA 1996), the proposed action is unlikely to impact the ecological character of any Ramsar site or 'important wetland'.</p>
4	Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term	<p>There are no estuarine, marine or permanent aquatic ecosystems within the study area. As such, there is not considered to be any extensive or major effects to any aquatic, estuary or marine system over the long-term.</p>

**Table 19.** A combination of two or more environmental effects that may warrant a referral

Item	Criteria	Response
1	Potential clearing of 10 hectares or more of native vegetation, unless authorised under an approved Forest Management Plan or Fire Protection Plan	A total of 0.288 hectares of native vegetation proposed to be impacted as part of the development (excluding 0.009 hectares of approved past removal).
2	<p>Matters listed under the <i>Flora and Fauna Guarantee Act 1988</i>:</p> <ul style="list-style-type: none"> <li>potential loss of a significant area of a listed ecological community; or,</li> <li>potential loss of a genetically important population of an endangered or threatened species (listed or nominated for listing), including as a result of loss or fragmentation of habitats; or</li> <li>potential loss of critical habitat; or</li> <li>potential significant effects on habitat values of a wetland supporting migratory bird species</li> </ul>	<p>There are no FFG Act-listed communities being impacted within the study area.</p> <p>It is not considered that the study area supports a genetically important population of, or critical habitat for any FFG Act-list species.</p> <p>Migratory and wetland bird species are not considered likely to utilise habitat within the study area on a regular or permanent basis given the absence of such habitats within the project area. 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</p> <p>Based on the above, we do not consider that any of the thresholds relating to FFG Act criteria have been exceeded.</p>
3	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 <i>National Parks Act 1975</i>	<p>A small area of land adjacent to the Wimmera Highway approximately 5 km south the project area is affected by an ESO7 overlay. No impacts to this area are proposed.</p> <p>The proposal is also not within or adjoining land reserved under the <i>National Parks Act 1975</i>.</p> <p>Based on the above, we do not consider this threshold to be exceeded.</p>

Based on a review of ecological impacts associated with the proposed development, it is Ecology and Heritage Partners' position that a referral under the EES Act is not required based on ecological impacts alone, as:

- None of the thresholds relating to any of the ecological criteria identified in Table 18 have been exceeded; and,
- None of the thresholds relating to any of the ecological criteria identified in Table 19 have been exceeded.

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).

### 4.3 *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' listed and/or protected flora species, listed vegetation communities and listed fish species in areas of public land (i.e. within road reserves, drainage lines and public reserves). 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.

There is the confirmed presence within the project area for one 'listed' flora species (Buloke) and two 'protected' flora species (Lemon Beauty-heads and Fuzzy New Holland Daisy) listed under the FFG Act (Appendix 2.1; Section 3.4).

#### 4.3.1 Implications

The Responsible Authority may consider flora, fauna and communities listed under the FFG Act when making decisions regarding the use and development of land. Field surveys recorded one 'listed' flora species (Buloke) and two 'protected' flora species (Lemon Beauty-heads and Fuzzy New Holland Daisy) listed under the FFG Act.

There are no impacts to Buloke. However, there is an impact in one location to Fuzzy New Holland Daisy (comprising 6 individual plants) (Figure 2e) due to the road upgrade works, and as such, an FFG Act permit will be required for the removal of this protected species.

BayWa r.e. should allow approximately four weeks to obtain the permit through DELWP.

#### 4.4 *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 require a planning permit from the relevant local Council to remove, destroy or lop native vegetation on a site of more than 0.4 hectares, unless an exemption under clause 52.17-7 of the Victorian Planning Schemes applies (Appendix 1.5.3).

##### 4.4.1 Local Planning Schemes

The study area is located within the Horsham Rural City municipality. The project area is zoned Farming Zone (FZ). No relevant ecological overlays apply (DELWP 2020b).

##### 4.4.2 The Guidelines

The study area is within Location Category 2, with 0.288 hectares of native vegetation proposed to be removed (in addition to the previously approved 0.009 hectares). As such, the permit application falls under the Intermediate assessment pathway.

The offset requirement for native vegetation removal is 0.034 General Habitat Units (HUs). No Specific HUs are generated by the proposed development.

##### 4.4.3 Implications

A permit is required under Clause 52.17 of the Horsham Rural City Planning Scheme to remove any native vegetation, including scattered native grasses and/or herbs.

A permit is required under Clause 52.32 of the Horsham Rural City Planning Scheme to use and develop a wind energy facility. This report satisfies the relevant ecological application requirements listed in Clause 52.32-4.

A permit is required under Clause 53.13 of the Horsham Rural City Planning Scheme to use or develop a renewable energy facility (other than a wind energy facility). This report satisfies the relevant ecological application requirements listed in Clause 53.13-2.

In accordance with Clause 61.01 of the Horsham Rural City Planning Scheme, the Minister for Planning is the Responsible Authority for the use and development of land for a Wind Energy facility or Solar facility.

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



## 4.5 **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 DELWP.

### 4.5.1 Implications

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*.

## 4.6 **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.

Weeds listed as noxious under the CaLP Act were recorded during the assessment. Similarly, there is evidence that the study area is currently occupied by several pest fauna species listed under the CaLP Act.

### 4.6.1 Implications

To meet CaLP Act requirements listed noxious weeds and pests should be appropriately controlled throughout the study area to minimise their spread and impact on ecological values.

## 4.7 **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. These values include those protected under Commonwealth and State legislation, 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.

### 4.7.1 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. Avoidance of all native vegetation patches, scattered trees, and significant impacts to environmental values at the site can be achieved by focusing construction and other project activity in areas currently cropped.

This copied document is 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.

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 2020f), and DELWP is developing risk assessment and mitigation guidelines specifically for Brolga, Southern Bent-wing Bat, Red-tailed Black Cockatoo, Black Falcon and White-bellied Sea Eagle (DELWP 2020g)

**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**

## 5 POTENTIAL IMPACTS

Any loss of ecological values within the study area should be viewed in the context of the overall ongoing loss, fragmentation, and deterioration in the quality of remnant vegetation throughout many areas of south western Victoria. Indeed, much of the study area has undergone dramatic change as a result of land clearing for agriculture. Consequently, incremental losses of ecological values are likely to continue across many areas throughout, and in the vicinity of the study area.

### 5.1 Potential Impacts on Flora

The majority of the study area has been cleared of native vegetation and little of the pre-1750 extent of EVCs remain within the study area and immediate surrounds.

No nationally significant flora species were recorded during field assessments, however, the State significant Buloke and Buloke Mistletoe are present. However, there are no impacts to either of these species as part of the current development footprint.

Potential impacts to flora and native vegetation include:

- Indirect disturbance to areas supporting patches of native vegetation, or isolated trees and shrubs.
- Decreases in population sizes of local flora and fauna as a consequence of habitat loss. However, there are opportunities to increase the total available habitat via revegetation using locally indigenous species.
- Potential for further spread of noxious and environmental weeds from on-site activities and subsequent degradation of remaining native vegetation.
- Loss of planted native and exotic trees and shrubs, which provide foraging, nesting and breeding habitat for native birds.

### 5.2 Potential Impacts on 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, and 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).

Less than 1% of observations made during the bird utilisation surveys conducted by Ecology and Heritage partners were of birds within, or above, RSA (Graph 2). Further, it cannot be assumed that all the birds observed within the study area 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.).

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. Of importance with regards to assessing the risk of turbine collision are those birds that are threatened on a regional, state or national level.

However, given the low proportion of bird flights within the RSA (0.25% 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 study area it is unlikely that the construction of the Wimmera Plains Energy Facility will have a significant impact on the avifauna of the region.

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. This will take the form of a Bird and Avifauna Management (BAM) Plan (Section 7).

Potential impacts to migratory species are discussed in Section 3.3.3.

### 5.3 Potential Impacts on Brolgas

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.

On ground assessment of historical records and potential Brolga habitats failed to positively identify potential breeding or flocking Brolga sites. The nearest flocking site is located near Marnoo, approximately 34 kilometres east of the study area. This site was identified by Sheldon (2004).

The Brolga Guidelines (DSE 2012) recommend that a 3.2 km and 5 km radius turbine-free buffer from breeding sites and flock roost sites respectively, will adequately meet the objectives set for these habitats.

Due to the absence of breeding or flocking habitat within the locality, these buffer distances will be achieved, and any potential impact to Brolga is considered to be low to negligible.

## 5.4 Potential Impacts to 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).

To date little scientific data has been published regarding the impact of existing wind farms on Australian bat species. Carcass surveys undertaken as part of the Studland Bay and Bluff Point Wind Farms in Tasmania revealed that the majority of the carcasses were Gould's Wattled Bat (a high-flying, open-air foraging species) with the remaining being *Vespadelus* spp. (Hull and Cawthen 2012). A carcass survey within the small scale (two turbine) Hepburn Wind Farm detected a single White-Striped Freetail Bat mortality (Bennett 2012).

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.* 2008).



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.

#### 5.4.1.1 Bat Species in the Study Area

The VBA (DELWP 2018a) indicates that six bat species have been recorded within the project locality (Table 12).

The majority of species previously recorded or predicted to occur within the study area are likely to focus their foraging activities in forested areas, around patches of vegetation and scattered remnant trees, at or below canopy height. The study area lacks waterbodies and supports densely vegetated areas, which is likely to limit foraging activity.

Species that use more open areas, such as the Lesser Long-eared Bat *Nyctophilus geoffroyi*, 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 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 RSA height (85 metres) and the location 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.

## 5.5 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 Wimmera bioregion is one of Victoria's most cleared bioregions. In 2011, the area of vegetation removed since European settlement within the bioregion was estimated to be 1,671,024 ha (83.1%) (VEAC 2011). 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 wind farm, operational activities have the potential to lead to incremental and cumulative impacts (e.g. barrier effects, changes to bird/bat behaviour and disturbance to vegetation) and proposed wind farms within the vicinity of the project area include:

- Murra Warra Wind Farm (Stage 1 operating) - 61 turbines located approximately 10 kilometres north of the project area. An additional 45 turbines to be constructed as part of Stage 2;
- Rifle Butt Wind Farm (proposed) - Up to 13 turbines located approximately 50 kilometres south-west of the project area; and,
- Kiata Wind Farm (operating) - Nine turbines located approximately 50 kilometres west of the project area.

Operation of the proposed Wimmera Plains Energy Facility Farm is considered unlikely to significantly increase cumulative pressures within the broader landscape due to:

- The sites distance from other operating and proposed wind energy facilities; and,
- The development footprint being located in a setting within a cleared and uniform landscape, outside the likely common distribution range of key species potentially impacted by wind farm developments (e.g. Brolga, Southern Bent-wing Bat, migratory shorebirds).

Despite this, ongoing monitoring of bird populations, through an extension of the Bird Utilisation Surveys conducted in this study, following commissioning of the wind farm, will enable the proponent to identify and mitigate cumulative impacts as other wind farms are brought on-line.

## 5.6 The Impact of Climate Change

Climate change is likely to have an impact on both the flora and fauna of the study area. 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 relatively very low carbon emissions.

## 6 MITIGATION MEASURES

For the removal of vegetation that falls under all assessment pathways, the Guidelines (DELWP 2017b) require the responsible authority to consider whether the applicant has demonstrated avoidance and minimisation of impacts to native vegetation.

### 6.1 Best Practice Mitigation Measures

Recommended measures to mitigate impacts upon terrestrial and aquatic values present within the study area may include:

- Minimise impacts to native vegetation 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. Habitat Zones (areas of sensitivity) should be included as a mapping overlay on any construction plans;
- Tree Retention Zones (TRZs) should be implemented to prevent indirect losses of native vegetation during construction activities (DSE 2011). A TRZ applies to a tree and is a specific area above and below the ground, with a radius 12 x the DBH. At a minimum standard a TRZ should consider the following:
  - A TRZ 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 TRZ;
  - Where encroachment exceeds 10% of the total area of the TRZ, the tree should be considered as lost and offset accordingly;
  - Directional drilling may be used for works within the TRZ 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 TRZ has not been met an offset may be required.
- Removal of any habitat trees or shrubs (particularly hollow-bearing trees) should be undertaken under the supervision of an appropriately qualified zoologist to salvage and translocate any displaced fauna. A Fauna Management Plan may be required to guide the salvage and translocation process;
- Where possible, construction stockpiles, machinery, roads, and other infrastructure should be placed away from areas supporting native vegetation, Large Trees and/or wetlands;
- Construction should have an environmental audit process in place for the construction works to be audited on a regular basis;

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

- All chemicals on site should be correctly bundled and stored following EPA Bunding Guidelines (EPA 1992).
- Ensure that best practice sedimentation and pollution control measures are undertaken at all times, in accordance with Environment Protection Authority guidelines (EPA 1991; EPA 1996; 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 and pathogen management measures, etc.;
- Weed Management Plan. This plan should follow the guidelines set out in the CaLP Act, and clearly outline any obligations of the project team in relation to minimising the spread of weeds as a result of this project. This may include a pre-clearance weed survey undertaken prior to any construction activities to record and map the locations of all noxious and environmental weeds; and,
- Fauna Management Plan. This may be required if habitat for common fauna species is likely to be impacted and salvage and translocation must be undertaken to minimise the risk of injury or death to those species.

## 6.2 Avoid and Minimise Statement

BayWa r.e. has used the ecological data recorded by Ecology and Heritage Partners to design the wind farm infrastructure and associated services to ensure that impacts to native vegetation are appropriately minimised.

Due to the requirement to upgrade several roads, as well as the associated installation of critical infrastructure associated with the renewable energy development (i.e. underground cabling), it is not possible to avoid impacts to all native vegetation. However, BayWa r.e. have committed to minimising impacts through the retention of all trees within the project area, and have designed the infrastructure footprint to achieve this outcome. This has included the revision of turning locations to ensure the swept path area avoids impacting trees, as well as the relocation of several underground cables and access track alignments outside of relevant Tree Retention Zones.

Of the 11.03 hectares of native vegetation patches, and 439 scattered trees within the project area, a total of 0.288 hectares of low quality Plains Savannah EVC will be impacted as part of the current proposal. This will result in the retention of all 439 scattered trees, including the FFG Act-listed Buloke (which is abundant on site), and 10.734 hectares of native vegetation patches.

The 0.288 hectares of low quality native vegetation proposed to be impacted is due to the requirement to facilitate access and egress within the project area (i.e. road upgrades), as well as the installation of renewable energy infrastructure. However, the ecological value of these areas is considered negligible in relation to the native vegetation being retained within the project footprint.

**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**

In the context of the ecological values present within the project area, as well as the resultant design of the infrastructure footprint ensuring in the retention of approximately 98% of native vegetation patches and all scattered trees, the above avoidance and minimisation measures implement by BayWa r.e. are considered appropriate in the context of the project, and broader ecological values within and adjacent to the project area.

### 6.3 Offset Impacts

Ecology and Heritage Partners are a DELWP accredited OTC offset broker and BushBroker site assessor. Ecology and Heritage Partners can confirm that the offset obligations generated by this development can be met through existing credits registered with Victoria's Native Vegetation Credit Register (Appendix 6).

Ecology and Heritage Partners have prepared a quote for BayWa r.e to secure the offset obligation via a 3<sup>rd</sup> party should a permit be issued for the development.

.

**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**



## 7 RECOMMENDATIONS

---

Based on the quality and extent of ecological values known to, or considered likely to occur, it is recommended that BayWa r.e. Wind:

1. Avoid impacts to Buloke and other scattered trees where possible ;
2. Prior to construction, develop a Construction Environmental Management Plan (CEMP) with specific management actions to mitigate against potential impacts to areas of ecological value;
3. Develop a Weed Management Plan, which should be incorporated into the CEMP;
4. Before commencement of construction, the preparation of a Bat and Avifauna Management Plan to the satisfaction of the responsible authority, in consultation with the DELWP. 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 energy facility 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 energy facility 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 DELWP;
  - c) A monitoring period of not less than one year 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.
5. 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 must be undertaken.

## 8 FURTHER REQUIREMENTS

Further requirements associated with development of the study area, as well as additional studies or reporting that may be required, are provided below (Table 20).

**Table 20.** Further requirements associated with development of the study area.

Relevant Legislation	Implications	Further Action
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	The proposed activity is considered highly unlikely to significantly impact any EPBC Act listed species (threatened or migratory), ecological communities or any other matters of NES.  As such, an EPBC Act referral regarding these matters is considered unwarranted.	No further action required.
<i>Flora and Fauna Guarantee Act 1988</i>	There are no impacts to Buloke.  However, there is an impact in one location to Fuzzy New Holland Daisy (comprising 6 individual plants) (Figure 2e) due to the road upgrade works, and as such, an FFG Act permit will be required for the removal of this protected species.	Prepare an FFG Act permit application. BayWa r.e. should allow approximately four weeks to obtain the permit through DELWP.
<i>Environment Effects Act 1978</i>	Based on a review of ecological impacts associated with the proposed development, it is Ecology and Heritage Partners' position that a referral under the EES Act is not required, as: <ul style="list-style-type: none"> <li>No patches of native vegetation are proposed to be removed;</li> <li>Based on the highly modified ecological condition of the project area and surrounding landscape, there will not be an impact that results in the long-term loss of a significant proportion (1-5% depending on conservation status of species) of known remaining habitat or population of a threatened species within Victoria; and,</li> <li>There will not be any impacts that result in potential significant loss to matters listed or protected under the FFG Act.</li> </ul>	No further action required.
<i>Planning and Environment Act 1987</i>	A Planning Permit from Horsham Rural City Council will be required under Clause 52.17 to remove <u>any</u> native vegetation within the project footprint.  A permit will also be required under Clause 52.32 and Clause 53.13 to develop renewable energy facilities.	Prepare and submit a Planning Permit application.
<i>Catchment and Land Protection Act 1997</i>	Several weed species listed under the CaLP Act were recorded within the study area. To meet requirements Under the CaLP Act, listed noxious weeds should be appropriately controlled throughout the study area.	Manage the risk of introducing and spreading weeds/ pests during construction.

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

Relevant Legislation	Implications	Further Action
<i>Wildlife Act 1975</i>	Any persons engaged to conduct salvage and translocation or general handling of terrestrial fauna species must hold a current Management Authorisation.	Ensure wildlife specialists hold a current Management Authorisation.

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

## REFERENCES

---

- Arnett, E.B., technical editor. 2005. Relationships between bats and wind turbines in Pennsylvania and West Virginia: an assessment of bat fatality search protocols, patterns of fatality, and behavioural interactions with wind turbines. A final report submitted to the Bats and Wind Energy Cooperative. Bat Conservation International. Austin, Texas, USA.
- AusWEA. 2005. Wind Farms and Birds: Interim Standards for Risk Assessment. Australian Wind Energy Association Report. Prepared for the Australian Wind Energy Association by Brett Lane & Associates Pty Ltd. In association with Aria Professional Services Pty Ltd. Report no. 2003.35(2.2).
- AusWind 2006. Best Practice Guidelines for Implementation of Wind Energy projects in Australia. AusWind Australia.
- Bearwald, E.F., D'Amours, G.H., Klug, B.J. and Barclay, R.M.R. 2008. Barotrauma is a significant cause of bat fatalities at wind turbines. *Current Biology* 18(16):695-696.
- Bennett, E. 2012. Hepburn Wind Farm Bird and Bat Mortality Survey Interim Report 11th July 2011 – 9th January 2012. Unpublished report prepared by Elmoby Ecology for Hepburn Wind Farm.
- Birdlife Australia 2019. Birds Australia Atlas Data. New Atlas. Birdlife Australia
- Chamberlain, D.E., Rehfisch, M.R., Fox, A.D., Desholm, M, & Anthony, S.J. 2006. Mortality in wind turbine collision risk models The effect of avoidance rates on bird mortality predictions made by wind turbine collision risk models. *Ibis* 148:198–202.
- Chambers, L. E., Hughes, L. & Weston, M. A. 2005. Climate change and its impact on Australia's avifauna. *Emu*, 105:1–20.
- Christidis, L. and Boles, W.E 2008. Systematics and Taxonomy of Australian Birds. CSIRO Publishing, Collingwood, Victoria.
- Churchill, S. 1998. Australian Bats. Reed New Holland, Sydney.
- Cogger, H. G (Ed). 1996. Reptiles and Amphibians of Australia. 5th Edition. Reed Books Australia, Victoria.
- Cogger, H. G., Cameron, E. E. and Cogger, H. M. 1983. Volume 1 of Zoological Catalogue of Australia: Amphibia and Reptilia. Australian Government Publishing Service, Canberra, ACT.
- Cogger, H.G., Cameron, E.E., Sadler, R.A. and Eggle P., 1993. The Action Plan for Australian Reptiles. Australian Nature conservation Agency, Canberra, ACT.
- Colwell, R. K. 2013. EstimateS: Statistical estimation of species richness and shared species from samples. Version 9. User's Guide and application published at: <http://purl.oclc.org/estimates>.
- Colwell, R. K., C. X. Mao, & J. Chang. 2004. Interpolating, extrapolating, and comparing incidence-based species accumulation curves. *Ecology* 85, 2717-2727

Commonwealth of Australia 2007. National Recovery Plan for the South-eastern Red-tailed Black Cockatoo *Calyptorhynchus banksii graptogyne*. Department of the Environment and Water Resources, Canberra.

Cryan, P. M. & Barclay, M. R. 2009. Causes of bat fatalities at wind turbines: hypotheses and predictions. *Journal of Mammalogy* 90:1330–1340.

DAWE 2020a. Protected Matters Search Tool: Interactive Map [www Document]. URL: <<http://www.environment.gov.au/epbc/pmst/>>. Commonwealth Department of Agriculture, Water and the Environment, Canberra, ACT.

DAWE 2020b. Directory of Important Wetlands: Australian Wetlands Database [www Document]. URL: <https://www.environment.gov.au/water/wetlands/australian-wetlands-database/directory-important-wetlands>. Commonwealth Department of Agriculture, Water and the Environment, Canberra, ACT.

DAWE 2020c. Species Profile and Threats Database. Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions – Listing Advice. [www Document]. URL: <http://www.environment.gov.au/node/14497>. Commonwealth Department of Agriculture, Water and the Environment, Canberra, ACT.

DELWP 2017a. Victoria's Guidelines for the removal, destruction or Lopping of Native Vegetation (the Guidelines). Victorian Department of Environment, Land Water and Planning, Melbourne, Victoria.

DELWP 2017c. Assessor's handbook – applications to remove, destroy or lop native vegetation (Assessor's handbook). Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2017b. Development of Wind Energy Facilities in Victoria: Policy and Planning Guidelines. Available at: [https://www.planning.vic.gov.au/\\_data/assets/pdf\\_file/0024/95361/Development-of-Wind-Energy-Facilities-Mar2019.pdf](https://www.planning.vic.gov.au/_data/assets/pdf_file/0024/95361/Development-of-Wind-Energy-Facilities-Mar2019.pdf)

DELWP 2017c. *Flora and Fauna Guarantee Act 1988* Protected Flora List – June 2017. Victorian Department of Environment, Land, Water and Planning. Melbourne, Victoria.

DELWP 2018a. Victorian Biodiversity Atlas. Sourced from GIS layers: "VBA\_FLORA25", "VBA\_FLORA100", "VBA\_FAUNA25", "VBA\_FAUNA100", March 2018. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2018b. *Flora and Fauna Guarantee Act 1988* Threatened List – April 2018. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2019a. Solar Energy Facilities Design and Development Guidelines. Available at: [https://www.planning.vic.gov.au/\\_data/assets/pdf\\_file/0025/426634/190704-Solar-Energy-Facilities-Guideline-August2019.pdf](https://www.planning.vic.gov.au/_data/assets/pdf_file/0025/426634/190704-Solar-Energy-Facilities-Guideline-August2019.pdf).

DELWP 2020a. NatureKit [www Document]. URL: <http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit>. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2020b. VicPlan [www Document]. URL: <https://mapshare.maps.vic.gov.au/vicplan/>. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2020c. Native Vegetation Information Management Tool [www Document]. URL: <https://maps.biodiversity.vic.gov.au/>. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

This copied document to be made available for the sole purpose of making 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



- DELWP 2020d. Ecological Vegetation Class (EVC) Benchmarks for each Bioregion [www Document]. URL: <<https://www.environment.vic.gov.au/biodiversity/bioregions-and-evc-benchmarks>>. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.
- DELWP 2020e. *Flora and Fauna Guarantee Act 1988* – Threatened List: Characteristics of Threatened Communities [WWW Document]. URL: < <https://www.environment.vic.gov.au/conserving-threatened-species/flora-and-fauna-guarantee-act-1988>>.
- DELWP 2020f. Improving the regulation of wind farms impacts on birds and bats. [www Document]. URL: [https://www.planning.vic.gov.au/\\_data/assets/pdf\\_file/0028/435259/Improving-the-regulation-of-wind-farms-impacts-on-birds-and-bats.pdf](https://www.planning.vic.gov.au/_data/assets/pdf_file/0028/435259/Improving-the-regulation-of-wind-farms-impacts-on-birds-and-bats.pdf).
- DELWP 2020g. Summary of ARI report species of concern for wind farm development. [www Document]. URL: [https://www.planning.vic.gov.au/\\_data/assets/pdf\\_file/0021/435261/Summary-of-ARI-report-species-of-concern-for-wind-farm-developments.pdf](https://www.planning.vic.gov.au/_data/assets/pdf_file/0021/435261/Summary-of-ARI-report-species-of-concern-for-wind-farm-developments.pdf).
- DEPI 2013. Advisory List of Threatened Vertebrate Fauna in Victoria. Department of Sustainability and Environment, Victoria
- DEPI 2014. Advisory List of Rare or Threatened Plants in Victoria. Victorian Department of Environment and Primary Industries, Melbourne, Victoria.
- DEWHA 2009. Significant impact guidelines for 36 migratory shorebird species. Draft EPBC Act policy statement 3.21. The Department of the Environment, Water, Heritage and the Arts, Canberra.
- DEWHA 2010. Survey Guidelines for Australia's Threatened Bats. EPBC Act survey guidelines 6.1. The Department of the Environment, Water, Heritage and the Arts, Canberra.
- DoE 2013. Significant Impact Guidelines 1.1. Matters of National Environmental Significance. Commonwealth Department of the Environment, Canberra, ACT.
- DoEE 2013. Significant Impact Guidelines 1.1. Matters of National Environmental Significance. Commonwealth Department of Environment and Energy, Canberra, ACT.
- DSE 2004. Vegetation quality assessment manual: Guidelines for applying the habitat hectares scoring method. Version 1.3. Victorian Department of Sustainability and Environment, Melbourne Victoria.
- DSE 2006. Ministerial guidelines for assessment of environmental effects under the *Environment Effects Act 1978*. Seventh Edition, 2006. Published by the Victorian Government Department of Sustainability and Environment, Melbourne. June 2006
- DSE 2009. Advisory list of Threatened Invertebrate Fauna in Victoria – 2009. Victorian Department of Sustainability and Environment, Melbourne, Victoria.
- DSE 2011a. National Recovery Plan for Buloke Woodlands of the Riverina and Murray Darling Depression Bioregions. Prepared by David Cheal, Alicia Lucas (both of the Arthur Rylah Institute for Environmental Research) and Lisa Macaulay (South West Region), Department of Sustainability and Environment, Victoria.

