

Final Report

# Biodiversity Assessment: Bannockburn Growth Area

Prepared for

**Victorian Planning Authority**

March 2020



**Ecology and Heritage Partners Pty Ltd**

## Executive Summary

### Introduction

Ecology and Heritage Partners Pty Ltd was engaged by the Victorian Planning Authority (VPA) to identify and assess the quality and extent of potential biodiversity values within the proposed Bannockburn Growth Area (the study area). The purpose of the Biodiversity Assessment was to ground-truth the findings of the desktop assessment (Ecology and Heritage Partners 2020), and to inform strategic decisions regarding future growth and avoid conflicts between urban development and ecological decisions in the more detailed planning process.

### Methods

A field assessment was undertaken on 21 and 22 January 2020 by a qualified ecologist to determine current conditions with reference to findings of the desktop review.

The field assessment consisted of on-ground visual assessment from roadsides and public land to verify the accuracy of the desktop assessment and determine the quality of vegetation present within the study area.

### Results

#### Flora

The presence of Melbourne Yellow-gum *Eucalyptus leucoxylon* subsp. *connata* listed as threatened under the FFG Act was confirmed within a parcel on Levys Road (Trenegrove 2017), and there is a moderate to high likelihood that several more specimens are present elsewhere within the study area.

In addition, Black Wattle *Acacia mearnsii* and Golden Wattle *Acacia pycnantha*, listed as protected under the FFG Act, were recorded within the study area during Ecology and Heritage Partners' site assessment.

Furthermore, given the distribution of records and the habitat encountered during the site assessment, the following significant flora species have the potential to occur within the study area:

- Nationally Significant:
  - Spiny Rice Flower *Pimelea spinsecens* var. *spinescens*
  - Button Wrinklewort *Rutidosia leptorhynchoides*
  - Large-headed Fireweed *Senecio macrocarpus*
  - Matted Flax-lily *Dianella amoena*
  - Adamson's Blown-grass *Lachnagrostis adamsonii*
- State Significant:
  - Cut-leaf Burr Daisy *Calotis anthemoides*
  - Small Scurf-pea *Cullen paarvum*
  - Hairy Tails *Ptilotus erubescens*

However, further detailed surveys are required to confirm the presence of any national or State significant flora.

### *Fauna*

No records of significant fauna species were identified within the study area. However, this does not indicate that such species are not present but may indicate a lack of survey effort for these species.

Based on species habitat requirements and distribution across the Victorian Volcanic Plain, the nationally following significant species have the potential to occur within native grasslands and woodlands within the study area:

- Golden Sun Moth *Synemon plana*
- Striped Legless Lizard *Delma impar*
- Growling Grass Frog *Litoria raniformis*

### *Communities*

There is potential for the nationally significant Grassy Eucalypt Woodland of the Victorian Volcanic Plain to occur within areas of private land that were inaccessible at the time of this on-ground assessment.. There is also potential for the nationally significant Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) NTGVVP, albeit of low quality, to occur within the study area, particularly within those pastoral properties along Harvey Road and to the south of Burnside Road

Whilst a current wetland is modelled to occur in the south-west section of the study area, ground truthing could not ascertain its presence or absence, as it was not visible from publicly accessible areas. There is potential for this wetland to align with the nationally significant Seasonal Herbaceous Wetlands ecological community.

On-ground observation and EVC modelling suggest that the state significant Western (Basalt) Plains Grassland Community and the Western Basalt Plains (River Red Gum) Grassy Woodland may occur in the subject area. Further detailed survey is required to confirm the presence of FFG listed communities in the subject area.

## **Legislation and Policy Implications**

### *Environment Protection and Biodiversity Conservation Act (EPBC Act – Federal)*

There is potential for the Grassy Eucalypt Woodland, NTGVVP and Seasonal Herbaceous Wetland communities to occur within the study area. There is potential habitat within the study area for five flora species (Spiny Rice-Flower, Button Wrinklewort, Large-headed Fireweed, Matted Flax-lily and Adamson's Blown-grass) and four fauna species (Striped Legless Lizard, Growling Grass Frog, Golden Sun Moth) listed under the EPBC Act.

Prior to any future development within the study area further assessment is recommended to confirm the quality and extent of potential habitat for these species, which may lead to targeted flora and fauna surveys being required. Pending the outcome of the targeted surveys for these species, a referral to the Commonwealth Environment Minister may also be required.

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

Melbourne Yellow-gum listed as threatened, and Black Wattle and Golden Wattle listed as *protected* under the FFG Act were recorded within the study area during Ecology and Heritage Partners' site assessment.

Acacia species were located around Bannockburn Lagoon and along road reserves. If listed or protected specimens located on public land are proposed to be removed, a permit under the FFG Act will be required. The proponent should allow up to six weeks to obtain an FFG Act permit through DELWP.

Habitat for the Brown Treecreeper, Hooded Robin and Diamond Firetail also has the potential to occur within the study area, however, an FFG Act permit is generally not required for the removal of these species' habitat

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

The information pertaining to the quality and extent of any ecological values within the boundaries of the Bannockburn Growth Area will be used to inform decisions about the future of the development area and assist the VPA to facilitate the strategic planning process. It is also understood that this information will assist decisions on the retention, removal and/or offsetting of native vegetation and fauna habitat.

As such, there are no plans presently in place for the development of the Growth Area. When the development plans are confirmed, the extent and condition of native vegetation and the corresponding offset requirements associated with the removal of native vegetation within the study area can be determined.

#### *Other Legislation and Policy*

Implications relating to other State and local policy, including local planning scheme controls related to environmental issues (e.g. zones and overlays) are provided in Section 5 and Section 7.

### **Recommendations**

Following the Desktop Assessment and the subsequent ground truthing, further assessments by a suitably qualified ecologist are required to understand the quality of native vegetation within the study area as well as determine the presence or absence of significant flora and fauna species.

Recommendations have been made pertaining to future detailed assessments and survey work, as well as future efforts to retain and enhance biodiversity throughout the study area. Details are provided in Section 6.



## Contents

EXECUTIVE SUMMARY.....	2
1 INTRODUCTION.....	6
2 STUDY AREA .....	6
3 METHODS .....	7
4 RESULTS .....	11
5 LEGISLATIVE AND POLICY IMPLICATIONS.....	27
6 RECOMMENDATIONS .....	31
7 CONCLUSIONS AND FURTHER REQUIREMENTS .....	36
REFERENCES.....	39
FIGURES .....	41
APPENDIX 1 - FLORA.....	53
APPENDIX 2 – HABITAT HECTARE ASSESSMENT .....	55
APPENDIX 3 – LARGE TREES AND SCATTERED TREES .....	56

## Document Control

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<b>Project number</b>	13226
<b>Project manager</b>	Elyse Harrison (Technical Officer – Botany)
<b>Report reviewer</b>	Shannon LeBel (Senior Ecologist / Geelong Resource Manager)
<b>Mapping</b>	Monique Elsley (GIS Coordinator)
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## **1 Introduction**

Ecology and Heritage Partners Pty Ltd was engaged by the Victorian Planning Authority (VPA) to identify and assess the quality and extent of potential biodiversity values within the proposed Bannockburn Growth Area (the study area).

The purpose of the Biodiversity Assessment was to ground-truth the findings of the desktop assessment (Ecology and Heritage Partners 2020), and to inform strategic decisions regarding future growth and avoid conflicts between urban development and ecological decisions in the more detailed planning process. Further, the assessments were undertaken with the objective of identifying any ecological opportunities and/or constraints in relation to relevant Commonwealth and State environmental legislation and policy (i.e. undertake a strategic approach to planning and development) within the broader investigation area. As such, the Biodiversity Assessment will provide the VPA with an understanding of the ecological values present within the boundaries of the Bannockburn Growth Area and will facilitate the strategic planning process.

Specifically, the objectives of the Biodiversity Assessment are as follows:

- To identify, assess, and map native flora, fauna, and habitat in the precinct area, including a determination of conservation significance;
- To identify ecological opportunities and constraints to inform and enable the Growth Area Plan and Biodiversity Plan; and,
- To collect and present information about environmental values to allow integration with the planning and potential future development of the area.

This report presents the results of the assessment, potential legislative and policy implications, and summarises future investigations that are likely to be required to inform any future planning approvals process.

## **2 Study Area**

The study area is located within the Bannockburn Growth area, to the south of Bannockburn-Shelford Road (Figure 1). The study area, identified as the Growth Investigation Area, covers approximately 1,000 hectares, and is bound by a railway corridor to the south, commercial, industrial and/or residential land to the north, Bannockburn Bushland Reserve to the west and agricultural land to the east (Figure 2c).

According to the Department of Environment, Land, Water and Planning (DELWP) Native Vegetation Information Management (NVIM) Tool (DELWP 2020a), the study area occur within the Victorian Volcanic Plains bioregion, is located within the jurisdiction of Corangamite Catchment Management Authority (CMA) and the Golden Plains Shire municipality.

The study area is zoned Farming Zone (FZ), and is partially affected by an Environmental Significance Overlay – Schedule 2 (ESO2) that intersects the centre of the study area from north to south, a Land Subject to Inundation Overlay (LSIO) along the Bruce Creek corridor, a Salinity Management Overlay (SMO) and a Bushfire Management Overlay (BMO) along the western edge adjacent to Harvey Road (DELWP 2020c).

### 3 Methods

#### 3.1 Desktop Assessment (Task 1)

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 Native Vegetation Information Management (NVIM) Tool (DELWP 2020b) for:
  - Modelled data for location risk, remnant vegetation patches, scattered trees and habitat for rare or threatened species; and,
  - The extent of historic and current EVCs.
- EVC benchmarks (DELWP 2020c) for descriptions of EVCs within the relevant bioregion;
- The Victorian Biodiversity Atlas (VBA) for previously documented flora and fauna records within the project locality (DELWP 2018a);
- 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 2020);
- Relevant listings under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act), including the latest Threatened and Protected Lists (DELWP 2018b; DELWP 2017a);
- The online VicPlan Map (DELWP 2020d) to ascertain current zoning and environmental overlays in the study area;
- Aerial photography of the study area;
- Any relevant reports, legislation and policy, including:
  - VPA Reports;
  - Ramsar Plans;
  - Published and unpublished reports (i.e. consultant reports);
  - National species Recovery Plans;
  - Conservation advice; and,
- Previous ecological assessments relevant to the study area; including;
  - Vegetation and Biodiversity Assessment Report – Levy Road, Bannockburn. Mark Trengrove Ecological Services 2017.
  - Flora and Fauna Assessment – Bannockburn South West Precinct. Golden Plains Shire 2019.

- Desktop Assessment – Bannockburn Growth Plan, Bannockburn, Victoria. Ecology and Heritage Partners Pty Ltd 2020.

### 3.2 Ground Truthing (Task 2)

A detailed field assessment was undertaken on 21 and 22 January 2020 by a qualified ecologist to determine current conditions with reference to findings of the desktop review. All fieldwork was completed in accordance with a project specific Safe Work Method Statement (SWMS) and under relevant scientific licences and animal ethics clearances.

The ground truthing consisted of on-ground visual assessment from roadsides and public land to verify the accuracy of the desktop assessment and determine the quality of vegetation present within the study area. For each parcel in the study area, the existing and any past land management practices and any impacts on biodiversity values were recorded, particularly areas which have been cultivated.

Where on-ground access was permitted, the following was undertaken:

- Identify and list all flora and fauna observed during the field assessment within the study area;
- Identify and list all native vegetation, including extant Ecological Vegetation Classes (EVCs) and scattered remnant trees;
- Identify the presence of any Matters of National Environmental Significance (NES);
- Identify and describe habitat for significant flora and fauna;
- Undertake a habitat hectares assessment of the native vegetation within the study area, in accordance with the Vegetation Quality Assessment Manual;
- Describe habitat values and legal status/implications of any BioSites within the study area;
- Record site and vegetation information including:
  - the address of the property;
  - photographs (dated) and description of the native vegetation;
  - copy of any property vegetation plan that applies to the site and details of any other native vegetation that was permitted to be removed from the property.

Survey sites of particular focus included:

- The Bannockburn Lagoon
- Roadside vegetation along Old Base Road
- Roadside vegetation along Harvey Road
- Roadside vegetation along Bannockburn-Shelford Road
- Uncultivated land in the area
- Bruce's Creek

Prior to undertaking the ground truthing, locations of significant flora and fauna previously documented near the study area were visited as a reference, to determine their likelihood of occurring within the study area.

### 3.3 Removal, Destruction or Lopping of Native Vegetation

Under the *Planning and Environment Act 1987*, Clause 52.17 of the Golden Plains Shire Planning Scheme requires a planning permit to remove, destroy or lop native vegetation. The assessment process for the clearing of vegetation follows the '*Guidelines for the removal, destruction or lopping of native vegetation*' (the Guidelines) (DELWP 2017b).

#### 3.3.1 Assessment Pathway

The Guidelines manage the impacts on biodiversity from native vegetation removal using a risk-based approach. Two factors – extent and location – are used to determine the risk associated with an application for a permit to remove native vegetation. 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 2020a). Determination of assessment pathway is summarised in Table 1.

**Table 1.** Application pathways for applications to remove native vegetation (DELWP 2017a)

Extent		Location Category		
		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.

#### 3.3.2 Vegetation Assessment

Native vegetation is assessed using two key parameters: extent (in hectares) and condition. Extent is determined through a field assessment. The condition score for a detailed assessment pathway must be assessed through a habitat hectare<sup>1</sup> assessment conducted by a qualified ecologist. The condition score for a basic or intermediate assessment pathway may be based on either modelled data available on the NVIM Tool (DELWP 2020a), or through a habitat hectare assessment.

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 2020b).

<sup>1</sup> A 'habitat hectare' is a unit of measurement which combines the condition and extent of native vegetation.



