

Final Report

# Ecological Assessment for the proposed Waterbird Creek Precinct, Kialla, Victoria

Prepared for

**Greater Shepparton City Council**

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**Ecology and Heritage Partners Pty Ltd**

MELBOURNE: 292 Mt Alexander Road, Ascot Vale VIC 3032 GEELONG: 230 Latrobe Terrace, Geelong West VIC 3218

BRISBANE: Level 22, 127 Creek Street, Brisbane QLD 4000 ADELAIDE: 78 Edmund Avenue, Unley SA 5061

CANBERRA: 19-23 Moor Street, Turner ACT 2612 SYDNEY: Level 5, 616 Harris Street, Ultimo NSW 2007


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Project manager	Jared McGuiness (Senior Botanist)
Report reviewer	Jared McGuiness (Senior Botanist)
Report Author	Linda Parker (Consultant Ecologist)
Other EHP staff	Linda Parker (Consultant Ecologist); Claire Mackay (Field Ecologist); Sara Petrovic (Zoologist)
Mapping	Petra Sorensen (GIS Analyst)
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## EXECUTIVE SUMMARY

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### Introduction

Ecology and Heritage Partners Pty Ltd was commissioned by Greater Shepparton City Council to undertake an Ecological Assessment for Waterbird Creek Precinct, Kialla, Victoria. The purpose of this assessment was to identify the extent and type of native vegetation present within the study area and to determine the likely presence of significant flora and fauna species and/or ecological communities.

### Methods

A field assessment was undertaken on 23 and 24 February 2022 to obtain information on flora and fauna values within the study area. The study area was walked, with all commonly observed vascular flora and fauna species recorded, significant records mapped, and the overall condition of vegetation and habitats noted. Ecological Vegetation Classes (EVCs) were determined with reference to DELWP pre-1750 and extant EVC mapping (DELWP 2022a) and their published descriptions (DELWP 2022c).

### Results

#### *Native Vegetation*

Remnant patches of native vegetation included 2.50 hectares (three patches) of Floodplain Riparian Woodland, 0.59 hectares of Plains Woodland (seven patches) and 124 scattered trees.

#### *Flora*

No nationally significant or State-significant (i.e. EPBC Act or FFG Act listed) flora species were recorded within the study area during the field assessment. Based on the modified nature of the study area, landscape context and the proximity of previous records, significant flora species are considered unlikely to occur within the study area due to the high levels of disturbance and absence of suitable habitat. Golden Wattle *Acacia pycnantha* was recorded within the study area and is listed as Protected under the FFG Act (DELWP 2019a) as it is a member of a protected flora genera (*Acacia*).

#### *Fauna*

There is limited suitable habitat within Floodplain Riparian Woodland and water courses within the study area for the nationally significant Painted Honeyeater *Grantiella picta* and State-significant Squirrel Glider *Petaurus norfolcensis*, Musk Duck *Biziura lobata*, Freckled Duck *Stictonetta naevosa*, Hardhead *Aythya australis*, Blue-billed Duck *Oxyura australis* and Square-tailed Kite *Lophoictinia isura*. Waterbird Creek also provides potential habitat for aquatic species including the Murray Short-necked Turtle *Emydura macquarii*, and Platypus *Ornithorhynchus anatinus*. Based on the modified nature of the study area, landscape context and the proximity of previous records, significant fauna species are considered unlikely to rely on habitat within the study area for foraging or breeding purposes due to the lack of suitable and/or important habitat features (Appendix 2.1).

#### *Communities*

Native vegetation within the study area did not meet the condition thresholds that define any national or State-significant communities due to the absence of key indicator species, the low diversity of native flora and high cover of exotic vegetation.

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# 1 INTRODUCTION

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## 1.1 Background

Ecology and Heritage Partners Pty Ltd was commissioned by Greater Shepparton City Council to undertake an Ecological Assessment for Waterbird Creek Precinct, Kialla, Victoria.

We understand that Greater Shepparton City Council has identified a need for an Ecological Assessment to be undertaken to inform the road network, open space and stormwater drainage infrastructure space that will guide the future development of the land within the Precinct.

The purpose of this assessment was to identify the extent and type of native vegetation present within the study area and to determine the likely presence of significant flora and fauna species and/or ecological communities. This report presents the results of the assessment and discusses the potential ecological and legislative implications associated with the proposed action.

## 1.2 Study Area

The study area is located at Waterbird Creek Precinct, Kialla and is approximately 180 kilometres north of Melbourne's CBD (Figure 1). The study area covers approximately 92 hectares and is bound by residential dwellings to the north, River Road to the south, Archer Road to the east and Shepparton-Seymour Road to the west.

The study area predominantly consists of low-density rural residential properties and agricultural land, although private businesses, a community college, and residential subdivisions (in construction) also occur within the site. It is generally flat, with no ridges or crests within or immediately adjacent to the site. Waterbird Creek runs east-west through the site and there are several scattered waterbodies, such as farm dams also present.

According to the Department of Environment, Land, Water and Planning (DELWP) NatureKit Map (DELWP 2022a), the study area is located within the Victorian Riverina bioregion, Goulburn Broken Catchment Management Authority (CMA) and Greater Shepparton City Council.

## 2 METHODS

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### 2.1 Desktop Assessment

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 2022a) and Native Vegetation Information Management (NVIM) Tool (DELWP 2022b) for:
  - Modelled data for location risk, native vegetation patches, scattered trees, and habitat for rare or threatened species; and,
  - The extent of historic and current Ecological Vegetation Classes (EVCs).
- EVC benchmarks (DELWP 2022c) 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 2022d);
- The Illustrated Flora Information System of Victoria (IFLISV) (Gullan 2022) and Atlas of Living Australia (ALA) (ALA 2022) for assistance with the distribution and identification of flora species;
- The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST) for matters of National Environmental Significance (NES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (DCCEEW 2022);
- Relevant listings under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act), including the latest Threatened (DELWP 2022e) and Protected (DELWP 2022f) Lists;
- The online VicPlan Map (DELWP 2022g) to ascertain current zoning and environmental overlays in the study area; and
- Aerial photography of the study area.

### 2.2 Field Assessment

A field assessment was undertaken on 23 and 24 February 2022 to obtain information on flora and fauna values within the study area. The study area was walked, with all commonly observed vascular flora and fauna species recorded, significant records mapped, and the overall condition of vegetation and habitats noted. Ecological Vegetation Classes (EVCs) were determined with reference to DELWP pre-1750 and extant EVC mapping (DELWP 2022a) and their published descriptions (DELWP 2022c).

#### 2.2.1 Vegetation Assessment

Native vegetation (as defined in Table 1) is assessed using two key parameters: extent (in hectares) and condition. For the purposes of this assessment, only extent was determined as part of the habitat hectare assessment.

**Table 1.** Determination of a patch of native vegetation (DELWP 2017).

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

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

### 2.2.2 Current Wetlands (DELWP)

The condition and extent of Current Wetlands modelled by DELWP were also assessed during the field assessment. Wetlands by their nature can be difficult to map and assess their extent accurately as they respond quite quickly to changes in environmental conditions, especially rainfall. After a period of no or low rainfall they can disappear or appear very degraded. They do, however, recover rapidly after periods of increased rainfall. As a result, under the Guidelines (DELWP 2017) all mapped wetlands (based on 'Current Wetlands' layer in the DELWP NatureKit Map) that are to be impacted must be included as native vegetation, with the modelled condition score assigned to them (DELWP 2022b).

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

## 2.3 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/or field assessments being undertaken.

Not all properties within the study area were assessed. Properties identified during the desktop assessment as having potential to hold ecological values were prioritised, with ecological values within sites not accessed mapped from adjacent properties or the road reserve.

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. The extent of wetlands may be difficult to assess as described above in Section 2.2.2 as the field assessment was conducted in Summer (February).

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 assist in determining the broader biodiversity values present within the study area.

Ecological values identified within the study area were recorded using a hand-held GPS or tablet with an accuracy of +/-5 metres. This level of accuracy is 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.

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 ecological values present within the study area.



## 3 RESULTS

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### 3.1 Vegetation Condition

Several patches of native vegetation and scattered native trees were recorded within the study area. The remainder of the study area comprised introduced and planted vegetation, present as pasture grass and ornamental gardens.

The study area is representative of many areas within the Victorian Riverina Bioregion, that is dominated by large areas of improved pastures and smaller amounts of derived native grasslands, scattered patches of remnant vegetation and regrowth from past clearing. The majority (>90%) of the study area was highly modified due to historic and current agricultural practices.

Given that much of the indigenous shrub and tree layer has been cleared throughout the study area, and there are extensive areas of planted indigenous and non-indigenous trees, it is difficult to determine whether patches of indigenous understorey species are representative of Plains Woodland, Floodplain Riparian Woodland or another similar EVC. In most cases, the decision for classifying patches was guided by the modelled pre-1750s native vegetation mapping (DELWP 2022a), with native flora in the study area best represented by two EVCs: Floodplain Riparian Woodland (EVC 56) and Plains Woodland (EVC 803).

Native vegetation mapping completed as part of this identified 3.092 hectares of native vegetation representative of three EVCs (Figure 2), including:

- 2.50 hectares of Floodplain Riparian Woodland;
- 0.59 hectares of Plains Woodland;
- 124 Scattered Trees including 27 Large Scattered Trees and 97 Small Scattered Trees.

The remaining assessed portions of the study area were identified as being either developed or supporting non-remnant vegetation (i.e. planted indigenous and non-indigenous species, grassland/ pasture dominated by introduced species or crops).