DSE 2011b. Native Vegetation Technical information sheet: Defining an acceptable distance for tree retention during construction works. Victorian Department of Sustainability and Environment, Melbourne, Victoria.

**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**

- DSE 2012. Interim Guidelines for the Assessment, Avoidance, Mitigation and Offsetting of Potential Wind Farm Impacts on the Victorian Brolga Population 2011. Revision 1, February 2012. Victorian Department of Sustainability and Environment, Melbourne, Victoria.
- DSE 2013. Advisory List of Threatened Vertebrate Fauna in Victoria. Victorian Department of Sustainability and Environment, Melbourne, Victoria.
- Duncan, A., G.B. Baker & N. Montgomery 1999. The Action Plan for Australian Bats. [Online]. Environment Australia. Canberra: Environment Australia. Available from: <http://www.environment.gov.au/biodiversity/threatened/publications/action/bats/index.html>
- Ecology Australia 2018. Desktop Assessment of Significant Flora and Fauna Values of the Avonbank Mineral Sands Project. Report prepared for WIM Resources. August 2018.
- Ecology Australia 2018. Avonbank Mineral Sands Project: Survey Findings 2018. Report prepared for WIM Resources. June 2019.
- Ecology and Heritage Partners 2018. Biodiversity Assessment for the Jung Wind, Solar and Battery Farm. Report prepared for Baywa r.e. Wind Pty Ltd. October 2018.
- EPA 1991. Construction Techniques for Sediment Pollution Control. Published document prepared by the Victorian Environment Protection Authority, Melbourne, Victoria.
- EPA 1992. Bunding Guidelines. Publication 347. Environmental Protection Agency, Melbourne, Victoria.
- EPA 1996. Environmental guidelines for major construction sites. Environment Protection Authority, Melbourne.
- Farfán, M.A., Vargas, J.M., Duarte, J. & Real, R. 2009. What is the impact of wind farms on birds? A case study in southern Spain. *Biodiversity Conservation* 18:3741–3758.
- Garnett, S. & Crowley, G. 2000. The Action Plan for Australian Birds. Environment Australia, Canberra.
- Goldstraw, P.W. & Du Gueslin P. 1991. Bird casualties from collisions with a 500 kV transmission line in south western Victoria, Australia in Harris, J., ed. 1991. Proceedings of the 1987 International Crane Workshop. 1-10 May 1987. Oigihar, Heilongjiang Province, China. International Crane Foundation, Baraboo, Wisconsin, USA. pp: 219-224.
- Gullan, P 2017. Illustrated Flora Information System of Victoria (IFLISV). Viridans Pty Ltd, Victoria.
- Higgins, P.J. 1999. Handbook of Australian, New Zealand and Antarctic Birds. Volume 4: Parrots to Dollarbird. Oxford, Melbourne.
- Horn, J. W., Arnett, E. B. & Kunz, T. H. 2008a. Behavioral Responses of Bats to Operating Wind Turbines. *Journal of Wildlife Management*. 72:123–132.
- Horn, J. W., Arnett, E. B., Jensen, M., & Kunz, T. H. 2008b. Testing the effectiveness of an experimental acoustic bat deterrent at the Maple Ridge wind farm. Report Prepared for: The Bats and Wind Energy Cooperative and Bat Conservation International, Austin, Texas, USA.
- Hull, C. & Cuthbert 2012. Bat fatalities at two wind farms in Tasmania, Australia: bat characteristics, and spatial and temporal patterns. *New Zealand Journal of Zoology* 40: 5-15.

- Janss, G.F.E. & Ferrer, M. 2000. Rate of bird collision with power lines: effects of conductor-marking and static wiremaking. *Journal of Field Ornithology* 69:8–17
- Kunz, T.H., E.B. Arnett, W.P. Erickson, A.R. Hoar, G.D. Johnson, R.P. Larkin, M.D. Strickland, R.W. Thresher, and M.D. Tuttle. 2007. Ecological impacts of wind energy development on bats: questions, research needs, and hypotheses. *Frontiers in Ecology and the Environment* 5:315–324.
- Kuvlesky, W.P., Brennan, L.A., Morrison, M.L., Boydston, K.K., Ballard, B.M., & Bryant, F.C. 2007. Wind energy development and wildlife conservations: challenges and opportunities. *Journal of Wildlife Management* 71:2487–2498.
- Leddy, K.L., Higgins, K.F., & Naugle, D.E. 1999. Effects of wind turbines on upland nesting birds in conservation reserve program grasslands. *Wilson Bulletin* 111:100–104.
- Lumsden, L. 2007. Guidelines for bat surveys in relation to wind farm developments. ARI, DSE, Melbourne.
- Marchant, S. and Higgins, P.J. 1991. *Handbook of Australian, New Zealand and Antarctic Birds. Volume 1: Ratites to ducks.* Oxford, Melbourne.
- Morcombe 2004. *Field Guide to Australian Birds. Complete Compact Edition.* Steve Parish Publishing. Archerfield, Queensland.
- Maxwell, S., Burbidge, A. & Morris, K. 1996. *Action Plan for Australian Marsupials and Monotremes.* IUCN Species Survival Commission.
- Menkhorst, P. 1996. *Mammals of Victoria.* Oxford University Press, Melbourne.
- Menkhorst, P. and Knight, F. 2004. *A Field Guide to the Mammals of Australia. 2nd Edition.* Oxford University Press, Victoria.
- Ministry of Natural Resources (MNR) Ontario 2007. *Guidelines to Assist in the Review of Wind Power Proposals – Potential Impacts to Bats and Bat Habitats.* Developmental Working Draft.
- Nelson, J. S. 1994. *Fishes of the World, 3rd Edition.* John Wiley & Sons, New York, USA.
- Nicholls, B. and Racey, P. A. 2009. The aversive effect of electromagnetic radiation on foraging bats—a possible means of discouraging bats from approaching wind turbines. *PLoS ONE* 4:e6246.
- Percival, S. M., Band, B. and Leeming T. 1999. Assessing the Ornithological Effects of Wind Farms: developing a standard methodology. *Proc. 21st British Wind Energy Assoc. Conf.*
- Piersma, T, Zwarts, L and Buggermann, J. H. 1990. Behaviour aspects of the departure of waders before long distances flights: flocking vocalisation, flight paths and diurnal timing. *Ardea* 78: 157-184
- Raaijmakers, J. G. W. 1987. Statistical analysis of the Michaelis-Menten equation. *Biometrics* 43, 793-803.
- Sæther, B.E. & Bakke, Ø. 2000. Avian life history variation and contribution of demographic traits to the population growth rate. *Ecology* 81:642–653.

Sheldon, R. 2004. Characterisation and modelling of Brolga *Grus rubicunda* flocking habitat in south-west Victoria: relationships between habitat characteristics, Brolga abundance and flocking duration. Honours thesis, School of Science and Engineering, University of Ballarat.

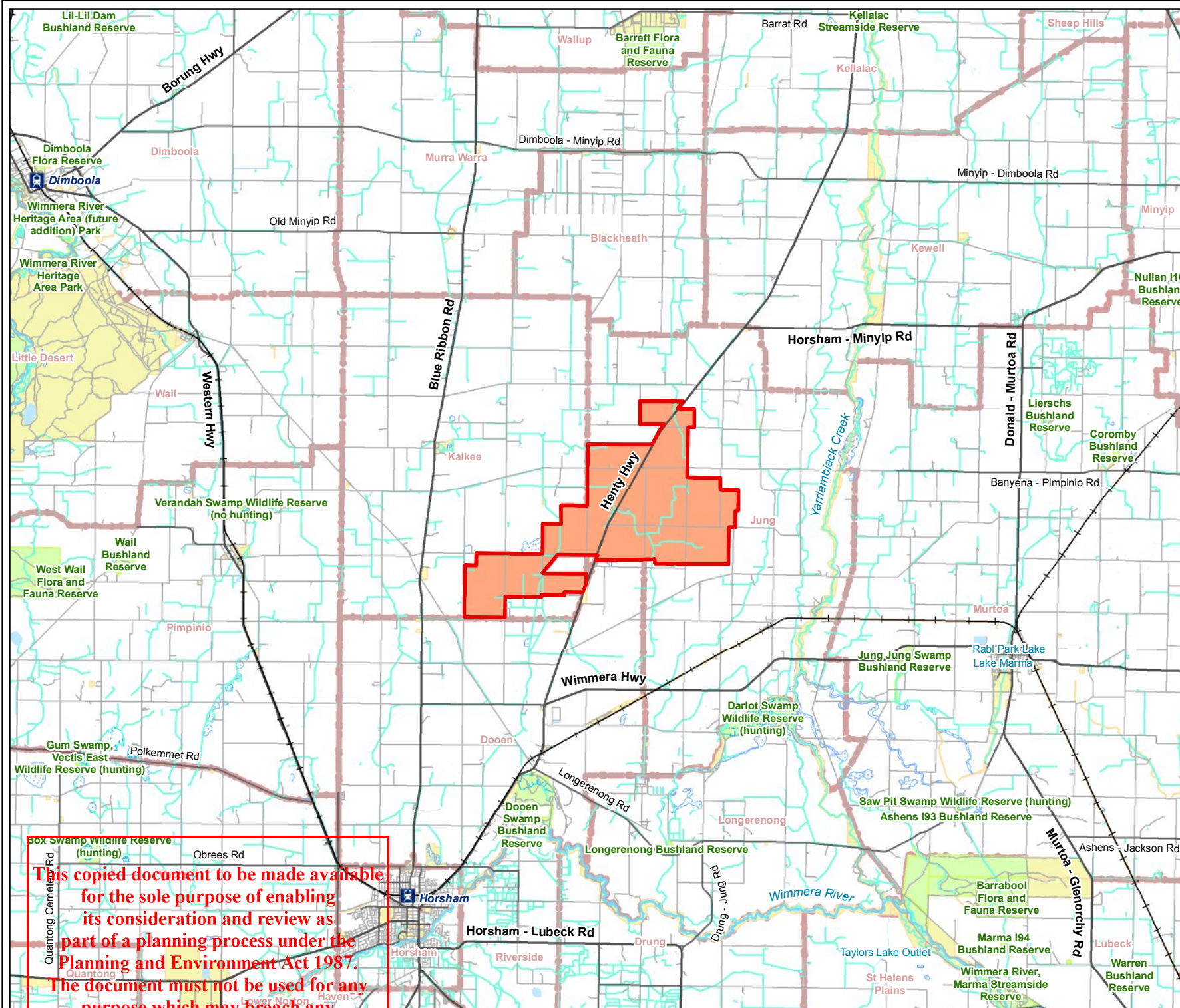
- Still, D., Painter, S. Lawrence, E.S. Little, B. and Thomas, M. 1995. Birds, wind farms, Blyth Harbour. Proceedings of the 16th British Wind Energy Association Conference. Pp: 175–181.
- Strahan, R. (Ed) 1995. The Mammals of Australia. Reed Books, Sydney, NSW.
- Tulp, I., McChesney, S and De Goeij, P. 1994. Migratory departures of waders from north-western Australia: behaviour, timing and possible migration routes. *Ardea* 82: 201-221.
- VEAC (Victorian Environmental Assessment Council) 2011. Remnant Native Vegetation Investigation, Final Report. Melbourne, Victoria.
- Victorian Urban Stormwater Committee 1999. Urban Stormwater: Best Practice Environmental Management Guidelines. CSIRO.
- Walsh, N.G. & Stajsic V. 2007. A Census of the Vascular Plants of Victoria. 8th Edn, Royal Botanic Gardens, Victoria.
- Watson, D.M. 2003. The 'standardized search': An improved way to conduct bird surveys. *Austral Ecology* 28:515–525.
- Weller, T.J. and Zabel, C.J. 2002. Variation in bat detections due to detector orientation in a forest. *Wildlife Society Bulletin* 30(3): 922-930.
- Williams, T. C., Williams, J. M., Ireland, L. C. and Teal, J. M. 1981 Autumnal bird migration over western North Atlantic Ocean. *Amer. Birds*. 31: 251-267
- Winkelman, J.E. 1992a. The impact of the Sep Wind Park near Oosterbierum (Fr.), The Netherlands, on birds. 1. Collision victims. RIN-Rapport 92/2. Rijksinstituut voor Natuurbeheer, Arnhem, The Netherlands.
- Winkelman, J.E. 1992b. The impact of the Sep wind Park near Oosterbierum (Fr.), The Netherlands on birds. 2. nocturnal collision victims. RIN-Rapport 92/3. Rijksinstituut voor Natuurbeheer, Arnhem, The Netherlands.
- Woinarski J. C. Z., Burbidge A. A. and Harrison P. 2014. The action plan for Australian mammals 2012. CSIRO Publishing, Collingwood, Victoria.

## FIGURES

---

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

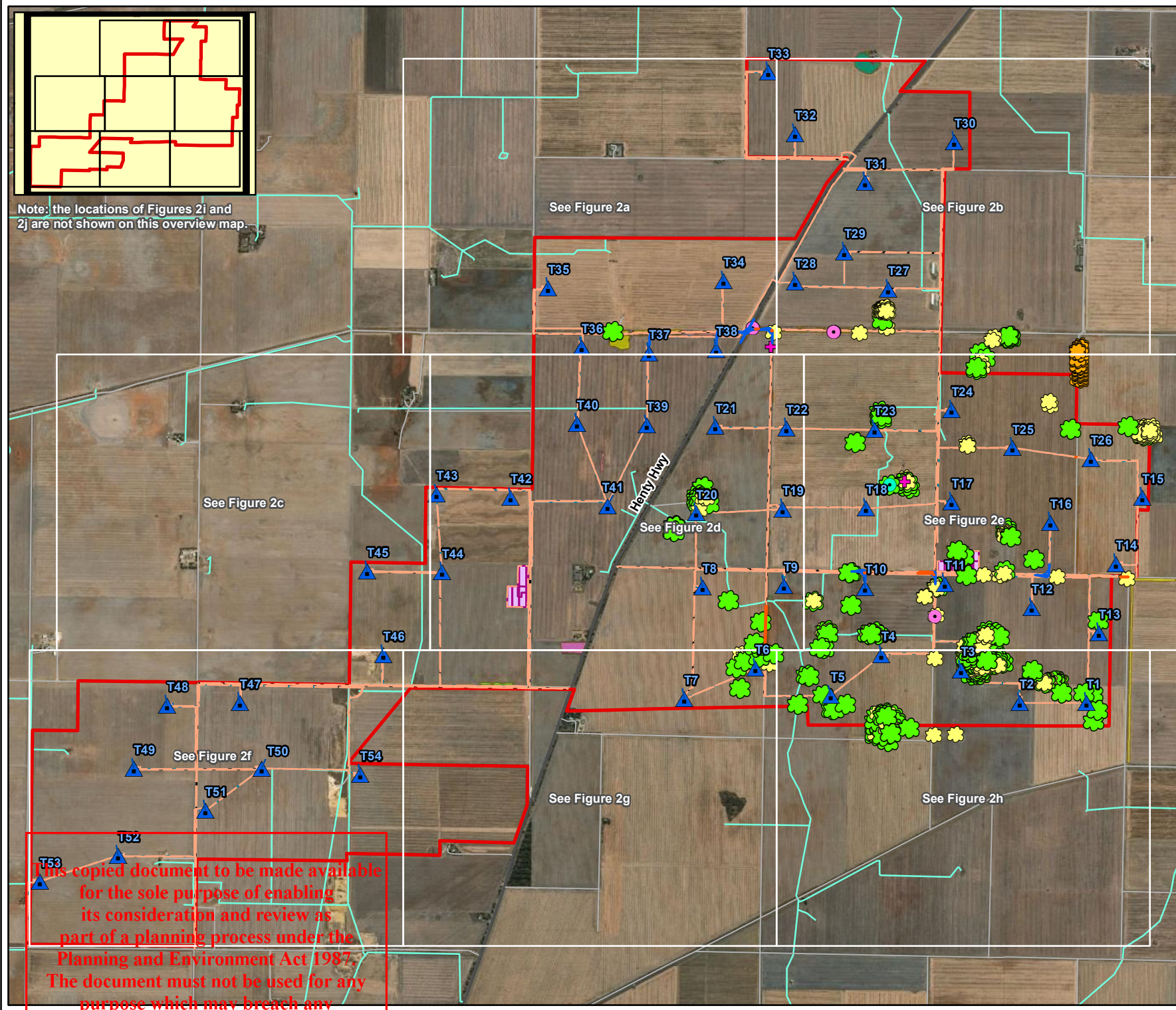




This copied document to be made available  
for the sole purpose of enabling  
its consideration and review as  
part of a planning process under the  
Planning and Environment Act 1987.  
The document must not be used for any  
purpose which may breach any  
copyright

VERIFIED





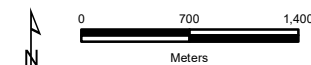
## Legend

- Study Area
  - Impact area
  - ✿ Scattered Large Tree
  - ✿ Scattered Small Tree
  - VROT
  - ✿ Scattered Natives
  - ✿ Noxious weed
  - FFG Act Protected flora
- ### Ecological Vegetation Classes
- Plains Grassland
  - Plains Savannah
  - Plains Woodland
  - Scattered native vegetation
  - Planted vegetation
  - Vegetation impacted
  - Vegetation previously impacted
- ### Development plan
- ▲ Wind turbine generators
  - Blade swept path
  - T to T cable
  - Underground cable
  - Access Track
  - Batching Plant, Construction Compound and Substation
  - Foundation and Hardstand

## Figure 2 Overview

### Ecological features

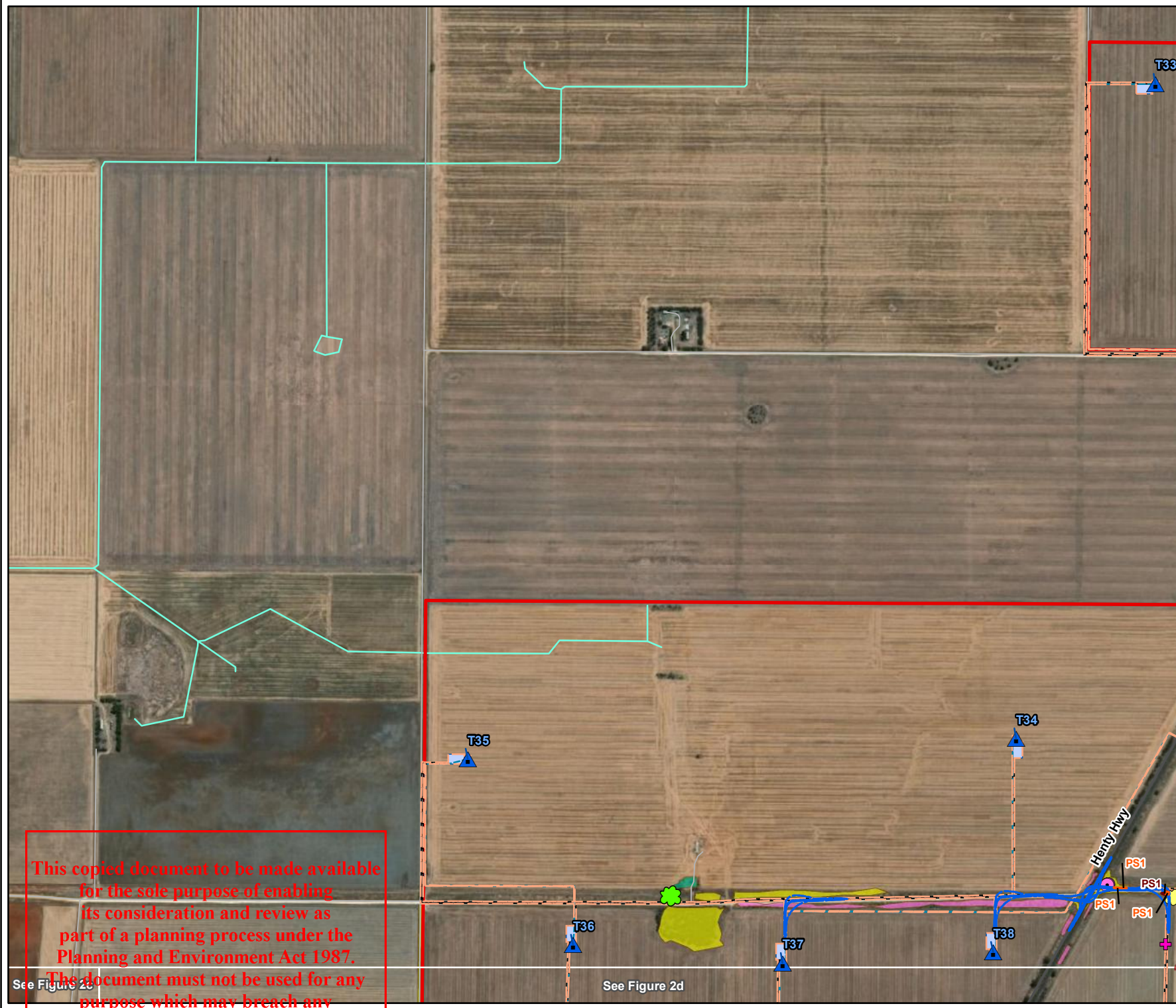
*Ecological Assessment:  
Wimmera Plains Energy  
Facility*



Version 0.01: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon this 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.

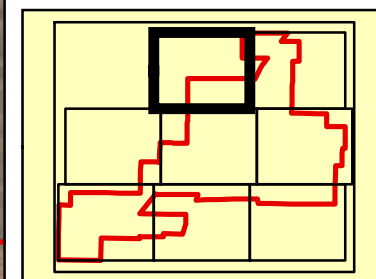
10/97 Ecology & Heritage, OV 1/04/2020 melsley





## Legend

- Study Area
  - Impact area
  - ✿ Scattered Large Tree
  - ✿ Scattered Small Tree
  - ✕ Noxious weed
  - FFG Act Protected flora
- ### Ecological Vegetation Classes
- Plains Savannah
  - Plains Woodland
  - Planted vegetation
  - Vegetation impacted
  - Vegetation previously impacted
- ### Development plan
- ▲ Wind turbine generators
  - Blade swept path
  - T to T cable
  - Access Track
  - Foundation and Hardstand



**Figure 2a**

## Ecological features

*Ecological Assessment:  
Wimmera Plains Energy  
Facility*

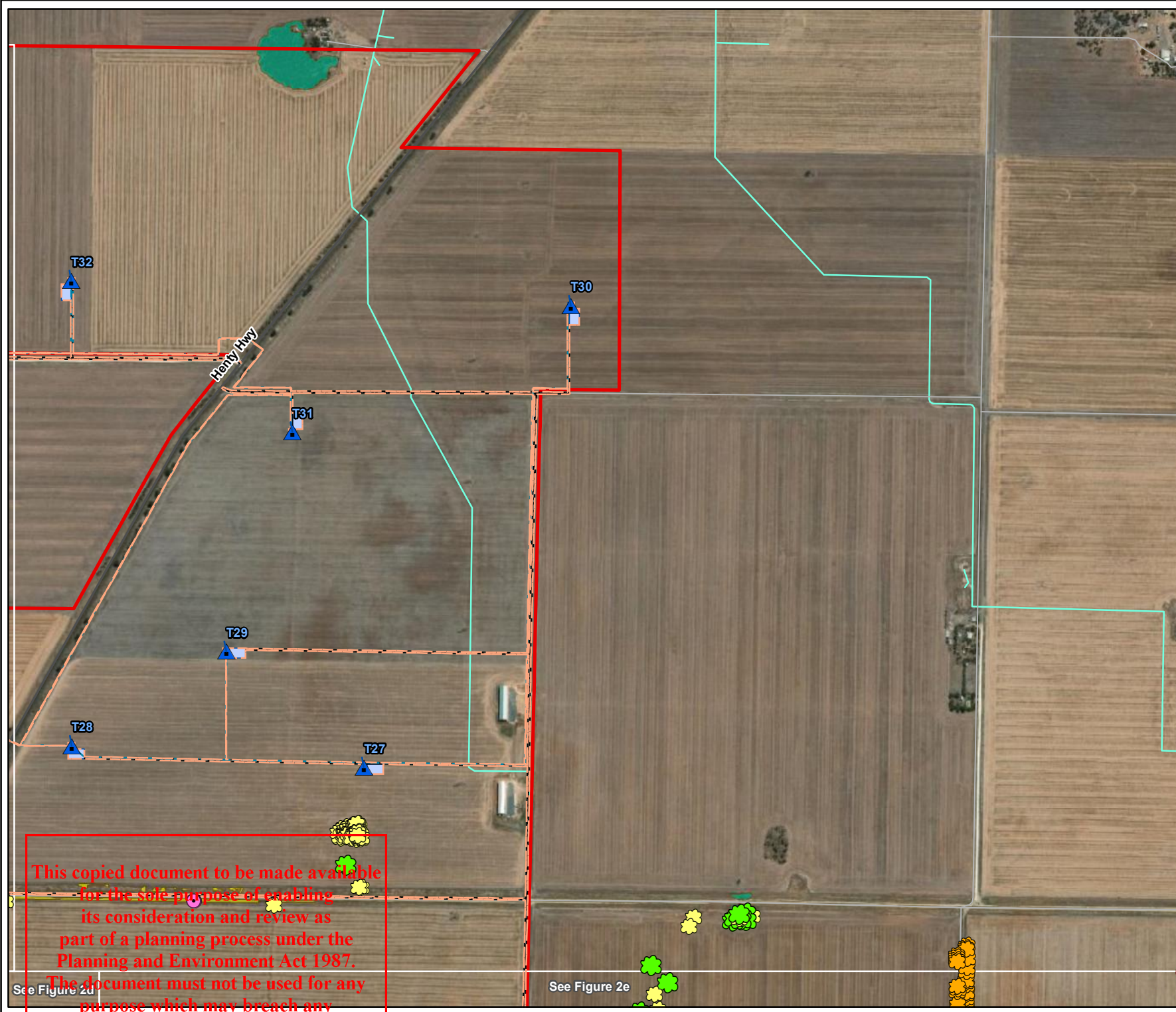


Version 1.0: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon this information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

1997-2020 E. B. C. M. Bv3 1/04/2020 melsley

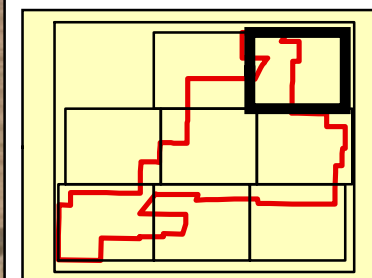
This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any





## Legend

- Study Area
- Impact area
- \* Scattered Large Tree
- \* Scattered Small Tree
- \* Scattered Natives
- \* FFG Act Protected flora
- Ecological Vegetation Classes**
- Plains Savannah
- Plains Woodland
- Development plan**
- ▲ Wind turbine generators
- T to T cable
- Access Track
- Foundation and Hardstand



**Figure 2b**  
**Ecological features**  
*Ecological Assessment:*  
*Wimmera Plains Energy*  
*Facility*



Victorian Data is the State of Victoria's official source of information. It is published and any person using or relying upon the information does so on the basis that the State of Victoria shall bear no responsibility or liability with respect to any errors, faults, defects or omissions in the information.