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

Category	Definition	Extent	Condition
<b>Patch of native vegetation</b>	An area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native; OR An area with three or more native canopy trees where the drip line of each tree touches the drip line of at least one other tree, forming a continuous canopy; OR any mapped wetland included in the <i>Current Wetlands map</i> , available in DELWP systems and tools.	Measured in hectares. Based on hectare area of the remnant patch.	Vegetation Quality Assessment Manual (DSE 2004).  Modelled condition for <i>Current Wetlands</i> .
<b>Scattered tree</b>	A native canopy tree that does not form part of a remnant 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’

### 3.4 Assessment Qualifications and Limitations

This report has been written based on the quality and extent of the ecological values and habitat considered to be present or absent at the time of the desktop and field assessments being undertaken.

The ‘snapshot’ nature of a standard biodiversity assessment meant that migratory, transitory or uncommon fauna species may have been absent from typically occupied habitats at the time of the field assessment. In addition, annual or cryptic flora species such as those that persist via underground tubers may also be absent.

To overcome this, the likely presence of threatened species was determined primarily through the habitat assessment since this is a more conservative approach and likely to include species that are difficult to detect. This precautionary approach will also account for any assessment which are completed outside the optimal time for detecting a species, and it would be assumed the species is present if suitable habitat was observed.

A comprehensive list of all terrestrial flora and fauna present within the study area was not undertaken as this was not the objective of the assessment. Rather a list of commonly observed species was recorded to inform the habitat hectare assessment and assist in determining the broader biodiversity values present within the study area.

Most ecological values were determined by on-ground visual assessment from roadsides and public land to verify the accuracy of the desktop assessment and determine the quality of vegetation present within the study area. For areas within the Growth Area that were inaccessible and/or located on private land, visual assessments and photographs were taken from or along the following locations:

- Glen Avon Drive;

- The intersection of Burnside Road and the railway line;
- Burnside Road;
- Charlton Road;
- Levy Road;
- Harvey Road;
- Old Base Road;
- Bannockburn-Shelford Road; and,
- The Bannockburn Business District.

The native vegetation assessment of some sections of the study area that had access constraints were undertaken using the data provided by Mark Trengrove Ecological Services and Golden Plains Shire Council. Areas of native vegetation with on-site access were recorded using a hand-held GPS or tablet with an accuracy of +/-5 metres. These levels of accuracy are considered 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.

Targeted flora or fauna surveys were not undertaken, as this was beyond the preliminary scope of the project. However, prior to undertaking the ground truthing and native vegetation assessments, locations of significant flora and fauna previously documented in close proximity to the study area were visited as a reference, to determine their likelihood of occurring within the study area.

Nevertheless, the terrestrial flora and fauna data collected during the field assessment and information obtained from relevant desktop sources is considered to adequately inform an accurate assessment of the potential ecological values present within the study area.

## 4 Results

### 4.1 Desktop Assessment

#### 4.1.1 Native Vegetation

Extant vegetation mapping (2005) using the NatureKit Map (DELWP 2020b) identifies that the study area is modelled to support four Endangered Ecological Vegetation Classes (EVC) (Figure 2a), including:

- Aquatic Herbland /Plains Sedgy Wetland Mosaic (EVC 691);
- Creekline Grassy Woodland (EVC 68);
- Plains Grassland (EVC 132); and,
- Plains Grassy Woodland (EVC 55).

Creekline Grassy Woodland is modelled to border the Bruce Creek corridor which flows directly through the study site from north to south. Additionally, located to the south-west of the site, is a modelled wetland that is potentially consistent with the Aquatic Herbland/Plains Sedgy Wetland Mosaic EVC.

Occurring throughout the study area are modelled fragmented patches of Plains Grassland and Plains Grassy Woodland. These EVCs occur more densely in the north-east section of the site adjoining the Bannockburn Bushland Reserve (Figure 2a).

However, based a review of current aerial photography, and a review of existing reports (Trengove 2017; Golden Plains Shire 2019), the majority of the study area appears to have been subjected to historical native vegetation removal, de-rocking, and is likely to be comprised of large areas of modified land subject to agricultural and rural residential uses. These areas include cropped land and improved pasture (Figure 2a).

## 4.2 Ground Truthing

Ground Truthing of the study area, carried out from available observation points, primarily consisting of roadsides, indicates that the EVC modelling is not wholly accurate. Within the study area, some areas modelled as Plains Grassland were unlikely to be comprised of native grassland, but were more likely to be semi-improved pasture with occasional scattered grassland elements present that would not meet the required thresholds to be considered as examples of the relevant EVC (refer to Table 2). Other areas not modelled as Plains Grassland may actually contain native grassland at sufficient threshold to meet the required benchmark for the vegetation community. Additionally, some areas modelled as Plains Grassland were clearly identified as Plains Grassy Woodland (Figure 2a; Figure 2b; Figure 2c).

Native vegetation in the study area comprises patches of remnant native vegetation, scattered native trees of significant size and value and potential areas of native grassland.

### 4.2.1 Native Patches

#### Plains Grassy Woodland

Plains Grassy Woodland is typically defined as an open, eucalypt woodland (to 15 metres tall), and which occurs on poorly drained, fertile soils on flat or gently undulating plains at low elevations. The understorey generally consists of a few sparse shrubs over a species-rich grassy and herbaceous ground layer (DELWP 2020c).

Moderate quality patches of Plains Grassy Woodland were present as roadside vegetation along Old Base Road and Harvey Road (Plate 1; Figure 2c). The roadside reserves supported a canopy of large River Red-gums *Eucalyptus camaldulensis*, with a sparse shrub layer of the occasional Hedge Wattle *Acacia paradoxa*, Golden Wattle *Acacia pycnantha* and Honey-myrtle *Melaleuca* spp. The ground layer was highly disturbed, dominated by exotic species including Annual Veldt-grass *Ehrharta longifolia*, Rye Grass *Lolium* spp., Cocksfoot *Dactylis glomerata*, Rye-grass *Lolium* spp., Capeweed *Arctotheca calendula* and Flatweed *Hypochaeris radicata*. The native Kangaroo Grass *Themeda triandra*, as well as a sedge *Carex* spp., were occasionally observed scattered throughout the road reserve.

Some sections of the road reserve, particularly adjacent to large residential properties along Old Base Road, the understorey was noticeably slashed and cleared of logs and fallen branches.

Patches of native vegetation, likely to be Plains Grassy Woodland, were also present within the adjacent open paddock areas (Plate 2; Figure 2b; Figure 2c).



**Plate 1.** Plains Grassy Woodland along Old Base Road (Ecology and Heritage Partners Pty Ltd 22/01/2020).



**Plate 2.** Native vegetation within paddock area adjacent to Old Base Road (Ecology and Heritage Partners Pty Ltd 22/01/2020).

Bannockburn Lagoon contained a patch of moderate quality Plains Grassy Woodland (Plate 3; Plate 4; Figure 2b; Figure 2c). Plains Grassy Woodland within this area contained an overstorey of River Red-gum *Eucalyptus camaldulensis*, with occasional young specimens of Manna Gum *Eucalyptus viminalis* also present. Blackwood *Acacia melanoxylon*, Golden Wattle and Hedge Wattle dominated the shrub-layer. Occasional specimens of Honey Myrtle, Sweet Bursaria *Bursaria spinosa*, and Drooping Sheoak *Allocasuarina verticillata* were also observed. The ground layer was highly modified, with the native Common Reed *Phragmites australis*, and the environmental weeds *Galenia pubescens* var. *pubescens*, Cocksfoot, Great Willow-herb *Epilobium hirsutum*, Drain Flat-sedge *Cyperus eragrostis*, Mouse-ear Chickweed *Cerastium* spp., Pimpernel *Lysimachia arvensis*, dominant, particularly around the lake's edge.

The native Blown Grass *Lachnagrostis* spp., Honey Pots *Acrotriche serrulata*, Saltbush *Atriplex* spp. and Slender Dock *Rumex brownii* were also present throughout the ground layer.





**Plate 3.** Plains Grassy Woodland within Bannockburn Lagoon (Ecology and Heritage Partners Pty Ltd 22/01/2020).



**Plate 4.** Plains Grassy Woodland within Bannockburn Lagoon (Ecology and Heritage Partners Pty Ltd 22/01/2020).

### Plains Grassland

Plains Grassland is characterised by treeless vegetation, mostly less than one metre tall, and dominated largely graminoid and herb life forms. It typically occurs on fertile cracking basalt soils prone to seasonal waterlogging (DELWP 2020c).

Native patches of Plains Grassland EVC have the potential to occur within the open paddock areas along Old Base Road, Harvey Road and Brislane Road (Plate 5). Whilst these properties were inaccessible at the time of the ground truthing assessment, some scattered native grasses (Wallaby-grass *Rytidosperma* spp. and Kangaroo-grass) were visible from the roadside (Plate 6).

Golden Plains Shire (2019) also identified native grasslands and/or semi-improved pastures within the open paddocks bound by Old Base Road, Harvey Road and Bannockburn Shelford Road, which may meet the threshold that describes patches of Plains Grassland (Figure 2b). However, access constraints meant that Ecology and Heritage Partners were unable to ground truth these areas to confirm the quality and extent.





**Plate 5.** Potential Plains Grassland within the study area (along Harvey Road) (Ecology and Heritage Partners Pty Ltd 22/01/2020).



**Plate 1.** Kangaroo Grass located within the study area (along Harvey Road) (Ecology and Heritage Partners Pty Ltd 22/01/2020).

### Creekline Grassy Woodland

Creekline Grassy Woodland is typically defined as a Eucalypt-dominated woodland (to 15 metre tall) with occasional scattered shrub layer over a mostly grassy/sedgy to herbaceous ground-layer. Occurs on low-gradient ephemeral to intermittent drainage lines which can include a range of graminoid and herbaceous species tolerant of water-logged soils (DELWP 2020c).

The Creekline Grassy Woodland within the accessible section of the Bruce's Creek riparian corridor was predominantly disturbed (Plate 7; Plate 8; Figure 2c). The canopy, whilst sparse, was generally dominated by a mixture of River Red-gums and the exotic Radiata Pine *Pinus radiata*. The shrub layer typically consisted of Hedge Wattle and the Weed of National Significance (WONS) African Box-thorn *Lycium ferocissimum* over a relatively bare ground layer, save for Annual Veldt-grass *Ehrharta longifolia* and the WoNS Chilean Needle-grass *Nassella neesiana*. Common Reed was also evident as emergent vegetation with the creek.

The African Box-thorn and Chilean Needle-grass were both dead and appeared as though they had been chemically treated (Plate 9). Rabbit burrows were also present within the banks of the creek (Plate 10).

### Aquatic Herbland/Plains Sedgy Wetland Mosaic

Aquatic Herbland/Plains Sedgy Wetland Mosaic is an intermixing of herbland and permanent to semi-permanent wetlands, primarily comprised of sedgy-herbaceous vegetation, and often occurring on fertile, silty, peaty or heavy clay soils. Where the Plains Sedgy Wetland is more dominant, scattered or fringing eucalypts or tea-tree/paperbark shrubs may occur in higher rainfall areas (DELWP 2020c).

Whilst a current wetland is modelled to occur in the south-west section of the study area, ground truthing could not ascertain the presence or absence of native vegetation, as it was not visible from publicly accessible areas.





**Plate 7.** Creekline Grassy Woodland along Bruce's Creek (Ecology and Heritage Partners Pty Ltd 21/01/2020).



**Plate 8.** Creekline Grassy Woodland along Bruce's Creek (Ecology and Heritage Partners Pty Ltd 21/01/2020).



**Plate 9.** African Box-thorn within the Bruce's Creek riparian corridor (Ecology and Heritage Partners Pty Ltd 21/01/2020).



**Plate 10.** Rabbit burrows within the Bruce's Creek riparian corridor (Ecology and Heritage Partners Pty Ltd 21/01/2020).

#### 4.2.2 Scattered Trees

Isolated, individual indigenous native trees were commonly observed in paddocks and cropped areas (Figure 2b; Figure 2c).

The majority of scattered trees observed appear to be Large Trees (i.e. DBH greater than 80 centimetres) and based on the presence of other specimens, are likely to comprise a mix of River Red Gum, Manna Gum and Melbourne Yellow Gum *Eucalyptus leucoxylon subsp connata*, a vulnerable flora species.

The land bound by Levy Road, Charlton Road and Burnside Road is recorded to have a total of five scattered trees (including one deceased) (Tren Grove 2017). These trees are Melbourne Yellow Gum and would once have been part of the Plains Grassy Woodland EVC, however the understorey vegetation consists of predominantly introduced species (mainly exotic pasture grasses) and the trees no longer form a patch of native vegetation.



Furthermore, established gardens on residential properties generally incorporate indigenous trees as part of the garden layout, with large old indigenous trees have been retained as significant garden features. Large scattered trees were observed in the open paddock areas and in the front gardens of private properties along Old Base Road and Harvey Road.



**Plate 11.** Scattered trees within the study area (Ecology and Heritage Partners Pty Ltd 21/01/2020).



**Plate 12.** Scattered tree within the study area (Ecology and Heritage Partners Pty Ltd 21/01/2020).

#### 4.2.3 Large Trees

A total of 56 Large Trees (LTs) in accessible Plains Grassy Woodland patches were recorded. These specimens were River Red-gum and were located around the Bannockburn Lagoon and along the Old Base, Harvey and Brislane road reserves (Figure 2c).

Other Large Trees were observed in native vegetation patches within private properties, particularly within the land behind Bannockburn Lagoon, at the corner of Bannockburn-Shelford Road and Old Base Road and along the access trail connecting Old Base Road to Harvey Road (Figure 2b). However, such areas were inaccessible at the time of the assessment, and so could not be measured accurately.

Bruce's Creek also contained numerous Large Trees, but were also unable to be measured due to access constraints.

#### 4.2.4 Introduced and Planted Vegetation

Introduced and planted vegetation across the study area, were generally present as (Golden Plains Shire 2019):

- **Semi-improved pasture:** open paddock with semi-improved non-native pasture. Scattered native grasses are generally present in these areas, however they did not have the required 25% relative cover to be considered a remnant patch.
- **Cropping:** land primarily used for cropping of cereal crops with little or no native vegetation present.
- **Non-native Shelterbelt:** plantings of non-native species; primarily Cypress Pines as windbreaks/shelterbelts.

