ecology & heritage partners

Final Report

Biodiversity Assessment for 100 Dhurringile Road, Tatura, 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
www.ehpartners.com.au | 1300 839 325

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Project manager	Jared McGuiness (Senior Botanist)
Report reviewer	Aaron Organ (Director/Principal Ecologist)
Other EHP staff	Sally Burgemeestre (Zoologist)
Mapping	Petra Sorensen (GIS Analyst)
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SUMMARY OF CLAUSE 52.17 APPLICATION REQUIREMENTS

Table S1. Application requirements for a permit to remove native vegetation (Victoria Planning Provisions Clause 52.17; DELWP 2017)

No.	Application Requirement	Response
Application requirements under the Detailed Assessment Pathway		
1	Information about the native vegetation to be removed, including: • The assessment pathway and reason for the assessment pathway; • A description of the native vegetation to be removed; • Maps showing the native vegetation and property in context; and • The offset requirement that will apply if the native vegetation is approved to be removed.	TBC
2	Topographic and land information relating to the native vegetation to be removed, showing ridges, crests and hilltops, wetlands and waterways, slopes of more than 20 percent, drainage lines, low lying areas, saline discharge areas, and areas of existing erosion, as appropriate.	Refer to Section 1.2 and Figure 1
3	Recent dated photographs of the native vegetation to be removed.	Refer to Section 3.1
4	Details of any other native vegetation that was permitted to be removed on the same property with the same ownership as the native vegetation to be removed, where the removal occurred in the five-year period before the application to remove native vegetation is lodged.	No removal of native vegetation has been removed by the proponent within the property within the past five years
5	An avoid and minimise statement. The statement describes any efforts to avoid the removal of and minimise the impacts on the biodiversity and other values of native vegetation, and how these efforts focussed on areas of native vegetation that have the most value.	Refer to Section 5.1
6	A copy of any Property Vegetation Plan contained within an agreement made pursuant to section 69 of the *Conservation, Forests and Lands Act 1987* that applies to the native vegetation to be removed.	Not applicable
7	Where the removal of native vegetation is to create defendable space, a written statement explaining why the removal of native vegetation is necessary. This statement must have regard to other available bushfire risk mitigation measures. This statement is not required when the creation of defendable space is in conjunction with an application under the Bushfire Management Overlay.	Not applicable as the vegetation clearance is not for defendable space
8	If the application is under Clause 52.16, a statement that explains how the proposal responds to the Native Vegetation Precinct Plan considerations at decision guideline 8.	Not applicable as the application responds to Clause 52.17
9	An offset statement providing evidence that an offset that meets the offset requirements for the native vegetation to be removed has been identified and can be secured in accordance with the Guidelines.	TBC

No.	Application Requirement	Response
10	A site assessment report of the native vegetation to be removed, including: • A habitat hectare assessment of any patches of native vegetation, including the condition, extent (in hectares), Ecological Vegetation Class and bioregional conservation status. • The location, number, circumference (in centimetres measured at 1.3 metres above ground level) and species of any large trees within patches. • The location, number, circumference (in centimetres measured at 1.3 metres above ground level) and species of any scattered trees, and whether each tree is small or large.	Refer to Figure 2, Appendix 1.2 (habitat hectares assessment) and Appendix 1.3 (tree information)
11	Information about impacts on rare or threatened species habitat, including the relevant section of the Habitat importance map for each rare or threatened species requiring a species offset.	TBC

1 INTRODUCTION

1.1 Background

Ecology and Heritage Partners Pty Ltd was commissioned by Greater Shepparton City Council to undertake a Biodiversity Assessment at 100 Dhurringile Road, Tatura, Victoria.

We understand that the property falls within the proposed Tatura Structure Plan area and Greater Shepparton City Council has identified the precinct as a future residential growth area with the potential to support urban expansion. Ecological investigations for the proposed Tatura Structure Plan area (Ecology and Heritage Partners 2021) identified a large portion of 100 Dhurringile Road as containing significant native vegetation.

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 100 Dhurringile Road, Tatura and is approximately 156 kilometres north of Melbourne's CBD (Figure 1). The study area covers approximately 37 hectares and is bound by the Midland Highway to the north, Dhurringile Road to the east and agricultural land to the south and west.

The study area is currently used for agricultural purposes. It is generally flat, with no ridges, crests or waterways within or immediately adjacent to the site. However, there are several irrigation channels within the study area.

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

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 2021b);
- The Illustrated Flora Information System of Victoria (IFLISV) (Gullan 2017) and Atlas of Living Australia (ALA) (ALA 2021) 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 2022);
- Relevant listings under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act), including the latest Threatened (DELWP 2021a) and Protected (DELWP 2019b) Lists;
- The online VicPlan Map (DELWP 2022d) to ascertain current zoning and environmental overlays in the study area;
- Aerial photography of the study area; and
- Previous ecological assessments relevant to the study area; including;
    - Ecological Investigations for the Proposed Tatura Structure Plan, Tatura, Victoria. Ecology and Heritage Partners 2021.

2.2 Field Assessment

A field assessment was undertaken on 23 November 2021 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).