1997-2020 Ecology & Heritage MBv3 1/04/2020 melsley

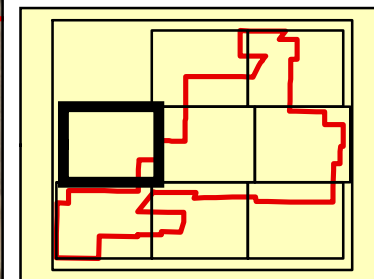
This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any





### Legend

-  Study Area
-  Impact area
- Development plan**
  -  Wind turbine generators
  -  T to T cable
  -  Access Track
  -  Foundation and Hardstand



**Figure 2c**  
**Ecological features**  
*Ecological Assessment:*  
*Wimmera Plains Energy*  
*Facility*

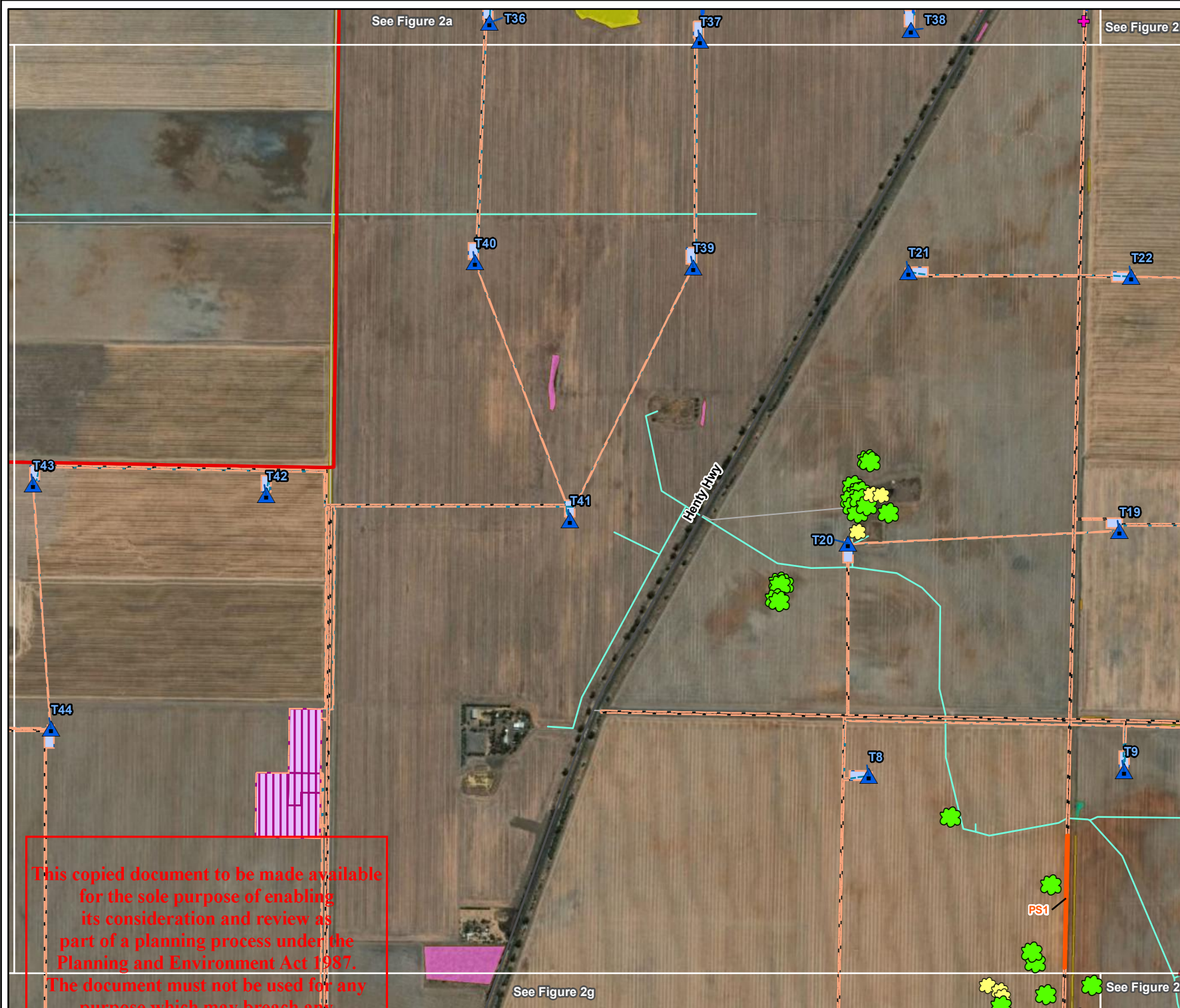


Victorian Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects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

11997 Fig02 EcoFeat MBv3 1/04/2020 melslev

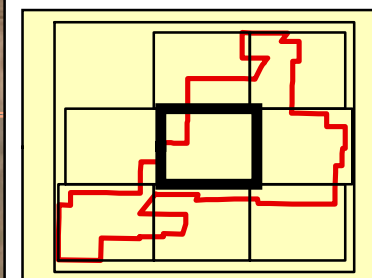
**This copied document to be made available  
for the sole purpose of enabling  
its consideration and review as  
part of a planning process under the  
Planning and Environment Act 1987.  
The document must not be used for any  
purpose which may breach any**





## Legend

- Study Area
- Impact area
- ✿ Scattered Large Tree
- ✿ Scattered Small Tree
- + Noxious weed
- Ecological Vegetation Classes**
- Plains Savannah
- Plains Woodland
- Scattered native vegetation
- Planted vegetation
- Vegetation impacted
- Development plan**
- ▲ Wind turbine generators
- Blade swept path
- T to T cable
- Access Track
- Batching Plant, Construction Compound and Substation
- Foundation and Hardstand



**Figure 2d**

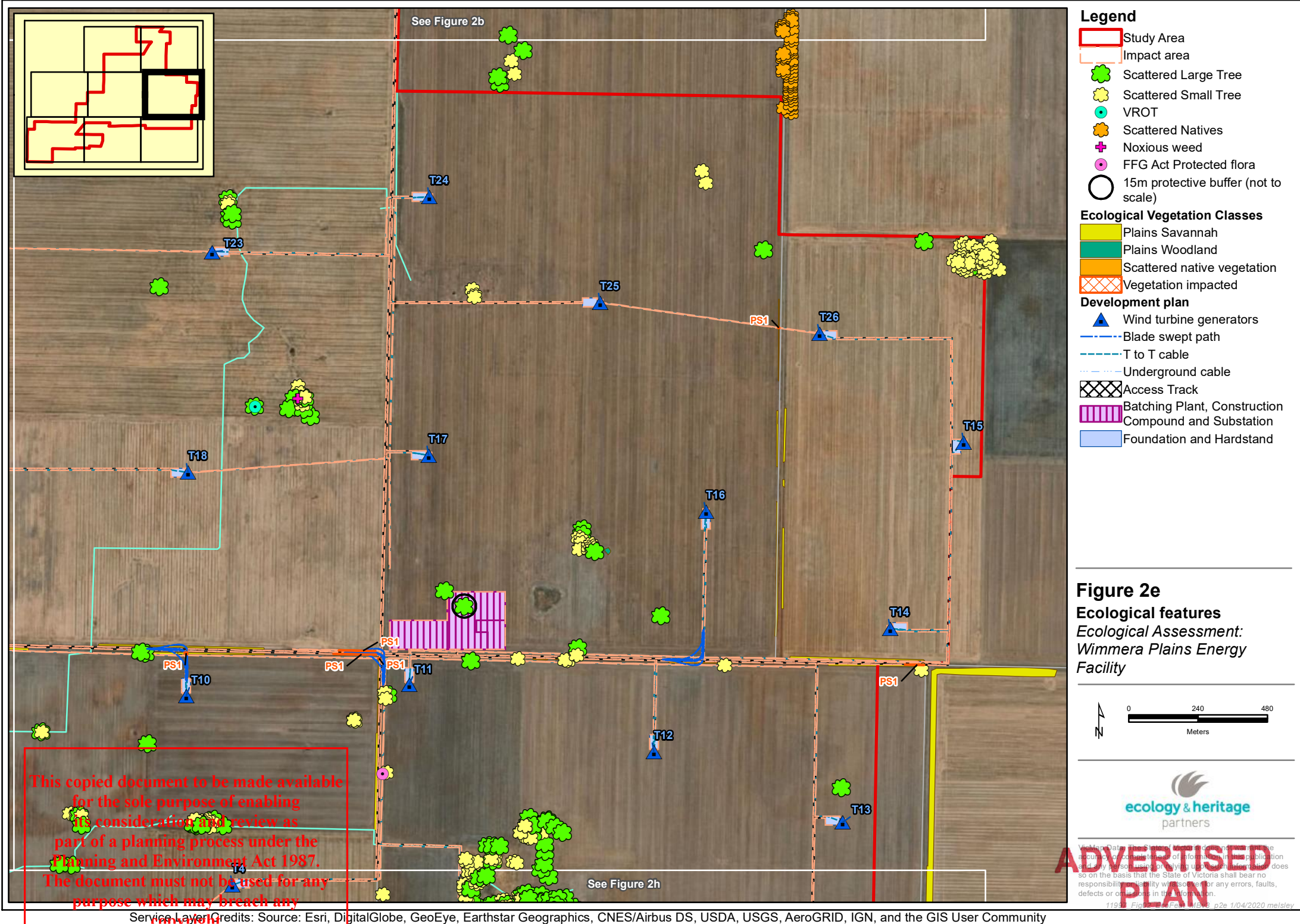
**Ecological features**  
*Ecological Assessment:  
 Wimmera Plains Energy  
 Facility*



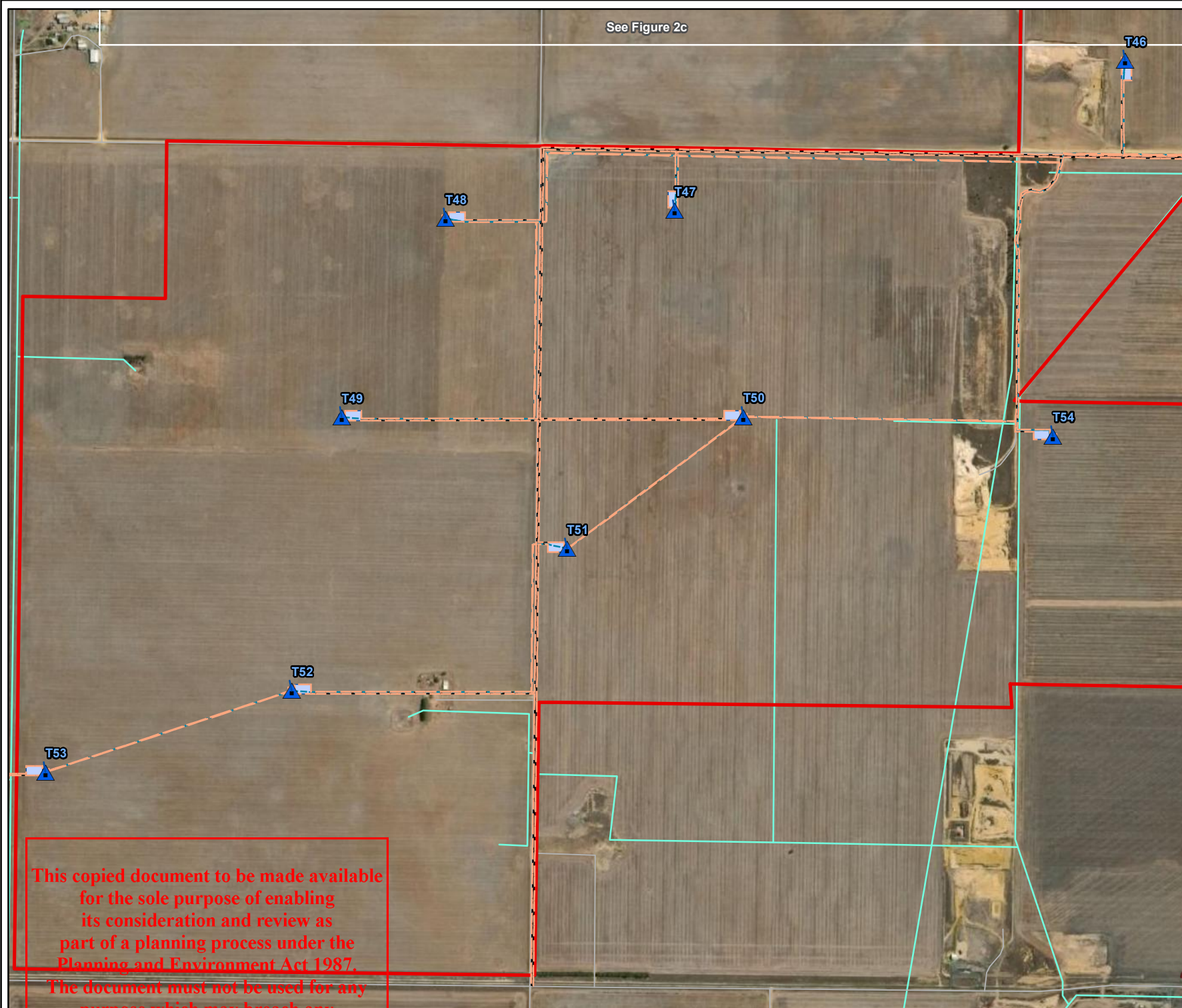
Version 0.1: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon this information does so on the basis that the State of Victoria shall bear no responsibility or liability with respect to any errors, faults, defects or omissions in the information.

**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**





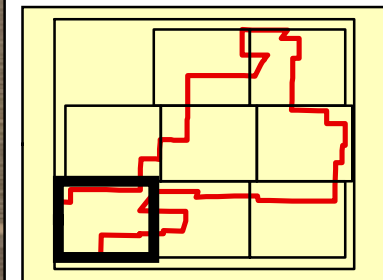




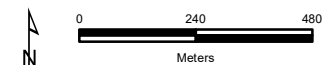
See Figure 2c

## Legend

- Study Area
- Impact area
- Development plan**
- ▲ Wind turbine generators
- T to T cable
- Access Track
- Foundation and Hardstand

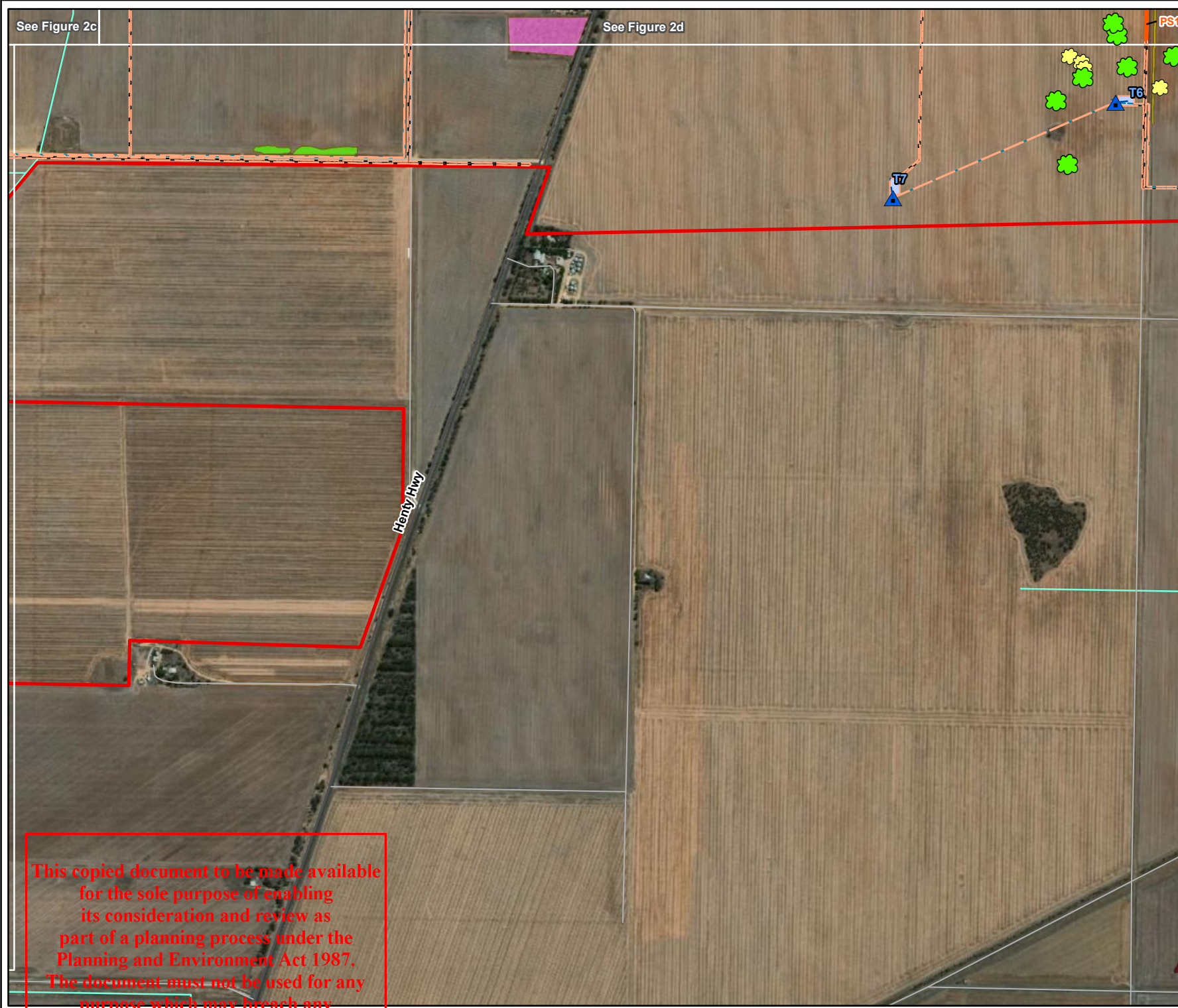


**Figure 2f**  
**Ecological features**  
*Ecological Assessment:*  
*Wimmera Plains Energy*  
*Facility*



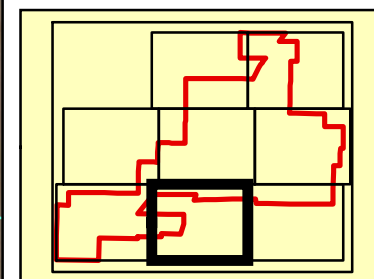
Victorian Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects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



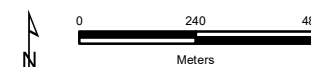


## Legend

- Study Area
- Impact area
- ✿ Scattered Large Tree
- ✿ Scattered Small Tree
- Ecological Vegetation Classes**
- Plains Grassland
- Plains Savannah
- Planted vegetation
- Vegetation impacted
- Development plan**
- ▲ Wind turbine generators
- T to T cable
- Access Track
- Foundation and Hardstand



**Figure 2g**  
**Ecological features**  
*Ecological Assessment:*  
*Wimmera Plains Energy*  
*Facility*

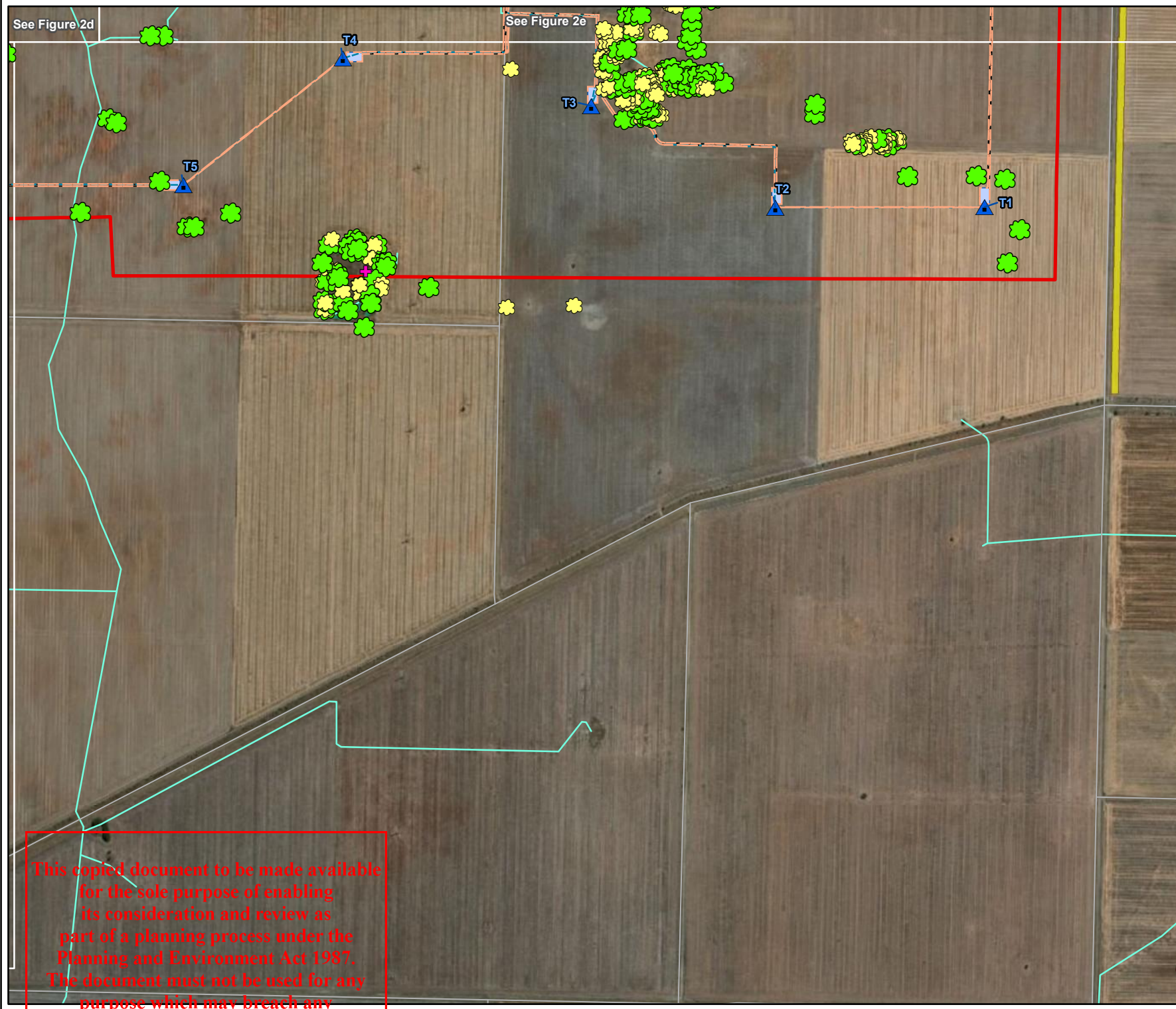


**ADVERTISED**

Version 0.01: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon this 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.

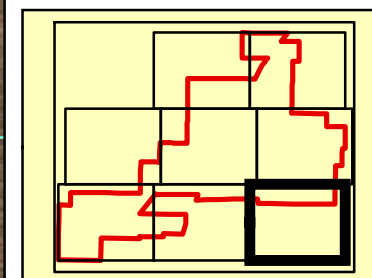
1997-2020 E. Bates MBv3 1/04/2020 melsley





## Legend

- Study Area
- Impact area
- ✿ Scattered Large Tree
- ✿ Scattered Small Tree
- ✕ Noxious weed
- Ecological Vegetation Classes**
- Plains Savannah
- Plains Woodland
- Development plan**
- ▲ Wind turbine generators
- T to T cable
- Access Track
- Foundation and Hardstand



**Figure 2h**  
**Ecological features**  
*Ecological Assessment:*  
*Wimmera Plains Energy Facility*



Version Data: The State of Victoria does not accept any liability for the accuracy or completeness of information in this publication and any person using or relying upon the 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.





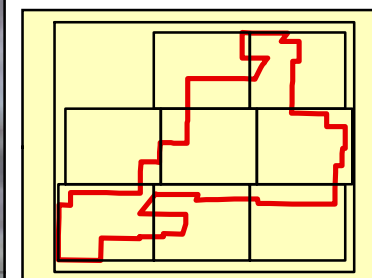
## Legend

- Study Area (road)
- Study Area (swept path)
- Impact area

- ★ Scattered Large Tree
- ★ Scattered Small Tree
- Large Tree in patch
- ▲ Planted Sugar Gum
- FFG Act Protected flora

## Ecological Vegetation Classes

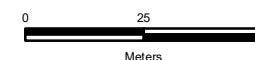
- Plains Savannah



**Figure 2i**

## Ecological features

*Ecological Assessment:  
Wimmera Plains Energy  
Facility*



**ADVERTISED PLAN**

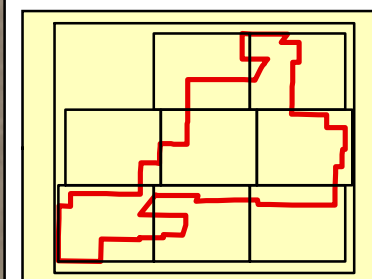
This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any





# Legend

- Study Area (road)
- Study Area (swept path)



**Figure 2j**  
**Ecological features**  
*Ecological Assessment:*  
*Wimmera Plains Energy*  
*Facility*

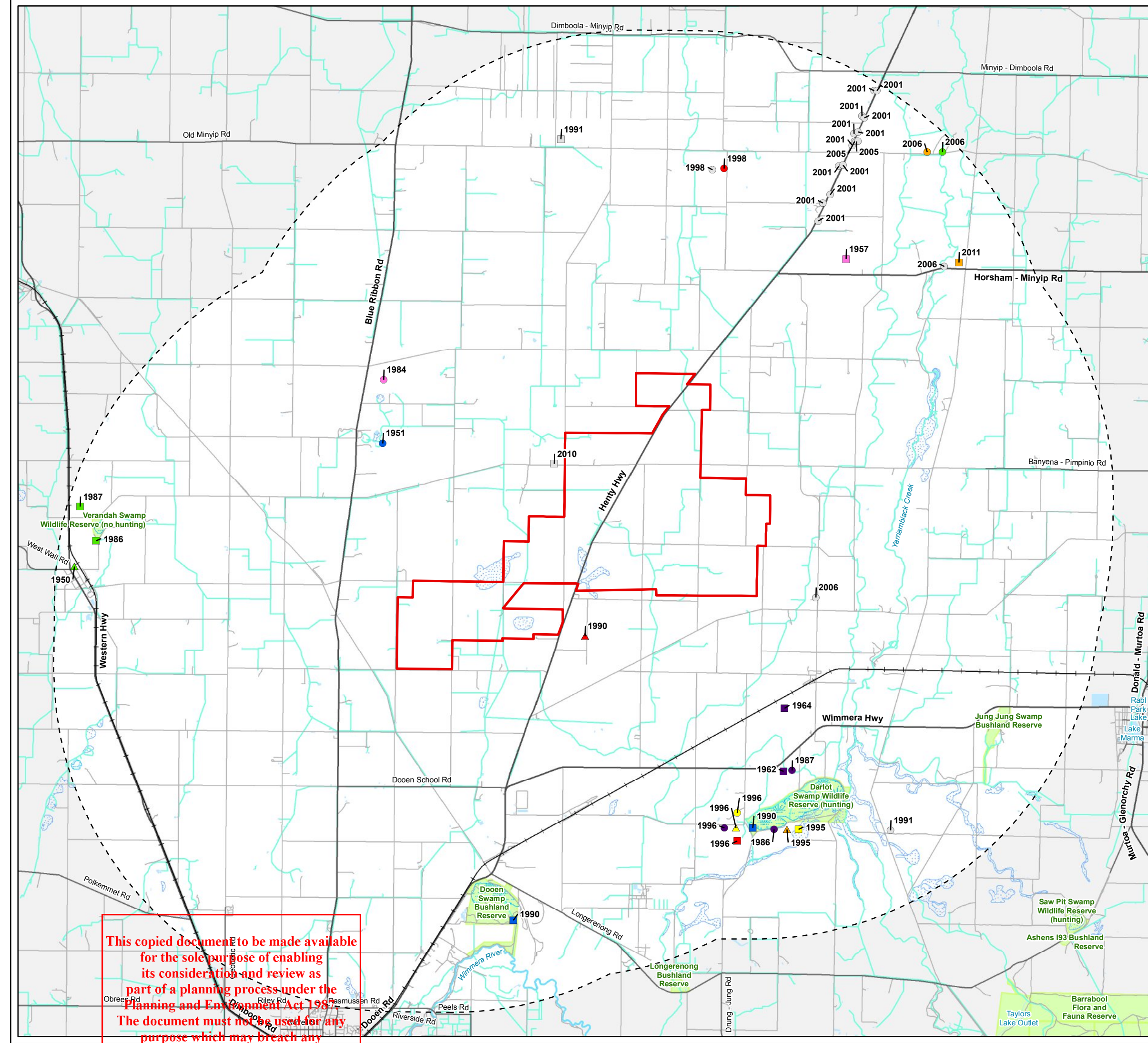


Victorian Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability with respect to any errors, faults, defects or omissions in the information.