- **Non-indigenous native Shelterbelt:** plantings of species native to Australia but not from the local area. Non-indigenous shelterbelts are mostly planted along property boundaries and on internal dividing lines within properties.
- **Mixed species Shelterbelt:** plantings of mixed local indigenous and non-indigenous species. Shelterbelts are planted mostly along property boundaries.
- **Property gardens:** established gardens on residential properties, generally consisting of ornamental plantings. Indigenous trees are also typically incorporated as part of the garden layout, with Large Old indigenous trees being retained as significant garden features.



**Plate 13.** Large tree within the Bannockburn Lagoon area (Ecology and Heritage Partners Pty Ltd 22/01/2020).



**Plate 14.** Large tree along Old Base Road (Ecology and Heritage Partners Pty Ltd 22/01/2020).

Areas of cropping, such as those paddocks to the south of Charlton Road, were noticeably ploughed and grazed and had limited to no native vegetation value.

The section of land bound by Levy Road, Charlton Road and Burnside Road appears to be subject to improved pasture and has previously been cropped (Tren Grove 2017). The exotic Onion Grass *Romulea* spp., Rye Grass and Cocksfoot were recorded to be the prevalent groundcover species within this area (Tren Grove 2017). The noxious weeds Horehound *Marrubium vulgare* and *Sour sob Oxalis pes-caprae*, as well as the WONS Chilean Needle-grass, Serrated Tussock *Nassella trichotoma* were also present. The area also appears to have been de-rocked and several non-indigenous native trees and exotic Cypress pines have also planted within the site (Tren Grove 2017).

In addition, African Box-thorn and Spear Thistle *Cirsium vulgare* were also observed along the roadsides of Levy Road during the ground truthing assessment.

The vegetation within the farmland located to the east and west of Burnside Road was assessed to be substantially modified as a result of repeat cultivation and is considered to be of low ecological value.

Areas of semi-improved pasture were generally observed within the properties bound by the north of Old Base Road and Harvey Road. Such areas were generally disturbed and had a high cover (>80%) of exotic grass species, many of which have been direct-seeded for use as pasture. Scattered native grasses are likely to be occasionally present in these areas, however would be highly unlikely to have the required 25% native cover to be considered a patch of vegetation.

Substantial shelterbelts or windbreaks of planted non-indigenous and mixed native Eucalypts were typically present between paddocks and along fence lines. The exotic tree species typically seen were Pepper Tree *Schinus molle* and Radiata Pine.

Areas of property gardens (along the north of Old Base Road) typically incorporated native vegetation elements, such as significant large old trees and regenerating native vegetation, however, were predominantly cleared and with *Agapanthus* spp. planted in garden beds or along driveways.



**Plate 15.** Farmland (semi-improved pasture) along Burnside Road (Ecology and Heritage Partners Pty Ltd 21/01/2020).



**Plate 16.** Exotic shelterbelt or windbreak along Burnside Road Scattered trees within the study area (Ecology and Heritage Partners Pty Ltd 21/01/2020).

### 4.3 Fauna Habitat

The areas of Plains Grassy Woodland and Creekline Grassy Woodland are likely to provide habitat for a range of fauna, including arboreal species that require trees for nesting/roosting (e.g. possums and bird species), as well as ground-dwelling species reliant on a grassy ground cover for their food or shelter (e.g. lizards). Eucalypt (*Eucalyptus* spp.) and Wattle (*Acacia* spp.) trees will provide foraging habitat for nectarivores (nectar-eating) and frugivorous (fruit-eating) bird species. Many eucalypts are mature, providing an array of small, medium and large hollows, bark fissures and crevices. These are likely to be used for shelter and nesting by a range of hollow-dependent fauna, including parrots, microbats, possums, gliders and owls.

Mature scattered trees are likely to act as 'stepping-stones' for fauna moving through the predominantly agricultural landscape, increasing landscape permeability. The Melbourne Yellow Gum trees are also potential foraging source for the critically endangered EPBC listed Swift Parrot *Lathamus discolor* (Trenegrove 2017). Fauna observed using this habitat included Sulphur-crested Cockatoo *Cacatua galerita* and Little Corella *Cacatua sanguinea*.



Areas of emergent vegetation were dispersed throughout Bruce's Creek and Bannockburn Lagoon, which can provide important habitat for various frog species, such as the nationally vulnerable Growling Grass Frog *Litoria raniformis* which requires still to slow moving waters with intact emergent vegetation on the margins (DEWHA 2009b). The Eastern Pobblebonk Frog *Limnodynastes dumerilii* was heard calling in the vicinity and rabbit warrens were also observed along the banks of Bruce's Creek.

The majority of the study area consists of paddocks which contain improved exotic pastures, likely to be used as a foraging resource by common generalist bird species which are tolerant of modified open areas. Macropods (e.g. Eastern Grey Kangaroo *Macropus giganteus*) were also observed to graze in these areas.

Furthermore, areas of native grassland can support a diversity of animal species, notably skinks, snakes, birds of prey and ground-dwelling birds (TSSC 2008). The nationally vulnerable Striped Legless Lizard *Delma impar*, a grassland specialist, typically occurs in such areas of native and non-native grassland, as does the Golden Sun Moth *Synemon plana*, a critically endangered species.

Wetland areas, when seasonally inundated, have the potential to provide habitat for a range of animals that rely on regular standing water during part of the year to provide food and other resources, such as aquatic invertebrates, frogs, reptiles and waterbirds (TSSC 2012). Snakes and lizards may inhabit rock piles and vegetation on the margins of the wetland and snakes will typically enter the wetlands to feed on frogs and other animals present in wetland habitats.

#### **4.4 Removal 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 relevant local Council to remove, destroy or lop native vegetation.

##### **4.4.1 Vegetation proposed to be removed**

The information pertaining to the quality and extent of any ecological values within the boundaries of the Bannockburn Growth Area will be used to inform decisions about the future of the development area and assist the VPA to facilitate the strategic planning process. It is also understood that this information will assist decisions on the retention, removal and/or offsetting of native vegetation and fauna habitat.

As such, there are no plans presently in place for the development of the Growth Area. When the development plans are confirmed, the extent and condition of native vegetation and the corresponding offset requirements associated with the removal of native vegetation within the study area can be determined.

However, for the purposes of this assessment, the condition scores for the patches of Plains Grassy Woodland along Old Base Road and Harvey Road and within the Bannockburn Lagoon has been determined (see Appendix 2). Other areas within the study area were unable to be assessed due to access constraints.

#### **4.5 Significance Assessment**

##### **4.5.1 Flora**

The VBA contains records of nine (9) nationally significant and 24 State significant flora species previously recorded within 10 kilometres of the study area (DELWP 2018a) (Figure 3). The PMST nominated an additional

11 nationally significant species which have not been previously recorded but have the potential to occur in the locality (DAWE 2020).

While there are multiple records of significant species within 10 kilometres of the study area, there are no recorded occurrences within the study area itself. However, this may not indicate the absence of the listed species but may simply reflect the lack of detailed flora survey in the area. Given the distribution of records and the habitat encountered during the site assessment, it is likely that significant flora species will be present within the study area. However, further detailed surveys are required to confirm the presence of any national or State significant flora.

A summary of those species that have a medium or higher likelihood of occurring within the study area are listed below (Table 3):

**Table 3.** Significant Flora Species with the potential to occur within the study area.

Common Name	Scientific Name	Habitat
<b>National Significance</b>		
<b>Dwarf Spider-orchid</b>	<i>Caladenia pumila</i>	This critically endangered species is known from records around Bannockburn in 1922 and 1926 and is now reduced to two plants in the Inverleigh Conservation Reserve. Due to its rarity, it is unlikely to occur within the study area due to the absence of suitable habitat.
<b>Spiny Rice-Flower</b>	<i>Pimelia spinescens</i> subsp. <i>spinescens</i>	<p>This species is endemic to Victoria and occurs in grasslands and open shrublands. It is known to occur in several locations west of Melbourne, with some very significant occurrences on roadsides in Golden Plains Shire.</p> <p>It has been depleted historically by land clearance for settlement, industry and agriculture but is also threatened by grazing and inappropriate fire regimes.</p> <p>With multiple records of the species present immediately adjacent to the north-eastern boundary of the study area, the species has the potential to occur in areas of relatively undisturbed Plains Grassland and Plains Grassy Woodland within the study area.</p> <p>There is also potential for this species to be present within the rail corridor directly adjacent to the southern boundary of the study area.</p>
<b>Button Wrinklewort</b>	<i>Rutidosis leptorhynchoides</i>	<p>In Victoria the species occurred across the Victorian Volcanic Plain but is now restricted to tiny refugia in the south-west, occurring on the outskirts of Melbourne, Bannockburn, Rokewood, Wickliffe and between Beaufort and Ararat. The species is not known to occur naturally in any conservation reserve in Victoria.</p> <p>In Victoria, Button Wrinklewort is restricted to open stands of plains grassland and grassy woodlands, on fertile clays to clay loams, usually in areas where the grass cover is more open, either as a result of recurrent fires or grazing by native macropods or stock (Golden Plains Shire 2019).</p> <p>The species is threatened by urban development, physical disturbance of sites, weeds, competition from native grasses, heavy grazing and unsuitable fire regimes.</p> <p>Due to the presence of suitable habitat along the western boundary of the study area and the proximity of previous records to the north of the study area, Button Wrinklewort has the potential to be present within the Plains Grassy Woodland vegetation along the Old Base Road, Harvey Road and Brislane Road reserves of the study area.</p> <p>There is also potential for this species to be present within the rail corridor directly adjacent to the southern boundary of the study area.</p>

Common Name	Scientific Name	Habitat
<b>Large-headed Fireweed</b>	<i>Senecio macrocarpus</i>	<p>The occurrence of Large-fruit Fireweed in Victoria is severely fragmented. Large-fruit Fireweed occurs most commonly in grasslands on red-brown earth soils.</p> <p>It may also occur in grassy woodlands and open woodlands. Most of the locations occur in small, disjunct remnants of vegetation prone to destruction and disturbance. Suitable habitat for this species exists in areas not subject to historical agricultural disturbance (i.e. cropping and/or other major ground disturbances), such as the intact areas of Plains Grassland and Plains Grassy Woodland along the western boundary of the study area.</p> <p>There are multiple records of Large-headed Fireweed along the rail corridor to the north-east of the study area, and there is also potential habitat along the rail corridor to the south of the study area.</p>
<b>Matted Flax-lily</b>	<i>Dianella amoena</i>	<p>The Matted Flax-lily is currently known to occur only in Victoria, where it is widely but patchily distributed from eastern to south-western Victoria, in the Victorian Volcanic Plains, South East Coastal Plain, South Eastern Highlands and Victorian Midlands bioregion.</p> <p>It generally occurs in grassland and grassy woodland habitats, on well drained to seasonally wet fertile sandy loams to heavy cracking clay soils. It is known from a single occurrence in the Bannockburn Cemetery.</p> <p>Due to the proximity of this previous record and the presence of suitable habitat, the species has the potential to occur within the Plains Grassy Woodland surrounding the Bannockburn Lagoon. Similarly, there is potential for the species to occur in areas of relatively undisturbed Plains Grassland and Plains Grassy Woodland along the road reserves of the western boundary of the study area.</p>
<b>Adamson's Blown Grass</b>	<i>Lachnagrostis adamsonii</i>	<p>Adamson's Blown-grass is confined to slow moving creeks, swamps, flats, depressions or drainage lines (such as along roadsides) that are seasonally inundated or waterlogged and usually moderately to highly saline.</p> <p>Whilst Adamson's Blown-grass has a wide distribution across the volcanic plains of Victoria, it only has approximately 70 sites, many of which are small and impacted by continuing threats.</p> <p>Although there are no previous records of Adamson's Blown-grass within the study area, there is potential that the Bruce Creek riparian corridor and the area modelled to support Aquatic Herbland/Plains Sedgy Wetland Mosaic may support low quality habitat for this species.</p> <p>Furthermore, based on the proximity of previous records to the south-east of the study area, there is also potential that the species will be present similar habitat along the rail corridor to the south of the study area.</p>
<b>State Significance*</b>		
<b>Cut-leaf Burr Daisy</b>	<i>Calotis anthemoides</i>	<p>The Cut-leaf Burr Daisy is located in scattered populations north and west of Melbourne. It grows on heavier soils prone to waterlogging and is now rare due to habitat depletion.</p> <p>Based on the proximity of previous records to the north of the study area and the presence of suitable habitat in the form of relatively undisturbed Plains Grassland and Plains Grassy Woodland) along Old Base Road, Harvey Road and Brislane Road, there is the potential for this species to occur within the study area.</p>
<b>Small Scurf-pea</b>	<i>Cullen parvum</i>	<p>Small Scurf-pea is considered very rare in Victoria where it is known from a few localities in the north-central and south-central areas and western suburbs of Melbourne. It grows in grassland or grassy woodland, often on basalt derived soils.</p> <p>Based on the proximity of previous records scattered around the study area and the presence of suitable habitat in the form of relatively undisturbed Plains Grassland</p>

Common Name	Scientific Name	Habitat
		and Plains Grassy Woodland) along Old Base Road, Harvey Road and Brislane Road, there is the potential for this species to occur within the study area.
<b>Hairy Tails</b>	<i>Ptilopus erubescens</i>	Hairy Tails typically occur on relatively fertile soils supporting grassland and woodland communities in northern and western Victoria. Based on the proximity of previous records to the west of the study area and the presence of suitable habitat in the form of relatively undisturbed Plains Grassland and Plains Grassy Woodland) along Old Base Road, Harvey Road and Brislane Road, there is the potential for this species to occur within the study area.

**Note. \* Those species with the highest likelihood of occurrence.**

Furthermore, the presence of Melbourne Yellow-gum *Eucalyptus leucoxylon* subsp. *connata* listed as threatened under the FFG Act was confirmed within a parcel on Levys Road (Tren Grove 2017), and there is a moderate to high likelihood that several more specimens are present elsewhere within the study area.