Specific details relating to the observed EVCs and other vegetation / habitat types are provided below. A list of all flora species recorded during the field assessment are provided in Appendix 1.1.

#### 3.1.1 Patches of Native Vegetation

##### Plains Woodland

Plains Woodland is characterised as a eucalypt woodland to 15 metres tall, with an understorey of comprised of a diversity of grassy and herbaceous flora species (DELWP 2022c). Plains Woodland occurs on a range of geologies, occupying fertile clays and clay loam soils on flat or gently undulating plains at low elevations in areas with an average annual rainfall of less than 600 millimetres (DELWP 2022c).

Plains Woodland patches within the study area generally consisted of small, isolated patches predominately present as canopy trees (typically Grey Box *Eucalyptus microcarpa*) over an exotic understorey dominated by pasture grasses, including Toowoomba Canary-grass *Phalaris aquatica*, Wild Oat *Avena fatua* and Cocksfoot *Dactylis glomerata* (Plate 1). Several patches of low-moderate quality treeless Plains Woodland, present as native grassland, were also present. These areas were dominated by wallaby grass *Rytidosperma* spp., with low species diversity (Plate 2).



**Plate 1.** Plains Woodland within the Study Area (Ecology and Heritage Partners Pty Ltd 23/02/2022).



**Plate 2.** Treeless Plains Woodland within the study area (Ecology and Heritage Partners Pty Ltd 24/02/2022).

### Floodplain Riparian Woodland

Floodplain Riparian Woodland is described as an open eucalypt woodland or open forest to 20 metres tall, over a medium to tall shrub layer (DELWP 2022c). These patches typically have a ground layer consisting of amphibious and aquatic herbs and sedges, occurring along the banks and floodplains of large meandering rivers and major creeks, often in conjunction with one or more floodplain wetland communities (DELWP 2022c).

Floodplain Riparian Woodland within the study area was generally confined to the banks and floodplain of Waterbird Creek. The vegetation contained native and introduced grasses and herbs and aquatic species including Wallaby grasses, Bulrush *Typha* spp., Pondweed *Potamogeton* sp., Pacific Azolla *Azolla filiculoides*, and Common Reed *Phragmites australis* (Plate 3 and Plate 4).



**Plate 3.** A patch of Floodplain Riparian Woodland within the study area (Ecology and Heritage Partners Pty Ltd 24/02/2022).



**Plate 4.** A patch of Floodplain Riparian Woodland within the study area (Ecology and Heritage Partners Pty Ltd 24/02/2022).



### 3.1.2 Large Trees in Patches

A total of 13 Large Trees (LTs) in patches were present (Figure 2). Most of these specimens were Grey Box (Plate 5; Plate 6; Appendix 1.2).



**Plate 5.** A Large Tree (Grey Box) (Ecology and Heritage Partners Pty Ltd 24/02/2022).



**Plate 6.** A Large Tree (Grey Box) within the study area (Ecology and Heritage Partners Pty Ltd 24/02/2022).

### 3.1.3 Scattered Trees

A total of 124 scattered trees, predominantly Eucalypts species including Grey Box *Eucalyptus microcarpa* and Yellow Box *Eucalyptus melliodora* recorded within the study area, which consisted of 27 large and 97 small, scattered trees (Figure 2; Appendix 1.2). These trees would have once formed part of the Plains Woodland EVC; however, the understorey vegetation contained predominantly introduced species (mainly exotic pasture grasses) and the trees no longer formed a patch of native vegetation (Plate 7). There were also seven Eucalyptus stags/stumps present within the study area (Plate 8) (Figure 2, Appendix 1.2). Some of the scattered trees were not identified to species level (Appendix 1.2) as they were lacking reproductive material to confirm their identity. These trees are likely to be Grey Box, Yellow Box, or maybe Black Box *Eucalyptus largiflorens* or Yellow Gum *Eucalyptus leucoxylon*.



**Plate 7.** A Scattered Tree within the study area (Ecology and Heritage Partners Pty Ltd 24/02/2022).



**Plate 8.** A dead eucalypt stag in the study area (Ecology and Heritage Partners Pty Ltd 24/02/2022).

### 3.1.4 Introduced and Planted Vegetation

Areas not supporting native vegetation had a high cover (>90%) of exotic grass species, many of which were direct seeded for use as pasture. Scattered native grasses were generally present in these areas, however they did not have the required 25% relative cover to be considered a patch under the *Guidelines* (DELWP 2017).

Native and introduced trees and shrubs were also planted for ornamental purposes within the study area, primarily around existing dwellings as gardens and sheds and in windrows along driveways (Plate 9 and Plate 10).

Non-native areas were dominated by pasture grasses and environmental weeds such as Toowoomba Canary-grass, Wild Oat, Rye-grass *Lolium* spp. and Couch *Cynodon dactylon* var. *dactylon* (Plate 11 and Plate 12).

Noxious weeds, as defined under the CaLP Act, were present within the study area, namely Spear Thistle *Cirsium vulgare* and Blackberry *Rubus fruticosus* spp. agg. Blackberry is also a Weed of National Significance (WoNS).



**Plate 9.** A row of planted trees within the study area (Ecology and Heritage Partners Pty Ltd 24/02/2022).



**Plate 10.** Planted trees within the study area (Ecology and Heritage Partners Pty Ltd 24/02/2022).



**Plate 11.** Exotic pasture grasses dominate most of the study area (Ecology and Heritage Partners Pty Ltd 24/02/2022).



**Plate 12.** Exotic grasses within the study area (Ecology and Heritage Partners Pty Ltd 24/02/2022).



### 3.2 Fauna Habitat

Most of the study area consisted of paddocks, which contained improved exotic pastures, likely to be used as a foraging resource by common generalist bird species that are tolerant of modified open areas. Fauna observed using this habitat included Australian Magpie *Cracticus tibicen*, Common Blackbird *Turdus merula*, Little Raven *Corvus mellori*, Magpie-lark *Grallina cyanoleuca*, House Sparrow *Passer domesticus*, Willie Wagtail *Rhipidura leucophrys*, Red Fox *Vulpes vulpes* and European Rabbit *Oryctolagus cuniculus*. The Red Fox and European Rabbit are listed as pest animals under the CaLP Act.

Woodland and scattered remnant trees occur throughout the study area and provide an important resource for arboreal fauna. The majority of the eucalypts are mature, providing an array of small, medium, large and very 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. Scattered trees provide habitat for more mobile fauna species, vantage points and nesting areas for diurnal and nocturnal raptors, as well as stepping-stones for more mobile fauna moving through the study area, enhancing landscape permeability for native fauna. Scattered trees within paddocks throughout the project area may act as means of connection for more mobile fauna, including birds, microbats and arboreal mammals.

During the current survey a variety of birds were observed foraging amongst trees and shrubs in these areas including Galah *Eolophus roseicapilla*, Sulphur-Crested Cockatoo *Cacatua galerita*, Laughing Kookaburra, and Noisy Miner *Manorina melanocephala*. Hollows and fissures within mature eucalypts and stags (dead trees) provide roosting, nesting and sheltering habitat for hollow-dependent birds and mammals. Microbats are also likely to roost within hollows in these areas and forage within, over and around canopy vegetation. While the ground layer and mid-storey within this vegetation is relatively open, several patches support a low-moderate cover of woody ground debris, likely to be inhabited and used by a range of reptile species.

Plains Woodland derived grasslands within the study area provides potential habitat for a diversity of fauna species. This habitat type is likely to support a range of native and introduced birds and mammals and reptile species that prefer to forage in open areas. There are some remnant patches and grazed paddocks with fallen dead trees that have been left on the ground as large logs that provide habitat for small ground dwelling mammal species and reptiles and invertebrates.

Wildlife corridors such as roadside reserves (Plate 13) and windrows along fence lines (Plate 14) and scattered vegetation, both native and introduced, have numerous benefits to native fauna populations, particularly in modified landscapes where much of the surrounding vegetation is restricted to linear strips along roadsides or streams.

Aquatic fauna habitat is present in the form of creeks and irrigation channels, drainage lines and farm dams



**Plate 13.** Wildlife corridors in the form of road reserve supporting native vegetation within the study area (Ecology and Heritage Partners Pty Ltd 24/02/2022).



**Plate 14.** Wildlife corridor in the form of the windrow within the study area (Ecology and Heritage Partners Pty Ltd 24/02/2022).

(Plate 15 and Plate 16). Waterbird Creek and the surrounding floodplain areas are likely to provide habitat for aquatic fauna species. Irrigation channels and farm dams (when inundated) within the study area are likely to support a range of common fauna species, including frogs.



**Plate 15.** A farm dam within the study area (Ecology and Heritage Partners Pty Ltd 24/02/2022).



**Plate 16.** A farm dam in the study area (Ecology and Heritage Partners Pty Ltd 24/02/2022).

### 3.3 Significance Assessment

#### 3.3.1 Flora

The VBA contains records of one Nationally significant and 15 State significant flora species previously recorded within 10 kilometres of the study area (DELWP 2022) (Figure 3). The PMST nominated an additional seven nationally significant species with the potential to occur in the locality (DCCEEW 2022; Appendix 1.3).

No nationally significant or State-significant (i.e. EPBC Act or FFG Act listed) flora species were recorded within the study area during the field assessment. Based on the modified nature of the study area, landscape context and the proximity of previous records, significant flora species are considered unlikely to occur within the study area due to the high levels of disturbance and absence of suitable habitat.



Golden Wattle *Acacia pycnantha* was recorded within the study area and is listed as Protected under the FFG Act (DELWP 2019a) as it is a member of a protected flora genera (*Acacia*).