1997-2012 Esri, Inc. MBv3 1/04/2020 melsley


**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**





















**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**

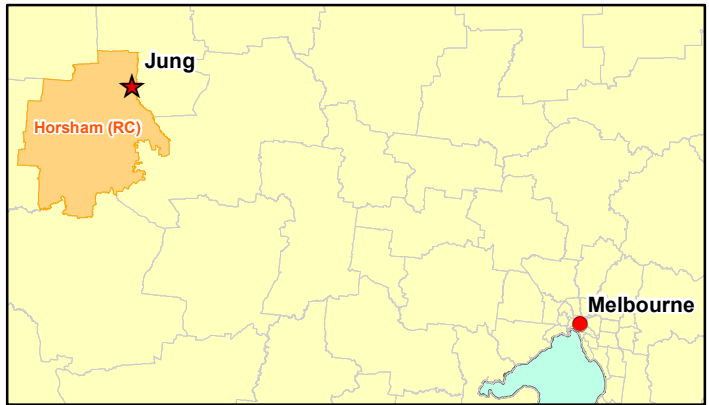
## Legend

 Study Area

### Significant Flora

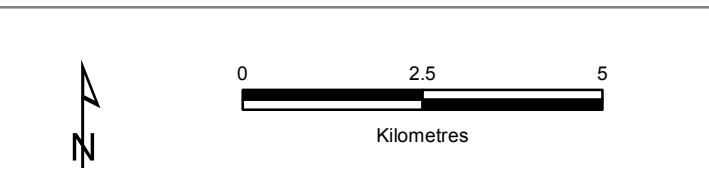
-  Buloke
-  Buloke Mistletoe
-  Cane Grass
-  Cut-leaf Burr-daisy
-  Dense Bent-grass
-  Downy Swainson-pea
-  Fuzzy New Holland Daisy
-  Hairy Tails
-  Leafless Bluebush

-  Pale Spike-sedge
-  Plains Joyweed
-  Riverina Bitter-cress
-  Spiny Lignum
-  Swamp Buttercup
-  Umbrella Wattle
-  Wavy Marshwort
-  Weeping Myall
-  Western Bitter-cress
-  Winged New Holland Daisy
-  Yellow-tongue Daisy



### Figure 3

**Previously documented significant  
flora within 10km of the study area**  
*Ecological Assessment: Wimmera Plains  
Energy Facility*





Legend

Study Area

Significant Fauna

- |  |                             |
|--|-----------------------------|
| ● Australasian Bittern                   | ▲ Grey Falcon               |
| ● Australian Pratincole                  | ▲ Grey-crowned Babbler      |
| ● Baillon's Crake                        | ▲ Growing Grass Frog        |
| ● Black Falcon                           | ▲ Hardhead                  |
| ● Black-eared Cuckoo                     | ▲ Hooded Robin              |
| ● Brolga                                 | ▲ Latham's Snipe            |
| ● Brown Treecreeper (south-eastern ssp.) | ▲ Little Button-quail       |
| ● Bush Stone-curlew                      | ⊕ Masked Owl                |
| ● Caspian Tern                           | ⊕ Musk Duck                 |
| ● Crested Bellbird                       | ⊕ Nankeen Night Heron       |
| ● Diamond Dove                           | ⊕ Pale Sun Moth             |
| ● Diamond Firetail                       | ⊕ Plains-wanderer           |
| ● Eastern Great Egret                    | ⊕ Royal Spoonbill           |
| ● Emu                                    | ⊕ Spotted Harrier           |
| ● Freckled Duck                          | ⊕ Square-tailed Kite        |
| ● Freshwater Catfish                     | ⊕ Striped Legless Lizard    |
| △ Golden Perch                           | ⊕ Swift Parrot              |
|  | ⊕ Whiskered Tern            |
|  | ⊕ White-throated Needletail |

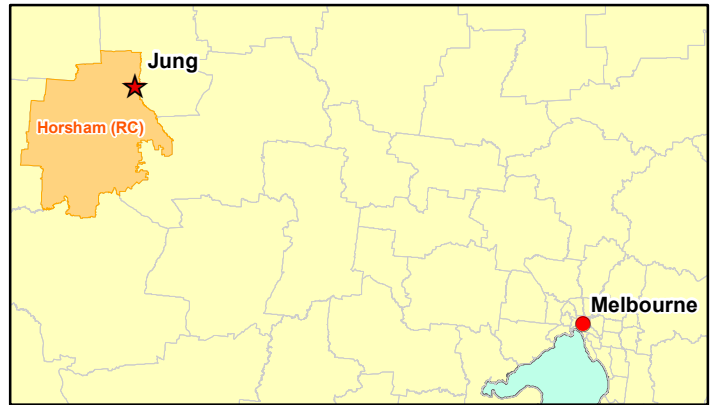
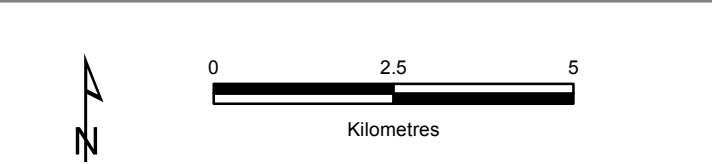


Figure 4

Previously documented significant fauna within 10km of the study area  
*Ecological Assessment: Wimmera Plains Energy Facility*



VBA 2018, Victorian Biodiversity Atlas (Source: VBA 2018, VBA FAUNA25, VBA FAUNA100, VBA FAUNA25 and VBA FAUNA100, March 2018) and Victorian Department of Environment, Land, Water and Planning. Records prior to 1949 not shown.

VicMap Data: The State of Victoria does not warrant the accuracy or completeness 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.

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.



Legend

Study Area

Brolga (VBA 2018)

Sheldon Database Flocking Records

**Figure 5**  
**Previously documented Brolga records near the study area**  
*Ecological Assessment: Wimmera Plains Energy Facility*

ADVERTISED PLAN

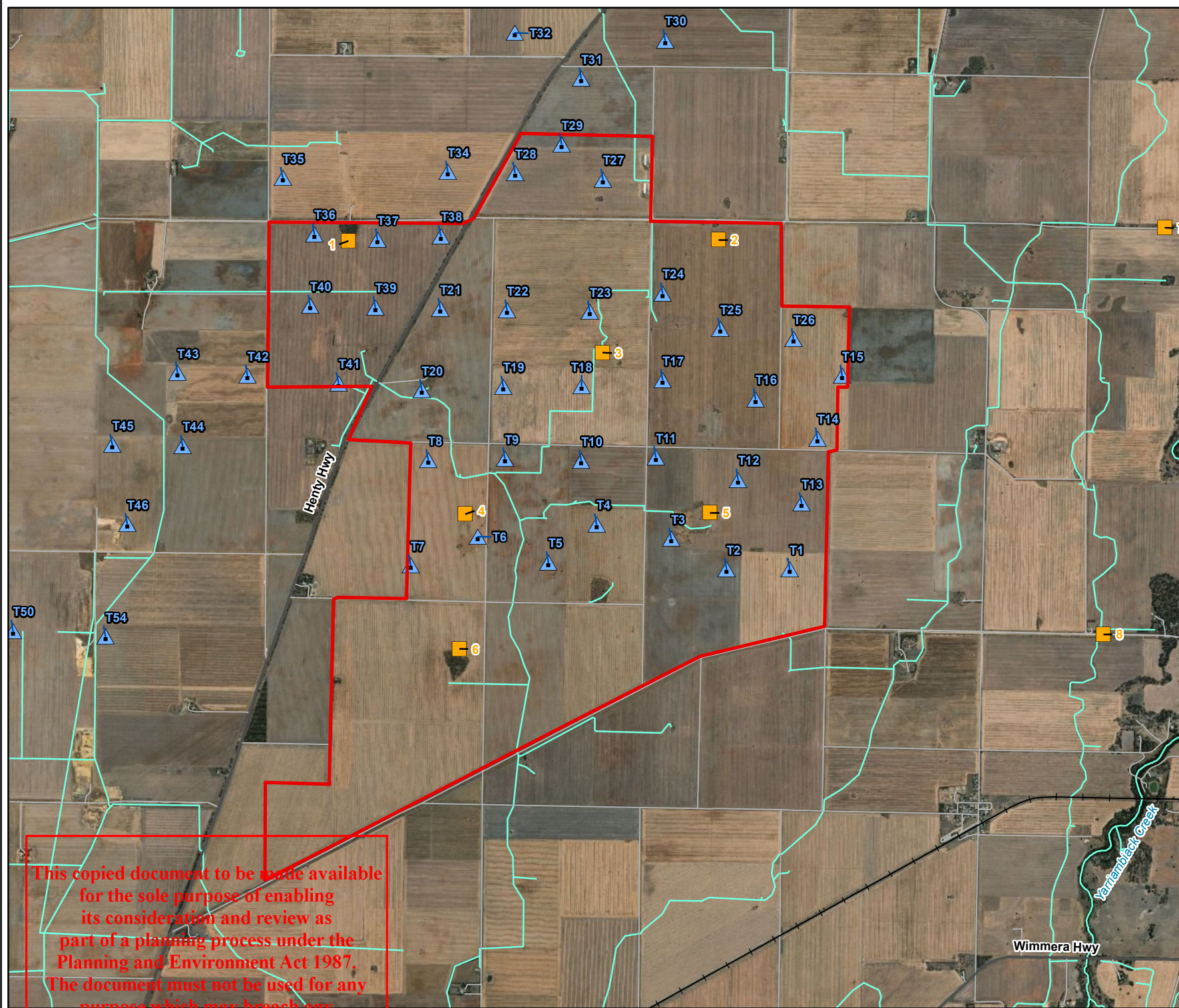
VBA 2018, Victorian Biodiversity Atlas, Sources: VBA 2018, VBA FAUNA25, VBA FAUNA100, VBA FAUNA25 and VBA FAUNA100, March 2018, Victorian Biodiversity Atlas, Department of Environment, Land, Water and Planning. Records prior to 1949 not shown.

VicMap Data: The State of Victoria does not warrant the accuracy or completeness 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.

11997 Fig05 Brolga\_VBA 3/03/2020 psorensen

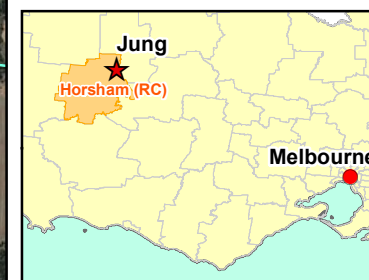
This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright



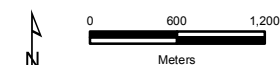


## Legend

- Study Area
- ▲ Wind turbine generators
- Bird utilisation
- Minor Watercourse



**Figure 6a**  
**Bird Utilisation Surveys -**  
**February/March 2019**  
*Ecological Assessment:*  
*Wimmera Plains Energy*  
*Facility*

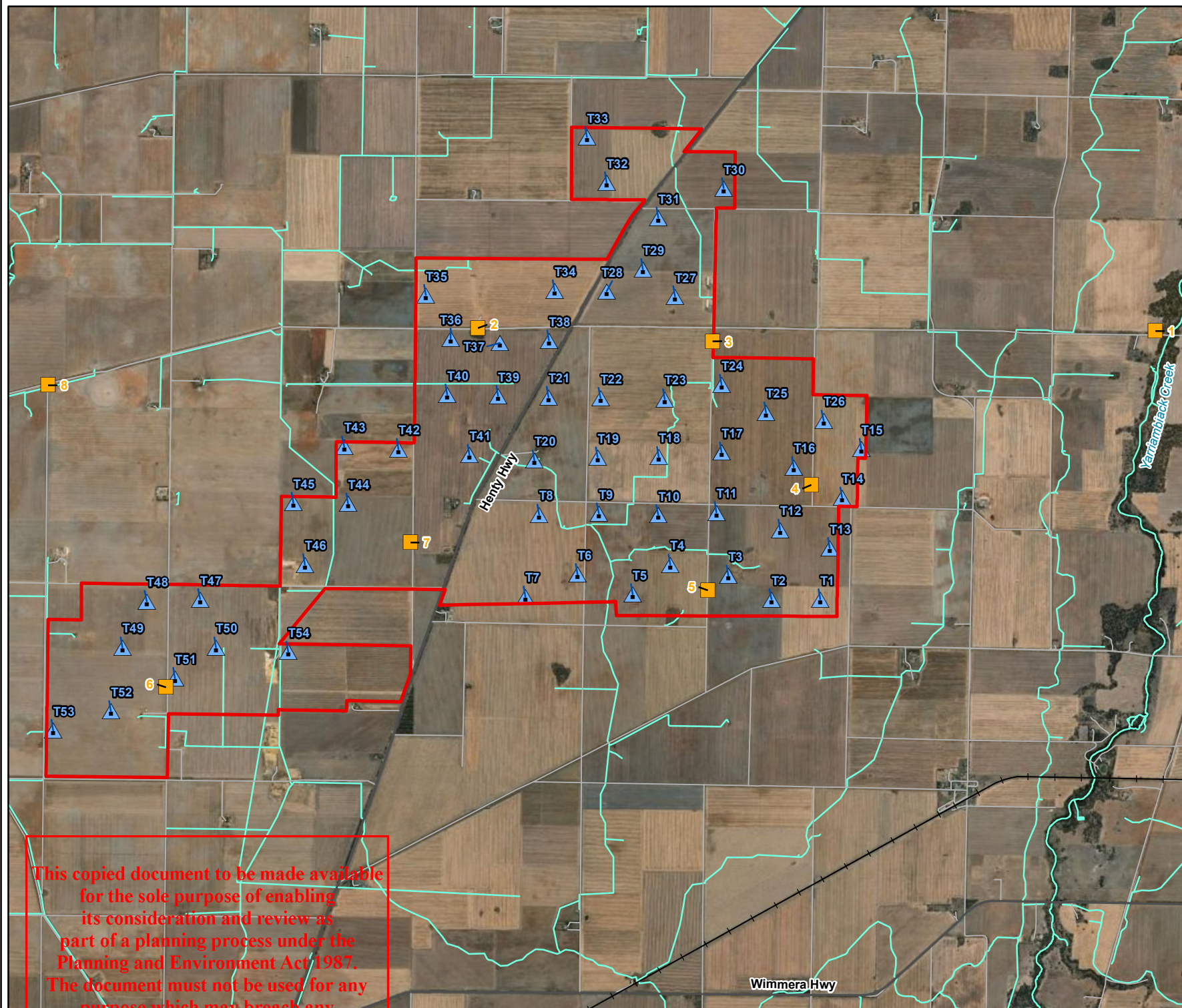


Version 1.0: The State of Victoria shall not be responsible for any errors, omissions, or any other inaccuracies or consequences of information in this publication and any person using or relying upon the information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

11/197 - Final Bird Utilisation 3/03/2020 psorensen

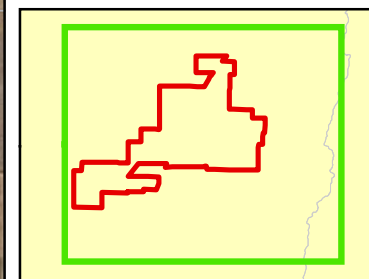
This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any



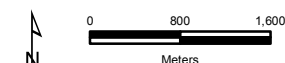


## Legend

- Study Area
- ▲ Wind turbine generators
- Bird utilisation
- Minor Watercourse



**Figure 6b**  
**Bird Utilisation Surveys -**  
**Winter / Spring 2019**  
*Ecological Assessment:*  
*Wimmera Plains Energy*  
*Facility*

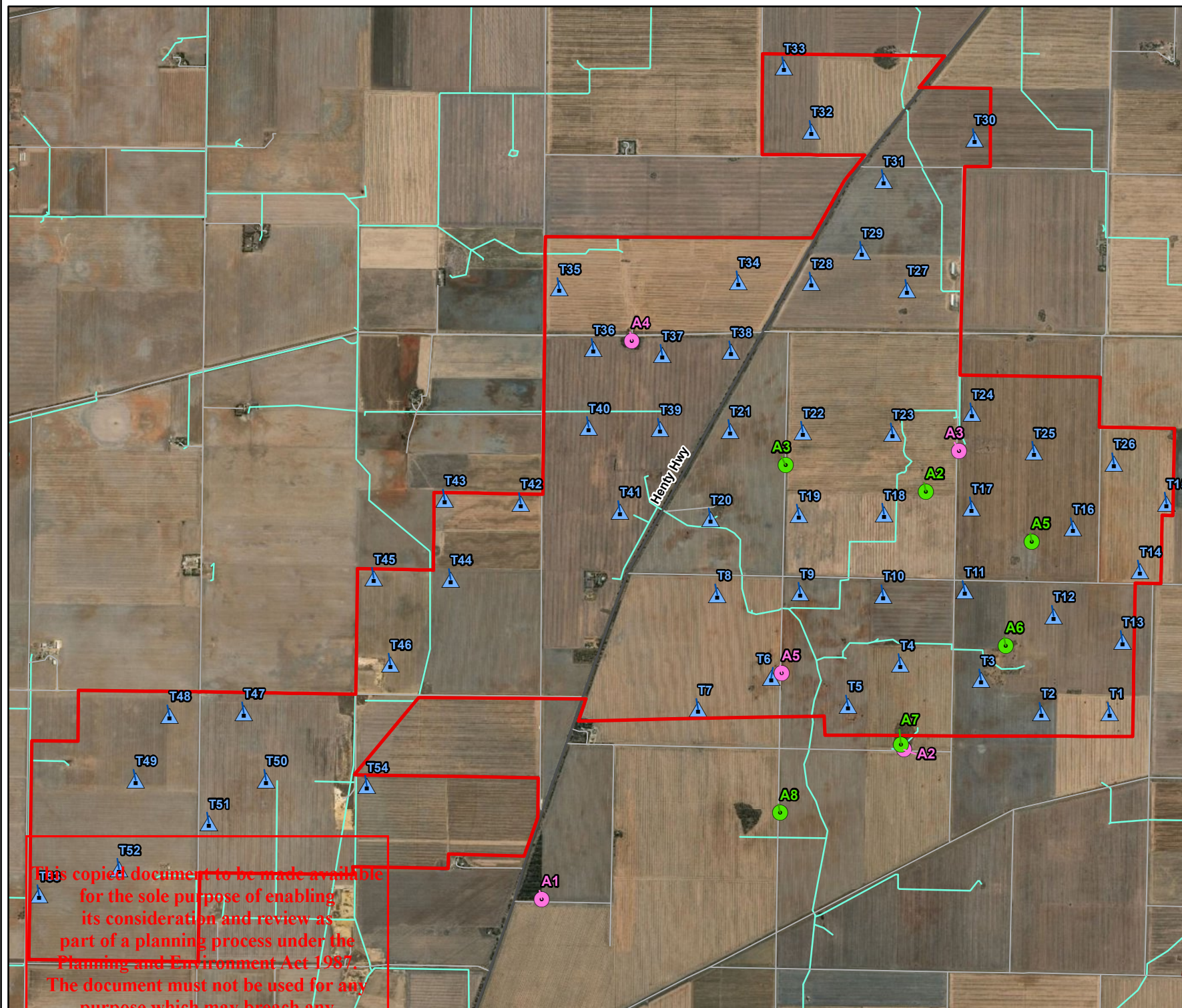


Wimmera Plains Energy Facility is a proposed renewable energy project. The accuracy of the information in this publication and any person using or relying upon the information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

11/197 - Final Bird Utilisation 3/03/2020 psorensen

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



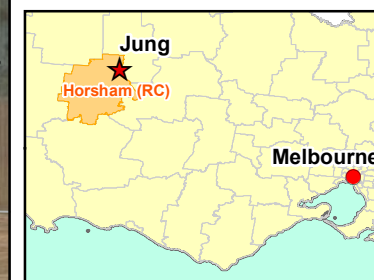


## Legend

- Study Area
- ▲ Wind turbine generators
- Minor Watercourse

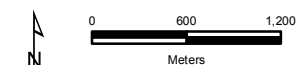
## Anabat locations

- February 2019
- October 2019



**Figure 7**

**Anabat locations**  
*Ecological Assessment:  
 Wimmera Plains Energy  
 Facility*



Victorian Data: the State of Victoria does not warrant the accuracy or completeness 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.

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

**ADVERTISED PLAN**

## APPENDICES

---

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



## APPENDIX 1

### Appendix 1.1 – Rare or Threatened Categories for Listed Victorian Taxa

**Table A1.1.** Rare or Threatened categories for listed Victorian taxa.

Rare or Threatened Categories
<b>Conservation Status in Australia (Based on the EPBC Act 1999)</b>
<b>EX</b> - Extinct: Extinct is when there is no reasonable doubt that the last individual of the species has died.
<b>CR</b> - Critically Endangered: A species is critically endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.
<b>EN</b> - Endangered: A species is endangered when it is not critically endangered but is facing a very high risk of extinction in the wild in the near future.
<b>VU</b> - Vulnerable: A species is vulnerable when it is not critically endangered or endangered but is facing a high risk of extinction in the wild in the medium-term future.
<b>R*</b> - Rare: A species is rare but overall is not currently considered critically endangered, endangered or vulnerable.
<b>K*</b> - Poorly Known: A species is suspected, but not definitely known, to belong to any of the categories extinct, critically endangered, endangered, vulnerable or rare.
<b>Conservation Status in Victoria (Based on DEPI 2014, DSE 2009 or DEPI 2013)</b>
<b>x</b> - Presumed Extinct in Victoria: not recorded from Victoria during the past 50 years despite field searches specifically for the plant, or, alternatively, intensive field searches (since 1950) at all previously known sites have failed to record the plant.
<b>e</b> - Endangered in Victoria: at risk of disappearing from the wild state if present land use and other causal factors continue to operate.
<b>v</b> - Vulnerable in Victoria: not presently endangered but likely to become so soon due to continued depletion; occurring mainly on sites likely to experience changes in land-use which would threaten the survival of the plant in the wild; or, taxa whose total population is so small that the likelihood of recovery from disturbance, including localised natural events such as drought, fire or landslip, is doubtful.
<b>r</b> - Rare in Victoria: rare but not considered otherwise threatened - there are relatively few known populations or the taxon is restricted to a relatively small area.
<b>k</b> - Poorly Known in Victoria: poorly known and suspected, but not definitely known, to belong to one of the above categories (x, e, v or r) within Victoria. At present, accurate distribution information is inadequate.