In addition, Black Wattle *Acacia mearnsii* and Golden Wattle *Acacia pycnantha*, listed as protected under the FFG Act, were recorded within the study area during Ecology and Heritage Partners' site assessment.

#### 4.5.2 Fauna

The VBA contains records of 11 nationally significant and 22 State significant fauna species previously recorded within 10 kilometres of the study area (DELWP 2018a) (Figure 4). The PMST nominated an additional nine (9) nationally significant species which have not been previously recorded but have the potential to occur in the locality (DAWE 2020).

No records of significant fauna species were identified within the study area. However, this does not indicate that such species are not present but may indicate a lack of survey effort for these species.

Based on species habitat requirements and distribution across the Victorian Volcanic Plain, the following significant species have medium or higher likelihood of occurring within native grasslands and woodlands around Bannockburn (Table 4):

**Table 4.** Significant Fauna Species with the potential to occur within the study area.

Common Name	Scientific Name	Habitat
<b>National Significance</b>		
<b>Golden Sun Moth</b>	<i>Synemon plana</i>	Historically, the distribution of the golden sun moth corresponded with native temperate grasslands across NSW, the ACT, Victoria and South Australia. Less than 1% of these temperate native grasslands remain. As a result, the remaining Golden Sun Moth populations are highly reduced and fragmented. Recent research into dietary specialisation in the golden sun moth revealed that larvae feed almost exclusively on wallaby grasses and spear grasses ( <i>Rytidosperma</i> spp. and <i>Austrostipa</i> spp.) and the exotic Chilean needle grass ( <i>Nassella</i> species). Given the species habitat requirements and distribution data, the species has the potential to be found in areas of grassland within the study area that support a high cover of the above species.

Common Name	Scientific Name	Habitat
<b>Swift Parrot</b>	<i>Lathamus discolor</i>	<p>The Swift Parrot may forage on eucalypts within the study area on occasion. It has been recorded in the Bannockburn Bush where winter flowering Eucalypts provide a food source.</p> <p>However, the species breeds only in Tasmania and migrates to mainland Australia in autumn and is usually recorded between Stawell in the central west and Wodonga in the north-east. As such the study area is unlikely to provide important or limiting habitat for this species.</p>
<b>Painted Honey-eater</b>	<i>Grantiella picta</i>	<p>The Painted Honeyeater is a seasonal north-south migrator following the fruiting of the plant parasite Mistletoe. The species prefers woodlands which contain a higher number of mature trees as these generally host greater numbers of mistletoe. Habitat loss is the primary threat to this species and therefore retention of mature trees that host mistletoe is essential.</p> <p>However, due to historical disturbance, and the presence of large remnants of higher quality habitat in adjacent areas outside the study area, this species is unlikely to rely on habitat within the study area for breeding or other limiting purposes. It is more likely that the species occasionally flies over or forages within scattered trees located within the study area.</p>
<b>Grey-headed Flying Fox</b>	<i>Pteropus poliocephalus</i>	<p>The Grey-headed Flying-fox requires foraging resources and roosting sites. It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, <i>Melaleuca</i> swamps and <i>Banksia</i> woodlands.</p> <p>However, due to historical disturbance, and the presence of large remnants of higher quality habitat in adjacent areas outside the study area, this species is unlikely to rely on habitat within the study area for breeding or other limiting purposes. It is more likely that the species occasionally flies over or forages within scattered trees located within the study area.</p>
<b>Striped Legless Lizard</b>	<i>Delma impar</i>	<p>The Striped Legless Lizard is a grassland specialist. Potential habitat for the Striped Legless Lizard includes all areas which have, or once had, native grasslands or grassy woodlands (including derived grasslands) across the historical range of the species, provided that area retains suitable tussock structure, the soil is of appropriate type and structure, and the site has not had major disturbance such as ploughing. All occupied sites have a grassy ground cover, often with a mixture of native and exotic perennial and annual species of tussock-forming grasses</p> <p>Given the species habitat requirements and distribution data, the species has the potential to be found in areas of grassland within the study area that support these habitat requirements, such as the areas of potential Plains Grassland and Plains Grassy Woodland throughout the study area.</p>
<b>Growing Grass Frog</b>	<i>Litoria raniformis</i>	<p>In Victoria and the south-east of South Australia, the species is usually found among vegetation within or at the edges of permanent water such as slow flowing streams, swamps, lagoons and lakes.</p> <p>Potential habitat for the species is present in Bruce's Creek and Bannockburn Lagoon, where fringing and/or emergent vegetation is present. If development is expected to have waterbody impacts to hydrology and flows, survey for this species should be undertaken.</p>
<b>Dwarf Galaxias</b>	<i>Galaxiella pusilla</i>	<p>The Dwarf Galaxias has broad habitat requirements and occurs in slow flowing and still, shallow, permanent and temporary freshwater habitats such as swamps, drains and the backwaters of streams and creeks, often (but not always) containing dense aquatic macrophytes and emergent plants.</p> <p>Dwarf Galaxias may utilise Bruce's Creek as a dispersal corridor to known habitat located further south within the Barwon River.</p>



Common Name	Scientific Name	Habitat
<b>Migratory Birds</b>	-	A number of migratory birds and shorebirds protected under the EPBC Act may utilise habitat near to the wetlands. However, given the distance from preferred coastal habitat and the highly modified nature of the landscape, the species may not utilise the study area on a regular basis, however, may occasionally forage within the study area.
<b>State Significance *</b>		
<b>Brown Treecreeper</b>	<i>Climacteris picumnus victoriae</i>	There are records of Brown Treecreeper from the local area. Habitat is mainly found in woodland areas within the study area, particularly within the Bannockburn Bushland Reserve to the west of the study area.  It is likely that this species may forage within the adjacent Plains Grassy Woodland patches along Old Base Road, Harvey Road and Brislane Road.
<b>Hooded Robin</b>	<i>Melanodryas cucullata cucullata</i>	There are records of Hooded Robin from the local area. Habitat is mainly found in woodland areas within the study area, particularly within the Bannockburn Bushland Reserve to the west of the study area.  It is likely that this species may forage within the adjacent Plains Grassy Woodland patches along Old Base Road, Harvey Road and Brislane Road.
<b>Diamond Firetail</b>	<i>Stagonopleura guttata</i>	There are records of Diamond Firetail from the local area, particularly within the Bannockburn Bushland Reserve to the west of the study area. Diamond Firetail generally prefers woodland habitats but is also associated with grassland habitats as well.  It is likely that this species may forage within the adjacent Plains Grassy Woodland patches along Old Base Road, Harvey Road and Brislane Road.

**Note. \* Those species with the highest likelihood of occurrence.**

#### 4.5.3 Communities

##### Nationally Significant

Five nationally listed ecological communities have the potential to occur within 10 kilometres of the study area (DAWE 2020).

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Natural Damp Grassland of the Victorian Coastal Plains;
- Natural Temperate Grassland of the Victorian Volcanic Plain;
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains; and
- White Box-Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Based on the EVCs predicted to occur within the study area as part of the Desktop Assessment, the following communities were considered to have a low to moderate likelihood of occurrence within the study area.

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain, which may align with areas of Plains Grassland/Plains Grassy Woodland. Modelled areas show that the ecological community may occur in the northern and western sections of the study area (Figure 2a).
- Natural Temperate Grassland of the Victorian Volcanic Plain which may align with areas of Plains Grassy Woodland and Plains Grassland. Larger patches of these modelled EVC types that may support

this community are mainly present throughout the north-west and western section of the study area, adjacent to the Bannockburn Bushland Reserve (Figure 2a).

- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains, which may align with areas of Aquatic Herbland/Plains Sedgy Wetland Mosaic. The area within the modelled wetland is considered to have a low likelihood to support this community (Figure 2a).

### Grassy Eucalypt Woodland of the Victorian Volcanic Plain

*Grassy Eucalypt Woodland of the Victorian Volcanic Plain* is an ecological community that is listed as 'Critically Endangered' under the EPBC Act. The structure of the Grassy Eucalypt Woodland of the Victorian Volcanic Plain is an open eucalypt woodland with a predominantly grassy understorey. The tree canopy is typically dominated by River Red Gum, and the understorey is dominated by a native ground layer, consisting of, but not limited to such species as Common Wallaby-grass *Rytidosperma caespitosa*, Weeping Grass *Microlaena stipoides* var. *stipoides*, Kangaroo Grass *Themeda triandra*, Sheep's Burr *Acaena echinata*, Common Everlasting *Chrysocephalum apiculatum* and Pink Bindweed *Convolvulus angustissimus*.

The Grassy Eucalypt Woodland of the Victorian Volcanic Plain generally correlates with the Plains Grassy Woodland (EVC 55\_61), and which comprises the majority of the national ecological community. However, degraded areas of Plains Grassy Woodland identified within the study area did not meet the condition thresholds that define the Grassy Eucalypt Woodland of the Victoria Volcanic Plain due to the absence of key indicator species, the low diversity of native flora and high cover of exotic vegetation.

It is important to note that there is potential for Grassy Eucalypt Woodland of the Victorian Volcanic Plain to occur within areas of private land that were inaccessible at the time of this on-ground assessment, particularly within properties along Old Base Road and Harvey Road (Figure 2b; Figure 2c). Such areas should be properly assessed prior to any future development within those sites.

### Natural Temperate Grassland of the Victorian Volcanic Plain

*Natural Temperate Grassland of the Victorian Volcanic Plain* (NTGVVP) is an ecological community that is listed as 'Critically Endangered' under the EPBC Act. The vegetation of the NTGVVP is mostly limited to a ground layer of grasses and herbs. Large shrubs and trees are typically absent, and the ground layer is dominated by native tussock-forming perennial grasses (such as Kangaroo Grass, Spear-grasses *Austrostipa* spp. and Tussock-grasses *Poa* spp.), with a variety of herbs (typically daisies, lilies and orchids) occupying the spaces among grass tussocks (TSSC 2008).

NTGVVP is generally synonymous with areas of Plains Grassland EVC. There is potential for NTGVVP, albeit of low quality, to occur within the study area, particularly within those pastoral properties along Harvey Road and to the south of Burnside Road (Figure 3b; Figure 2c). Whilst these properties were inaccessible at the time of the ground truthing assessment, some scattered native grasses, including Wallaby-grass and Kangaroo Grass were visible from the roadside. As such, it is recommended that these properties be further assessed to determine if such areas meet the condition thresholds that define this ecological community.

### Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plain

*Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plain* is an ecological community that is listed as 'Critically Endangered' under the EPBC Act. This community is an isolated, freshwater wetland that

is usually inundated on a seasonal basis through rainfall, then dry out, so surface water is not permanently present. The community have a vegetation structure that is open, with woody cover sparse and the ground layer dominated by herbs (grasses, sedges and forbs) adapted to seasonally wet or waterlogged conditions.

Whilst a current wetland is modelled to occur in the south-west section of the study area, ground truthing could not ascertain its presence or absence, as it was not visible from publicly accessible areas. The Seasonal Herbaceous Wetlands ecological community is highly variable because it is strongly influenced by seasonal factors, particularly, rainfall patterns. As such, a thorough assessment is required to be undertaken after spring rainfall (i.e. October-November) to determine whether the community is present.

### State Significant

Two FFG Act-listed ecological communities were identified through the desktop assessment as having the potential to occur within the study area:

- Western (Basalt) Plains Grasslands Community and,
- Western Basalt Plains (River Red Gum) Grassy Woodland.

Areas of Plains Grassland/Plains Grassy Woodland were initially considered to potentially meet the relevant description and characteristics described for these FFG Act-listed ecological communities (DELWP 2020c). On-ground observation and EVC modelling suggest that the Western (Basalt) Plains Grassland Community and the Western Basalt Plains (River Red Gum) Grassy Woodland are likely to occur in the subject area. Further detailed survey is required to confirm the presence of FFG listed communities in the subject area.

## 5 Legislative and Policy Implications

### 5.1 *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 (i.e. project, development, undertaking, activity, or series of activities) likely to have a significant impact on Matters of National Environmental Significance (NES), or those that are undertaken on Commonwealth Land. An action, unless otherwise exempt, requires approval from the Commonwealth Minister for the Environment if it is likely to have an impact on any of the following matters of NES:

- World Heritage properties;
- National Heritage places;
- Ramsar wetlands of international significance;
- Nationally listed threatened species and ecological communities;
- Migratory species protected under international agreements;
- Commonwealth marine areas;
- The Great Barrier Reef Marine Park; and,
- Nuclear actions and water resources (for coal seam gas and large coal mining projects).

Key ecological constraints associated with the EPBC Act relate to the known or potential presence of threatened species of flora and fauna. Any action that is likely to significantly impact upon these values or any other matter of NES would need to be referred to DoEE for assessment and approval.

A referred action will subsequently be classed as one of the following:

- *Not a controlled action* – approval is not required if the action is undertaken in accordance with the referral
- *Not a controlled Action ‘particular manner’* – approval is not required if the action is undertaken in accordance with the manner specified.
- *Controlled action* – the action is subject to the assessment and approval process under the EPBC Act.

#### 5.1.1 Implications

Patches of Plains Grassy Woodland assessed within the study area were relatively degraded. As such, it is considered unlikely that the Grassy Eucalypt Woodland of the Victorian Volcanic Plain community is present in assessed accessible areas. However, there is potential for this ecological community to be present within private properties, and as such further investigation is required.

There is also potential for NTGVVP, albeit of low quality, to occur within the study area, particularly within those pastoral properties along Harvey Road and to the south of Burnside Road. Whilst not identified during the ground truthing, there is also the potential for the Seasonal Herbaceous Wetlands ecological community to occur within private property.

A thorough assessment of native vegetation patches within private properties is recommended to determine whether these ecological communities occur (see Section 6).