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

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

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

2.3.1 Assessment Pathway

The Guidelines manage the impacts on biodiversity from native vegetation removal using an assessment-based approach. Two factors – extent risk and location category – are used to determine the risk associated with an application for a permit to remove native vegetation. The location category (1, 2 or 3) has been determined for all areas in Victoria and is available on DELWP's NVIM Tool (DELWP 2022b). Determination of assessment pathway is summarised in Table 1.

Table 1. Assessment pathways for applications to remove, destroy or lop native vegetation (DELWP 2017).

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

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

2.3.2 Vegetation Assessment

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

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

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

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

2.3.3 Impact Avoidance and Minimisation

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

2.3.4 Offsets

Biodiversity offsets are required to compensate for the permitted removal of native vegetation. Offset obligations and offset site criteria are determined in accordance with the Guidelines (DELWP 2017) and are divided into two categories, being General Habitat Units and Species Habitat Units.

The offset requirements for native vegetation removal are calculated by DELWP and presented in a Native Vegetation Removal (NVR) Report, which are based on the vegetation condition scores determined during the biodiversity assessment.

2.4 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/or 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 or difficult to detect due to a large proportion of the study area (>50%) being grazed at the time of the assessment.

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.

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

3.1 Vegetation Condition

The study area is representative of many areas within the Victorian Riverina bioregion, with large areas of improved pastures and derived native grasslands, scattered patches of remnant vegetation and regrowth from past clearing.

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 in the surrounding landscape, it is difficult to determine whether patches of indigenous understorey species are representative of Plains Woodland or another similar EVC. In most cases, the decision for classifying patches was guided by the modelled pre-1750s native vegetation mapping (DELWP 2022c), with native flora in the study area best represented by one EVC: Plains Woodland (EVC 803).

Specific details relating to the observed EVCs and other vegetation/ habitat types are provided below.

3.1.1 Patches of Native Vegetation

Native vegetation in the study area is representative of Plains Woodland (EVC 803). The presence of this EVC is generally consistent with the modelled pre-1750s native vegetation mapping (DELWP 2022c). Specific details relating to the observed EVC are provided below.

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. 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.

Plains Woodland patches within the study area generally consisted of several small patches, predominately present as canopy trees (Grey Box *Eucalyptus microcarpa*) over an exotic understorey dominated by pasture grasses (Plate 1).

One large patch of remnant Plains Woodland (PW1) predominantly comprised of derived native grassland covered approximately half of the study area and consisted of a predominantly native understorey dominated by Wallaby Grasses *Rytidosperma* spp., with several large eucalypts (Grey Box) scattered throughout the patch (Plate 2).

Plate 1. Predominantly treeless Plains Woodland (derived native grassland) within the southern half of the study area (Ecology and Heritage Partners Pty Ltd 23/11/2021).

Plate 2. A patch of Plains Woodland within the north of the study area (Ecology and Heritage Partners Pty Ltd 23/11/2021).

3.1.2 Large Trees in Patches

A total of 36 Large Trees (LTs) in Plains Woodland patches were present (Figure 2). Most of these specimens were Grey Box, with occasional Yellow Gums also present (Plate 3; Plate 4; Appendix 1.3).

3.1.3 Scattered Trees

A total of 60 scattered trees (mostly Grey Box) were recorded within the study area, which consisted of 44 large and 16 small scattered trees (Figure 2; Appendix 1.3). 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 5; Plate 6).

Plate 3. Large Tree (Grey Box) in PGW1 (Ecology and Heritage Partners Pty Ltd 23/11/2021).

Plate 4. Two Large Trees (Grey Box) in PW1 (Ecology and Heritage Partners Pty Ltd 23/11/2021).

Plate 5. A large Yellow Gum near the western boundary the study area (Ecology and Heritage Partners Pty Ltd 23/11/2021).

Plate 6. Several scattered trees within the study area (Ecology and Heritage Partners Pty Ltd 23/11/2021).

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, including Toowoomba Canary-grass *Phalaris aquatica*, Rye-grass *Lolium* spp., Barley Grass *Hordeum* spp. and Wild Oat *Avena fatua* (Plate 7). Scattered native grasses were generally present in these areas, however they did not have the required 25% relative cover to be considered a patch.

Noxious weeds, as defined under the CaLP Act, were present within the study area, with Horehound *Marrubium vulgare*, Sweet Briar *Rosa rubiginosa* and Bathurst Burr *Xanthium spinosum* present in limited numbers within the study area (Plate 8).

Plate 7. Exotic pasture grass within the north of the study area (Ecology and Heritage Partners Pty Ltd 23/11/2021).

Plate 8. Sweet Briar within the study area (Ecology and Heritage Partners Pty Ltd 23/11/2021).

3.2 Fauna Habitat

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 (including a diversity of

raptors), mammals (e.g. Eastern Grey Kangaroo *Macropus giganteus* and Red Fox *Vulpes Vulpes*), reptiles (e.g. Eastern Brown Snake *Pseudonaja textilis*) and frogs (e.g. Spotted Marsh Frog *Limnodynastes tasmaniensis*).