## Appendix 1.2 – Defining Ecological Significance

**Table A1.2.** Criteria for defining Ecological Significance ratings for significant flora, fauna and communities.

National Significance
<p><b>Flora:</b> National conservation status is based on the EPBC Act list of taxa considered threatened in Australia (i.e. extinct, critically endangered, endangered, vulnerable).</p>
<p><b>Fauna:</b> National conservation status is based on the EPBC Act list of taxa considered threatened in Australia (i.e. Extinct, Critically Endangered, Endangered, Vulnerable). Fauna listed as Extinct, Critically Endangered, Endangered, Vulnerable, or Rare under National Action Plans for terrestrial taxon prepared for DoE: mammals (Woinarski <i>et al.</i> 2014), bats (Duncan <i>et al.</i> 1999), birds (Garnett <i>et al.</i> 2011), reptiles (Cogger <i>et al.</i> 1993), amphibians (Tyler 1997) and butterflies (Sands and New 2002).</p>
<p><b>Communities:</b> Vegetation communities considered critically endangered, endangered or vulnerable under the EPBC Act and considering vegetation condition.</p>
State Significance
<p><b>Flora:</b> Threatened taxa listed under the provisions of the FFG Act. Flora listed in the State Government's Advisory List of Rare or Threatened Plants in Victoria (DEPI 2014).</p>
<p><b>Fauna:</b> Threatened taxon listed under Schedule 2 of the FFG Act. Fauna listed as Extinct, Critically Endangered, Endangered and Vulnerable on the State Government's Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2013). Listed as Lower Risk (Near Threatened, Conservation Dependent or Least concern) or Data Deficient under National Action Plans for terrestrial species prepared for the DoE: mammals (Woinarski <i>et al.</i> 2014), bats (Duncan <i>et al.</i> 1999), birds (Garnett <i>et al.</i> 2011), reptiles (Cogger <i>et al.</i> 1993), amphibians (Tyler 1997) and butterflies (Sands and New 2002).</p>
<p><b>Communities:</b> Ecological communities listed as threatened under the FFG Act (DELWP 2017h). EVC listed as threatened (i.e. endangered, vulnerable) or rare in a Native Vegetation Plan for a particular bioregion and considering vegetation condition.</p>
Regional Significance
<p><b>Fauna:</b> Fauna with a disjunct distribution, or a small number of documented recorded or naturally rare in the particular Bioregion in which the study area is located. A particular taxon that is has an unusual ecological or biogeographical occurrence or listed as Lower Risk – Near Threatened, Data Deficient or Insufficiently Known on the State Government's Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2013).</p>
<p><b>Communities:</b> EVC listed as depleted or least concern in a Native Vegetation Plan for a particular bioregion) and considering vegetation condition. EVC considered rare by the author for a particular bioregion.</p>
Local Significance
<p>Local significance is defined as flora, fauna and ecological communities indigenous to a particular area, which are not considered rare or threatened on a national, state or regional level.</p>

**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**

## Appendix 1.3 – Defining Site Significance

**Table A1.3.** Criteria for defining Site Significance ratings.

National Significance
<p>A site is of National significance if:</p> <ul style="list-style-type: none"> <li>It regularly supports, or has a high probability of regularly supporting individuals of a taxon listed as ‘Critically Endangered’ or ‘Endangered’ under the EPBC Act and/or under National Action Plans for terrestrial taxon prepared for the DoE.</li> <li>It regularly supports, or has a high probability of supporting, an ‘important population’ as defined under the EPBC Act of one or more nationally ‘vulnerable’ flora and fauna taxon.</li> <li>It is known to support, or has a high probability of supporting taxon listed as ‘Vulnerable’ under National Action Plans.</li> <li>It is known to regularly support a large proportion (i.e. greater than 1%) of a population of a taxon listed as ‘Conservation Dependent’ under the EPBC Act and/or listed as Rare or Lower Risk (near threatened, conservation dependent or least concern) under National Action Plans.</li> <li>It contains an area, or part thereof designated as ‘critical habitat’ under the EPBC Act, or if the site is listed under the Register of National Estate compiled by the Australian Heritage Commission.</li> <li>It is a site which forms part of, or is connected to a larger area(s) of remnant native vegetation or habitat of national conservation significance such as most National Park, and/or a Ramsar Wetland(s).</li> </ul>
State Significance
<p>A site is of State significance if:</p> <ul style="list-style-type: none"> <li>It occasionally (i.e. every 1 to 5 years) supports, or has suitable habitat to support taxon listed as ‘Critically Endangered’ or ‘Endangered’ under the EPBC Act and/or under National Action Plans.</li> <li>It regularly supports, or has a high probability of regularly supporting (i.e. high habitat quality) taxon listed as ‘Vulnerable’, ‘Near threatened’, ‘Data Deficient’ or ‘Insufficiently Known’ in Victoria (,DSE 2013; DEPI 2014), or species listed as ‘Data Deficient’ or ‘Insufficiently Known’ under National Action Plans.</li> <li>It contains an area, or part thereof designated as ‘critical habitat’ under the FFG Act.</li> <li>It supports, or likely to support a high proportion of any Victorian flora and fauna taxa.</li> <li>It contains high quality, intact vegetation/habitat supporting a high species richness and diversity in a particular bioregion.</li> <li>It is a site which forms part of, or connected to a larger area(s) of remnant native vegetation or habitat of state conservation significance such as most State Parks and/or Flora and Fauna Reserves.</li> </ul>
Regional Significance
<p>A site is of Regional significance if:</p> <ul style="list-style-type: none"> <li>It regularly supports, or has a high probability of regularly supporting regionally significant fauna as defined in Table 1.2.</li> <li>It contains a large population (i.e. greater than 1% or 5%) of flora considered rare in any regional Native Vegetation Plan for a particular bioregion.</li> <li>It supports a fauna population with a disjunct distribution, or a particular taxon that has an unusual ecological or biogeographical occurrence.</li> <li>It is a site which forms part of, or is connected to a larger area(s) of remnant native vegetation or habitat of regional conservation significance such as most Regional Parks and/or Flora and Fauna Reserves.</li> </ul>
Local Significance
<p>Most sites are considered to be of at least local significant for conservation, and in general a site of local significance can be defined as:</p> <ul style="list-style-type: none"> <li>An area which supports indigenous flora species and/or a remnant EVC, and habitats used by locally significant fauna species.</li> <li>An area which currently acts, or has the potential to act as a wildlife corridor linking other areas of higher conservation significance and facilitating fauna movement throughout the landscape.</li> </ul>

**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**

## Appendix 1.4 – Vegetation Condition and Habitat Quality

**Table A1.4.1** Defining Vegetation Condition ratings.

Criteria for defining Vegetation Condition
<b>High Quality:</b> Vegetation dominated by a diversity of indigenous species, with defined structures (where appropriate), such as canopy layer, shrub layer, and ground cover, with little or few introduced species present.
<b>Moderate Quality:</b> Vegetation dominated by a diversity of indigenous species, but is lacking some structures, such as canopy layer, shrub layer or ground cover, and/or there is a greater level of introduced flora species present.
<b>Low Quality:</b> Vegetation dominated by introduced species, but supports low levels of indigenous species present, in the canopy, shrub layer or ground cover.

**Table A1.4.2** Defining Habitat Quality.

Criteria for defining Habitat Quality
<b>High Quality:</b> <ul style="list-style-type: none"> <li>• High degree of intactness (i.e. floristically and structurally diverse), containing several important habitat features such as ground debris (logs, rocks, vegetation), mature hollow-bearing trees, and a dense understorey component.</li> <li>• High species richness and diversity (i.e. represented by a large number of species from a range of fauna groups).</li> <li>• High level of foraging and breeding activity, with the site regularly used by native fauna for refuge and cover.</li> <li>• Habitat that has experienced, or is experiencing low levels of disturbance and/or threatening processes (i.e. weed invasion, introduced animals, soil erosion, salinity).</li> <li>• High contribution to a wildlife corridor, and/or connected to a larger area(s) of high quality habitat.</li> <li>• Provides known, or likely habitat for one or more rare or threatened species listed under the EPBC Act, FFG Act, or species considered rare or threatened according to DEPI 2014; DSE 2009 or 2013.</li> </ul>
<b>Moderate Quality:</b> <ul style="list-style-type: none"> <li>• Moderate degree of intactness, containing one or more important habitat features such as ground debris (logs, rocks, vegetation), mature hollow-bearing trees, and a dense understorey component.</li> <li>• Moderate species richness and diversity - represented by a moderate number of species from a range of fauna groups.</li> <li>• Moderate levels of foraging and breeding activity, with the site used by native fauna for refuge and cover.</li> <li>• Habitat that has experienced, or is experiencing moderate levels of disturbance and/or threatening processes.</li> <li>• Moderate contribution to a wildlife corridor, or is connected to area(s) of moderate quality habitat.</li> <li>• Provides potential habitat for a small number of threatened species listed under the EPBC Act, FFG Act, or species considered rare or threatened according to DEPI 2014; DSE 2009 or 2013.</li> </ul>
<b>Low Quality:</b> <ul style="list-style-type: none"> <li>• Low degree of intactness, containing few important habitat features such as ground debris (logs, rocks, vegetation), mature hollow-bearing trees, and a dense understorey component.</li> <li>• Low species richness and diversity (i.e. represented by a small number of species from a range of fauna groups).</li> <li>• Low levels of foraging and breeding activity, with the site used by native fauna for refuge and cover.</li> <li>• Habitat that has experienced, or is experiencing high levels of disturbance and/or threatening processes.</li> <li>• Unlikely to form part of a wildlife corridor, and is not connected to another area(s) of habitat.</li> <li>• Unlikely to provide habitat for rare or threatened species listed under the EPBC Act, FFG Act, or considered rare or threatened according to DEPI 2014; DSE 2009 or 2013.</li> </ul>

## Appendix 1.5 – Flora and Fauna Guarantee Act 1988 Protected Species

Protected flora and fauna under the *Flora and Fauna Guarantee Act 1988* (FFG Act) are defined as those that have legal protection under the Act. Protected taxa includes plants and animals from three sources:

- plant or animal taxa (species, subspecies or varieties) listed as threatened under the FFG Act;
- plant taxa belonging to communities listed as threatened under the FFG Act; and,
- plant taxa which are not threatened but require protection for other reasons.

Note that representative plants of a given community are protected as well as the community itself (for example scattered Wallaby-grasses *Rytidosperma* spp. are protected in degraded areas previously supporting the listed Western [Basalt] Plains Grassland Community).

Table A1.6 provides a list of plant groups protected under the FFG Act. For threatened plant species likely to occur within the study area refer to Appendix and for listed communities (or representative species) likely to occur within the study area refer to Sections 3.4.1 and 3.4.2.

**Table A1.6.** Plant groups (Families, Genera and Kingdom Divisions) protected under the FFG Act (DELWP 2016).

Family/Genera	Common Name	Exclusions
Pteridophyta	Clubmosses, ferns and fern allies	Austral Bracken <i>Pteridium esculentum</i>
Asteraceae	Daisies	N/A
Ericaceae (formerly Epacridaceae)	Heaths	N/A
Orchidaceae	Orchids	N/A
<i>Acacia</i>	Wattles	<i>Acacia dealbata</i> , <i>Acacia decurrens</i> , <i>Acacia implexa</i> , <i>Acacia melanoxylon</i> and <i>Acacia paradoxa</i>
<i>Baeckea</i>	Baeckneas	N/A
<i>Boronia</i>	Boronias	N/A
<i>Calytrix</i>	Fringe-myrtles	N/A
<i>Correa</i> -	Correas	N/A
<i>Darwinia</i>	Darwinias	N/A
<i>Eremophila</i>	Emu-bushes	N/A
<i>Eriostemon</i>	Wax-flowers	N/A
<i>Gompholobium</i>	Wedge-peas	N/A
<i>Grevillea</i>	Grevilleas	N/A
<i>Prostanthera</i>	Mint-bushes	N/A
<i>Sphagnum</i>	Sphagnum mosses	N/A
<i>Stylidium</i>	Trigger-plants	N/A
<i>Thryptomene</i>	Thryptomenes	N/A
<i>Thysanotus</i>	Fringe-lilies	N/A
<i>Xanthorrhoea</i>	Grass-trees	N/A

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

## APPENDIX 2 - FLORA

### Appendix 2.1 – Flora Results

#### Legend:

**P** Protected under the FFG Act (DELWP 2016);

**L** Listed under the FFG Act (DELWP 2017e);

**e/v/r** Listed as endangered/vulnerable/rare in Victoria under the Advisory List of Rare or Threatened Plants in Victoria (DEPI 2014);

**\*** Listed as a noxious weed under the CaLP Act;

**#** Planted native or non-native specimen

**w** Weed of National Significance;

- Not applicable

**Table A2.1.** Flora recorded within the study area.

Scientific Name	Common Name	Comment
<b>Indigenous Species</b>		
<i>Acacia acinacea</i> s.s.	Gold-dust Wattle	P
<i>Allocasuarina leuhmannii</i>	Buloke	L
<i>Amyema linophylla</i> subsp. <i>orientalis</i>	Buloke Mistletoe	v
<i>Atriplex semibaccata</i>	Berry Saltbush	-
<i>Austrostipa aristiglumis</i>	Plump Spear-grass	-
<i>Austrostipa scabra</i>	Rough Spear-grass	-
<i>Callitris gracilis</i>	Slender Cypress-pine	-
<i>Calocephalus citreus</i>	Lemon Beauty-heads	P
<i>Chloris truncata</i>	Windmill Grass	-
<i>Duma florulenta</i>	Tangled Lignum	-
<i>Enchylaena tomentosa</i>	Ruby Saltbush	-
<i>Eucalyptus camaldulensis</i>	River Red-gum	-
<i>Eucalyptus microcarpa</i>	Grey Box	-
<i>Lachnagrostis filiformis</i> s.s.	Common Blown-grass	-
<i>Maireana enchylaenoides</i>	Wingless Bluebush	-
<i>Panicum decompositum</i>	Native Millet	-
<i>Rytidosperma racemosum</i>	Common Wallaby-grass	-
<i>Rytidosperma setacea</i>	Bristly Wallaby-grass	-
<i>Rytidosperma</i> spp.	Wallaby Grass	-
<i>Sclerolobos diacantha</i>	Grey Copperburr	-

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



Scientific Name	Common Name	Comment
<i>Sida corrugata</i>	Variable Sida	-
<i>Teucrium racemosum</i>	Grey Germander	-
<i>Vittadinia cuneata</i>	Fuzzy New Holland Daisy	P
<i>Walwholleya proluta</i>	Rigid Panic	-
<b>Non-Indigenous Species</b>		
<i>Arctotheca calendula</i>	Cape Weed	-
<i>Avena</i> spp.	Oat	-
<i>Bromus</i> spp.	Brome	-
<i>Callistemon</i> sp.	Bottlebrush	#
<i>Echium plantagineum</i>	Paterson's curse	-
<i>Eucalyptus cladocalyx</i>	Sugar Gum	#
<i>Eucalyptus megacornuta</i>	Warty Yate	#
<i>Eucalyptus spathulata</i> subsp. <i>spathulata</i>	Swamp Mallet	#
<i>Helminthotheca echioides</i>	Ox-tongue	-
<i>Hordeum vulgare</i>	Barley	-
<i>Lactuca serriola</i>	Prickly Lettuce	-
<i>Lolium perenne</i>	Perennial Rye-grass	-
<i>Lolium</i> spp.	Rye Grass	-
<i>Lycium ferocissimum</i>	African Box-thorn	* w
<i>Malva</i> spp.	Mallow	-
<i>Marrubium vulgare</i>	Horehound	*
<i>Plantago lanceolata</i>	Ribwort	-
<i>Salvia verbenaca</i>	Wild Sage	-
<i>Silybum marianum</i>	Milk thistle	-
<i>Solanum elaeagnifolium</i>	Silverleaf Nightshade	-
<i>Sonchus oleraceus</i>	Common Sow-thistle	-
<i>Vulpia bromoides</i>	Squirrel-tail Fescue	-

**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**

## Appendix 2.2 – Significant Flora Species

**Table A2.2** Significant flora recorded within 10 kilometres of the study area

**Likelihood:** Habitat characteristics of significant flora species previously recorded within 10 kilometres of the study area, or that may potentially occur within the study area were assessed to determine their likelihood of occurrence. The likelihood of occurrence rankings are defined below.

**1 - Known occurrence**

- Recorded within the study area recently (i.e. within ten years)

**2 - High Likelihood**

- Previous records of the species in the local vicinity; and/or,
- The study area contains areas of high quality habitat.

**3 - Moderate Likelihood**

- Limited previous records of the species in the local vicinity; and/or,
- The study area contains poor or limited habitat.

**4 - Low Likelihood**

- Poor or limited habitat for the species however other evidence (such as a lack of records or environmental factors) indicates there is a very low likelihood of presence.

**5 – Unlikely**

- No suitable habitat and/or outside the species range.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DEPI	Likely occurrence in study area
<b>NATIONAL SIGNIFICANCE</b>							
<i>Acacia glandulicarpa</i> #	Hairy-pod Wattle	-	-	VU	L	v	4
<i>Amphibromus fluitans</i> #	River Swamp Wallaby-grass	-	-	VU	-	-	4
<i>Caladenia tensa</i> #	Greencomb Spider-orchid	-	-	EN	-	v	4
<i>Caladenia versicolor</i> #	Candy Spider-orchid	-	-	VU	L	e	5
<i>Pimelea spinescens</i> subsp. <i>pubiflora</i> #	Wimmera Rice-flower	-	-	CR	L	e	4
<i>Pimelea spinescens</i> subsp. <i>spinescens</i> #	Spiny Rice-flower	-	-	CR	L	e	4
<i>Pterostylis cheraphila</i> #	Floodplain Rustyhood	-	-	VU	L	v	5
<i>Scilla hololeuca</i> var. <i>purpurea</i> #	Turnip Copperburr	-	-	EN	L	e	4
<i>Swainsona murrayana</i> #	Slender Darling-pea	-	-	VU	L	e	4

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

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DEPI	Likely occurrence in study area
STATE SIGNIFICANCE							
<i>Acacia oswaldii</i>	Umbrella Wattle	1	1957	-	L	v	4
<i>Acacia pendula</i>	Weeping Myall	1	1990	-	L	e	3
<i>Allocasuarina luehmannii</i>	Buloke	20	2006	-	L	e	1
<i>Alternanthera sp. 1 (Plains)</i>	Plains Joyweed	1	2011	-	-	k	3
<i>Amyema linophylla subsp. orientalis</i>	Buloke Mistletoe	2	1998	-	-	v	1
<i>Brachyscome chrysoglossa</i>	Yellow-tongue Daisy	1	1950	-	L	v	4
<i>Calotis anthemoides</i>	Cut-leaf Burr-daisy	1	1996	-	L	-	4
<i>Cardamine lineariloba</i>	Western Bitter-cress	2	1995	-	-	v	3
<i>Cardamine moirensis</i>	Riverina Bitter-cress	3	1995	-	-	r	3
<i>Centipeda nidiformis</i>	Cotton Sneezeweed	2	1902	-	-	r	4
<i>Deyeuxia imbricata</i>	Dense Bent-grass	1	2006	-	-	v	4
<i>Duma horrida subsp. horrida</i>	Spiny Lignum	2	1987	-	-	r	3
<i>Eleocharis pallens</i>	Pale Spike-sedge	1	1996	-	-	k	4
<i>Eragrostis australasica</i>	Cane Grass	1	2006	-	-	v	5
<i>Maireana aphylla</i>	Leafless Bluebush	2	2010	-	-	k	3
<i>Nymphoides crenata</i>	Wavy Marshwort	3	1964	-	L	v	5
<i>Picris squarrosa</i>	Squat Picris	1	1901	-	-	r	4
<i>Ptilotus erubescens</i>	Hairy Tails	4	1999	-	L	v	4
<i>Ranunculus undosus</i>	Swamp Buttercup	2	1990	-	-	v	5
<i>Swainsona benhamii</i>	Southern Swainson-pea	2	1999	-	-	r	4
<i>Swainsona swainsonioides</i>	Downy Swainson-pea	1	1951	-	L	e	4
<i>Vittadinia cumingii var. cumingii</i>	Fuzzy New Holland Daisy	1	1984	-	-	r	2

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

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DEPI	Likely occurrence in study area
<i>Vittadinia pterochaeta</i>	Winged New Holland Daisy	1	1996	-	-	v	2

**Notes:** EPBC = *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), FFG = *Flora and Fauna Guarantee Act 1988* (FFG Act), DEPI= Advisory List of Rare or Threatened Plants in Victoria (DEPI 2014), L = Listed, # = Records identified from EPBC Act Protected Matters Search Tool, Data source: Victorian Biodiversity Atlas (DELWP 2018a); Protected Matters Search Tool (DAWE 2020a). Order: Alphabetical. .

**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**



## Appendix 2.3 – Habitat Hectares

**Table A2.3.** Habitat Hectares results for remnant vegetation recorded within the study area.

Vegetation Zone		PS <sub>1</sub>	PS <sub>2</sub>	PS <sub>3</sub>	PG <sub>1</sub>	PW <sub>1</sub>	PW <sub>2</sub>	PW <sub>3</sub>
Bioregion		Wim	Wim	Wim	Wim	Wim	Wim	Wim
EVC / Tree		PS	PS	PS	PG	PW	PW	PW
EVC Number		826	826	826	132	803	803	803
EVC Conservation Status		En	En	En	En	En	En	En
Patch Condition	Large Old Trees /10	0	0	0	0	2	6	2
	Canopy Cover /5	0	0	0	0	4	4	5
	Under storey /25	5	10	5	5	5	5	5
	Lack of Weeds /15	2	2	2	2	0	0	0
	Recruitment /10	3	3	6	1	1	0	1
	Organic Matter /5	2	2	2	2	2	2	4
	Logs /5	0	0	0	0	4	0	0
	Treeless EVC Multiplier	1.00	1.00	1.00	1.36	1.00	1.00	1.00
	Subtotal =	12.00	17.00	15.00	13.60	18.00	17.00	17.00
Landscape Value /25		2	2	2	2	2	2	3
Habitat Points /100		14	19	17	16	20	19	20
Habitat Score		0.14	0.19	0.17	0.16	0.20	0.19	0.20
Total Area (ha)		5.053	0.353	2.235	0.688	0.396	0.080	2.223

**Note:** PS = Plains Savannah EVC; PW = Plains Woodland EVC; PG = Plains Grassland EVC; Wim = Wimmera bioregion, En = Endangered.

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

## Appendix 2.4 – Scattered Trees

**Table A2.4.** Remnant scattered trees recorded within the study area.

Tree ID	Common Name	Species Name	DBH	Size Class	Comments
1	Buloke	<i>Allocasuarina luehmannii</i>	51	Large Tree	
2	Slender Cypress-Pine	<i>Callitris gracilis</i> subsp. <i>murrayensis</i>	10	Small Tree	
3	Buloke	<i>Allocasuarina luehmannii</i>	35	Small Tree	
4	Buloke	<i>Allocasuarina luehmannii</i>	52	Large Tree	
5	Buloke	<i>Allocasuarina luehmannii</i>	47	Large Tree	
6	Buloke	<i>Allocasuarina luehmannii</i>	44	Large Tree	
7	Buloke	<i>Allocasuarina luehmannii</i>	24	Small Tree	
8	Buloke	<i>Allocasuarina luehmannii</i>	8	Small Tree	
9	Buloke	<i>Allocasuarina luehmannii</i>	65	Large Tree	
10	Buloke	<i>Allocasuarina luehmannii</i>	16	Small Tree	
11	Buloke	<i>Allocasuarina luehmannii</i>	30	Small Tree	
12	Buloke	<i>Allocasuarina luehmannii</i>	28	Small Tree	
13	Buloke	<i>Allocasuarina luehmannii</i>	25	Small Tree	
14	Buloke	<i>Allocasuarina luehmannii</i>	20	Small Tree	
15	Buloke	<i>Allocasuarina luehmannii</i>	33	Small Tree	
16	Buloke	<i>Allocasuarina luehmannii</i>	30	Small Tree	
17	Buloke	<i>Allocasuarina luehmannii</i>	26	Small Tree	
18	Buloke	<i>Allocasuarina luehmannii</i>	18	Small Tree	
19	Buloke	<i>Allocasuarina luehmannii</i>	17	Small Tree	
20	Buloke	<i>Allocasuarina luehmannii</i>	19	Small Tree	
21	Buloke	<i>Allocasuarina luehmannii</i>	17	Small Tree	
22	Buloke	<i>Allocasuarina luehmannii</i>	20	Small Tree	
23	Buloke	<i>Allocasuarina luehmannii</i>	26	Small Tree	
24	Buloke	<i>Allocasuarina luehmannii</i>	29	Small Tree	
25	Buloke	<i>Allocasuarina luehmannii</i>	33	Small Tree	
26	Buloke	<i>Allocasuarina luehmannii</i>	30	Small Tree	
27	Buloke	<i>Allocasuarina luehmannii</i>	18	Small Tree	
28	Buloke	<i>Allocasuarina luehmannii</i>	11	Small Tree	
29	Buloke	<i>Allocasuarina luehmannii</i>	15	Small Tree	
30	Buloke	<i>Allocasuarina luehmannii</i>	17	Small Tree	
31	Buloke	<i>Allocasuarina luehmannii</i>	15	Small Tree	
32	Buloke	<i>Allocasuarina luehmannii</i>	17	Small Tree	
33	Buloke	<i>Allocasuarina luehmannii</i>	15	Small Tree	
34	Buloke	<i>Allocasuarina luehmannii</i>	14	Small Tree	

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.