There is potential habitat within the study area for five flora species (Spiny Rice-Flower, Button Wrinklewort, Large-headed Fireweed, Matted Flax-lily and Adamson’s Blown-grass) and four fauna species (Striped Legless Lizard, Growling Grass Frog, Golden Sun Moth, and Dwarf Galaxias) listed under the EPBC Act.

Prior to any future development within the study area further assessment is recommended to confirm the quality and extent of potential habitat for these species, which may lead to targeted flora and fauna surveys being required. Pending the outcome of the targeted surveys for these species, a referral to the Commonwealth Environment Minister may also be required.

## 5.2 Flora and Fauna Guarantee Act 1988 (Victoria)

The FFG Act is the primary legislation dealing with biodiversity conservation and the 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 and listed vegetation communities in areas of public land (i.e. within road reserves). An FFG Act permit is generally not required for removal of listed and/or protected flora species and communities on private land, or for the removal of habitat for a listed terrestrial fauna species. There are currently no requirements for proponents to apply for a permit under the FFG Act where a proposed activity requires the removal of habitat for a listed terrestrial fauna species. The Act does however regulate the removal, salvage, temporary holding, translocation, taking, trading and keeping of FFG Act-listed fish species, and as such, an FFG Act permit is required if listed fish species are likely to be affected by a proposed activity.

Melbourne Yellow-gum listed as threatened, and Black Wattle and Golden Wattle listed as protected under the FFG Act were recorded within the study area during Ecology and Heritage Partners' site assessment.

Acacia species were located around Bannockburn Lagoon and along road reserves. If listed or protected specimens located on public land are proposed to be removed, a permit under the FFG Act will be required. The proponent should allow up to six weeks to obtain an FFG Act permit through DELWP.

Habitat for the Brown Treecreeper, Hooded Robin and Diamond Firetail also has the potential to occur within the study area, however, an FFG Act permit is generally not required for the removal of these species' habitat.

### **5.3 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, unless an exemption under clause 52.17-7 of the Victorian Planning Schemes applies.

#### **5.3.1 Local Planning Schemes**

The study area is located within the Golden Plains Shire municipality and is zoned Farming Zone (FZ). The study area is partially affected by the following overlays:

- An Environmental Significance Overlay – Schedule 2 (ESO2), which intersects the centre of the study area from north to south;
- A Land Subject to Inundation Overlay (LSIO) along the Bruce Creek corridor;
- A Salinity Management Overlay (SMO); and,
- A Bushfire Management Overlay (BMO) along the western edge adjacent to Harvey Road.

#### **5.3.2 Environmental Significance Overlay – Schedule 2**

A permit is required to remove, destroy or lop any vegetation, including dead vegetation.

This does not apply:

- If a schedule to this overlay specifically states that a permit is not required.
- If the table to Clause 42.01-3 specifically states that a permit is not required.
- To the removal, destruction or lopping of native vegetation in accordance with a native vegetation precinct plan specified in the schedule to Clause 52.16

Any application to develop land may be referred for comment to:

- the Department of Natural Resources and Environment; and,
- the relevant water board or water supply authority.

Planning permits are not required for works and maintenance of roads, railways and highways controlled by VicRoads or the Public Transport Corporation, where an agreed Vegetation Management Plan has been approved.

Remove, destroy or lop any vegetation, including dead vegetation. This does not apply: – If a schedule to this overlay specifically states that a permit is not required. – If the table to Clause 42.01-3 specifically states that a permit is not required. – To the removal, destruction or lopping of native vegetation in accordance with a native vegetation precinct plan specified in the schedule to Clause 52.16

### 5.3.3 *Salinity Management Overlay*

The purpose of the Salinity Management Overlay includes to identify areas subject to saline ground water discharge or high ground water recharge, encourage development to be undertaken in a manner which brings about a reduction in salinity recharge and to ensure development is compatible with site capability and the retention of vegetation, and complies with the objectives of any salinity management plan for the area.

A permit is required to remove, destroy or lop any vegetation.

This does not apply:

- If a schedule to this overlay specifically states that a permit is not required.
- If the table to Clause 44.02-5 specifically states that a permit is not required.
- To the removal, destruction or lopping of native vegetation in accordance with a native vegetation precinct plan specified in the schedule to Clause 52.16.

### 5.3.4 *The Guidelines*

The State Planning Policy Framework and the decision guidelines at Clause 52.17 (Native Vegetation) and Clause 12.01 require Planning and Responsible Authorities to have regard for the 'Guidelines for the removal, destruction or lopping of native vegetation' (the Guidelines) (DELWP 2017a).

### 5.3.5 *Implications*

A planning permit from the Golden Shire Council is required to remove, destroy or lop native vegetation under Clause 52.17 of the Planning Scheme. A permit is also required to remove, destroy or lop any vegetation (including dead vegetation) along Bruce's Creek under Clause 42.01 of the Environmental Significance Overlay (ESO2). Any application to develop land along Bruce's Creek may also be referred for comment to:

- The Department of Environment, Land, Water and Planning; and,
- The relevant water board or water supply authority.

In addition, a permit is also required to remove, destroy or lop any vegetation under Clause 44.02 of the Salinity Management Overlay (SMO).

Furthermore, detailed survey work by a suitably qualified ecologist/botanist is required to understand the quality of native vegetation within areas that were inaccessible during this ground truthing assessment. The findings of these assessments will also inform the future development of the Growth Area and assist to identify vegetation to be removed, offset and retained (see Section 6 for future recommendations and requirements).

## 6 Recommendations

Following the Desktop Assessment and the subsequent ground truthing within the study area, recommendations have been made pertaining to future detailed assessments and survey work.

Further assessments by a suitably qualified ecologist is required to confirm the quality and extent of native vegetation within the study area as well as determine the presence or absence of significant flora and fauna species.

Such assessments should be undertaken in preparation for the Precinct Structure Plan (PSP).

Where feasible, targeted surveys for significant flora species will be conducted simultaneously whereby flowering periods overlap or coincide with one another. Known reference sites of significant flora previously documented within proximity to the study area will be visited prior to conducting the targeted surveys, to determine whether the species is presently flowering.

### 6.1 Future Assessments and Surveys

#### 6.1.1 Flora

- Conduct detailed native vegetation assessments of areas inaccessible at the time of this ground truthing, to confirm the extent and quality of native vegetation present within private properties and to inform potential offset requirements;
- Conduct detailed native vegetation assessments during spring/early summer to confirm the presence or otherwise of EPBC listed vegetation communities, namely;
  - *Grassy Eucalypt Woodland of the Victorian Volcanic Plain*;
  - *Natural Temperate Grassland of the Victorian Volcanic Plain* (NTGVVP); and,
  - *Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plain*.
- Conduct detailed native vegetation assessments to confirm the presence and quality of FFG Act listed vegetation communities, namely;
  - Western (Basalt) Plains Grassland Community; and,
  - Western Basalt Plains (River Red Gum) Grassy Woodland.
- Conduct detailed native vegetation assessments to confirm the presence and quality of EPBC listed and FFG listed flora species, namely;

**Table 5.** Recommended Survey Times for Significant Flora Species

Common Name	Scientific Name	Recommended Survey Time
<b>National Significance</b>		
<b>Spiny Rice-Flower</b>	<i>Pimelia spinescens</i> subsp <i>spinescens</i>	April to August (When in flower)
<b>Button Wrinklewort</b>	<i>Rutidosis leptorhynchoides</i>	Late Spring to early Summer (Oct – Jan) (When in flower)



Common Name	Scientific Name	Recommended Survey Time
<b>Large-headed Fireweed</b>	<i>Senecio macrocarpus</i>	August to November (When in flower)
<b>Matted Flax-lily</b>	<i>Dianella amoena</i>	Late Spring to early Summer (Nov – Jan) (When in flower)
<b>Adamson's Grass</b>	<i>Lachnagrostis adamsonii</i>	November to February (When in flower)
<b>State Significance</b>		
<b>Cut-leaf Burr Daisy</b>	<i>Calotis anthemoides</i>	September to December (When in flower)
<b>Small Scurf-pea</b>	<i>Cullen parvum</i>	October to January (When in flower)
<b>Hairy Tails</b>	<i>Ptilotus erubescens</i>	November to February (When in flower)

#### 6.1.2 Fauna

- Conduct surveys for Growling Grass Frog in Bruce's Creek if development is expected to have waterbody impacts to hydrology (see Table 6);
- Conduct tile surveys for Striped Legless Lizard *Delma impar* in areas of potential habitat (see Table 6);
- Conduct surveys for Golden Sun Moth *Synemon plana* in areas of potential habitat (see Table 6);

**Table 6.** Recommended Survey Times for Significant Fauna Species

Common Name	Scientific Name	Recommended Survey Time
<b>National Significance</b>		
<b>Golden Sun Moth</b>	<i>Synemon plana</i>	October to December (During flight season)
<b>Striped Legless Lizard</b>	<i>Delma impar</i>	Establish tile grids in June/July. Undertake tile checks between September to December
<b>Growling Grass Frog</b>	<i>Litoria raniformis</i>	October to December (During mating season when males are calling)

- Establish fauna salvage protocols where native vegetation containing hollows is to be removed/impacted;
- Improve habitat availability by using tree and shrub species of local provenance in streetscapes; and,
- Protect wetland habitats by enacting erosion controls where the combination of slope and soils creates a risk to local waterways.

## 6.2 Enhancing Biodiversity

### 6.2.1 *High value areas for retention*

Ideally, occurrences of high quality endangered EVC's would be excluded from development and retained either in public reserves or protected areas on private land. Where possible, large, high quality patches of native vegetation should be considered for retention and be incorporated into reserves or subdivision layout that minimises patch fragmentation and decline.

It is recommended that the Bannockburn Lagoon remain as a public reserve. Furthermore, pending the outcome of an assessment to determine whether the current modelled wetland in the south-west section of the study area, this area should also be retained as a public reserve.

Such reserves will provide important 'stepping stones' of suitable habitat through a largely altered environment, particularly for rather mobile species, such as migratory birds, which regularly move between sites of food and other resources.

#### 6.2.1 *Bruce's Creek*

Bruce's Creek has the potential to act as a 'habitat' or 'biodiversity corridor' for fauna species, as it can provide a continuous link of suitable habitat through an otherwise largely modified landscape. Future management of the existing biodiversity values would be beneficial to maintain and enhance the biodiversity of the remaining fragmented patches. As such, it is recommended that the Bruce's Creek riparian corridor and potential native vegetation along the escarpment and watercourse be restored via enhancing habitat quality, increasing habitat connectivity, and reducing impacts from the surrounding environments.

Specifically, these works should seek to achieve the enhancement and extension of existing habitat characteristics currently present within the Bruce's Creek riparian corridor and reintroduce suitable habitat features into the area for species such as the Swift Parrot (via nest boxes and extension of habitat through revegetation), Growling Grass Frog and Dwarf Galaxias (through Bruce's Creek enhancements and creation of waterbodies).

A summary of practically achievable ecological enhancement opportunities available within the Bruce's Creek riparian corridor is provided below.

#### **Revegetation / Replanting Works**

Existing native vegetation present along Bruce's Creek is in the form fragmented of Creekline Grassy Woodland patches. Through strategic revegetation activities, there is an opportunity to expand the extent of Creekline Grassy Woodland along the full length of the creek and re-introduce suitable habitat for avian and arboreal fauna back into the site.

In order to ensure any revegetation activities most closely represents the indigenous EVC formerly present within the study area, it is recommended that the following species list is reviewed (Table 7).

**Table 7.** Species from the Creekline Grassy Woodland EVC suitable for revegetation.

Life Form	Species Name	Common Name
T	<i>Eucalyptus camaldulensis</i>	River Red-gum
T	<i>Acacia melanoxylon</i>	Blackwood
T	<i>Acacia retinodes</i>	Wirilda
MS	<i>Hymenathera dentata</i> s.l.	Tree Violet
SS	<i>Rubus parvifolius</i>	Small-leaf Bramble
SS	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	Ruby Saltbush
MH	<i>Oxalis perennans</i>	Grassland Wood-sorrel
SH	<i>Azolla filiculoides</i>	Pacific Azolla
SH	<i>Lemna disperma</i>	Common Duckweed
LTG	<i>Austrostipa bigeniculata</i>	Kneed Spear-grass
LTG	<i>Poa labillardierei</i>	Common Tussock-grass
LNG	<i>Phragmites australis</i>	Common Reed
MTG	<i>Rytidosperma racemosa</i> var. <i>racemosa</i>	Stiped Wallaby-grass
MTG	<i>Rytidosperma caespitosa</i>	Common Wallaby-grass
MNG	<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass
SC	<i>Glycine clandestina</i>	Twining Glycine

**Note.** T = Tree; MS = Medium Shrub; SS = Small Shrub; MH = Medium Herb; SH = Small Herb; LTG = Large Tufted Graminoid; LNG = Large Non-tufted Graminoid; MTG = Medium Tufted Graminoid; MNG = Medium Non-tufted Graminoid; SC = Scrambler

An additional focus should be on embellishing the diversity of existing patches of native vegetation to be retained within the study area. Where patches of retained native vegetation exhibit low species diversity or structure, revegetation activities should focus on re-establishing these respective elements using the relevant EVC benchmark as a guideline.

## Habitat Creation

### Nest Boxes

Many species of wildlife rely on natural tree hollows for nesting, breeding and shelter. Hollows provide a safe home away from the weather and predators. In eucalypt trees, small hollows may take over 70 years to develop and large hollows many decades longer.

Within existing canopy trees along Bruce's Creek, there is an opportunity to re-introduce fauna into the riparian corridor through the installation and creation of fauna habitat.

Nest boxes of varying types and sizes are an important aspect to wildlife conservation in that they provide additional habitat for hollow-dependant fauna in areas where hollows are in short supply, and in addition, support the persistence or reintroduction of a species in any areas where natural nesting hollows are not available.

### Logs

Logs provide an excellent habitat and food for many species and are extremely important for the proper function of a healthy ecosystem. Frogs, reptiles and small mammals use logs with hollows for shelter and a food resource. It is recommended that any trees that are proposed to be impacted by any future development within the Bannockburn Growth Area are repurposed for use as habitat logs within the Bruce's Creek riparian corridor.