### 3.3.2 Fauna

The VBA contains records of 22 Nationally significant and 32 State significant fauna species previously recorded within 10 kilometres of the study area (DELWP 2022) (Figure 4). The PMST nominated an additional eight Nationally significant species which have not been previously recorded but have the potential to occur in the locality (DCCEEW 2022; Appendix 2.1).

Of these species, there is limited suitable habitat within Floodplain Riparian Woodland and water courses within the study area for the nationally significant Painted Honeyeater *Grantiella picta* and State-significant Squirrel Glider *Petaurus norfolcensis*, Musk Duck *Biziura lobata*, Freckled Duck *Stictonetta naevosa*, Hardhead *Aythya australis*, Blue-billed Duck *Oxyura australis* and Square-tailed Kite *Lophoictinia isura*. Waterbird Creek also provides potential habitat for aquatic species including the Murray Short-necked Turtle *Emydura macquarii*, and Platypus *Ornithorhynchus anatinus*.

Based on the modified nature of the study area, landscape context and the proximity of previous records, significant fauna species are considered unlikely to rely on habitat within the study area for foraging or breeding purposes due to the lack of suitable and/or important habitat features (Appendix 2.1). Most of these significant fauna species are bird species that could use sections of the study area and fly over it to get to other areas, with all species more likely to rely on more suitable habitat within the Broken River environs to the north of the study area and the Goulburn River and Sevens Creek environs to the west (Figure 4).

### 3.3.3 Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DCCEEW 2022):

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

However, vegetation within the study area did not meet the condition thresholds that define any national or State-significant communities due to the absence of key indicator species, the low diversity of native flora and high cover of exotic vegetation. Floodplain Riparian Woodland vegetation in the study area is highly modified and generally lacking in canopy trees so it is unlikely to provide suitable habitat for woodland bird species associated with the FFG Act-listed Victorian Temperate Woodland Bird Community.

## **4 SUMMARY OF ECOLOGICAL VALUES**

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The desktop review and field survey identified the following key ecological values within the study area:

- Remnant patches of native vegetation included 2.50 hectares (three patches) of Floodplain Riparian Woodland, 0.59 hectares of Plains Woodland (seven patches) and 124 scattered trees.
- Potential habitat for fauna species associated with the Floodplain Riparian Woodland and the Waterbird Creek and associated drainage line including frogs, turtles and fish. However, there is higher quality habitat to the north and west of the study area within the Broken River, Goulburn River and Sevens Creek environs.

## 5 IMPLICATIONS FOR FUTURE DEVELOPMENT

Further requirements associated with development of the study area, as well as additional studies or reporting that may be required, are provided in Table 2.

**Table 2.** Further requirements associated with development of the study area.

Relevant Legislation	Implications
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	<p>The EPBC Act establishes a Commonwealth process for the assessment of proposed actions likely to have a significant impact on matters of 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, nuclear actions and water resources (for coal seam gas and large coal mining projects).</p> <p>Key ecological constraints associated with the EPBC Act relate to the known or potential presence of threatened species of flora and fauna and ecological communities (Section 4). Any action that is likely to significantly impact upon these values or any other matter of NES would need to be referred to DAWE for assessment and approval. Referrals are assessed over a period of 20 working days, including a ten-day public comment period. A referred action will subsequently be classed as one of the following:</p> <ul style="list-style-type: none"> <li>• <i>Not a controlled action</i> – approval is not required if the action is undertaken in accordance with the referral.</li> <li>• <i>Not a controlled Action ‘particular manner’</i> – approval is not required if the action is undertaken in accordance with the manner specified.</li> <li>• <i>Controlled action</i> – the action is subject to the assessment and approval process under the EPBC Act.</li> </ul> <p>Should matters of NES be identified within the study area following a detailed ecological assessment, a referral to the Commonwealth via an EPBC Act referral may be required. The Minister will decide whether the proposed action is a ‘controlled action’ and, if so, will require further assessment to determine whether approval will be granted under the EPBC Act. However, if the impact area avoids all known matters of NES, then it is considered unlikely that the proposed development will be a ‘controlled action’.</p>

Relevant Legislation	Implications
<i>Environment Effects Act 1978</i>	<p>The <i>Environment Effects Act 1978</i> (EE Act) provides for an assessment of proposed activities that are capable of having a significant impact on the environment at a State level. The Act allows the Victorian Minister for planning to decide whether an Environment Effects Statement (EES) is required to be completed. The “<i>Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act 1978</i>” provides triggers for which an EES is required, such as the removal of 10 or more hectares of native vegetation or potential impacts on remaining habitat or populations of threatened species.</p> <p>Any action that is likely to have a significant impact on State matters, as defined under the relevant guidelines, would need to be referred under the EE Act. Actions undertaken in accordance with a prescribed Precinct Structure Plan (PSP) are exempt from the requirements of the EE Act.</p>
<i>Flora and Fauna Guarantee Act 1988</i>	<p>The FFG Act is the primary legislation dealing with biodiversity conservation and the sustainable use of native flora and fauna in Victoria. The provisions of the FFG Act bind all public agencies, public landowners and land managers. The Act contains lists of threatened flora and fauna species, ‘protected flora species’ and threatened vegetation communities, as well as action statements to protect the long-term viability of these values. The Act applies to the removal of <u>listed</u> threatened species and communities, as well as <u>protected</u> flora species. Protected flora species include any of the Asteraceae (Daisies) family, all orchids, ferns (excluding <i>Pteridium esculentum</i>) and Acacia species (excluding <i>Acacia dealbata</i>, <i>Acacia decurrens</i>, <i>Acacia implexa</i>, <i>Acacia melanoxylon</i> and <i>Acacia paradoxa</i>); in addition to any taxa that forms a component of a listed FFG Act vegetation community. A species may be both listed and protected.</p> <p>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. 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, relocation, 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.</p> <p>Key ecological constraints within the study area associated with the FFG Act are likely to include threatened ecological communities (e.g. Victorian Temperate Woodland Bird community) and species of flora and fauna. The majority of land within the study area is privately owned and therefore exempt from most provisions under the FFG Act including the requirement to obtain a permit for the removal or disturbance of listed/ protected plants, ecological communities and fish species. Any such action on public land affecting these values would require a permit from DELWP.</p>

Relevant Legislation	Implications
<i>Planning and Environment Act 1987</i>	<p>The <i>Planning and Environment Act 1987</i> outlines the legislative framework for planning in Victoria and for the development and administration of planning schemes. All planning schemes contain native vegetation provisions at Clause 52.17 which require a planning permit from the relevant local Council to remove, destroy or lop native vegetation on a site of more than 0.4 hectares, unless an exemption clause under 52.17-6 of the Victorian Planning Schemes applies, or if the proposed clearing is in accordance with a Native Vegetation Precinct Plan (NVPP) (Clause 52.16) that has been incorporated into the Planning Scheme.</p> <p>Permitting requirements associated with the removal of native vegetation will be dependent on the future planning process.</p>
<i>Guidelines for the removal, destruction or lopping of native vegetation (the Guidelines)</i>	<p>The assessment process for the clearing of vegetation follows the '<i>Guidelines for the removal, destruction or lopping of native vegetation</i>' (the Guidelines) (DELWP 2017). The '<i>Assessor's handbook: Applications to remove, destroy or lop native vegetation</i>' (Assessor's handbook) (DELWP 2018) provides clarification regarding the application of the Guidelines (DELWP 2017).</p> <p>Any permitted clearing of native vegetation within the study area would be offset in accordance with the Guidelines.</p>
<i>Catchment and Land Protection Act 1994</i>	<p>The <i>Catchment and Land Protection Act 1994</i> (CaLP Act) contains provisions relating to catchment planning, land management, noxious weeds and pest animals. The Act also provides a legislative framework for the management of private and public land and sets out the responsibilities of land managers, stating that they must take all reasonable steps to:</p> <ul style="list-style-type: none"> <li>• Avoid causing or contributing to land degradation which causes or may cause damage to land of another land owner;</li> <li>• Protect water resources;</li> <li>• Conserve soil;</li> <li>• Eradicate regionally prohibited weeds;</li> <li>• Prevent the growth and spread of regionally controlled weeds; and</li> <li>• Prevent the spread of, and as far as possible eradicate, established pest animals.</li> </ul> <p>A number of weeds listed as noxious under the CaLP Act are known occur throughout the study area (Section 3). Similarly, it is likely that the region is occupied by several pest fauna species listed under the Act. Landowners are responsible for the control of any infestation of noxious weeds and pest fauna species. To meet CaLP Act requirements listed noxious weeds and pests should be appropriately controlled during any development activity to minimise their spread and impact on any ecological values.</p>
<i>Wildlife Act 1975 and Wildlife Regulations 2013</i>	<p>The <i>Wildlife Act 1975</i> (and associated Wildlife Regulations 2013) is the primary legislation in Victoria providing for protection and management of wildlife. Authorisation for habitat removal may be obtained under the <i>Wildlife Act 1975</i> through a licence granted under the <i>Forests Act 1958</i>, or under any other Act such as the <i>Planning and Environment Act 1987</i>. Any persons engaged to remove, salvage, hold or relocate native fauna during construction must hold a current Management Authorisation under the <i>Wildlife Act 1975</i>, issued by DELWP.</p>
<i>Water Act 1989</i>	<p>A 'works on waterways' permit is likely to be required from the Goulburn Broken CMA where any action impacts on waterways within the study area.</p>

## 6 CONCLUSION

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The Waterbird Creek Precinct ('study area') has been identified as a significant growth area with the potential to support population growth.