**ADVERTISED  
PLAN**

Tree ID	Common Name	Species Name	DBH	Size Class	Comments
35	Buloke	<i>Allocasuarina luehmannii</i>	19	Small Tree	
36	Buloke	<i>Allocasuarina luehmannii</i>	22	Small Tree	
37	Buloke	<i>Allocasuarina luehmannii</i>	26	Small Tree	
38	Buloke	<i>Allocasuarina luehmannii</i>	28	Small Tree	
39	Buloke	<i>Allocasuarina luehmannii</i>	15	Small Tree	
40	Buloke	<i>Allocasuarina luehmannii</i>	29	Small Tree	
41	Buloke	<i>Allocasuarina luehmannii</i>	23	Small Tree	
42	Buloke	<i>Allocasuarina luehmannii</i>	14	Small Tree	
43	Buloke	<i>Allocasuarina luehmannii</i>	24	Small Tree	
44	Buloke	<i>Allocasuarina luehmannii</i>	25	Small Tree	
45	Buloke	<i>Allocasuarina luehmannii</i>	18	Small Tree	
46	Buloke	<i>Allocasuarina luehmannii</i>	33	Small Tree	
47	Buloke	<i>Allocasuarina luehmannii</i>	30	Small Tree	
48	Buloke	<i>Allocasuarina luehmannii</i>	14	Small Tree	
49	Buloke	<i>Allocasuarina luehmannii</i>	11	Small Tree	
50	Buloke	<i>Allocasuarina luehmannii</i>	10	Small Tree	
51	Buloke	<i>Allocasuarina luehmannii</i>	8	Small Tree	
52	Buloke	<i>Allocasuarina luehmannii</i>	18	Small Tree	
53	Buloke	<i>Allocasuarina luehmannii</i>	26	Small Tree	
54	Buloke	<i>Allocasuarina luehmannii</i>	17	Small Tree	
55	Buloke	<i>Allocasuarina luehmannii</i>	15	Small Tree	
56	Buloke	<i>Allocasuarina luehmannii</i>	14	Small Tree	
57	Buloke	<i>Allocasuarina luehmannii</i>	18	Small Tree	
58	Buloke	<i>Allocasuarina luehmannii</i>	34	Small Tree	
59	Buloke	<i>Allocasuarina luehmannii</i>	16	Small Tree	
60	Buloke	<i>Allocasuarina luehmannii</i>	13	Small Tree	
61	Buloke	<i>Allocasuarina luehmannii</i>	27	Small Tree	
62	Buloke	<i>Allocasuarina luehmannii</i>	36	Small Tree	
63	Buloke	<i>Allocasuarina luehmannii</i>	19	Small Tree	
64	Buloke	<i>Allocasuarina luehmannii</i>	13	Small Tree	
65	Buloke	<i>Allocasuarina luehmannii</i>	23	Small Tree	
66	Buloke	<i>Allocasuarina luehmannii</i>	20	Small Tree	
67	Buloke	<i>Allocasuarina luehmannii</i>	15	Small Tree	
68	Buloke	<i>Allocasuarina luehmannii</i>	20	Small Tree	
69	Buloke	<i>Allocasuarina luehmannii</i>	16	Small Tree	
70	Buloke	<i>Allocasuarina luehmannii</i>	31	Small Tree	
71	Buloke	<i>Allocasuarina luehmannii</i>	17	Small Tree	
72	Buloke	<i>Allocasuarina luehmannii</i>	19	Small Tree	

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

**ADVERTISED  
PLAN**

Tree ID	Common Name	Species Name	DBH	Size Class	Comments
73	Buloke	<i>Allocasuarina luehmannii</i>	11	Small Tree	
74	Buloke	<i>Allocasuarina luehmannii</i>	16	Small Tree	
79	Buloke	<i>Allocasuarina luehmannii</i>	39	Small Tree	
92	River Red-gum	<i>Eucalyptus camaldulensis</i>	26	Small Tree	
94	River Red-gum	<i>Eucalyptus camaldulensis</i>	36	Small Tree	
97	Buloke	<i>Allocasuarina luehmannii</i>	43	Large Tree	stag
98	Buloke	<i>Allocasuarina luehmannii</i>	14	Small Tree	
99	Buloke	<i>Allocasuarina luehmannii</i>	20	Small Tree	
108	River Red-gum	<i>Eucalyptus camaldulensis</i>	33	Small Tree	
109	River Red-gum	<i>Eucalyptus camaldulensis</i>	24	Small Tree	
110	River Red-gum	<i>Eucalyptus camaldulensis</i>	29	Small Tree	
111	Grey Box	<i>Eucalyptus microcarpa</i>	76	Large Tree	Hollow
112	Grey Box	<i>Eucalyptus microcarpa</i>	51	Small Tree	
113	River Red-gum	<i>Eucalyptus camaldulensis</i>	15	Small Tree	
114	Buloke	<i>Allocasuarina luehmannii</i>	41	Large Tree	
115	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
116	Buloke	<i>Allocasuarina luehmannii</i>	42	Large Tree	
135	Buloke	<i>Allocasuarina luehmannii</i>	64	Large Tree	
138	Buloke	<i>Allocasuarina luehmannii</i>	42	Large Tree	
139	Buloke	<i>Allocasuarina luehmannii</i>	39	Small Tree	
140	Buloke	<i>Allocasuarina luehmannii</i>	36	Small Tree	
141	Buloke	<i>Allocasuarina luehmannii</i>	36	Small Tree	
142	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
143	Buloke	<i>Allocasuarina luehmannii</i>	72	Large Tree	
144	Buloke	<i>Allocasuarina luehmannii</i>	47	Large Tree	Hollow
145	Buloke	<i>Allocasuarina luehmannii</i>	42	Large Tree	Hollow
146	Buloke	<i>Allocasuarina luehmannii</i>	46	Large Tree	Hollow
147	Buloke	<i>Allocasuarina luehmannii</i>	46	Large Tree	
148	Buloke	<i>Allocasuarina luehmannii</i>	44	Large Tree	
149	Buloke	<i>Allocasuarina luehmannii</i>	55	Large Tree	
151	Buloke	<i>Allocasuarina luehmannii</i>	33	Small Tree	
152	Buloke	<i>Allocasuarina luehmannii</i>	32	Small Tree	
153	Buloke	<i>Allocasuarina luehmannii</i>	57	Large Tree	Hollow
154	Buloke	<i>Allocasuarina luehmannii</i>	65	Large Tree	Hollow
155	Stag		40	Large Tree	Hollow
156	Buloke	<i>Allocasuarina luehmannii</i>	51	Large Tree	Hollow
157	Buloke	<i>Allocasuarina luehmannii</i>	29	Small Tree	
158	Buloke	<i>Allocasuarina luehmannii</i>	31	Small Tree	

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

**ADVERTISED  
PLAN**

108



Tree ID	Common Name	Species Name	DBH	Size Class	Comments
159	Buloke	<i>Allocasuarina luehmannii</i>	34	Small Tree	
160	Buloke	<i>Allocasuarina luehmannii</i>	41	Large Tree	
161	Buloke	<i>Allocasuarina luehmannii</i>	39	Small Tree	
163	Buloke	<i>Allocasuarina luehmannii</i>	60	Large Tree	
167	Grey Box	<i>Eucalyptus microcarpa</i>	55	Small Tree	
170	River Red-gum	<i>Eucalyptus camaldulensis</i>	27	Small Tree	Nest
172	River Red-gum	<i>Eucalyptus camaldulensis</i>	41	Small Tree	
173	Grey Box	<i>Eucalyptus microcarpa</i>	150	Large Tree	Hollow
174	Grey Box	<i>Eucalyptus microcarpa</i>	71	Large Tree	Hollow
175	Grey Box	<i>Eucalyptus microcarpa</i>	66	Small Tree	Hollow
176	Grey Box	<i>Eucalyptus microcarpa</i>	49	Small Tree	
177	Grey Box	<i>Eucalyptus microcarpa</i>	53	Small Tree	Hollow
178	Grey Box	<i>Eucalyptus microcarpa</i>	51	Small Tree	Hollow
179	Grey Box	<i>Eucalyptus microcarpa</i>	50	Small Tree	
180	Grey Box	<i>Eucalyptus microcarpa</i>	44	Small Tree	
181	Grey Box	<i>Eucalyptus microcarpa</i>	58	Small Tree	Hollow
182	Grey Box	<i>Eucalyptus microcarpa</i>	44	Small Tree	
183	Grey Box	<i>Eucalyptus microcarpa</i>	56	Small Tree	Hollow
184	Grey Box	<i>Eucalyptus microcarpa</i>	73	Large Tree	Hollow
185	Buloke	<i>Allocasuarina luehmannii</i>	57	Large Tree	Hollow
186	Buloke	<i>Allocasuarina luehmannii</i>	50	Large Tree	Hollow
187	Buloke	<i>Allocasuarina luehmannii</i>	41	Large Tree	
188	Buloke	<i>Allocasuarina luehmannii</i>	62	Large Tree	
189	Buloke	<i>Allocasuarina luehmannii</i>	43	Large Tree	
190	Buloke	<i>Allocasuarina luehmannii</i>	30	Small Tree	
191	Buloke	<i>Allocasuarina luehmannii</i>	22	Small Tree	Hollow
192	Buloke	<i>Allocasuarina luehmannii</i>	21	Small Tree	
194	Buloke	<i>Allocasuarina luehmannii</i>	25	Small Tree	
195	Buloke	<i>Allocasuarina luehmannii</i>	53	Large Tree	Hollow
196	Buloke	<i>Allocasuarina luehmannii</i>	24	Small Tree	Hollow
197	Buloke	<i>Allocasuarina luehmannii</i>	44	Large Tree	Hollow
198	Buloke	<i>Allocasuarina luehmannii</i>	22	Small Tree	
199	Buloke	<i>Allocasuarina luehmannii</i>	19	Small Tree	
200	Buloke	<i>Allocasuarina luehmannii</i>	22	Small Tree	
201	Buloke	<i>Allocasuarina luehmannii</i>	24	Small Tree	Hollow
202	Buloke	<i>Allocasuarina luehmannii</i>	17	Small Tree	
203	Buloke	<i>Allocasuarina luehmannii</i>	47	Large Tree	
204	Buloke	<i>Allocasuarina luehmannii</i>	35	Small Tree	

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

**ADVERTISED  
PLAN**

Tree ID	Common Name	Species Name	DBH	Size Class	Comments
205	Buloke	<i>Allocasuarina luehmannii</i>	32	Small Tree	Hollow
206	Buloke	<i>Allocasuarina luehmannii</i>	19	Small Tree	
207	Buloke	<i>Allocasuarina luehmannii</i>	36	Small Tree	
208	Buloke	<i>Allocasuarina luehmannii</i>	28	Small Tree	
209	Buloke	<i>Allocasuarina luehmannii</i>	18	Small Tree	
210	Buloke	<i>Allocasuarina luehmannii</i>	30	Small Tree	Hollow
211	Buloke	<i>Allocasuarina luehmannii</i>	42	Large Tree	Hollow
212	Buloke	<i>Allocasuarina luehmannii</i>	31	Small Tree	
213	Buloke	<i>Allocasuarina luehmannii</i>	22	Small Tree	Hollow
214	Buloke	<i>Allocasuarina luehmannii</i>	33	Small Tree	
215	Buloke	<i>Allocasuarina luehmannii</i>	44	Large Tree	Hollow
216	Buloke	<i>Allocasuarina luehmannii</i>	46	Large Tree	Hollow
217	Buloke	<i>Allocasuarina luehmannii</i>	57	Large Tree	
218	Buloke	<i>Allocasuarina luehmannii</i>	63	Large Tree	Hollow
219	Stag		35	Small Tree	Hollow
220	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
221	Buloke	<i>Allocasuarina luehmannii</i>	28	Small Tree	Buloke Mistletoe
222	Buloke	<i>Allocasuarina luehmannii</i>	34	Small Tree	
223	Buloke	<i>Allocasuarina luehmannii</i>	35	Small Tree	Hollow
224	Buloke	<i>Allocasuarina luehmannii</i>	53	Large Tree	Hollow
225	Buloke	<i>Allocasuarina luehmannii</i>	19	Small Tree	Hollow
226	Buloke	<i>Allocasuarina luehmannii</i>	44	Large Tree	Hollow
227	Stag		45	Large Tree	Hollow
228	Stag		45	Large Tree	
229	Buloke	<i>Allocasuarina luehmannii</i>	62	Large Tree	Hollow
231	Buloke	<i>Allocasuarina luehmannii</i>	44	Large Tree	
232	Buloke	<i>Allocasuarina luehmannii</i>	76	Large Tree	Hollow
233	Buloke	<i>Allocasuarina luehmannii</i>	58	Large Tree	
234	Buloke	<i>Allocasuarina luehmannii</i>	47	Large Tree	
235	Buloke	<i>Allocasuarina luehmannii</i>	43	Large Tree	
236	Buloke	<i>Allocasuarina luehmannii</i>	33	Small Tree	
238	Buloke	<i>Allocasuarina luehmannii</i>	47	Large Tree	
239	Buloke	<i>Allocasuarina luehmannii</i>	25	Small Tree	
240	Buloke	<i>Allocasuarina luehmannii</i>	31	Small Tree	
241	Buloke	<i>Allocasuarina luehmannii</i>	29	Small Tree	
242	Buloke	<i>Allocasuarina luehmannii</i>	28	Small Tree	
243	Buloke	<i>Allocasuarina luehmannii</i>	28	Small Tree	Hollow
244	Buloke	<i>Allocasuarina luehmannii</i>	20	Small Tree	

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

**ADVERTISED  
PLAN**

Tree ID	Common Name	Species Name	DBH	Size Class	Comments
245	Buloke	<i>Allocasuarina luehmannii</i>	30	Small Tree	
246	Buloke	<i>Allocasuarina luehmannii</i>	21	Small Tree	
247	Buloke	<i>Allocasuarina luehmannii</i>	24	Small Tree	
248	Buloke	<i>Allocasuarina luehmannii</i>	55	Large Tree	Hollow
249	Buloke	<i>Allocasuarina luehmannii</i>	44	Large Tree	Hollow
250	Buloke	<i>Allocasuarina luehmannii</i>	50	Large Tree	
251	Buloke	<i>Allocasuarina luehmannii</i>	45	Large Tree	
252	Buloke	<i>Allocasuarina luehmannii</i>	55	Large Tree	
253	Buloke	<i>Allocasuarina luehmannii</i>	58	Large Tree	
254	Buloke	<i>Allocasuarina luehmannii</i>	39	Small Tree	40 20 20
255	Buloke	<i>Allocasuarina luehmannii</i>	45	Large Tree	
256	Buloke	<i>Allocasuarina luehmannii</i>	41	Large Tree	
257	Buloke	<i>Allocasuarina luehmannii</i>	35	Small Tree	Hollow
258	Buloke	<i>Allocasuarina luehmannii</i>	18	Small Tree	
259	Buloke	<i>Allocasuarina luehmannii</i>	38	Small Tree	
260	Buloke	<i>Allocasuarina luehmannii</i>	36	Small Tree	
261	Buloke	<i>Allocasuarina luehmannii</i>	35	Small Tree	
262	Buloke	<i>Allocasuarina luehmannii</i>	17	Small Tree	Nest
263	Buloke	<i>Allocasuarina luehmannii</i>	44	Large Tree	
264	Buloke	<i>Allocasuarina luehmannii</i>	54	Large Tree	
266	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
267	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
268	Buloke	<i>Allocasuarina luehmannii</i>	35	Small Tree	
270	Buloke	<i>Allocasuarina luehmannii</i>	53	Large Tree	Buloke Mistletoe
271	Buloke	<i>Allocasuarina luehmannii</i>	43	Large Tree	
272	Buloke	<i>Allocasuarina luehmannii</i>	37	Small Tree	
273	Stag		35	Small Tree	
275	Buloke	<i>Allocasuarina luehmannii</i>	36	Small Tree	
276	Buloke	<i>Allocasuarina luehmannii</i>	35	Small Tree	
277	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
278	Buloke	<i>Allocasuarina luehmannii</i>	38	Small Tree	
279	Buloke	<i>Allocasuarina luehmannii</i>	55	Large Tree	
280	Buloke	<i>Allocasuarina luehmannii</i>	61	Large Tree	Hollow
281	Buloke	<i>Allocasuarina luehmannii</i>	26	Small Tree	
282	Buloke	<i>Allocasuarina luehmannii</i>	42	Large Tree	Buloke Mistletoe
283	Buloke	<i>Allocasuarina luehmannii</i>	78	Large Tree	Hollow
284	Buloke	<i>Allocasuarina luehmannii</i>	58	Large Tree	
285	Buloke	<i>Allocasuarina luehmannii</i>	43	Large Tree	

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

**ADVERTISED  
PLAN**

Tree ID	Common Name	Species Name	DBH	Size Class	Comments
286	Buloke	<i>Allocasuarina luehmannii</i>	41	Large Tree	
287	Buloke	<i>Allocasuarina luehmannii</i>	50	Large Tree	
288	Buloke	<i>Allocasuarina luehmannii</i>	44	Large Tree	
289	Buloke	<i>Allocasuarina luehmannii</i>	73	Large Tree	
300	Buloke	<i>Allocasuarina luehmannii</i>	36	Small Tree	
301	Buloke	<i>Allocasuarina luehmannii</i>	30	Small Tree	
302	Buloke	<i>Allocasuarina luehmannii</i>	41	Large Tree	
304	Buloke	<i>Allocasuarina luehmannii</i>	37	Small Tree	Hollow
305	Stag		40	Large Tree	
306	Buloke	<i>Allocasuarina luehmannii</i>	54	Large Tree	
307	Buloke	<i>Allocasuarina luehmannii</i>	39	Small Tree	
309	Buloke	<i>Allocasuarina luehmannii</i>	47	Large Tree	
310	Buloke	<i>Allocasuarina luehmannii</i>	51	Large Tree	
311	Buloke	<i>Allocasuarina luehmannii</i>	28	Small Tree	
312	Buloke	<i>Allocasuarina luehmannii</i>	50	Large Tree	
313	Buloke	<i>Allocasuarina luehmannii</i>	48	Large Tree	
314	Buloke	<i>Allocasuarina luehmannii</i>	57	Large Tree	Hollow
315	Buloke	<i>Allocasuarina luehmannii</i>	41	Large Tree	
316	Buloke	<i>Allocasuarina luehmannii</i>	38	Small Tree	
317	Buloke	<i>Allocasuarina luehmannii</i>	20	Small Tree	
318	Buloke	<i>Allocasuarina luehmannii</i>	55	Large Tree	
319	Buloke	<i>Allocasuarina luehmannii</i>	55	Large Tree	Hollow
320	Buloke	<i>Allocasuarina luehmannii</i>	49	Large Tree	
339	Buloke	<i>Allocasuarina luehmannii</i>	19	Small Tree	Hollow
340	Buloke	<i>Allocasuarina luehmannii</i>	29	Small Tree	Hollow
341	Buloke	<i>Allocasuarina luehmannii</i>	24	Small Tree	Hollow
342	Buloke	<i>Allocasuarina luehmannii</i>	41	Large Tree	Hollow
343	Buloke	<i>Allocasuarina luehmannii</i>	38	Small Tree	Hollow
344	Buloke	<i>Allocasuarina luehmannii</i>	44	Large Tree	Hollow
345	Buloke	<i>Allocasuarina luehmannii</i>	27	Small Tree	
346	Buloke	<i>Allocasuarina luehmannii</i>	46	Large Tree	Hollow
347	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	Hollow
348	Buloke	<i>Allocasuarina luehmannii</i>	42	Large Tree	Hollow
349	Buloke	<i>Allocasuarina luehmannii</i>	42	Large Tree	Hollow
350	Buloke	<i>Allocasuarina luehmannii</i>	22	Small Tree	
351	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
352	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	Hollow
353	Buloke	<i>Allocasuarina luehmannii</i>	55	Large Tree	

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

**ADVERTISED  
PLAN**



Tree ID	Common Name	Species Name	DBH	Size Class	Comments
354	Buloke	<i>Allocasuarina luehmannii</i>	44	Large Tree	
355	Buloke	<i>Allocasuarina luehmannii</i>	41	Large Tree	Hollow
356	Buloke	<i>Allocasuarina luehmannii</i>	19	Small Tree	Hollow
357	Buloke	<i>Allocasuarina luehmannii</i>	37	Small Tree	
360	Buloke	<i>Allocasuarina luehmannii</i>	50	Large Tree	
361	Grey Box	<i>Eucalyptus microcarpa</i>	34	Small Tree	
362	Grey Box	<i>Eucalyptus microcarpa</i>	31	Small Tree	
365	Buloke	<i>Allocasuarina luehmannii</i>	44	Small Tree	
371	Buloke	<i>Allocasuarina luehmannii</i>	21	Small Tree	
372	Buloke	<i>Allocasuarina luehmannii</i>	21	Small Tree	
373	Buloke	<i>Allocasuarina luehmannii</i>	27	Small Tree	
374	Buloke	<i>Allocasuarina luehmannii</i>	17	Small Tree	
375	Buloke	<i>Allocasuarina luehmannii</i>	51	Small Tree	Hollow
376	Buloke	<i>Allocasuarina luehmannii</i>	22	Small Tree	
377	Buloke	<i>Allocasuarina luehmannii</i>	48	Small Tree	Hollow
382	Buloke	<i>Allocasuarina luehmannii</i>	20	Small Tree	
383	Buloke	<i>Allocasuarina luehmannii</i>	20	Small Tree	
386	Buloke	<i>Allocasuarina luehmannii</i>	47	Large Tree	
387	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
388	Buloke	<i>Allocasuarina luehmannii</i>	36	Small Tree	
389	Buloke	<i>Allocasuarina luehmannii</i>	24	Small Tree	
390	Buloke	<i>Allocasuarina luehmannii</i>	47	Large Tree	
391	Buloke	<i>Allocasuarina luehmannii</i>	43	Large Tree	
392	Buloke	<i>Allocasuarina luehmannii</i>	45	Large Tree	
393	Buloke	<i>Allocasuarina luehmannii</i>	38	Small Tree	
394	Buloke	<i>Allocasuarina luehmannii</i>	39	Small Tree	
395	Buloke	<i>Allocasuarina luehmannii</i>	34	Small Tree	
396	Buloke	<i>Allocasuarina luehmannii</i>	42	Large Tree	
397	Buloke	<i>Allocasuarina luehmannii</i>	30	Small Tree	
398	Buloke	<i>Allocasuarina luehmannii</i>	23	Small Tree	
399	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
400	Buloke	<i>Allocasuarina luehmannii</i>	48	Large Tree	
401	Buloke	<i>Allocasuarina luehmannii</i>	42	Large Tree	
402	Buloke	<i>Allocasuarina luehmannii</i>	35	Small Tree	
403	Buloke	<i>Allocasuarina luehmannii</i>	41	Large Tree	
404	Buloke	<i>Allocasuarina luehmannii</i>	44	Large Tree	
405	Buloke	<i>Allocasuarina luehmannii</i>	32	Small Tree	
406	Buloke	<i>Allocasuarina luehmannii</i>	43	Large Tree	

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

**ADVERTISED  
PLAN**

Tree ID	Common Name	Species Name	DBH	Size Class	Comments
407	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
408	Buloke	<i>Allocasuarina luehmannii</i>	41	Large Tree	
409	Buloke	<i>Allocasuarina luehmannii</i>	28	Small Tree	
410	Buloke	<i>Allocasuarina luehmannii</i>	22	Small Tree	
411	Buloke	<i>Allocasuarina luehmannii</i>	36	Small Tree	
412	Buloke	<i>Allocasuarina luehmannii</i>	35	Small Tree	
413	Buloke	<i>Allocasuarina luehmannii</i>	39	Small Tree	
414	Buloke	<i>Allocasuarina luehmannii</i>	32	Small Tree	
415	Buloke	<i>Allocasuarina luehmannii</i>	38	Small Tree	
416	Buloke	<i>Allocasuarina luehmannii</i>	46	Large Tree	
417	Buloke	<i>Allocasuarina luehmannii</i>	33	Small Tree	
418	Buloke	<i>Allocasuarina luehmannii</i>	38	Small Tree	
419	Buloke	<i>Allocasuarina luehmannii</i>	47	Large Tree	
420	Buloke	<i>Allocasuarina luehmannii</i>	28	Small Tree	
421	Buloke	<i>Allocasuarina luehmannii</i>	53	Large Tree	
422	Buloke	<i>Allocasuarina luehmannii</i>	42	Large Tree	
423	Buloke	<i>Allocasuarina luehmannii</i>	34	Small Tree	
424	Buloke	<i>Allocasuarina luehmannii</i>	32	Small Tree	
425	Buloke	<i>Allocasuarina luehmannii</i>	42	Large Tree	
426	Buloke	<i>Allocasuarina luehmannii</i>	26	Small Tree	
427	Buloke	<i>Allocasuarina luehmannii</i>	38	Small Tree	
428	Buloke	<i>Allocasuarina luehmannii</i>	34	Small Tree	
429	Buloke	<i>Allocasuarina luehmannii</i>	34	Small Tree	
430	Buloke	<i>Allocasuarina luehmannii</i>	29	Small Tree	
431	Buloke	<i>Allocasuarina luehmannii</i>	28	Small Tree	
432	Buloke	<i>Allocasuarina luehmannii</i>	37	Small Tree	
433	Buloke	<i>Allocasuarina luehmannii</i>	45	Large Tree	
434	Buloke	<i>Allocasuarina luehmannii</i>	30	Small Tree	
435	Buloke	<i>Allocasuarina luehmannii</i>	36	Small Tree	
436	Buloke	<i>Allocasuarina luehmannii</i>	29	Small Tree	
437	Buloke	<i>Allocasuarina luehmannii</i>	34	Small Tree	
438	Buloke	<i>Allocasuarina luehmannii</i>	35	Small Tree	
439	Buloke	<i>Allocasuarina luehmannii</i>	34	Small Tree	
440	Buloke	<i>Allocasuarina luehmannii</i>	31	Small Tree	
441	Buloke	<i>Allocasuarina luehmannii</i>	33	Small Tree	
442	Buloke	<i>Allocasuarina luehmannii</i>	42	Large Tree	
443	Buloke	<i>Allocasuarina luehmannii</i>	38	Small Tree	
444	Buloke	<i>Allocasuarina luehmannii</i>	37	Small Tree	

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

**ADVERTISED  
PLAN**

Tree ID	Common Name	Species Name	DBH	Size Class	Comments
445	Buloke	<i>Allocasuarina luehmannii</i>	38	Small Tree	
446	Buloke	<i>Allocasuarina luehmannii</i>	27	Small Tree	
447	Buloke	<i>Allocasuarina luehmannii</i>	32	Small Tree	
448	Buloke	<i>Allocasuarina luehmannii</i>	34	Small Tree	
449	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
450	Buloke	<i>Allocasuarina luehmannii</i>	41	Large Tree	
451	Buloke	<i>Allocasuarina luehmannii</i>	34	Small Tree	
452	River Red-gum	<i>Eucalyptus camaldulensis</i>	36	Small Tree	
453	River Red-gum	<i>Eucalyptus camaldulensis</i>	28	Small Tree	
454	Buloke	<i>Allocasuarina luehmannii</i>	47	Large Tree	
455	Buloke	<i>Allocasuarina luehmannii</i>	30	Small Tree	
456	Buloke	<i>Allocasuarina luehmannii</i>	28	Small Tree	
457	Buloke	<i>Allocasuarina luehmannii</i>	36	Small Tree	
458	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
459	Buloke	<i>Allocasuarina luehmannii</i>	42	Large Tree	
460	Buloke	<i>Allocasuarina luehmannii</i>	45	Large Tree	
461	Buloke	<i>Allocasuarina luehmannii</i>	36	Small Tree	
462	Buloke	<i>Allocasuarina luehmannii</i>	34	Small Tree	
466	Grey Box	<i>Eucalyptus microcarpa</i>	55	Large Tree	
467	Buloke	<i>Allocasuarina luehmannii</i>	48	Large Tree	
468	Buloke	<i>Allocasuarina luehmannii</i>	74	Large Tree	
469	Buloke	<i>Allocasuarina luehmannii</i>	58	Large Tree	
472	Buloke	<i>Allocasuarina luehmannii</i>	26	Small Tree	
473	Buloke	<i>Allocasuarina luehmannii</i>	24	Small Tree	
474	Buloke	<i>Allocasuarina luehmannii</i>	30	Small Tree	
475	Buloke	<i>Allocasuarina luehmannii</i>	32	Small Tree	
476	Buloke	<i>Allocasuarina luehmannii</i>	32	Small Tree	
477	Buloke	<i>Allocasuarina luehmannii</i>	43	Large Tree	
478	Buloke	<i>Allocasuarina luehmannii</i>	38	Small Tree	
479	Buloke	<i>Allocasuarina luehmannii</i>	30	Small Tree	
480	Buloke	<i>Allocasuarina luehmannii</i>	26	Small Tree	
481	Buloke	<i>Allocasuarina luehmannii</i>	26	Small Tree	
482	Buloke	<i>Allocasuarina luehmannii</i>	24	Small Tree	
483	Buloke	<i>Allocasuarina luehmannii</i>	25	Small Tree	
484	Buloke	<i>Allocasuarina luehmannii</i>	19	Small Tree	
485	Buloke	<i>Allocasuarina luehmannii</i>	16	Small Tree	
486	Buloke	<i>Allocasuarina luehmannii</i>	22	Small Tree	
487	Buloke	<i>Allocasuarina luehmannii</i>	20	Small Tree	