### **Weed Control**

Weeds are present throughout the Bruce's Creek riparian corridor and will be required to be controlled as part of the revegetation and enhancement works.

Within the areas proposed for revegetation, the highest priority for weed control should be WONS and noxious weeds. Noxious weeds and WONS present include African Box-thorn and Chilean Needle-grass. Landowners of adjacent areas are responsible for the control of any infestation of noxious weeds to minimise their spread and impact on ecological values under the *Catchment and Land Protection Act 1994* (CaLP Act), which contains provisions relating to catchment planning, land management, noxious weeds and pest animals.

Within the proposed revegetation areas, the second priority for weed control should be those species identified as introduced flora and not listed as a WONS or Noxious weed.

Where weeds are present, particularly if they are dominant, weed control should be undertaken for at least two years prior to undertaking any planting, to ensure that weeds and weed seed in the soil bank is depleted.

#### **6.2.2 Old Base Road, Harvey Road and Brislane Road**

Plains Grassy Woodland patches occur as linear remnants along the roadsides of Old Base Road, Harvey Road and Brislane Road. Many of the River Red-gums within these remnants are mature and possess hollows, which are likely to be used as shelter and nesting by a range of hollow-dependent fauna, including parrots, microbats, possums, gliders and owls. In addition to providing important faunal habitat, these strips of Plains Grassy Woodland also provide a 'habitat corridor' that facilitates the movement of fauna (particularly arboreal species) from the northern end to the southern end of the study area.

As such, it is recommended that the Plains Grassy Woodland patches along Old Base Road, Harvey Road and Brislane Road be retained as part of the future development within the Bannockburn Growth Area.

### **6.3 Best Practice Mitigation Measures**

Furthermore, recommended measures to mitigate impacts upon terrestrial and aquatic values present within the study area during future development 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. Native vegetation (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.
- Where possible, construction stockpiles, machinery, roads, and other infrastructure should be placed away from areas supporting native vegetation, Large Trees and/or wetlands;
- 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.

## 7 Conclusions and Further Requirements

The Biodiversity Assessment for the Bannockburn Growth Area has identified areas containing moderate to high quality native vegetation in the form of native patches of woodland, high quality vegetated roadsides, large scattered trees and potential native grasslands and wetlands.

A suitably qualified Ecologist/Botanist will be required to undertake an assessment of the quality of any native vegetation within areas that were inaccessible at the time of the site assessment and/or areas determined to contain potential native vegetation. This will be conducted using more accurate data obtained during the ground truthing, further field studies and habitat hectare assessments.

Based on nearby records and species habitat requirements observed within the study area, further investigations are recommended to confirm the presence or absence of significant species that have the potential to occur. These assessments and surveys will determine the quality and extent of any ecological values within the growth area to further inform decisions about the future development of the area and assist decisions on the retention, removal and/or offsetting of native vegetation and fauna habitat.

Further requirements associated with development of the study area, as well as additional studies or reporting that may be required, are provided in Table 8.

**Table 8.** Further requirements associated with development of the study area

Relevant Legislation	Implications	Further Action
<b>Environment Protection and Biodiversity Conservation Act 1999</b>	<p>There is a low likelihood of the Grassy Eucalypt Woodland, NTGVVP and Seasonal Herbaceous Wetland communities to occur within the study area.</p> <p>There is potential habitat within the study area for five flora species (Spiny Rice-Flower, Button Wrinklewort, Large-headed Fireweed, Matted Flax-lily and Adamson's Blown-grass) and four fauna species (Striped Legless Lizard, Growling Grass Frog, Golden Sun Moth) listed under the EPBC Act.</p>	<p>Prior to any future development within the study area further assessment is recommended to confirm the quality and extent of potential habitat for these species, which may lead to targeted flora and fauna surveys being required.</p> <p>Pending the outcome of the targeted surveys for these species, a referral to the Commonwealth Environment Minister may also be required.</p>
<b>Flora and Fauna Guarantee Act 1988</b>	<p>Melbourne Yellow-gum listed as threatened, and Black Wattle and Golden Wattle listed as <i>protected</i> under the FFG Act were recorded within the study area during Ecology and Heritage Partners' site assessment.</p> <p>Acacia species were located around Bannockburn Lagoon and along road reserves. If listed or protected specimens located on public land are proposed to be removed, a permit under the FFG Act will be required. The proponent should allow up to six weeks to obtain an FFG Act permit through DELWP.</p> <p>Habitat for the Brown Treecreeper, Hooded Robin and Diamond Firetail also has the potential to occur within the study area, however, an FFG Act permit is generally not required for the removal of these species' habitat.</p>	<p>If listed or protected specimens located on public land are proposed to be removed, a permit under the FFG Act will be required. The proponent should allow up to six weeks to obtain an FFG Act permit through DELWP.</p>
<b>Planning and Environment Act 1987</b>	<p>A planning permit from the Golden Shire Council is required to remove, destroy or lop native vegetation under Clause 52.17 of the Planning Scheme. A permit is also required to remove, destroy or lop any vegetation (including dead vegetation) along Bruce's Creek under Clause 42.01 of the Environmental Significance Overlay (ESO2). Any application to develop land along Bruce's Creek may also be referred for comment to:</p> <ul style="list-style-type: none"> <li>• The Department of Environment, Land, Water and Planning; and,</li> <li>• The relevant water board or water supply authority.</li> </ul> <p>In addition, a permit is also required to remove, destroy or lop any vegetation under Clause 44.02 of the Salinity Management Overlay (SMO).</p> <p>Furthermore, detailed survey work by a suitably qualified ecologist/botanist is required to understand the quality of native vegetation within areas that were inaccessible during this ground truthing assessment. The findings of these assessments will also inform the</p>	<p>There are no plans presently in place for the development of the Growth Area. When the development plans are confirmed, the extent and condition of native vegetation and the corresponding offset requirements associated with the removal of native vegetation within the study area can be determined.</p> <ul style="list-style-type: none"> <li>• A suitably qualified ecologist/botanist is to map and assess the quality of native vegetation within areas that were inaccessible during this ground truthing assessment;</li> <li>• Confirm development plans for the Bannockburn Growth Area;</li> <li>• Prepare and submit a Planning Permit application; and,</li> <li>• Refer application for development along Bruce's Creek, as necessary</li> </ul>



Relevant Legislation	Implications	Further Action
	future development of the Growth Area and assist to identify vegetation to be removed, offset and retained (see Section 6 for future recommendations and requirements).	to the Department of Environment, Land, Water and Planning and/or the relevant water supply authority.

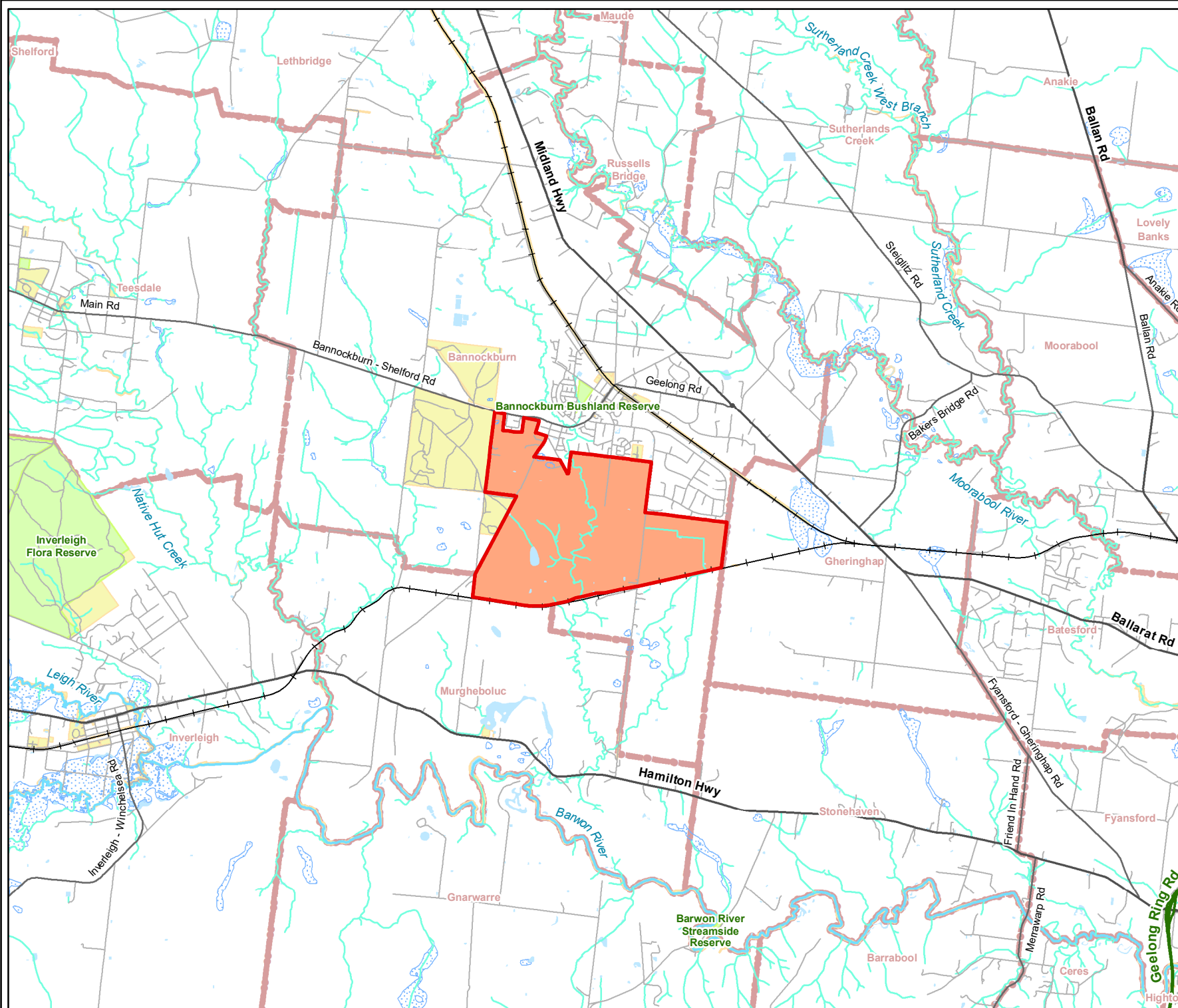
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## Figures





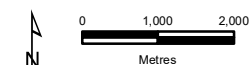
## Legend

- Study Area
- Railway
- Freeway
- Major Road
- Collector Road
- Minor Road
- Minor Watercourse
- Major Watercourse
- Permanent Waterbody
- Land Subject to Inundation
- Wetland/Swamp
- Parks and Reserves
- Commonwealth Land
- Crown Land
- Localities



**Figure 1**

**Location of the study area**  
*Biodiversity Assessment for*  
*Golden Plains Shire Project,*  
*Bannockburn*



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.





## Legend

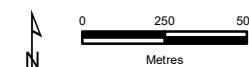
- Study Area
- Current Wetlands

## Modelled Ecological Vegetation Classes (DELWP 2005)

- Aquatic Herbland/Plains Sedgy Wetland Mosaic (EVC 691)
- Creekline Grassy Woodland (EVC 68)
- Plains Grassland (EVC 132)
- Plains Grassy Woodland (EVC 55)



**Figure 2a**  
**Modelled Ecological Vegetation Classes**  
*Biodiversity Assessment for Golden Plains Shire Project, Bannockburn*

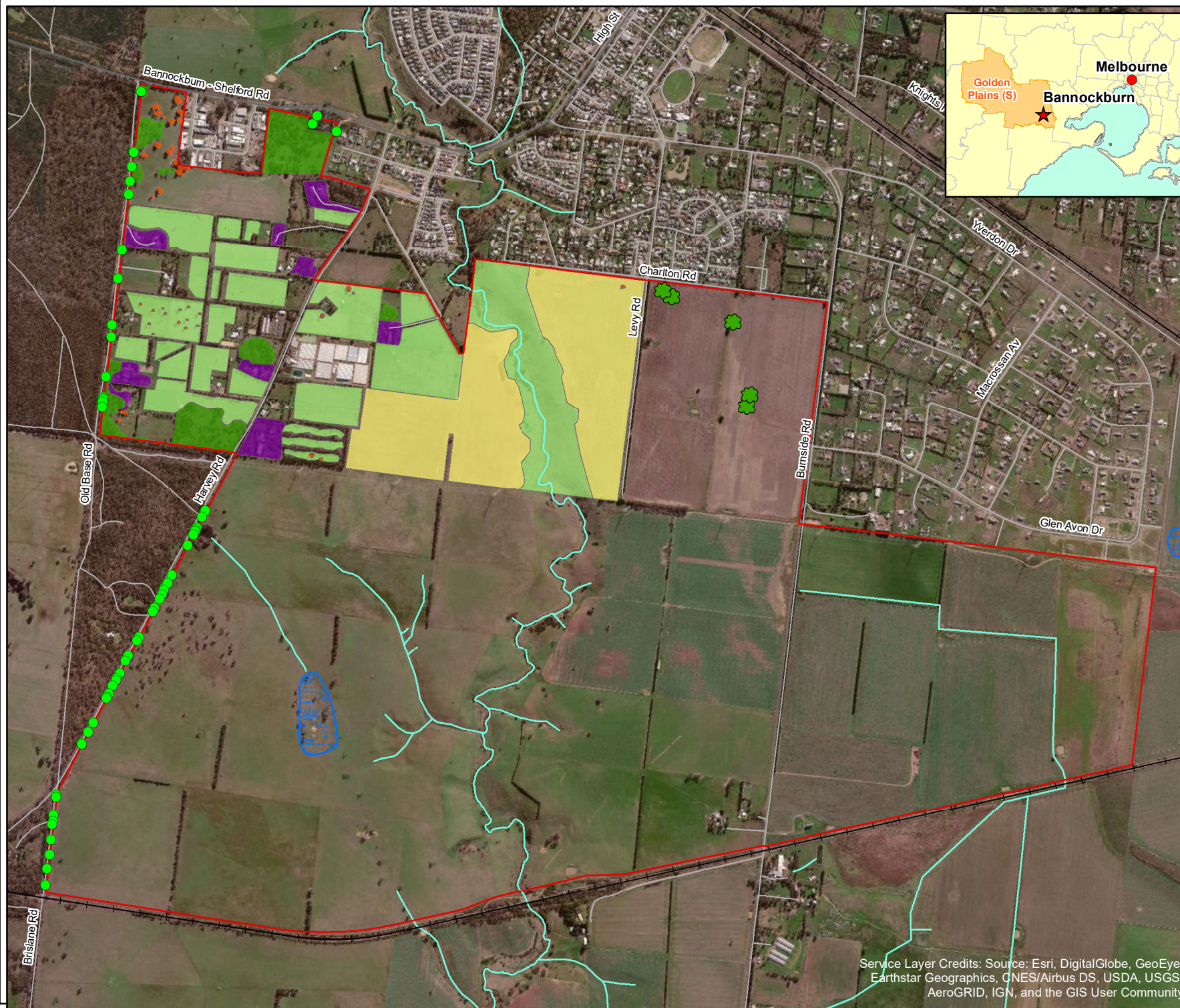


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13226 Flg02a ModEVCs 23/01/2020 melsley