The purpose of the ecological assessment was to provide a high-level assessment of the ecological values within the study area to inform the early stage of the precinct planning process. Therefore, it is recommended that detailed ecological assessments be undertaken prior to the commencement of any development within the study area.

Desktop-based assessments and field surveys were undertaken to broadly assess the biodiversity value of the study area and inform early stage of the precinct planning process. The findings of the assessment confirmed that the majority (>90%) of the study area supports non-native vegetation and is highly disturbed. Despite its modified nature, the study area supports a diversity of natural assets (Section 3), which are subject to the natural and anthropogenic pressures commonly associated with developed and fringing landscapes. Given the potential for future development within the study area to intensify existing pressures and threaten the overall viability of retained ecological values (particularly scattered trees), a precinct-wide approach is required to ensure all known values are accounted for and that management responses are consistent and implemented on a landscape-scale.

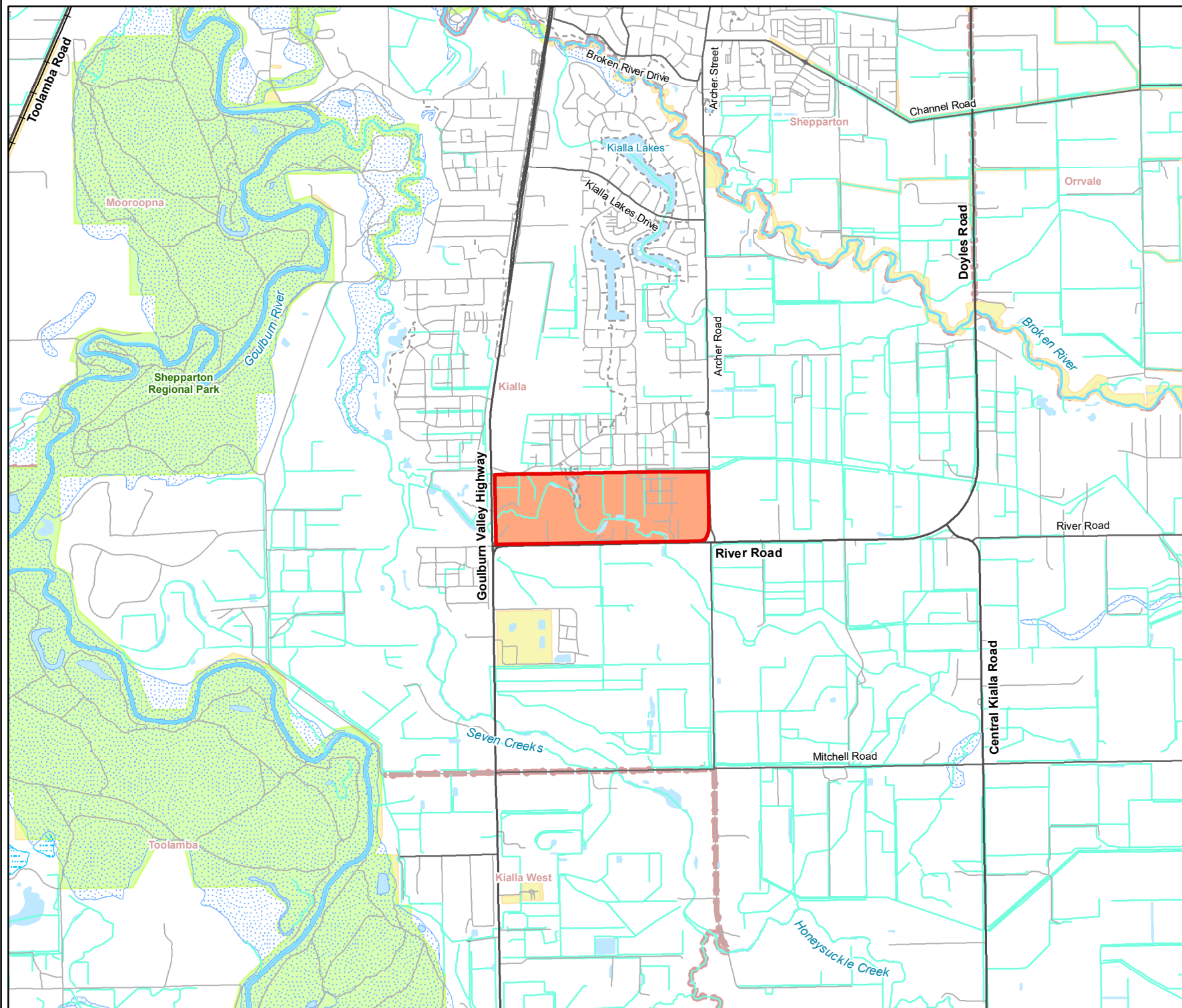
Based on the findings of the assessment, it is considered that the study area can accommodate the medium to longer-term growth of this precinct whilst maintaining and enhancing the key ecological values present.



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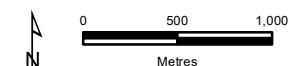
## Legend

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



**Figure 1**

**Location of the study area**  
*Ecological Assessment for the*  
*Waterbird Creek Precinct,*  
*Kialla*



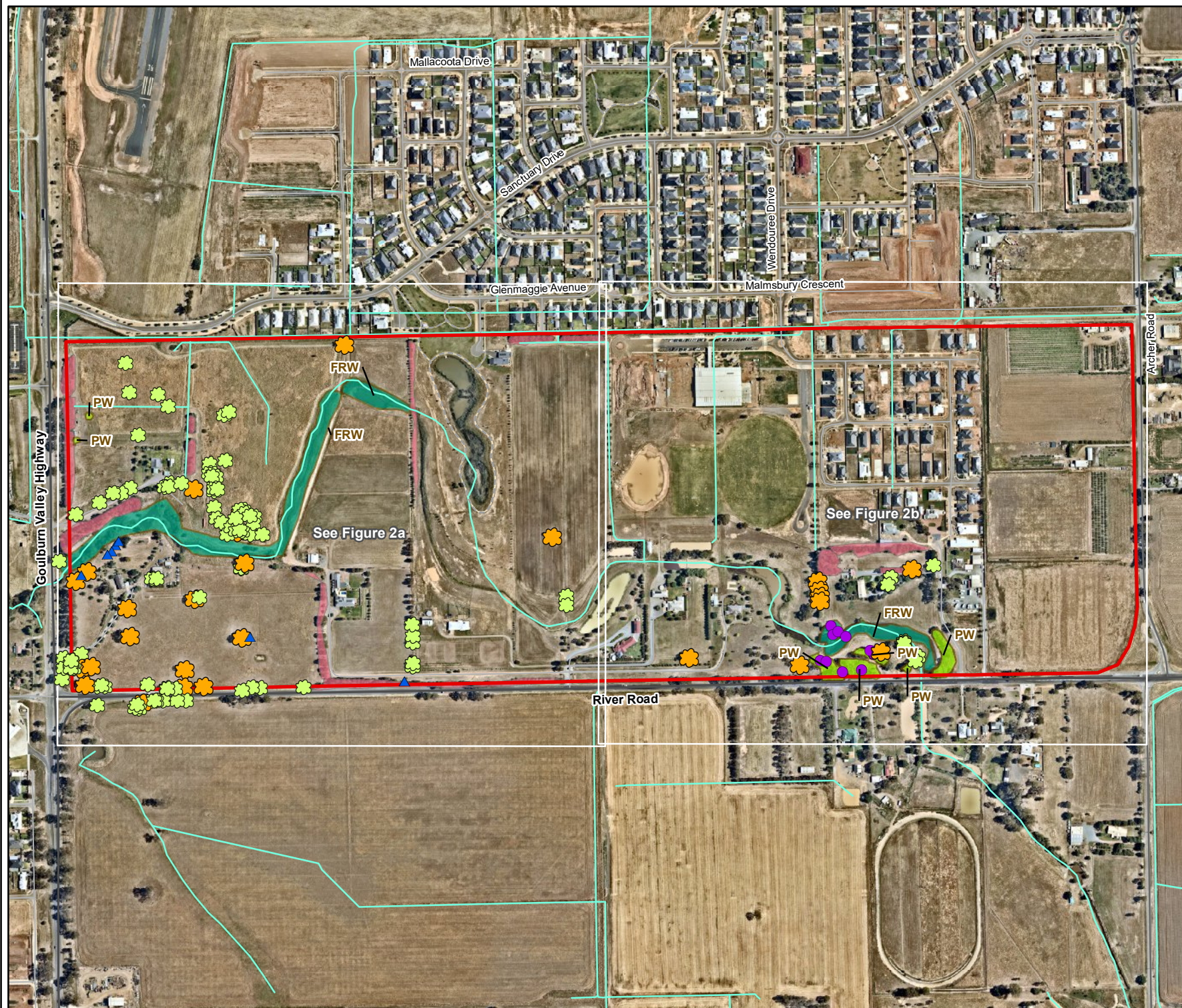
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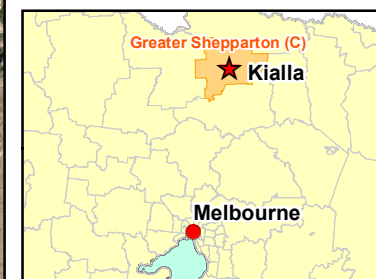
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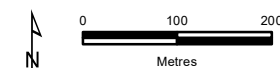
## Legend

- Study Area
- ★ Scattered Large Tree
- ★ Scattered Small Tree
- Large Tree in patch
- ▲ Stump
- Planted vegetation
- Ecological Vegetation Classes**
- Floodplain Riparian Woodland (EVC 56)
- Plains Woodland (EVC 803)