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

**ADVERTISED  
PLAN**

Tree ID	Common Name	Species Name	DBH	Size Class	Comments
488	Buloke	<i>Allocasuarina luehmannii</i>	20	Small Tree	
489	Buloke	<i>Allocasuarina luehmannii</i>	38	Small Tree	
490	Buloke	<i>Allocasuarina luehmannii</i>	34	Small Tree	
491	Buloke	<i>Allocasuarina luehmannii</i>	27	Small Tree	
492	Buloke	<i>Allocasuarina luehmannii</i>	26	Small Tree	
493	Buloke	<i>Allocasuarina luehmannii</i>	38	Small Tree	
500	Buloke	<i>Allocasuarina luehmannii</i>	18	Small Tree	
501	Buloke	<i>Allocasuarina luehmannii</i>	21	Small Tree	
502	Buloke	<i>Allocasuarina luehmannii</i>	20	Small Tree	
503	Buloke	<i>Allocasuarina luehmannii</i>	17	Small Tree	
504	Buloke	<i>Allocasuarina luehmannii</i>	18	Small Tree	
505	Buloke	<i>Allocasuarina luehmannii</i>	22	Small Tree	
506	Buloke	<i>Allocasuarina luehmannii</i>	23	Small Tree	
507	Buloke	<i>Allocasuarina luehmannii</i>	15	Small Tree	
508	Buloke	<i>Allocasuarina luehmannii</i>	28	Small Tree	
509	Buloke	<i>Allocasuarina luehmannii</i>	30	Small Tree	
510	Buloke	<i>Allocasuarina luehmannii</i>	26	Small Tree	
511	Buloke	<i>Allocasuarina luehmannii</i>	18	Small Tree	
512	Buloke	<i>Allocasuarina luehmannii</i>	24	Small Tree	
513	Buloke	<i>Allocasuarina luehmannii</i>	16	Small Tree	
514	Buloke	<i>Allocasuarina luehmannii</i>	25	Small Tree	
515	Buloke	<i>Allocasuarina luehmannii</i>	23	Small Tree	
516	Buloke	<i>Allocasuarina luehmannii</i>	27	Small Tree	
519	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
520	Buloke	<i>Allocasuarina luehmannii</i>	44	Large Tree	
521	Buloke	<i>Allocasuarina luehmannii</i>	35	Small Tree	
522	Buloke	<i>Allocasuarina luehmannii</i>	38	Small Tree	
594	Buloke	<i>Allocasuarina luehmannii</i>	22	Small Tree	
595	Buloke	<i>Allocasuarina luehmannii</i>	48	Large Tree	Hollow
596	Buloke	<i>Allocasuarina luehmannii</i>	51	Large Tree	Hollow
598	Buloke	<i>Allocasuarina luehmannii</i>	23	Small Tree	
599	Buloke	<i>Allocasuarina luehmannii</i>	21	Small Tree	
600	Buloke	<i>Allocasuarina luehmannii</i>	16	Small Tree	
601	Buloke	<i>Allocasuarina luehmannii</i>	25	Small Tree	
602	Buloke	<i>Allocasuarina luehmannii</i>	23	Small Tree	
603	Buloke	<i>Allocasuarina luehmannii</i>	51	Large Tree	
608	Buloke	<i>Allocasuarina luehmannii</i>	44	Large Tree	
614	Buloke	<i>Allocasuarina luehmannii</i>	21	Small Tree	

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

**ADVERTISED  
PLAN**



Tree ID	Common Name	Species Name	DBH	Size Class	Comments
615	Buloke	<i>Allocasuarina luehmannii</i>	21	Small Tree	
616	Buloke	<i>Allocasuarina luehmannii</i>	17	Small Tree	
617	Buloke	<i>Allocasuarina luehmannii</i>	27	Small Tree	
618	Buloke	<i>Allocasuarina luehmannii</i>	20	Small Tree	
619	Buloke	<i>Allocasuarina luehmannii</i>	20	Small Tree	
620	Buloke	<i>Allocasuarina luehmannii</i>	41	Large Tree	
621	Buloke	<i>Allocasuarina luehmannii</i>	41	Large Tree	
622	Buloke	<i>Allocasuarina luehmannii</i>	60	Large Tree	
623	Buloke	<i>Allocasuarina luehmannii</i>	50	Large Tree	
624	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
625	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
626	Buloke	<i>Allocasuarina luehmannii</i>	45	Large Tree	
627	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
628	Buloke	<i>Allocasuarina luehmannii</i>	45	Large Tree	
629	Buloke	<i>Allocasuarina luehmannii</i>	45	Large Tree	
630	Buloke	<i>Allocasuarina luehmannii</i>	45	Large Tree	
631	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
632	Buloke	<i>Allocasuarina luehmannii</i>	40	Large Tree	
633	Buloke	<i>Allocasuarina luehmannii</i>	48	Large Tree	
634	Buloke	<i>Allocasuarina luehmannii</i>	41	Large Tree	
635	Buloke	<i>Allocasuarina luehmannii</i>	41	Large Tree	
636	Buloke	<i>Allocasuarina luehmannii</i>	58	Large Tree	
637	Buloke	<i>Allocasuarina luehmannii</i>	32	Small Tree	
638	Buloke	<i>Allocasuarina luehmannii</i>	31	Small Tree	
639	Buloke	<i>Allocasuarina luehmannii</i>	31	Small Tree	

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

**ADVERTISED  
PLAN** 117

## APPENDIX 3 - FAUNA

### Appendix 3.1 – Significant Fauna Species

**Table A3.1.** Significant fauna within 10 kilometres of the study area.

**Likelihood:** Habitat characteristics of significant fauna species previously recorded within 10 kilometres of the study area, or that may potentially occur within the study area were assessed to determine their likelihood of occurrence. The likelihood of occurrence rankings are defined below.

1	High Likelihood	<ul style="list-style-type: none"> <li>Known resident in the study area based on site observations, database records, or expert advice; and/or,</li> <li>Recent records (i.e. within five years) of the species in the local area (DELWP 2017d); and/or,</li> <li>The study area contains the species' preferred habitat.</li> </ul>
2	Moderate Likelihood	<ul style="list-style-type: none"> <li>The species is likely to visit the study area regularly (i.e. at least seasonally); and/or,</li> <li>Previous records of the species in the local area (DELWP 2017d); and/or,</li> <li>The study area contains some characteristics of the species' preferred habitat.</li> </ul>
3	Low Likelihood	<ul style="list-style-type: none"> <li>The species is likely to visit the study area occasionally or opportunistically whilst en route to more suitable sites; and/or,</li> <li>There are only limited or historical records of the species in the local area (i.e. more than 20 years old); and/or,</li> <li>The study area contains few or no characteristics of the species' preferred habitat.</li> </ul>
4	Unlikely	<ul style="list-style-type: none"> <li>No previous records of the species in the local area; and/or,</li> <li>The species may fly over the study area when moving between areas of more suitable habitat; and/or,</li> <li>Out of the species' range; and/or,</li> <li>No suitable habitat present.</li> </ul>

EPBC *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

FFG *Flora and Fauna Guarantee Act 1988* (FFG Act)

DSE Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2013); Advisory List of Threatened Invertebrate Fauna in Victoria (DSE 2009)

NAP National Action Plan (Cogger et al 1993; Duncan et al. 1999; Garnet et al 2011; Woinarski et al 2014; Sands and New 2002; Tyler 1997)

**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**

EX Extinct  
RX Regionally extinct  
CR Critically endangered  
# Listed on the Protected Matters Search Tool

DD Data deficient (insufficiently or poorly known)  
L Listed as threatened under FFG Act  
EN Endangered  
NT Near threatened

VU Vulnerable  
LC least concern

CD Conservation dependent  
RA Rare

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	Likelihood
<b>NATIONAL SIGNIFICANCE</b>							
Australasian Bittern	<i>Botaurus poiciloptilus</i>	1987	3	EN	L	EN	4
Australian Painted Snipe #	<i>Rostatula australis</i>	-	-	VU	L	CR	4
Curlew Sandpiper #	<i>Calidris ferruginea</i>	-	-	CR	-	EN	4
Eastern Curlew #	<i>Numenius madagascariensis</i>	-	-	CR	-	VU	4
Grey-headed Flying-fox #	<i>Pteropus poliocephalus</i>	-	-	VU	L	VU	4
Growling Grass Frog	<i>Litoria raniformis</i>	1982	2	VU	L	EN	4
Malleefowl #	<i>Leipoa ocellata</i>	-	-	VU	L	EN	4
Murray Cod #	<i>Maccullochella peelii</i>	-	-	VU	L	VU	4
Painted Honeyeater #	<i>Grantiella picta</i>	-	-	VU	L	VU	4
Plains-wanderer	<i>Pedionomus torquatus</i>	1984	5	CR	L	CR	4
Striped Legless Lizard	<i>Delma impar</i>	2005	3	VU	L	EN	4
Swift Parrot	<i>Lathamus discolor</i>	1966	2	CR	L	EN	4
<b>STATE SIGNIFICANCE</b>							
Baillon's Crake	<i>Porzana pusilla palustris</i>	1979	2	-	L	VU	4
Black Falcon	<i>Falco subniger</i>	2010	5	-	-	VU	1
Brolga	<i>Grus rubicunda</i>	1996	1	-	L	VU	4
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2001	7	-	-	NT	3
Bush Stone-curlew	<i>Burhinus grallarius</i>	1995	4	-	L	EN	3
Caspian Tern	<i>Hydroprogne caspia</i>	1985	1	-	L	NT	4
Crested Bellbird	<i>Oreoica gutturalis gutturalis</i>	1960	1	-	L	NT	4
Diamond Dove	<i>Geopelia cuneata</i>	1993	1	-	L	NT	4

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

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	Likelihood
Diamond Firetail	<i>Stagonopleura guttata</i>	1964	3	-	L	NT	3
Eastern Great Egret	<i>Ardea modesta</i>	2001	4	-	L	VU	4
Freckled Duck	<i>Stictonetta naevosa</i>	1991	1	-	L	EN	4
Freshwater Catfish	<i>Tandanus tandanus</i>	2000	8	-	L	EN	4
Grey Falcon	<i>Falco hypoleucos</i>	1989	3	-	L	EN	3
Grey-crowned Babbler	<i>Pomatostomus temporalis temporalis</i>	1964	2	-	L	EN	3
Hardhead	<i>Aythya australis</i>	1979	2	-	-	VU	4
Hooded Robin	<i>Melanodryas cucullata cucullata</i>	1994	4	-	L	NT	3
Masked Owl	<i>Tyto novaehollandiae novaehollandiae</i>	1982	1	-	L	EN	3
Musk Duck	<i>Biziura lobata</i>	1988	4	-	-	VU	4
Pale Sun Moth	<i>Synemon selene</i>	1993	1	-	-	CR	4
Square-tailed Kite	<i>Lophoictinia isura</i>	1980	1	-	L	VU	3
White-throated Needletail	<i>Hirundapus caudacutus</i>	1960	1	-	-	VU	3

#### REGIONAL SIGNIFICANCE

Australian Pratincole	<i>Stiltia isabella</i>	1980	2	-	-	NT	4
Black-eared Cuckoo	<i>Chrysococcyx osculans</i>	1960	1	-	-	NT	4
Emu	<i>Dromaius novaehollandiae</i>	1960	2	-	-	NT	3
Golden Perch	<i>Macquaria ambigua</i>	2012	3	-	-	NT	4
Latham's Snipe	<i>Gallinago hardwickii</i>	1980	5	-	-	NT	4
Little Button-quail	<i>Turnix velox</i>	1960	1	-	-	NT	3
Nankeen Night Heron	<i>Nycticorax caledonicus hillii</i>	1999	5	-	-	NT	4
Royal Spoonbill	<i>Platalea regia</i>	1991	1	-	-	NT	3
Sooty Tern	<i>Circus assimilis</i>	1980	4	-	-	NT	3

**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**



Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	Likelihood
Whiskered Tern	<i>Chlidonias hybridus javanicus</i>	2005	1	-	-	NT	4

**Data source:** Victorian Biodiversity Atlas (DELWP 2018a); Protected Matters Search Tool (DAWE 2020a).

**Taxonomic order:** Mammals (Strahan 1995 *in* Menkhorst and Knight 2004); Birds (Christidis and Boles, 2008); Reptiles and Amphibians (Cogger *et al.* 1983 *in* Cogger 1996); Fish (Nelson 1994).

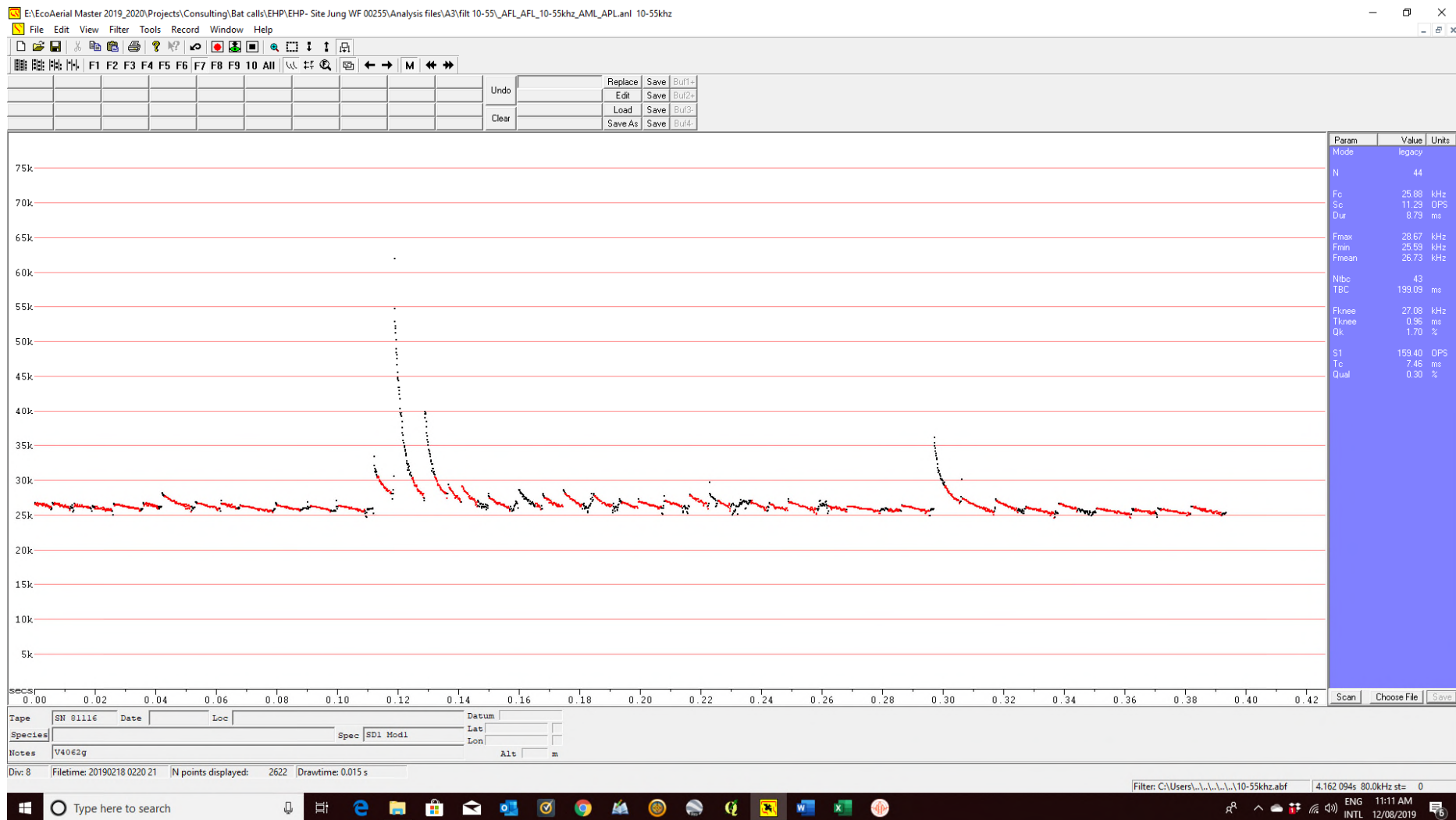
This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

## APPENDIX 4 – MICROBAT CALL ANALYSIS

---

### Appendix 4.1 – February Call Images

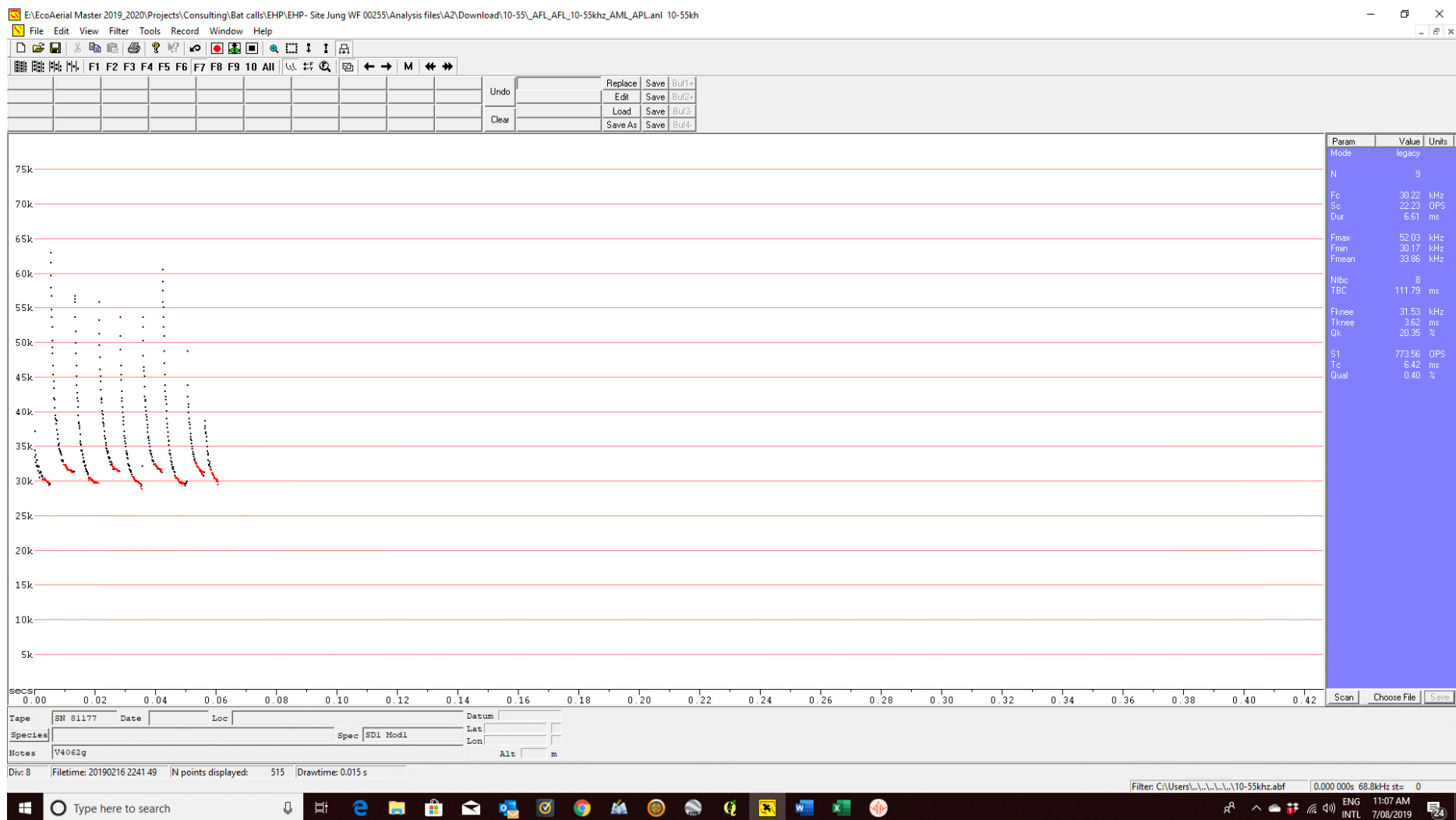
This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright



Southern Freetail Bat

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

ADVERTISED  
PLAN

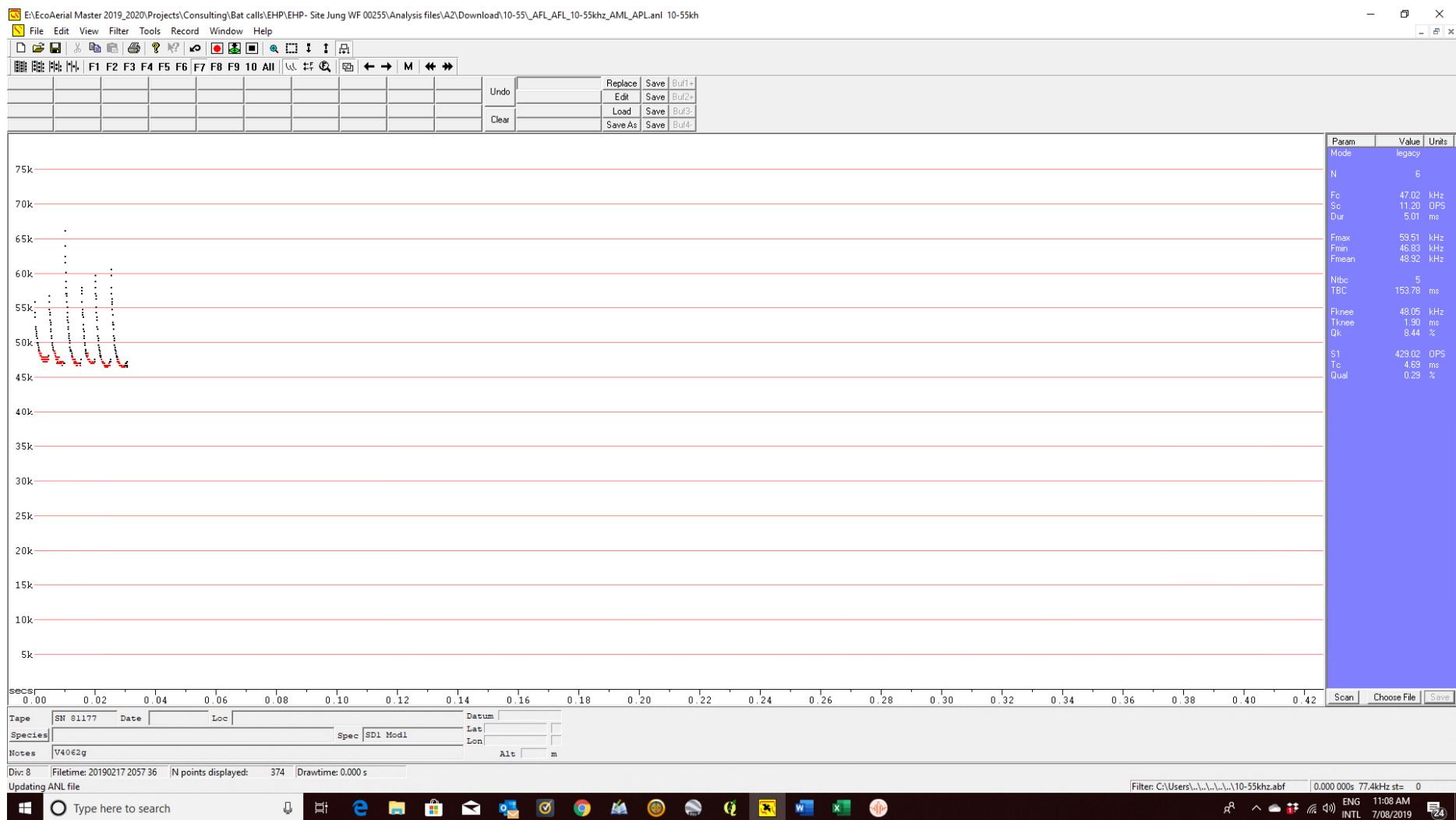


## Gould's Wattled Bat

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

ADVERTISED  
PLAN

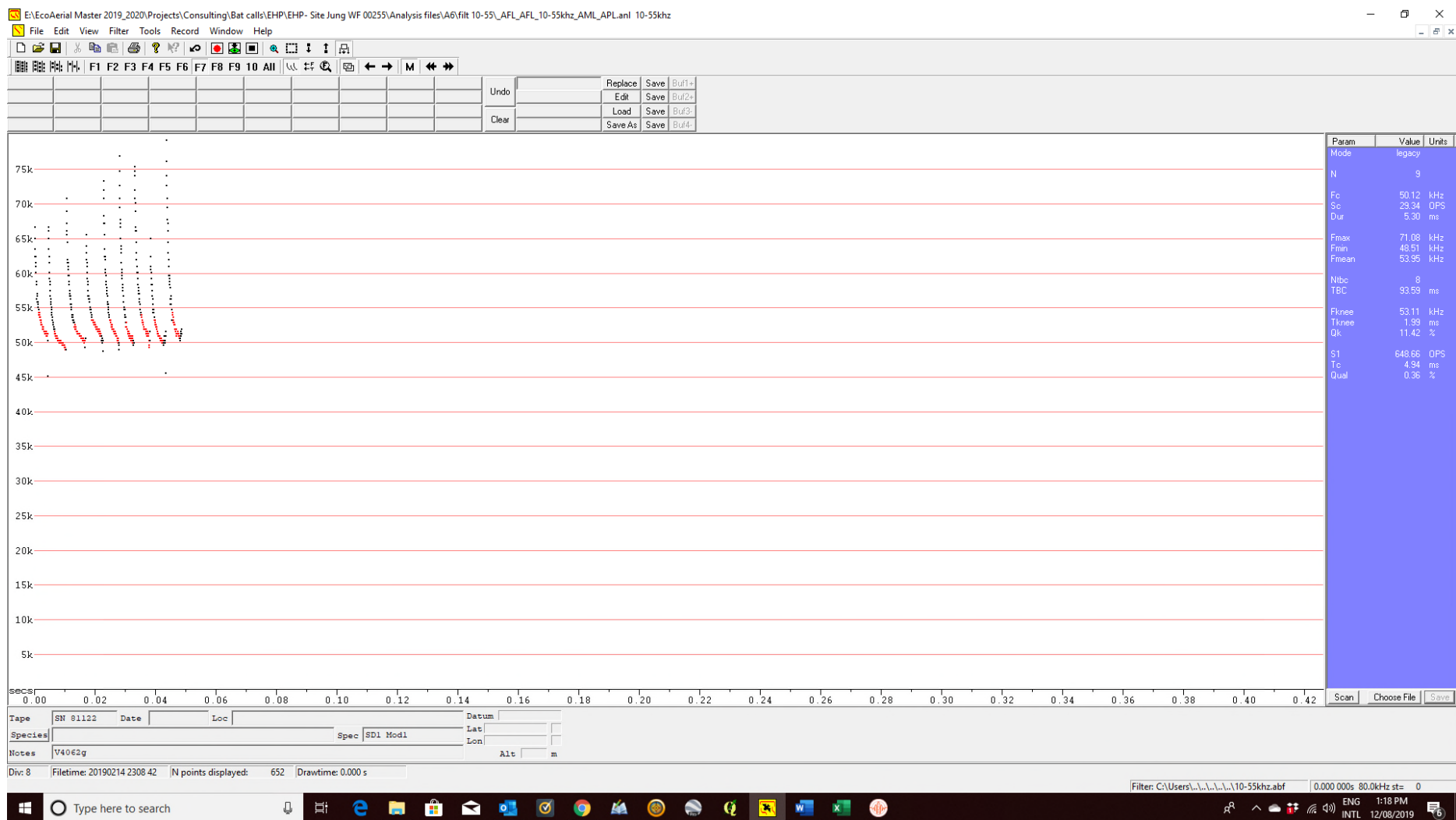




Little Forest Bat

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

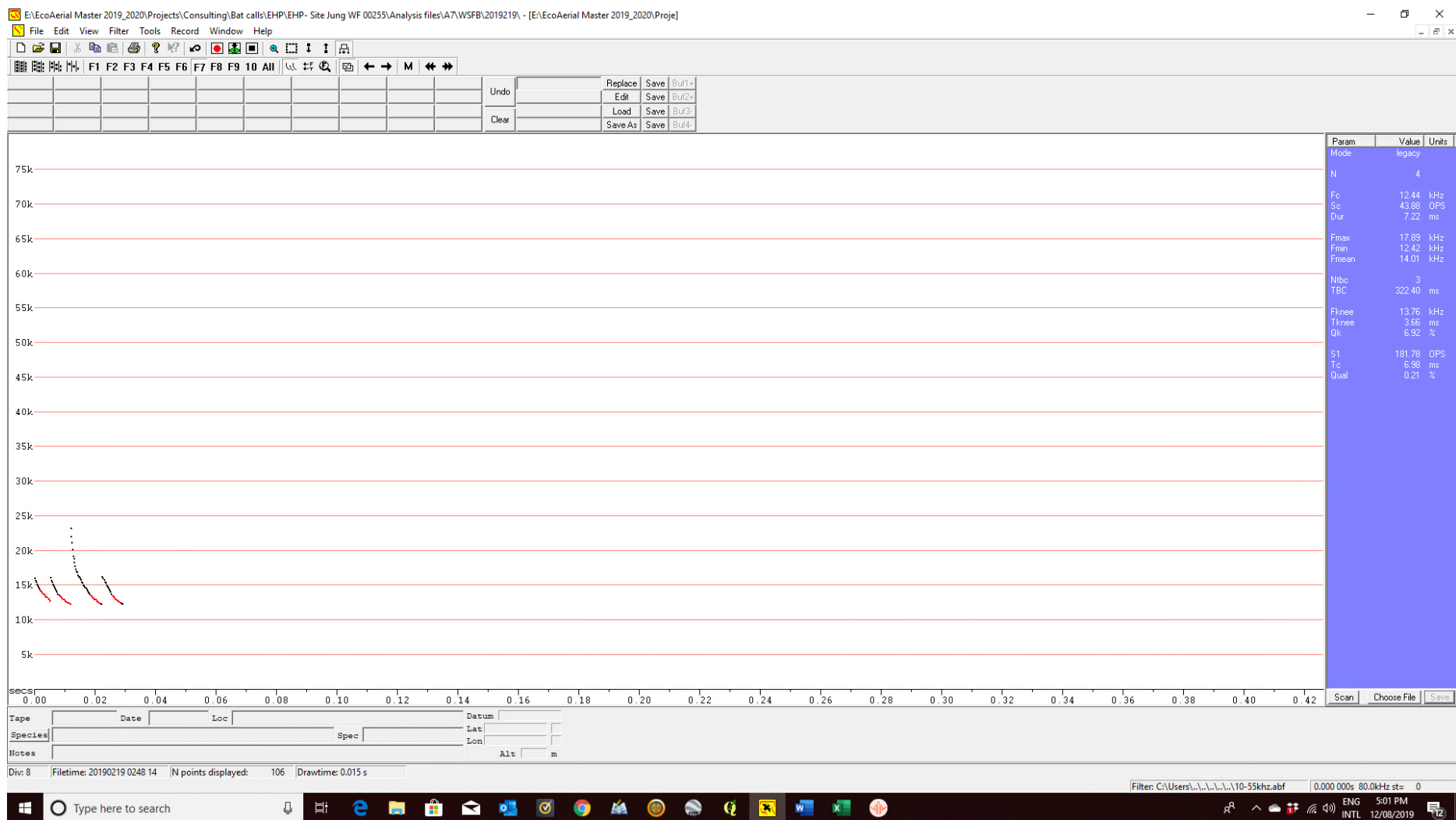
ADVERTISED  
PLAN



## Chocolate Wattled Bat

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

ADVERTISED  
PLAN



White-striped freetail bat

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

ADVERTISED  
PLAN

## Appendix 4.2 – October Call Images

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















## APPENDIX 5 - NATIVE VEGETATION REMOVAL (NVR) REPORT

---

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

# Native vegetation removal report

This report provides information to support an application to remove, destroy or lop native vegetation in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation*. The report **is not an assessment by DELWP** of the proposed native vegetation removal. Native vegetation information and offset requirements have been determined using spatial data provided by the applicant or their consultant.