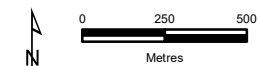




## Legend

- Study Area
  - Current Wetlands
  - ✪ Scattered Tree
  - LOT
- Flora and Fauna Assessment (Golden Plains Shire 2019)**
- Cropping
  - Native Grassland / Semi-improved pasture
  - Property garden
  - Remnant patch
  - Scattered Tree

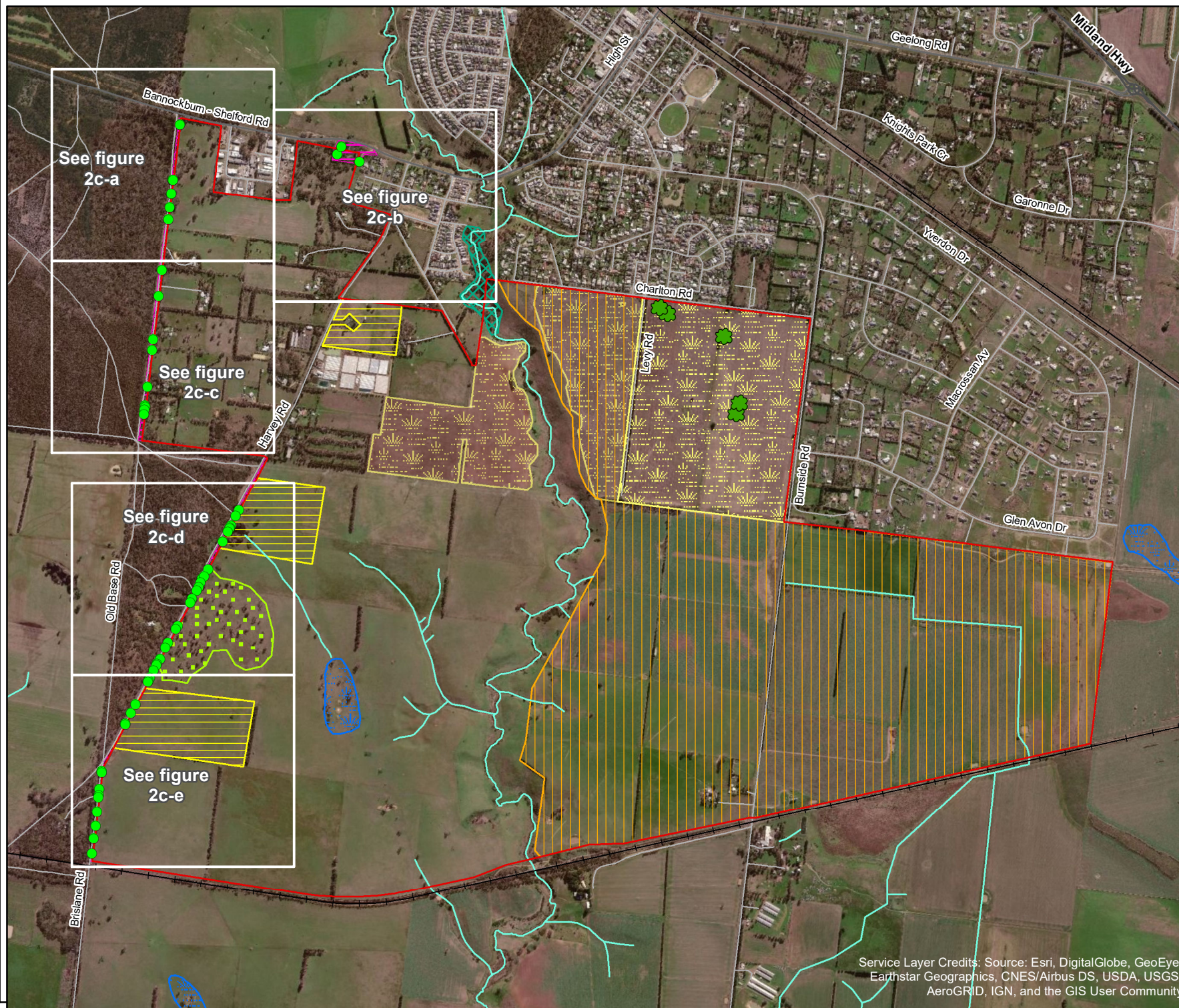
**Figure 2b**  
**Golden Plains Flora and Fauna Assessment 2019**  
*Biodiversity Assessment for Golden Plains Shire Project, Bannockburn*



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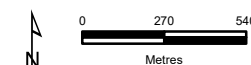


## Legend

- Study Area
- Current Wetlands
- Scattered Tree
- LOT
- Ground Truthing (Ecology and Heritage Partners)**
  - Creekline Grassy Woodland
  - Cropping
  - Farmland and / or cropped
  - Plains Grassy Woodland
  - Potential Plains Grassland
  - Scattered Eucalypts



**Figure 2c- Overview**  
**Ground Truthing**  
*Biodiversity Assessment for*  
*Golden Plains Shire Project,*  
*Bannockburn*



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## Legend

Study Area

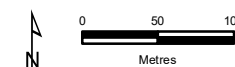
● LOT

## Ground Truthing (Ecology and Heritage Partners)

Plains Grassy Woodland



**Figure 2c-a**  
Ground Truthing  
Biodiversity Assessment for  
Golden Plains Shire Project,  
Bannockburn



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## Legend

Study Area

● LOT

## Ground Truthing (Ecology and Heritage Partners)

Creekline Grassy Woodland

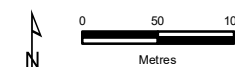
Farmland and / or cropped

Plains Grassy Woodland

Potential Plains Grassland



**Figure 2c-b**  
Ground Truthing  
Biodiversity Assessment for  
Golden Plains Shire Project,  
Bannockburn



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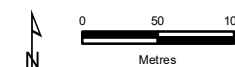


## Legend

- Study Area
- LOT
- Ground Truthing (Ecology and Heritage Partners)**
- Plains Grassy Woodland



**Figure 2c-c**  
**Ground Truthing**  
*Biodiversity Assessment for*  
*Golden Plains Shire Project,*  
*Bannockburn*



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## Legend

Study Area

● LOT

## Ground Truthing (Ecology and Heritage Partners)

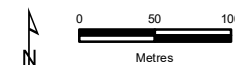
Plains Grassy Woodland

Potential Plains Grassland

Scattered Eucalypts



**Figure 2c-d**  
Ground Truthing  
Biodiversity Assessment for  
Golden Plains Shire Project,  
Bannockburn



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## Legend

Study Area

LOT

## Ground Truthing (Ecology and Heritage Partners)

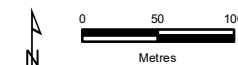
Plains Grassy Woodland

Potential Plains Grassland

Scattered Eucalypts



**Figure 2c-e**  
**Ground Truthing**  
*Biodiversity Assessment for*  
*Golden Plains Shire Project,*  
*Bannockburn*



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Legend

Study Area

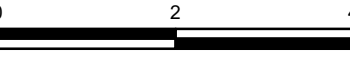

Significant flora


- Adamson's Blown-grass
- Bellarine Yellow-gum
- Branching Groundsel
- Button Wrinklewort
- Clover Glycine
- Crimson Sun-orchid
- Cut-leaf Burr-daisy
- Derrinalum Billy-buttons
- Fringed Sun-orchid
- Golden Cowslips
- Hairy Tails
- Hoary Rapier-sedge
- Inverleigh Spider-orchid

- Large-headed Fireweed
- Limestone Spider-orchid
- Matted Flax-lily
- Melbourne Yellow-gum
- Pale-flower Crane's-bill
- Purple Diuris
- Rosemary Grevillea
- Salt Blown-grass
- Scented Bush-pea
- Slender Bindweed
- Small Scurf-pea
- Snowy Mint-bush
- Spiny Rice-flower
- White Sunray
- Woodland Leek-orchid



**Figure 3**  
Previously documented significant flora within 10km of the study area  
*Biodiversity Assessment for Golden Plains Shire Project, Bannockburn*

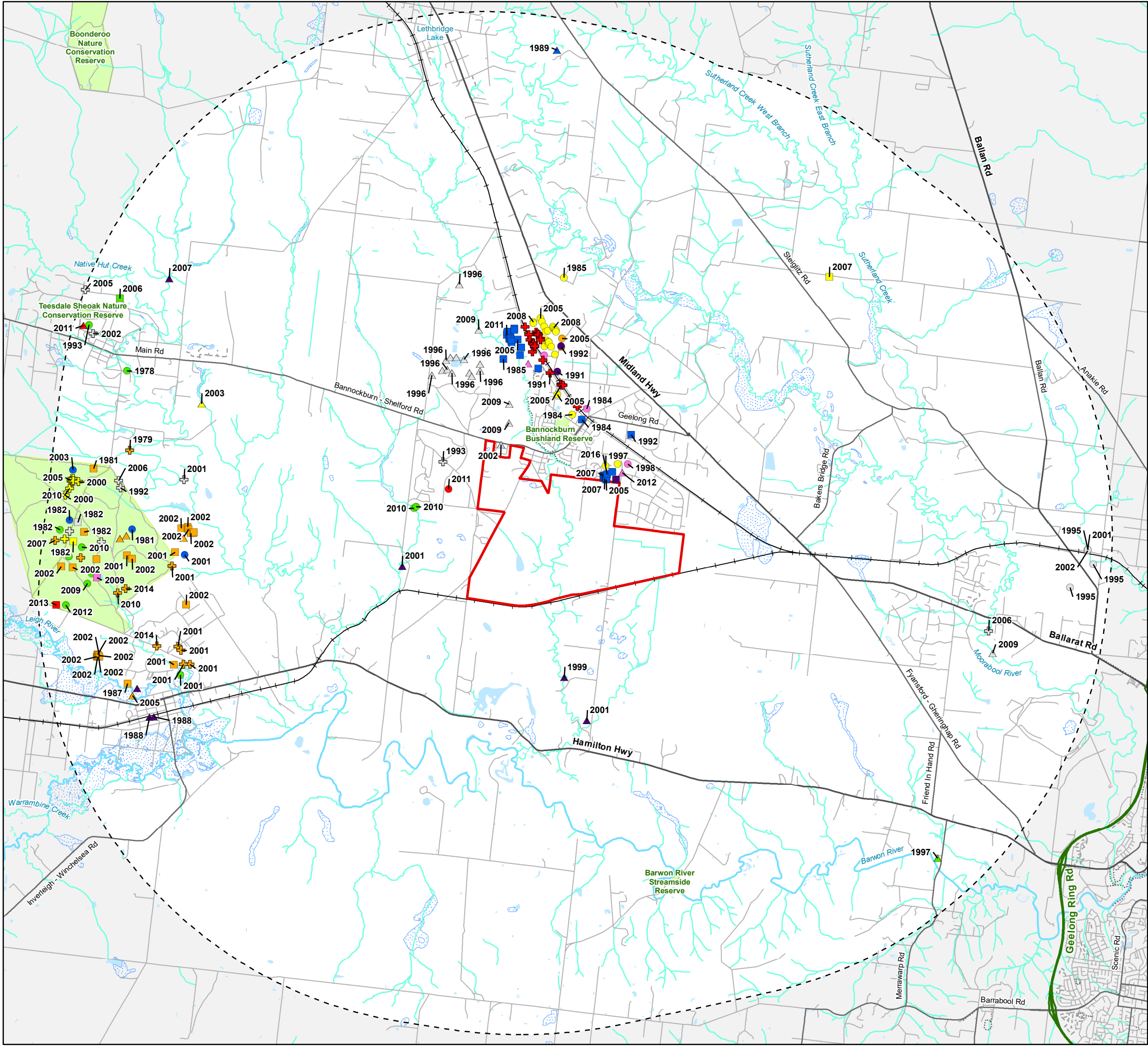




VBA 2018. Victorian Biodiversity Atlas // Sourced from: 'VBA\_FLORA25', 'VBA\_FLORA100', 'VBA\_FAUNA25' and 'VBA\_FAUNA100', March 2018 © The State of Victoria, Department of Environment, Land, Water and Planning. Records prior to 1949 not shown.

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13226\_Fig03\_SigFlora\_19/12/2019\_melsley





Legend

- Study Area

Significant fauna

Australasian Shoveler

Australian Bustard

Australian Grayling

Black-eared Cuckoo

Brolga

Brown Treecreeper (south-eastern ssp.)