## Figure 2 Overview

**Ecological features**  
*Ecological Assessment for the Waterbird Creek Precinct, Kialla*



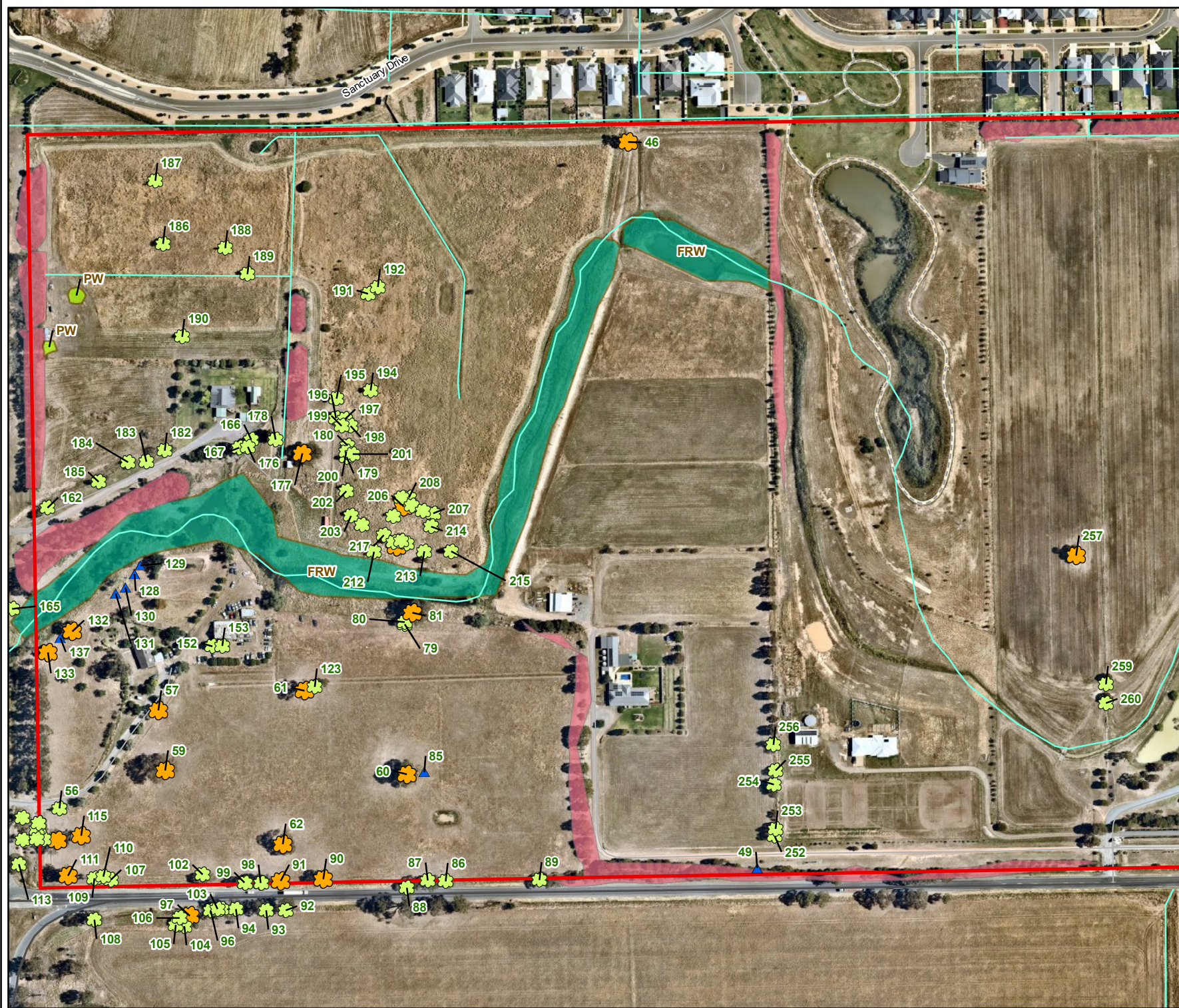
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15949 Fig02\_EcolFeat\_G20 4/07/2022 Melsley





## Legend

- Study Area
- ✿ Scattered Large Tree
- ✿ Scattered Small Tree
- ▲ Stump
- Planted vegetation
- Ecological Vegetation Classes**
- Floodplain Riparian Woodland (EVC 56)
- Plains Woodland (EVC 803)



**Figure 2a**

**Ecological features**  
*Ecological Assessment for the Waterbird Creek Precinct, Kialla*



Map Scale: 1:3,700 @ A4  
 Coordinate System: GDA2020 MGA Zone 55



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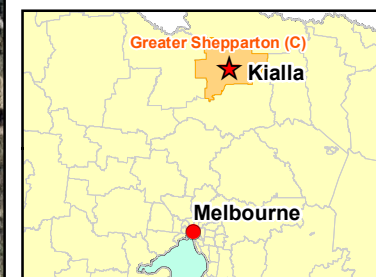
15949 Fig02\_EcolFeat\_G20 4/07/2022 Melsley





## Legend

- Study Area
- ✿ Scattered Large Tree
- ✿ Scattered Small Tree
- Large Tree in patch
- Planted vegetation
- Ecological Vegetation Classes**
- Floodplain Riparian Woodland (EVC 56)
- Plains Woodland (EVC 803)



**Figure 2b**

**Ecological features**  
*Ecological Assessment for the Waterbird Creek Precinct, Kialla*



Map Scale: 1:3,700 @ A4  
 Coordinate System: GDA2020 MGA Zone 55



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Legend

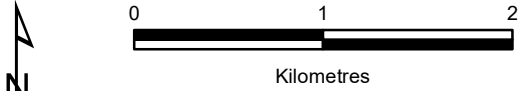
Study Area

Significant flora

- Buloke
- Delicate Crane's-bill
- Late-flower Flax-lily
- River Swamp Wallaby-grass
- Riverina Bitter-cress
- Sand Rush
- Small Scurf-pea



**Figure 3**  
**Previously documented significant**  
**flora within 5km of the study area**  
*Ecological Assessment for the Waterbird*  
*Creek Precinct, Kialla*



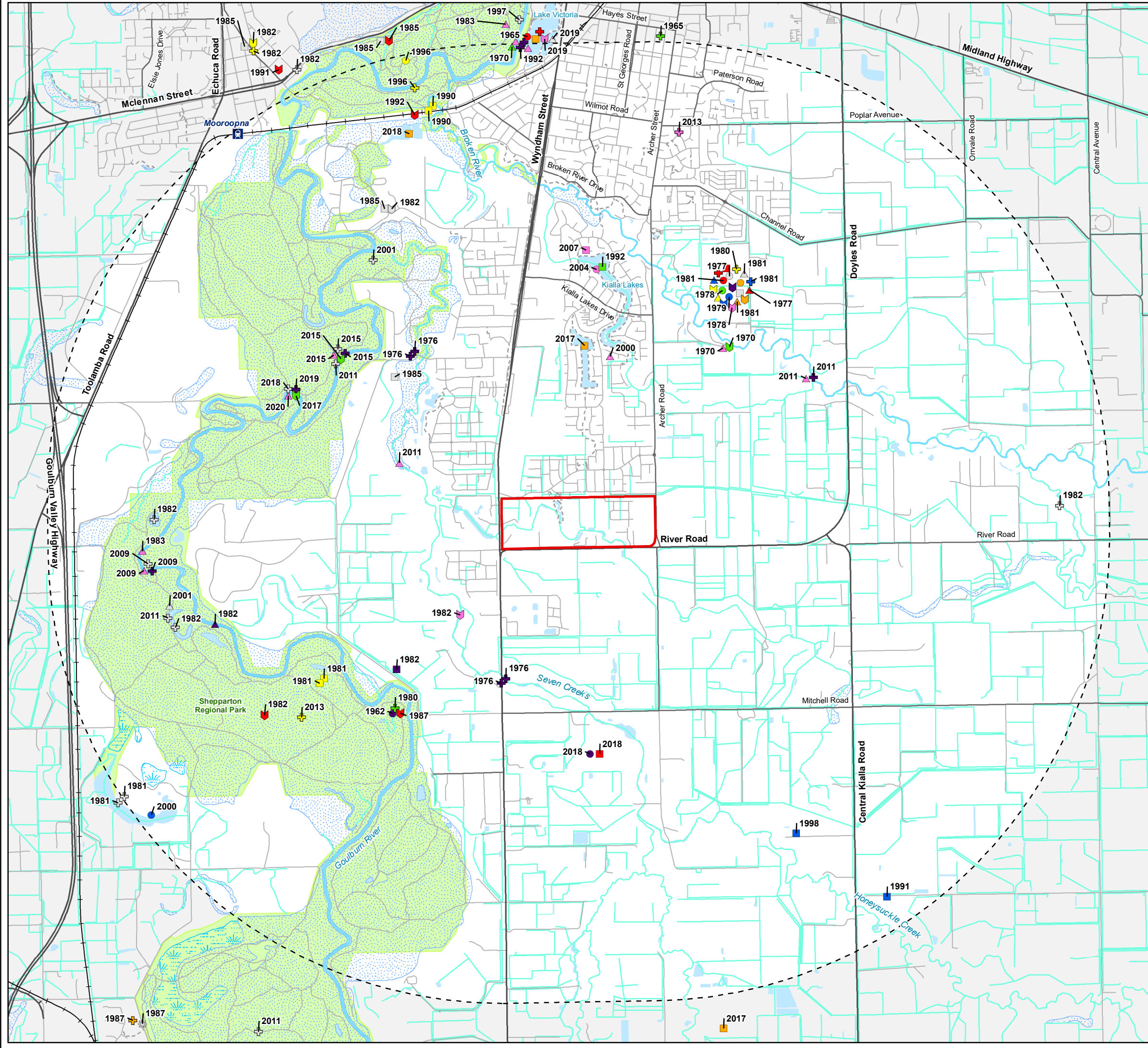
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Coordinate System: GDA2020 MGA Zone 55