Date of issue: 06/04/2020

Time of issue: 7:48 pm

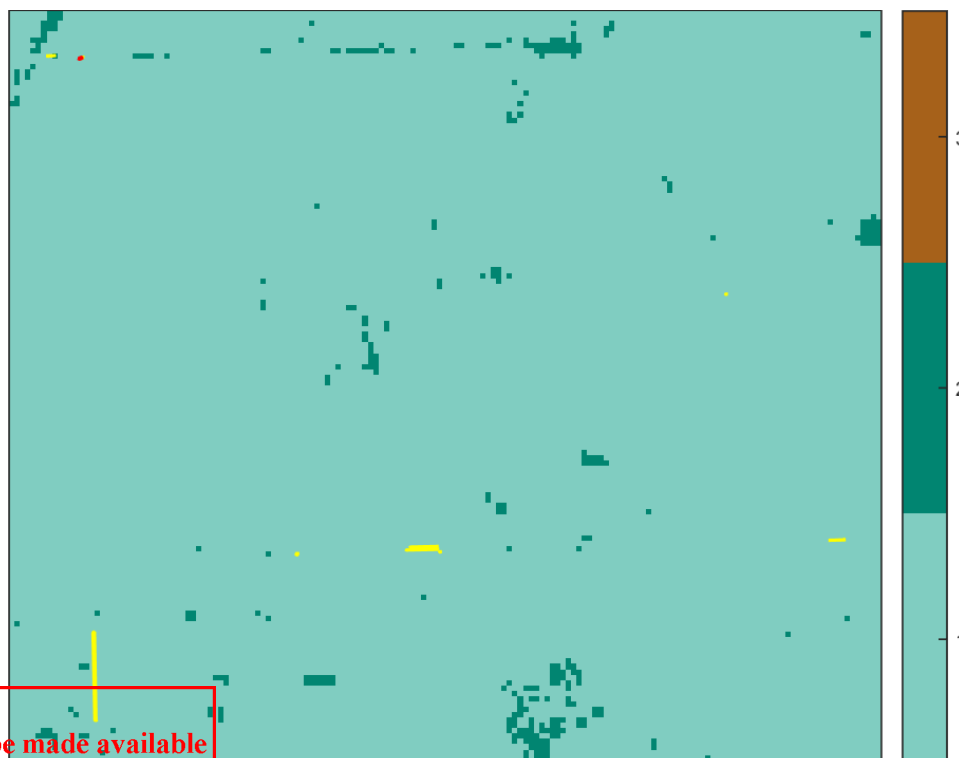
Report ID: EHP\_2020\_069

Project ID EHP11997\_WimPlains

## Assessment pathway

Assessment pathway	Intermediate Assessment Pathway
Extent including past and proposed	0.296 ha
Extent of past removal	0.009 ha
Extent of proposed removal	0.288 ha
No. Large trees proposed to be removed	0
Location category of proposed removal	Location 2 The native vegetation is in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map). Removal of less than 0.5 hectares of native vegetation in this location will not have a significant impact on any habitat for a rare or threatened species.

### 1. Location map



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

# Native vegetation removal report

## Offset requirements if a permit is granted

Any approval granted will include a condition to obtain an offset that meets the following requirements:

General offset amount <sup>1</sup>	0.034 general habitat units
Vicinity	Wimmera Catchment Management Authority (CMA) or Horsham Rural City Council
Minimum strategic biodiversity value score <sup>2</sup>	0.097
Large trees	0 large trees

NB: values within tables in this document may not add to the totals shown above due to rounding

Appendix 1 includes information about the native vegetation to be removed

Appendix 2 includes information about the rare or threatened species mapped at the site.

Appendix 3 includes maps showing native vegetation to be removed and extracts of relevant species habitat importance maps

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

<sup>1</sup> The general offset amount required is the sum of all general habitat units in Appendix 1.

<sup>2</sup> Minimum strategic biodiversity score is 80 per cent of the weighted average score across habitat zones where a general offset is required

**ADVERTISED  
PLAN**



## Next steps

Any proposal to remove native vegetation must meet the application requirements of the Intermediate Assessment Pathway and it will be assessed under the Intermediate Assessment Pathway.

If you wish to remove the mapped native vegetation you are required to apply for a permit from your local council. Council will refer your application to DELWP for assessment, as required. **This report is not a referral assessment by DELWP.**

This *Native vegetation removal report* must be submitted with your application for a permit to remove, destroy or lop native vegetation.

Refer to the *Guidelines for the removal, destruction or lopping of native vegetation* (the Guidelines) for a full list of application requirements. This report provides information that meets the following application requirements:

- The assessment pathway and reason for the assessment pathway
- A description of the native vegetation to be removed (met unless you wish to include a site assessment)
- Maps showing the native vegetation and property
- The offset requirements determined in accordance with section 5 of the Guidelines that apply if approval is granted to remove native vegetation.

Additional application requirements must be met including:

- Topographical and land information
- Recent dated photographs
- Details of past native vegetation removal
- An avoid and minimise statement
- A copy of any Property Vegetation Plan that applies
- A defensible space statement as applicable
- A statement about the Native Vegetation Precinct Plan as applicable
- An offset statement that explains that an offset has been identified and how it will be secured.

---

© The State of Victoria Department of Environment, Land, Water and Planning  
Melbourne 2020

This work is licensed under a Creative Commons Attribution 4.0 International licence. You are free to re-use the work under that licence, on the condition that you credit the State of Victoria as author. The licence does not apply to any images, photographs or branding, including the Victorian Coat of Arms, the Victorian Government logo and the Department of Environment, Land, Water and Planning logo. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/3.0/au/deed.en>

Authorised by the Victorian Government, 8 Nicholson Street, East Melbourne.

For more information contact the DELWP Customer Service Centre 136 186

[www.delwp.vic.gov.au](http://www.delwp.vic.gov.au)

### Disclaimer

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

Obtaining this publication does not guarantee that an application will meet the requirements of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes or that a permit to remove native vegetation will be granted.

Notwithstanding anything else contained in this publication, you must ensure that you comply with all relevant laws, legislation, awards or orders and that you obtain and comply with all permits, approvals and the like that affect, are applicable or are necessary to undertake any action to remove, lop or destroy or otherwise deal with any native vegetation or that apply to matters within the scope of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes.

**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**

**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

Appendix 1: Description of native vegetation to be removed

All zones requiring a general offset, the general habitat units each zone is calculated by the following equation in accordance with the Guidelines:  
*General habitat units = extent x condition x general landscape factor x 1.5, where the general landscape factor = 0.5 + (strategic biodiversity value score/2)*  
The general offset amount required is the sum of all general habitat units per zone.

Native vegetation to be removed

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
2-A	Patch	wim_0826	Endangered	0	no	0.140	0.003	0.003	0.430		0.001	General
3-A	Patch	wim_0826	Endangered	0	no	0.140	0.252	0.252	0.118		0.030	General
4-A	Patch	wim_0826	Endangered	0	no	0.140	0.001	0.001	0.100		0.000	General
5-A	Patch	wim_0826	Endangered	0	no	0.140	0.001	0.001	0.100		0.000	General
6-A	Patch	wim_0826	Endangered	0	no	0.140	0.008	0.008	0.100		0.001	General
7-A	Patch	wim_0826	Endangered	0	no	0.140	0.015	0.015	0.100		0.002	General
8-A	Patch	wim_0826	Endangered	0	no	0.140	0.005	0.005	0.100		0.001	General
9-A	Patch	wim_0826	Endangered	0	no	0.140	0.001	0.001	0.100		0.000	General
10-A	Patch	wim_0826	Endangered	0	no	0.140	0.000	0.000	0.430		0.000	General
11-A	Patch	wim_0826	Endangered	0	no	0.140	0.001	0.001	0.430		0.000	General

ADVERTISED PLAN

## Appendix 2: Information about impacts to rare or threatened species' habitats on site

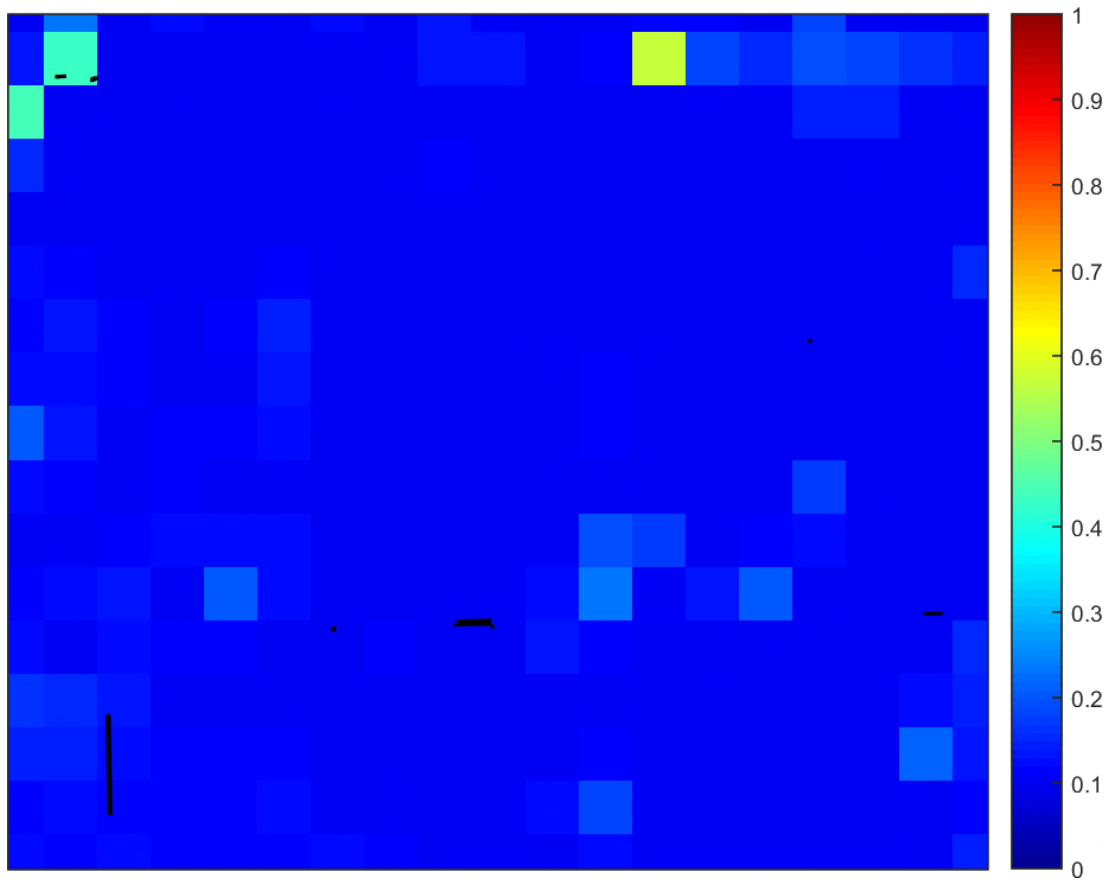
This is not applicable in the Intermediate Assessment Pathway.

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.

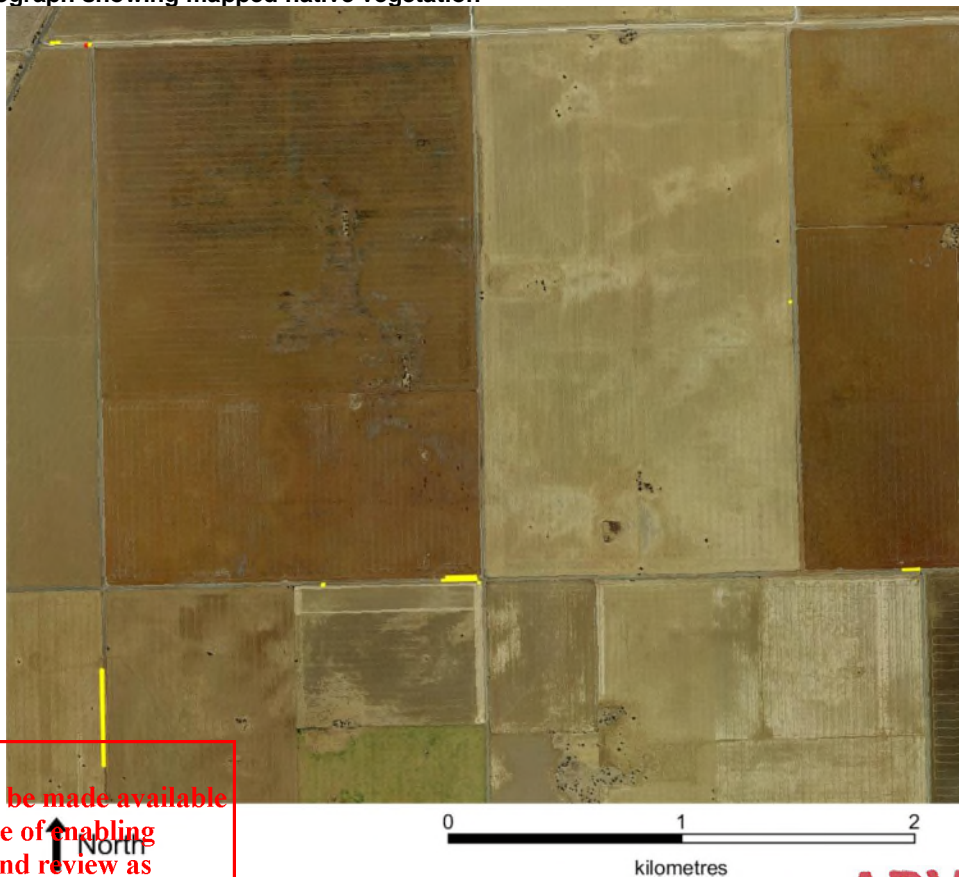
**ADVERTISED  
PLAN**

## Appendix 3 – Images of mapped native vegetation

### 2. Strategic biodiversity values map



### 3. Aerial photograph showing mapped native vegetation

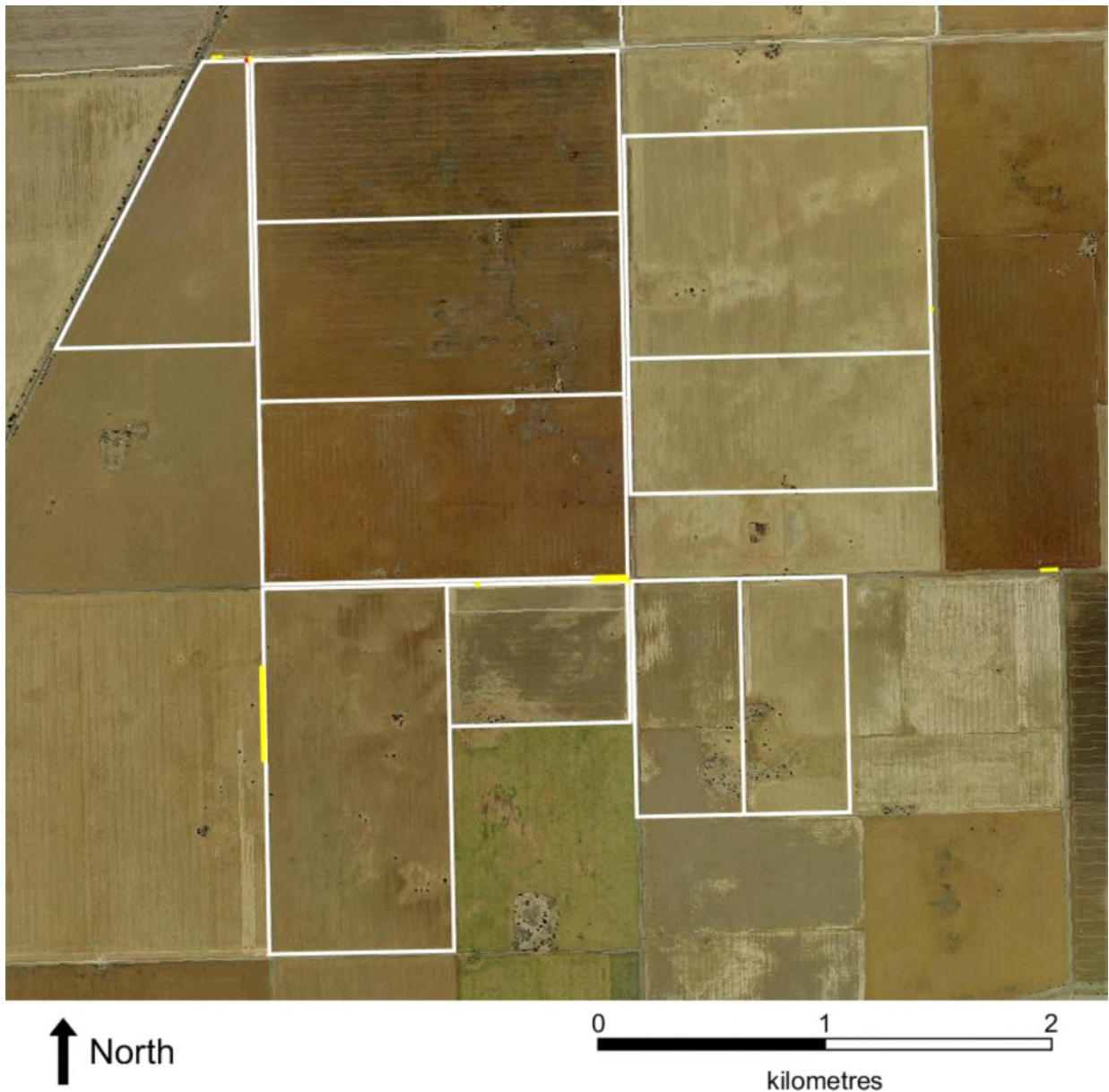


This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright

**ADVERTISED  
PLAN**



#### 4. Map of the property in context



Yellow boundaries denote areas of proposed native vegetation removal.

Red boundaries denote areas of past removal.

## APPENDIX 6 - OFFSET AVAILABILITY

---

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

# Report of available native vegetation credits

This report lists native vegetation credits available to purchase through the Native Vegetation Credit Register.

This report is **not evidence** that an offset has been secured. An offset is only secured when the units have been purchased and allocated to a permit or other approval and an allocated credit extract is provided by the Native Vegetation Credit Register.

Date and time: 01/04/2020 12:26

Report ID: 3649

## What was searched for?

### General offset

General habitat units	Strategic biodiversity value	Large trees	Vicinity (Catchment Management Authority or Municipal district)	
0.034	0.097	0	CMA	Wimmera
			or LGA	Horsham Rural City

## Details of available native vegetation credits on 01 April 2020 12:26

### These sites meet your requirements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
BBA-2854	0.494	27	Wimmera	Horsham Rural City	Yes	Yes	No	Contact NVOR
BBA-3001	5.211	0	Wimmera	Hindmarsh Shire	Yes	Yes	No	VegLink
BBA-3001	0.688	0	Wimmera	Hindmarsh Shire	Yes	Yes	Yes	VegLink
BBA-3002	6.486	5	Wimmera	Northern Grampians Shire	Yes	Yes	No	Bio Offsets, EHP, VegLink
BBA-3002	1.357	0	Wimmera	Northern Grampians Shire	Yes	Yes	Yes	EHP
BBA-3018	1.376	10	Wimmera	Northern Grampians Shire	Yes	Yes	No	VegLink
TFN-C1864	1.177	13	Wimmera	Ararat Rural City	Yes	Yes	No	VegLink
VC_TFN-C2019_01	0.553	204	Wimmera	Northern Grampians Shire	Yes	Yes	No	Ecocentric

### These sites meet your requirements using alternative arrangements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
----------------	-----	----	-----	-----	------------	--------	-------------	-----------

There are no sites listed in the Native Vegetation Credit Register that meet your offset requirements when applying the alternative arrangements as listed in section 11.2 of the Guidelines for the removal, destruction or lopping of native vegetation.

### These potential sites are not yet available, land owners may finalise them once a buyer is confirmed.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
----------------	-----	----	-----	-----	------------	--------	-------------	-----------

There are no potential sites listed in the Native Vegetation Credit Register that meet your offset requirements.

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

ADVERTISED  
PLAN

## Next steps

### If applying for approval to remove native vegetation

Attach this report to an application to remove native vegetation as evidence that your offset requirement is currently available.

### If you have approval to remove native vegetation

Below are the contact details for all brokers. Contact the broker(s) listed for the credit site(s) that meet your offset requirements. These are shown in the above tables. If more than one broker or site is listed, you should get more than one quote before deciding which offset to secure.

## Broker contact details

Broker Abbreviation	Broker Name	Phone	Email	Website
Abezco	Abzeco Pty. Ltd.	(03) 9431 5444	offsets@abzeco.com.au	www.abzeco.com.au
Bass Coast SC	Bass Coast Shire Council	(03) 5671 2125	d.whittington@basscoast.vic.gov.au	www.basscoast.vic.gov.au
Baw Baw SC	Baw Baw Shire Council	(03) 5624 2411	bawbaw@bawbawshire.vic.gov.au	www.bawbawshire.vic.gov.au
Bio Offsets	Biodiversity Offsets Victoria	0452 161 013	info@offsetsvictoria.com.au	www.offsetsvictoria.com.au
Contact NVOR	Native Vegetation Offset Register	136 186	nativevegetation.offsetregister@delwp.vic.gov.au	www.environment.vic.gov.au/native-vegetation
Ecocentric	Ecocentric Environmental Consulting	0410 564 139	ecocentric@me.com	Not available
EHP	Ecology & Heritage Partners Pty Ltd	(03) 9377 0100	offsets@ehpartners.com.au	www.ehpartners.com.au
Enviro Offset	Enviro Offset Trading Pty Ltd	(03) 5444 0002	info@envirooffsettrading.com.au	www.envirooffsettrading.com.au
Ethos	Ethos NRM Pty Ltd	(03) 5153 0037	offsets@ethosnrm.com.au	www.ethosnrm.com.au
Nillumbik SC	Nillumbik Shire Council	(03) 9433 3316	offsets@nillumbik.vic.gov.au	www.nillumbik.vic.gov.au
TFN	Trust for Nature	8631 5888	offsets@tfn.org.au	www.trustfornature.org.au
VegLink	Vegetation Link Pty Ltd	(03) 5470 5232	offsets@vegetationlink.com.au	www.vegetationlink.com.au
Yarra Ranges SC	Yarra Ranges Shire Council	1300 368 333	biodiversityoffsets@yarraranges.vic.gov.au	www.yarraranges.vic.gov.au

© The State of Victoria Department of Environment, Land, Water and Planning 2020



This work is licensed under a Creative Commons Attribution 4.0 International licence. You are free to re-use the work under that licence, on the condition that you

credit the State of Victoria as author. The licence does not apply to any images, photographs or branding, including the Victorian Coat of Arms, the Victorian Government logo and the Department of Environment, Land, Water and Planning (DELWP) logo. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>

For more information contact the DELWP Customer Service Centre 136 186 or the Native Vegetation Credit Register at [nativevegetation.offsetregister@delwp.vic.gov.au](mailto:nativevegetation.offsetregister@delwp.vic.gov.au)

### Disclaimer

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

Obtaining this publication does not guarantee that the credits shown will be available in the Native Vegetation Credit Register either now or at a later time when a purchase of native vegetation credits is planned.

Notwithstanding anything else contained in this publication, you must ensure that you comply with all relevant laws, legislation, awards or orders and that you obtain and comply with all permits, approvals and the like that affect, are applicable or are necessary to undertake any action to remove, lop or destroy or otherwise deal with any native vegetation or that apply to matters within the scope of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes

**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**

**ADVERTISED  
PLAN**