Brush-tailed Phascogale

Bush Stone-curlew

Caspian Tern

Common Dunnart

Curlew Sandpiper

Diamond Firetail

Eastern Great Egret

Fat-tailed Dunnart

Freckled Duck

Golden Sun Moth

Grey-headed Flying-fox

Growing Grass Frog

Hardhead

Hooded Robin

Latham's Snipe

Macquarie Perch

Major Mitchell's Cockatoo

Masked Owl

Musk Duck

Nankeen Night Heron

Painted Honeyeater

Pied Cormorant

Plains-wanderer

Royal Spoonbill

Speckled Warbler

Spotted Harrier

Swift Parrot

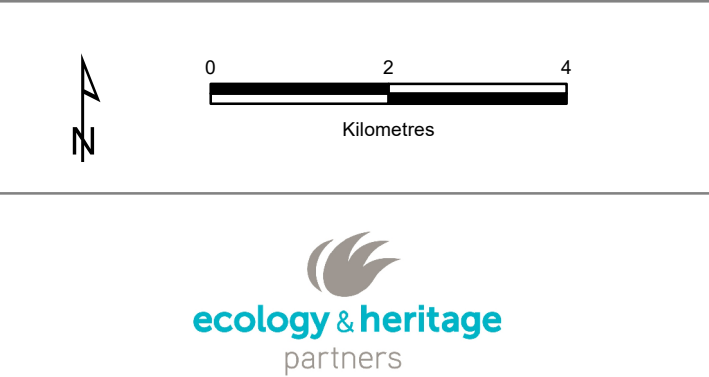
Whiskered Tern

White-throated Needletail

Yarra Pygmy Perch



**Figure 4**  
**Previously documented significant fauna within 10km of the study area**  
*Biodiversity Assessment for Golden Plains Shire Project, Bannockburn*



VBA 2018. Victorian Biodiversity Atlas // Sourced from: 'VBA\_FLORA25', 'VBA\_FLORA100', 'VBA\_FAUNA25' and 'VBA\_FAUNA100'. March 2018 © The State of Victoria, Department of Environment, Land, Water and Planning. Records prior to 1949 not shown.

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13226 Fig04\_SigFauna 19/12/2019 melsley

## Appendix 1 - Flora

### Legend:

I Protected under the FFG Act (DELWP 2016);

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

w Weed of National Significance;

**Table A1.1.** Flora recorded within the study area

Scientific Name	Common Name	Notes
<b>INDIGENOUS SPECIES</b>		
<i>Acacia mearnsii</i>	Black Wattle	I
<i>Acacia melanoxylon</i>	Blackwood	-
<i>Acacia paradoxa</i>	Hedge Wattle	-
<i>Acacia pycnantha</i>	Golden Wattle	I
<i>Acrotriche serrulata</i>	Honey-pots	-
<i>Allocasuarina verticillata</i>	Drooping Sheoak	-
<i>Atriplex</i> spp.	Saltbush	-
<i>Austrostipa</i> spp.	Spear Grass	-
<i>Bursaria</i> spp.	Bursaria	-
<i>Carex</i> spp.	Sedge	-
<i>Eucalyptus camaldulensis</i>	River Red-gum	-
<i>Eucalyptus leucoxylon</i> subsp. <i>connata</i>	Melbourne Yellow Gum	I
<i>Eucalyptus microcarpa</i>	Brey Box	-
<i>Eucalyptus viminalis</i>	Manna Gum	-
<i>Juncus</i> spp.	Rush	-
<i>Lachnagrostis</i> spp.	Blown Grass	-
<i>Leptospermum</i> spp.	Tea-tree	-
<i>Lotus</i> spp.	Trefoil	-
<i>Melaleuca</i> spp.	Honey Myrtle	-
<i>Pteridium esculentum</i>	Austral bracken	-
<i>Rumex brownii</i>	Slender Dock	-
<i>Themeda triandra</i>	Kangaroo Grass	-
<b>NON-INDIGENOUS OR INTRODUCED SPECIES</b>		
<i>Annual Veldt-grass</i>	<i>Ehrharta longifolia</i>	-
<i>Arctotheca calendula</i>	Capeweed	-
<i>Avena fatua</i>	Wild Oat	-

Scientific Name	Common Name	Notes
<i>Brassica</i> spp.	Turnip	-
<i>Briza maxima</i>	Large Quaking-grass	-
<i>Cerastium</i> spp.	Mouse-ear Chickweed	-
<i>Cirsium vulgare</i>	Spear Thistle	*
<i>Cynodon dactylon</i>	Couch	-
<i>Cyperus eragrostis</i>	Drain Flat-sedge	-
<i>Dactylis glomerata</i>	Cocksfoot	-
<i>Epilobium hirsutum</i>	Great Willow-herb	-
<i>Galenia pubescens</i> var. <i>pubescens</i>	Galenia	-
<i>Holcus lanatus</i>	Yorkshire Fog	-
<i>Hypochaeris radicata</i>	Flatweed	-
<i>Lolium</i> spp.	Rye Grass	-
<i>Lycium ferocissimum</i>	African Box-thorn	*w
<i>Lysimachia arvensis</i>	Pimpernel	-
<i>Marrubium vulgare</i>	Horehound	*
<i>Nassella neesiana</i>	Chilean Needle-grass	*w
<i>Nassella trichotoma</i>	Serrated Tussock	*w
<i>Oxalis pes-caprae</i>	Soursob	*
<i>Phragmites australis</i>	Common reed	-
<i>Plantago lanceolata</i>	Ribwort	-
<i>Romulea</i> spp.	Onion Grass	-
<i>Schinus molle</i>	Pepper Tree	-
<i>Sonchus oleraceus</i>	Common Sow-thistle	-

## Appendix 2 – Habitat Hectare Assessment

**Table A2.1.** Habitat Hectare Table

Vegetation Zone		Harvey Road - Brislane Road	Old Base Road	Bannockburn Lagoon
Bioregion		Victorian_Volcanic_Plain	Victorian_Volcanic_Plain	Victorian_Volcanic_Plain
EVC / Tree		Plains Grassy Woodland	Plains Grassy Woodland	Plains Grassy Woodland
EVC Number		55_61	55_61	55_61
EVC Conservation Status		Endangered	Endangered	Endangered
Patch Condition	Large Old Trees /10	9	7	3
	Canopy Cover /5	2	2	2
	Under storey /25	15	15	15
	Lack of Weeds /15	4	4	4
	Recruitment /10	0	0	3
	Organic Matter /5	3	3	3
	Logs /5	0	0	2
	Treeless EVC Multiplier	1.00	1.00	1.00
	Subtotal =	33.00	31.00	32.00
Landscape Value /25		9	9	9
Habitat Points /100		42	40	41
Habitat Score		0.42	0.40	0.41
Total Area (ha)		2.259	2.197	1.613



## Appendix 3 – Large Trees and Scattered Trees

**Table A3.1.** Large Trees and Scattered Trees recorded within the study area.

Tree #	Common Name	Species Name	DBH	Category	Comments	Source
1	Dead	<i>Eucalyptus</i> spp.	63	Small Tree	Scattered	Trengrove 2017
2	Melbourne Yellow Gum	<i>Eucalyptus leucoxylon</i> subsp. <i>connata</i>	71	Small Tree	Scattered	Trengrove 2017
3	Melbourne Yellow Gum	<i>Eucalyptus leucoxylon</i> subsp. <i>connata</i>	85	Large Tree	Scattered	Trengrove 2017
4	Melbourne Yellow Gum	<i>Eucalyptus leucoxylon</i> subsp. <i>connata</i>	92	Large Tree	Scattered	Trengrove 2017
5	Melbourne Yellow Gum	<i>Eucalyptus leucoxylon</i> subsp. <i>connata</i>	112	Large Tree	Scattered	Trengrove 2017
6	River Red-gum	<i>Eucalyptus camaldulensis</i>	86	Large Tree	Patch	EHP 2020
7	Dead	<i>Eucalyptus</i> spp.	108	Large Tree	Patch	EHP 2020
8	River Red-gum	<i>Eucalyptus camaldulensis</i>	80.5	Large Tree	Patch	EHP 2020
9	River Red-gum	<i>Eucalyptus camaldulensis</i>	99	Large Tree	Patch	EHP 2020
10	River Red-gum	<i>Eucalyptus camaldulensis</i>	149.5	Large Tree	Patch	EHP 2020
12	River Red-gum	<i>Eucalyptus camaldulensis</i>	87	Large Tree	Patch	EHP 2020
13	River Red-gum	<i>Eucalyptus camaldulensis</i>	119	Large Tree	Patch	EHP 2020
14	River Red-gum	<i>Eucalyptus camaldulensis</i>	94	Large Tree	Patch	EHP 2020
15	River Red-gum	<i>Eucalyptus camaldulensis</i>	112	Large Tree	Patch	EHP 2020
16	River Red-gum	<i>Eucalyptus camaldulensis</i>	89	Large Tree	Patch	EHP 2020
17	River Red-gum	<i>Eucalyptus camaldulensis</i>	91	Large Tree	Patch	EHP 2020
18	River Red-gum	<i>Eucalyptus camaldulensis</i>	81	Large Tree	Patch	EHP 2020
19	River Red-gum	<i>Eucalyptus camaldulensis</i>	128	Large Tree	Patch	EHP 2020
20	River Red-gum	<i>Eucalyptus camaldulensis</i>	83	Large Tree	Patch	EHP 2020
21	River Red-gum	<i>Eucalyptus camaldulensis</i>	98	Large Tree	Patch	EHP 2020
22	River Red-gum	<i>Eucalyptus camaldulensis</i>	98	Large Tree	Patch	EHP 2020
23	River Red-gum	<i>Eucalyptus camaldulensis</i>	82	Large Tree	Patch	EHP 2020
24	River Red-gum	<i>Eucalyptus camaldulensis</i>	112	Large Tree	Patch	EHP 2020
25	River Red-gum	<i>Eucalyptus camaldulensis</i>	111	Large Tree	Patch	EHP 2020
26	River Red-gum	<i>Eucalyptus camaldulensis</i>	108	Large Tree	Patch	EHP 2020
27	River Red-gum	<i>Eucalyptus camaldulensis</i>	100	Large Tree	Patch	EHP 2020
28	River Red-gum	<i>Eucalyptus camaldulensis</i>	126	Large Tree	Patch	EHP 2020
29	River Red-gum	<i>Eucalyptus camaldulensis</i>	-	Large Tree	Patch	EHP 2020
30	River Red-gum	<i>Eucalyptus camaldulensis</i>	140	Large Tree	Patch	EHP 2020
32	River Red-gum	<i>Eucalyptus camaldulensis</i>	134	Large Tree	Patch	EHP 2020
33	River Red-gum	<i>Eucalyptus camaldulensis</i>	120	Large Tree	Patch	EHP 2020
34	River Red-gum	<i>Eucalyptus camaldulensis</i>	104	Large Tree	Patch	EHP 2020
35	River Red-gum	<i>Eucalyptus camaldulensis</i>	-	Large Tree	Patch	EHP 2020

Tree #	Common Name	Species Name	DBH	Category	Comments	Source
36	River Red-gum	<i>Eucalyptus camaldulensis</i>	106	Large Tree	Patch	EHP 2020
37	River Red-gum	<i>Eucalyptus camaldulensis</i>	121	Large Tree	Patch	EHP 2020
38	River Red-gum	<i>Eucalyptus camaldulensis</i>	-	Large Tree	Patch	EHP 2020
39	River Red-gum	<i>Eucalyptus camaldulensis</i>	123	Large Tree	Patch	EHP 2020
40	River Red-gum	<i>Eucalyptus camaldulensis</i>	102	Large Tree	Patch	EHP 2020
41	River Red-gum	<i>Eucalyptus camaldulensis</i>	93	Large Tree	Patch	EHP 2020
42	River Red-gum	<i>Eucalyptus camaldulensis</i>	80	Large Tree	Patch	EHP 2020
43	River Red-gum	<i>Eucalyptus camaldulensis</i>	-	Large Tree	Patch	EHP 2020
44	River Red-gum	<i>Eucalyptus camaldulensis</i>	88	Large Tree	Patch	EHP 2020
45	River Red-gum	<i>Eucalyptus camaldulensis</i>	92	Large Tree	Patch	EHP 2020
46	River Red-gum	<i>Eucalyptus camaldulensis</i>	83	Large Tree	Patch	EHP 2020
47	River Red-gum	<i>Eucalyptus camaldulensis</i>	115	Large Tree	Patch	EHP 2020
48	River Red-gum	<i>Eucalyptus camaldulensis</i>	86	Large Tree	Patch	EHP 2020
49	River Red-gum	<i>Eucalyptus camaldulensis</i>	-	Large Tree	Patch	EHP 2020
50	River Red-gum	<i>Eucalyptus camaldulensis</i>	132	Large Tree	Patch	EHP 2020
51	River Red-gum	<i>Eucalyptus camaldulensis</i>	91	Large Tree	Patch	EHP 2020
52	River Red-gum	<i>Eucalyptus camaldulensis</i>	102	Large Tree	Patch	EHP 2020
53	River Red-gum	<i>Eucalyptus camaldulensis</i>	81	Large Tree	Patch	EHP 2020
54	River Red-gum	<i>Eucalyptus camaldulensis</i>	100	Large Tree	Patch	EHP 2020
55	River Red-gum	<i>Eucalyptus camaldulensis</i>	88	Large Tree	Patch	EHP 2020
56	River Red-gum	<i>Eucalyptus camaldulensis</i>	122	Large Tree	Patch	EHP 2020
57	River Red-gum	<i>Eucalyptus camaldulensis</i>	-	Large Tree	Patch	EHP 2020
58	River Red-gum	<i>Eucalyptus camaldulensis</i>	103	Large Tree	Patch	EHP 2020
59	River Red-gum	<i>Eucalyptus camaldulensis</i>	106	Large Tree	Patch	EHP 2020
60	River Red-gum	<i>Eucalyptus camaldulensis</i>	-	Large Tree	Patch	EHP 2020
61	River Red-gum	<i>Eucalyptus camaldulensis</i>	104	Large Tree	Patch	EHP 2020
62	River Red-gum	<i>Eucalyptus camaldulensis</i>	95	Large Tree	Patch	EHP 2020

**Note.** Trees without a recorded DBH were located behind fencelines and within private property and so were unable to be measured accurately.