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**Legend**

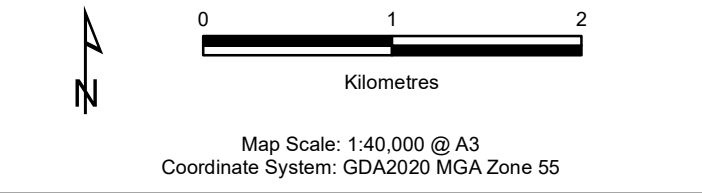
Study Area

**Significant fauna**

- |                           |                            |
|---------------------------|----------------------------|
| Australasian Bittern      | Macquarie Perch            |
| Australasian Shoveler     | Marsh Sandpiper            |
| Australian Little Bittern | Murray Cod                 |
| Barking Owl               | Murray River Turtle        |
| Black Falcon              | Murray-Darling Rainbowfish |
| Blue-billed Duck          | Musk Duck                  |
| Brown Toadlet             | Pacific Golden Plover      |
| Brush-tailed Phascogale   | Painted Honeyeater         |
| Bush Stone-curlew         | Platypus                   |
| Diamond Firetail          | Plumed Egret               |
| Eastern Great Egret       | Regent Honeyeater          |
| Flat-headed Galaxias      | Silver Perch               |
| Freshwater Catfish        | Speckled Warbler           |
| Grey-crowned Babbler      | Squirrel Glider            |
| Grey-headed Flying-fox    | Superb Parrot              |
| Growling Grass Frog       | Swift Parrot               |
| Hardhead                  | Trout Cod                  |
| Hooded Robin              | Turquoise Parrot           |
| Little Eagle              | White-bellied Sea-Eagle    |
| Little Egret              | White-throated Needletail  |
|                           | Wood Sandpiper             |



**Figure 4**  
**Previously documented significant fauna within 5km of the study area**  
*Ecological Assessment for the Waterbird Creek Precinct, Kialla*



Map Scale: 1:40,000 @ A3  
Coordinate System: GDA2020 MGA Zone 55



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## APPENDIX 1 FLORA

### Appendix 1.1 Flora Results

**Legend:**

**I** Protected under the FFG Act (DELWP 2019b);

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

**w** Weed of National Significance;

**#** Planted Victorian and non-Victorian species.

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

Scientific Name	Common Name	Notes
<b>INDIGENOUS SPECIES</b>		
<i>Acacia acinacea</i>	Gold-dust Wattle	I
<i>Acacia dealbata</i>	Silver Wattle	-
<i>Acacia mearnsii</i>	Black Wattle	I
<i>Acacia melanoxylon</i>	Blackwood	-
<i>Acacia pycnantha</i>	Golden Wattle	I
<i>Allocasuarina littoralis</i>	Black Sheoak	-
<i>Allocasuarina verticillata</i>	Drooping Sheoak	-
<i>Alternanthera</i> spp.	Joyweed	I
<i>Atriplex semibaccata</i>	Berry Saltbush	-
<i>Austrostipa</i> spp.	Spear Grass	-
<i>Azolla filiculoides</i>	Pacific Azolla	-
<i>Callistemon sieberi</i>	River Bottlebrush	-
<i>Carex appressa</i>	Tall Sedge	-
<i>Centipeda</i> spp.	Sneezeweed	-
<i>Chamaesyce</i> spp.	Caustic Weed	-
<i>Chloris truncata</i>	Windmill Grass	-
<i>Chrysocephalum apiculatum</i> s.l.	Common Everlasting	I
<i>Convolvulus</i> spp.	Bindweed	-
<i>Cyperus</i> spp.	Flat Sedge	-
<i>Dichondra</i> spp.	Kidney Weed	-
<i>Einadia nutans</i>	Nodding Saltbush	-
<i>Eleocharis acuta</i>	Common Spike-sedge	-
<i>Enchylaena</i> spp.	Ruby Saltbush	-
<i>Eucalyptus camaldulensis</i>	River Red-gum	-

Scientific Name	Common Name	Notes
<i>Eucalyptus melliodora</i>	Yellow Box	-
<i>Eucalyptus microcarpa</i>	Grey Box	-
<i>Exocarpos cupressiformis</i>	Cherry Ballart	-
<i>Galium</i> spp.	Bedstraw	-
<i>Geranium</i> spp.	Crane's Bill	-
<i>Gnaphalium</i> spp.	Cudweed	I
<i>Hakea</i> spp.	Hakea	-
<i>Hypericum</i> spp.	St John's Wort	-
<i>Hypoxis vaginata</i>	Yellow Star	-
<i>Isolepis</i> spp.	Club Sedge	-
<i>Juncus</i> spp.	Rush	-
<i>Kunzea ericoides</i>	Burgan	-
<i>Lachnagrostis</i> spp.	Blown Grass	-
<i>Leptospermum</i> aff. <i>continentale</i>	Black Tea-tree	-
<i>Lomandra filiformis</i>	Wattle Mat-rush	-
<i>Ludwigia</i> spp.	Ludwigia	-
<i>Melaleuca ericifolia</i>	Swamp Paperbark	-
<i>Melaleuca</i> spp.	Honey-myrtle	-
<i>Microlaena</i> spp.	Weeping Grass	-
<i>Myriophyllum</i> spp.	Water Milfoil	-
<i>Oxalis perennans</i>	Grassland Wood-sorrel	-
<i>Persicaria decipiens</i>	Slender Knotweed	-
<i>Phragmites australis</i>	Common Reed	-
<i>Picris</i> spp.	Picris	-
<i>Poa labillardierei</i>	Common Tussock-grass	-
<i>Poa</i> spp.	Tussock Grass	-
<i>Polymeria calycina</i>	Slender Bindweed	-
<i>Portulaca oleracea</i>	Common Purslane	-
<i>Potamogeton</i> spp.	Pondweed	-
<i>Rumex brownii</i>	Slender Dock	-
<i>Rumex</i> spp.	Dock	-
<i>Rytidosperma</i> spp.	Wallaby Grass	-
<i>Sida corrugata</i>	Variable Sida	-
<i>Typha orientalis</i>	Broad-leaf Cumbungi	-
<i>Wurmbea dioica</i>	Common Early Nancy	-
<b>NON-INDIGENOUS OR INTRODUCED SPECIES</b>		

Scientific Name	Common Name	Notes
<i>Agrostis capillaris</i> var. <i>capillaris</i>	Brown-top Bent	-
<i>Avena fatua</i>	Wild Oat	-
<i>Brassica</i> spp.	Turnip	-
<i>Briza</i> sp.	Quaking-grass	-
<i>Bromus catharticus</i>	Prairie Grass	-
<i>Bromus diandrus</i>	Great Brome	-
<i>Bromus hordeaceus</i> subsp. <i>hordeaceus</i>	Soft Brome	-
<i>Catapodium rigidum</i>	Fern Grass	-
<i>Cenchrus clandestinus</i>	Kikuyu	-
<i>Cirsium vulgare</i>	Spear Thistle	-
<i>Corymbia ficifolia</i>	Flowering Gum	#
<i>Corymbia maculata</i>	Spotted Gum	#
<i>Cynodon dactylon</i> var. <i>dactylon</i>	<i>Couch</i>	-
<i>Cupressus sempervirens</i>	Pencil Pine	#
<i>Echinochloa colona</i>	Awnless Barnyard-grass	-
<i>Eucalyptus sideroxylon</i> subsp. <i>sideroxylon</i>	Mugga	#
<i>Fraxinus angustifolia</i>	Desert Ash	-
<i>Cenchrus clandestinus</i>	Kikuyu	-
<i>Nassella trichotoma</i>	Serrated Tussock	* W
<i>Phoenix canariensis</i>	Canary Island Date-palm	-
<i>Pinus radiata</i>	Radiata Pine	#
<i>Plantago lanceolata</i>	Ribwort	-
<i>Quercus</i> spp.	Oak	#
<i>Rubus fruticosus</i>	Blackberry	*
<i>Salix babylonica</i>	Weeping Willow	-
<i>Salix humboldtiana</i>	Pencil Willow	*
<i>Salix</i> spp.	Willow	#
<i>Schinus molle</i>	Pepper Tree	#
<i>Xanthium spinosum</i>	Bathurst Burr	-

## Appendix 1.2 Scattered Trees and Large Trees in Patches

**Table A1.3.** Scattered Trees and Large Trees in Patches.

Tree # (Figure 2)	Species Name	Common Name	Size Class	Notes	Scattered / Patch
4	<i>Eucalyptus</i> sp.	Eucalypt	Small		Scattered
6	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Scattered
7	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Scattered
8	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Scattered
9	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Scattered
10	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Scattered
12	<i>Eucalyptus</i> sp.	Eucalypt	Large		Patch
13	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Patch
14	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Patch
15	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Patch
21	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Patch
22	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Patch
23	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Patch
25	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Patch
28	<i>Eucalyptus camaldulensis</i>	River Red-gum	Large		Patch
29	<i>Eucalyptus melliodora</i>	Yellow Box	Large		Patch
30	<i>Eucalyptus melliodora</i>	Yellow box	Large		Patch
31	<i>Eucalyptus melliodora</i>	Yellow box	Large		Patch
32	<i>Eucalyptus melliodora</i>	Yellow box	Large		Patch
33	<i>Eucalyptus melliodora</i>	Yellow box	Large		Scattered
38	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
39	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
40	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
42	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
43	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
44	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
45	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
46	<i>Eucalyptus microcarpa</i>	Grey box	Large		Scattered
49	<i>Eucalyptus microcarpa</i>	Grey Box	Large	Dead	Stump
56	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
57	<i>Eucalyptus</i> sp.	Eucalypt	Large		Scattered
59	<i>Eucalyptus microcarpa</i>	Grey box	Large		Scattered



Tree # (Figure 2)	Species Name	Common Name	Size Class	Notes	Scattered / Patch
60	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Scattered
61	<i>Eucalyptus microcarpa</i>	Grey box	Large		Scattered
62	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Scattered
79	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
80	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
81	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Scattered
85	<i>Eucalyptus</i> sp.	Eucalypt	Large	Dead	Stump
86	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
87	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
88	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
89	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
90	<i>Eucalyptus</i> sp.	Eucalypt	Large		Scattered
91	<i>Eucalyptus</i> sp.	Eucalypt	Large		Scattered
92	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
93	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
94	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
95	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
96	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
97	<i>Eucalyptus</i> sp.	Eucalypt	Large		Scattered
98	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
99	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
100	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
101	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
102	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
103	<i>Eucalyptus melliodora</i>	Yellow box	Small	Dead	Scattered
104	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
105	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
106	<i>Eucalyptus melliodora</i>	Yellow box	Small	Dead	Scattered
107	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
108	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
109	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
110	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
111	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Scattered
112	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Scattered
113	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
114	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered



Tree # (Figure 2)	Species Name	Common Name	Size Class	Notes	Scattered / Patch
115	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Scattered
116	<i>Eucalyptus</i> sp.	Eucalypt	Small		Scattered
117	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
118	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
119	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
120	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
121	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
122	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
123	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
128	<i>Eucalyptus</i> sp.	Eucalypt	Small	Stump	Stump
129	<i>Eucalyptus</i> sp.	Eucalypt	Small	Stump	Stump
130	<i>Eucalyptus</i> sp.	Eucalypt	Small	Stump	Stump
131	<i>Eucalyptus</i> sp.	Eucalypt	Small	Stump	Stump
132	<i>Eucalyptus</i> sp.	Eucalypt	Large		Scattered
133	<i>Eucalyptus</i> sp.	Eucalypt	Large		Scattered
137	<i>Eucalyptus</i> sp.	Eucalypt		Stump	Stump
152	<i>Allocasuarina</i> sp.	Sheoak	Small		Scattered
153	<i>Allocasuarina</i> sp.	Sheoak	Small		Scattered
162	<i>Eucalyptus melliodora</i>	Yellow box	Small	Dead	Scattered
165	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
166	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
167	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
176	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
177	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Scattered
178	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
179	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
180	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
182	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
183	<i>Eucalyptus melliodora</i>	Yellow box	Small	Dead	Scattered
184	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
185	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
186	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
187	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
188	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
189	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
190	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered

Tree # (Figure 2)	Species Name	Common Name	Size Class	Notes	Scattered / Patch
191	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
192	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
194	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
195	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
196	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
197	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
198	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
199	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
200	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
201	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
202	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
203	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
204	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
205	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Scattered
206	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Scattered
207	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
208	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
209	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
210	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
212	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
213	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
214	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
215	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
216	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
217	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
218	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
219	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
220	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
221	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
252	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
253	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
254	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
255	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
256	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
257	<i>Eucalyptus microcarpa</i>	Grey box	Large		Scattered
258	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Scattered

Tree # (Figure 2)	Species Name	Common Name	Size Class	Notes	Scattered / Patch
259	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
260	<i>Eucalyptus melliodora</i>	Yellow box	Small		Scattered
261	<i>Eucalyptus microcarpa</i>	Grey Box	Large		Scattered

## Appendix 1.3 Significant Flora Species

Significant flora within 10 kilometres of the study area is provided in the Table A1.4.3 at the end of this section, with Tables A1.4.1 and A1.4.2 below providing the background context for the values in Table 1.4.3.

**Table A1.4.1** Conservation status of each species for each Act. The values in this table correspond to Columns 5 and 6 in Table A1.4.3.

EPBC ( <i>Environment Protection and Biodiversity Conservation Act 1999</i> ):		FFG ( <i>Flora and Fauna Guarantee Act 1988</i> ):	
EX	Extinct	ex	Extinct
CR	Critically endangered	cr	Critically endangered
EN	Endangered	en	Endangered
VU	Vulnerable	vu	Vulnerable
#	Listed on the Protected Matters Search Tool		

**Table A1.4.2** Likelihood of occurrence rankings: Habitat characteristics assessment of significant flora species previously recorded within 10 kilometres of the study area, or that may potentially occur within the study area to determine their likelihood of occurrence. The values in this table correspond to Column 7 in Table A1.4.3.

1	Known Occurrence	<ul style="list-style-type: none"> <li>Recorded within the study area recently (i.e. within ten years).</li> </ul>
2	High Likelihood	<ul style="list-style-type: none"> <li>Previous records of the species in the local vicinity; and/or,</li> <li>The study area contains areas of high-quality habitat.</li> </ul>
3	Moderate Likelihood	<ul style="list-style-type: none"> <li>Limited previous records of the species in the local vicinity; and/or</li> <li>The study area contains poor or limited habitat.</li> </ul>
4	Low Likelihood	<ul style="list-style-type: none"> <li>Poor or limited habitat for the species, however other evidence (such as lack of records or environmental factors) indicates there is a very low likelihood of presence.</li> </ul>
5	Unlikely	<ul style="list-style-type: none"> <li>No suitable habitat and/or outside the species range.</li> </ul>

**Table A1.4.3** Significant flora recorded within 10 kilometres of the study area.

Scientific Name	Common Name	Last Documented Record (VBA)	Total # of Records (VBA)	EPBC	FFG	Likelihood of Occurrence in Study Area	Rationale for Likelihood of Occurrence
<b>NATIONAL SIGNIFICANCE</b>							
<i>Amphibromus fluitans</i>	River Swamp Wallaby-grass	1996	3	VU	-	5	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Brachyscome muelleroides</i> #	Mueller Daisy	-	-	VU	en	5	Minimal suitable habitat in study area and no records within close proximity.
<i>Lepidium monoplacoides</i> #	Winged Pepper-cress	-	-	EN	en	5	Minimal suitable habitat in study area and no records within close proximity.
<i>Pimelea spinescens</i> subsp. <i>spinescens</i> #	Plains Rice-flower, Spiny Rice-flower, Prickly Pimelea	-	-	CR	cr	5	Minimal suitable habitat in study area and no records within close proximity.
<i>Sclerolaena napiformis</i> #	Turnip Copperburr	-	-	EN	cr	5	Minimal suitable habitat in study area and no records within close proximity.
<i>Senecio macrocarpus</i> #	Large-fruit Fireweed, Large-fruit Groundsel	-	-	VU	cr	5	Minimal suitable habitat in study area and no records within close proximity.
<i>Senecio psilocarpus</i> #	Swamp Fireweed, Smooth-fruited Groundsel	-	-	VU	-	5	Minimal suitable habitat in study area and no records within close proximity.
<i>Swainsona plagiotropis</i> #	Red Darling-pea, Red Swainson-pea	-	-	VU	en	5	Minimal suitable habitat in study area and no records within close proximity.
<b>STATE SIGNIFICANCE</b>							
<i>Acacia flexifolia</i>	Bent-leaf Wattle	2008	2	-	en	5	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Allocasuarina luehmannii</i>	Buloke	2008	18	-	vu	5	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Amyema linophylla</i> subsp. <i>orientalis</i>	Buloke Mistletoe	2008	1	-	cr	5	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Aristida jerichoensis</i> var. <i>subspinulifera</i>	Jericho Wire-grass	2015	2	-	cr	5	Minimal suitable habitat in study area and no recent records within close proximity.

Scientific Name	Common Name	Last Documented Record (VBA)	Total # of Records (VBA)	EPBC	FFG	Likelihood of Occurrence in Study Area	Rationale for Likelihood of Occurrence
<i>Brachyscome chrysoglossa</i>	Yellow-tongue Daisy	2002	1	-	en	5	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Cardamine moirensis</i>	Riverina Bitter-cress	2017	2	-	en	5	Limited suitable habitat available in study area.
<i>Corymbia maculata</i>	Spotted Gum	2020	1	-	vu	5	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Cullen parvum</i>	Small Scurf-pea	2002	3	-	en	5	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Dianella tarda</i>	Late-flower Flax-lily	2017	4	-	cr	5	Limited suitable habitat available in study area.
<i>Diplachne fusca</i> subsp. <i>fusca</i>	Brown Beetle-grass	1987	1	-	en	5	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Fimbristylis velata</i>	Veiled Fringe-sedge	2000	2	-	en	5	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Geranium</i> sp. 6	Delicate Crane's-bill	2011	1	-	en	5	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Juncus psammophilus</i>	Sand Rush	2000	3	-	en	5	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Lespedeza juncea</i> subsp. <i>sericea</i>	Chinese Lespedeza	2002	1	-	en	5	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Rumex crystallinus</i> s.s.	Glistening Dock	1979	1	-	en	5	Minimal suitable habitat in study area and no recent records within close proximity.

**Data Sources:** Victorian Biodiversity Atlas (DELWP 2022d); Protected Matters Search Tool (DCCEEW 2022).

## APPENDIX 2 FAUNA

### Appendix 2.1 Significant Fauna Species

Significant fauna within 10 kilometres of the study area is provided in the Table A2.1.3 at the end of this section, with Tables A2.1.1 and A2.1.2 below providing the background context for the values in Table 2.1.3.

**Table A2.1.1** Conservation status of each species for each Act/policy. The values in this table correspond to Columns 5 to 8 in Table A2.1.3.

EPBC ( <i>Environment Protection and Biodiversity Conservation Act 1999</i> ):		FFG ( <i>Flora and Fauna Guarantee Act 1988</i> ):	
EX	Extinct	ex	Extinct
CR	Critically endangered	cr	Critically endangered
EN	Endangered	en	Endangered
VU	Vulnerable	vu	Vulnerable
CD	Conservation dependent		
#	Listed on the Protected Matters Search Tool		

**Table A2.1.2** Likelihood of occurrence rankings: Habitat characteristics assessment of significant fauna species previously recorded within 10 kilometres of the study area, or that may potentially occur within the study area to determine their likelihood of occurrence. The values in this table correspond to Column 9 in Table A2.1.3.

1	High Likelihood	<ul style="list-style-type: none"> <li>Known resident in the study area based on site observations, database records, or expert advice; and/or,</li> <li>Recent records (i.e. within five years) of the species in the local area (DELWP 2018); and/or,</li> <li>The study area contains the species' preferred habitat.</li> </ul>
2	Moderate Likelihood	<ul style="list-style-type: none"> <li>The species is likely to visit the study area regularly (i.e. at least seasonally); and/or,</li> <li>Previous records of the species in the local area (DELWP 2018); and/or,</li> <li>The study area contains some characteristics of the species' preferred habitat.</li> </ul>
3	Low Likelihood	<ul style="list-style-type: none"> <li>The species is likely to visit the study area occasionally or opportunistically whilst en route to more suitable sites; and/or,</li> <li>There are only limited or historical records of the species in the local area (i.e. more than 20 years old); and/or,</li> <li>The study area contains few or no characteristics of the species' preferred habitat.</li> </ul>



4	Unlikely	<ul style="list-style-type: none"> <li>No previous records of the species in the local area; and/or,</li> <li>The species may fly over the study area when moving between areas of more suitable habitat; and/or,</li> <li>Out of the species' range; and/or,</li> <li>No suitable habitat present.</li> </ul>
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**Table A2.1.3** Significant fauna recorded within 10 kilometres of the study area.

Scientific name	Common name	Last Documented Record (VBA)	Total # of Records (VBA)	EPBC	FFG	Likelihood of Occurrence in Study Area	Rationale for Likelihood of Occurrence
<b>NATIONAL SIGNIFICANCE</b>							
<i>Botaurus poiciloptilus</i>	Australasian Bittern	2011	2	EN	cr	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Rostratula australis</i> #	Australian Painted Snipe	-	-	EN	cr	4	Minimal suitable habitat in study area and no records within close proximity.
<i>Calidris ferruginea</i> #	Curlew Sandpiper	-	-	CR	cr	4	Minimal suitable habitat in study area and no records within close proximity.
<i>Numenius madagascariensis</i> #	Eastern Curlew, Far Eastern Curlew	-	-	CR	cr	4	Minimal suitable habitat in study area and no records within close proximity.
<i>Galaxias rostratus</i>	Flat-headed Galaxias	1990	4	CR	vu	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Synemon plana</i> #	Golden Sun Moth	-	-	VU	vu	4	Minimal suitable habitat in study area and no records within close proximity.
<i>Falco hypoleucos</i> #	Grey Falcon	-	-	VU	vu	4	Minimal suitable habitat in study area and no records within close proximity.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	2010	2	VU	vu	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Litoria raniformis</i>	Growing Grass Frog	1982	3	VU	vu	4	Minimal suitable habitat in study area and no recent records within close proximity.

Scientific name	Common name	Last Documented Record (VBA)	Total # of Records (VBA)	EPBC	FFG	Likelihood of Occurrence in Study Area	Rationale for Likelihood of Occurrence
<i>Macquaria australasica</i>	Macquarie Perch	1975	7	EN	en	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Maccullochella peelii</i>	Murray Cod	2020	53	VU	en	3	Found recently nearby, but in waterways not well-connected to water in the study area.
<i>Grantiella picta</i>	Painted Honeyeater	2018	5	VU	vu	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Aprasia parapulchella</i> #	Pink-tailed Worm-lizard, Pink-tailed Legless Lizard	-	-	VU	en	4	Minimal suitable habitat in study area and no records within close proximity.
<i>Pedionomus torquatus</i> #	Plains-wanderer	-	-	CR	cr	4	Minimal suitable habitat in study area and no records within close proximity.
<i>Anthochaera phrygia</i>	Regent Honeyeater	2013	1	CR	cr	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Bidyanus bidyanus</i>	Silver Perch	2020	17	CR	en	4	Found recently nearby, but in waterways not well-connected to water in the study area.
<i>Crinia sloanei</i> #	Sloane's Froglet	-	-	EN	en	4	Minimal suitable habitat in study area and no records within close proximity.
<i>Delma impar</i> #	Striped Legless Lizard, Striped Snake-lizard	-	-	VU	en	4	Minimal suitable habitat in study area and no records within close proximity.
<i>Polytelis swainsonii</i>	Superb Parrot	1977	1	VU	en	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Lathamus discolor</i>	Swift Parrot	2018	12	CR	cr	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Maccullochella macquariensis</i>	Trout Cod	2020	10	EN	en	4	Found recently nearby, but in waterways not well-connected to water in the study area.
<i>Hirundapus caudacutus</i>	White-throated Needletail	1981	9	VU	vu	4	May fly over by chance but unlikely to rely upon the study area for breeding or foraging habitat.
STATE SIGNIFICANCE							
<i>Spatula rhynchotis</i>	Australasian Shoveler	1997	25	-	vu	4	Minimal suitable habitat in study area and no recent records within close proximity.

Scientific name	Common name	Last Documented Record (VBA)	Total # of Records (VBA)	EPBC	FFG	Likelihood of Occurrence in Study Area	Rationale for Likelihood of Occurrence
<i>Ixobrychus dubius</i>	Australian Little Bittern	2017	8	-	en	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Ninox connivens</i>	Barking Owl	1995	1	-	cr	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Falco subniger</i>	Black Falcon	1978	1	-	cr	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Oxyura australis</i>	Blue-billed Duck	2000	7	-	vu	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Chelodina expansa</i>	Broad-shelled Turtle	2003	1	-	en	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Pseudophryne bibronii</i>	Brown Toadlet	2004	1	-	en	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	2018	5	-	vu	3	Limited suitable habitat available in study area.
<i>Burhinus grallarius</i>	Bush Stone-curlew	1985	23	-	cr	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Stagonopleura guttata</i>	Diamond Firetail	2018	5	-	vu	3	Limited suitable habitat available in study area.
<i>Ardea alba modesta</i>	Eastern Great Egret	2019	53	-	vu	3	May visit study area by chance but limited suitable habitat available.
<i>Tandanus tandanus</i>	Freshwater Catfish	1992	1	-	en	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	2009	9	-	vu	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Aythya australis</i>	Hardhead	2019	39	-	vu	3	May visit study area by chance but limited suitable habitat available.
<i>Melanodryas cucullata</i>	Hooded Robin	1977	1	-	vu	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Varanus varius</i>	Lace Monitor	2018	6	-	en	4	Minimal suitable habitat in study area and no recent records within close proximity.

Scientific name	Common name	Last Documented Record (VBA)	Total # of Records (VBA)	EPBC	FFG	Likelihood of Occurrence in Study Area	Rationale for Likelihood of Occurrence
<i>Hieraaetus morphnoides</i>	Little Eagle	1981	9	-	vu	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Egretta garzetta</i>	Little Egret	2000	5	-	en	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Tringa stagnatilis</i>	Marsh Sandpiper	1980	1	-	en	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Emydura macquarii</i>	Murray River Turtle	1982	1	-	cr	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Melanotaenia fluviatilis</i>	Murray-Darling Rainbowfish	2018	61	-	en	4	Found recently nearby, but in waterways not well-connected to water in the study area.
<i>Biziura lobata</i>	Musk Duck	2018	16	-	vu	3	May visit study area by chance but limited suitable habitat available.
<i>Pluvialis fulva</i>	Pacific Golden Plover	1987	1	-	vu	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Ornithorhynchus anatinus</i>	Platypus	2018	5	-	vu	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Ardea intermedia plumifera</i>	Plumed Egret	2001	16	-	cr	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Ninox strenua</i>	Powerful Owl	1992	1	-	vu	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Pyrrholaemus sagittatus</i>	Speckled Warbler	1982	2	-	en	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Lophoictinia isura</i>	Square-tailed Kite	2018	1	-	vu	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Petaurus norfolcensis</i>	Squirrel Glider	2016	25	-	vu	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Neophema pulchella</i>	Turquoise Parrot	1980	2	-	vu	4	Minimal suitable habitat in study area and no recent records within close proximity.
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	2019	13	-	en	3	May fly over study area by chance but limited suitable habitat available.



Scientific name	Common name	Last Documented Record (VBA)	Total # of Records (VBA)	EPBC	FFG	Likelihood of Occurrence in Study Area	Rationale for Likelihood of Occurrence
<i>Tringa glareola</i>	Wood Sandpiper	1987	2	-	en	4	Minimal suitable habitat in study area and no recent records within close proximity.

**Data source:** Victorian Biodiversity Atlas (DELWP 2022d); Protected Matters Search Tool (DCCEEW 2022).