Plains Woodland within the study area provides suitable habitat for a variety of fauna guilds including arboreal mammals, microbats, birds and reptiles. During the current survey, a variety of birds were observed foraging amongst trees and shrubs in these areas. 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.

The large areas of exotic grassland within the study are likely to be utilised by common mammal and bird species. Several bird species common to modified, grassy or open habitats were recorded during the current assessment. Diurnal and nocturnal raptors are likely to forage over these areas.

Irrigation channels and farm dams (when inundated) within the study area are likely to support a range of common fauna species. The modified (irrigation channel) and ephemeral (farm dams) nature of the waterbodies, and the site's proximity to areas of high-quality habitat provided by the extensive Goulburn River system to the east, minimises the likelihood of migratory/ threatened waterbird species making significant use of these resources.

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

The feasibility of development on the site is currently being investigated. Impacts to native vegetation will be calculated once the development footprint has been determined.

3.4 Significance Assessment

3.4.1 Flora

The VBA contains records of five State significant flora species previously recorded within 10 kilometres of the study area (DELWP 2021b) (Appendix 1.4). The PMST nominated an additional nine nationally significant species which have not been previously recorded but have the potential to occur in the locality (DAWE 2022) (Figure 3; Appendix 1.4).

Buloke *Allocasuarina luehmannii*, listed as critically endangered under the FFG Act, was recorded within the study area. As Buloke was recorded within the study area, there is also potential habitat for Buloke *Mistletoe linophylla* (also listed as critically endangered under the FFG Act); however, the species was not detected within the study area.

No additional national or State significant flora were recorded during the site assessment and, based on the modified nature of the study area, landscape context and the proximity of previous records, additional significant flora species are considered unlikely to occur within the study area due to the and high levels of agricultural disturbance and absence of suitable habitat.

3.4.2 Fauna

The VBA contains records of nine nationally significant and 31 State significant fauna species previously recorded within 10 kilometres of the study area (DELWP 2021b) (Appendix 2.1). The PMST nominated an additional 15 nationally significant species which have not been previously recorded but have the potential to occur in the locality (DAWE 2022) (Appendix 2.1).

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.

3.4.3 Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DAWE 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-Blakely's Red Gum Grassy Woodland and Derived Native Grassland;

Plains Woodland vegetation, mapped as PW1, was generally consistent with the description of the nationally significant (EPBC Act-listed) Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia ecological community. As trees covered less than 10% of the patch, at least 12 perennial native species area required to be present in the mid and ground layer. As the majority of PW1 within the study area was being grazed at the time of the assessment, it could not be determined if the patch contained the required species diversity to be considered the EPBC Act listed ecological community.

One FFG Act-listed ecological community is present in the study area, being Grey Box - Buloke Grassy Woodland Community. This community corresponds to areas of Plains Woodland EVC mapped in the study area and meets the relevant description and characteristics described for this community (DELWP 2019c). Plains Woodland vegetation in the north of the study area contained potential habitat for woodland birds associated with the FFG Act-listed Victorian Temperate Woodland Bird Community.

4 LEGISLATIVE AND POLICY IMPLICATIONS

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

The EPBC Act establishes a Commonwealth process for the assessment of proposed actions likely to have a significant impact on any matters of National Environment Significance (NES). There is suitable habitat within the study area for one ecological community (Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia) listed under the EPBC Act. Pending the outcome of targeted surveys for the community, a referral to the Commonwealth Environment Minister may be required.

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

The FFG Act is the primary legislation dealing with biodiversity conservation and sustainable use of native flora and fauna in Victoria. Proponents are required to apply for an FFG Act Permit to 'take' threatened and/or protected flora species, listed vegetation communities and listed fish species in areas of public land (e.g. within road reserves, drainage lines and public reserves/parks). An FFG Act permit is generally not required for removal of species or communities on private land, or for the removal of habitat for a listed terrestrial fauna species.

There are confirmed records of FFG Act-listed Buloke and Grey Box - Buloke Grassy Woodland Community. There is also potential habitat for woodland birds associated with the FFG Act-listed Victorian Temperate Woodland Bird Community. However, as the study area is privately owned, a permit under the FFG Act is not required.

4.3 *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 requires a planning permit from the relevant local Council to remove, destroy or lop native vegetation, unless an exemption at Clause 52.17-7 of the Victoria Planning Provisions applies.

As part of Clause 52.17, all native vegetation is considered lost as part of a subdivision development where the lots are 0.4 hectares or less in area, which must be offset at the time of subdivision.

4.3.1 Local Planning Scheme

The study area is located within the Greater Shepparton City Council. The following zoning and overlays apply (DELWP 2022d):

- Farming Zone – Schedule 1(FZ1);
- Land Subject to Inundation Overlay (LSIO); and
- Specific Controls Overlay – Schedule 3 (SCO3).

4.3.2 *The Guidelines*

The State Planning Policy Framework and the decision guidelines at Clause 12.01 Biodiversity and Clause 52.17 Native Vegetation require Planning and Responsible Authorities to have regard for the Guidelines (DELWP 2017).

4.3.3 *Implications*

A planning permit from the Greater Shepparton City Council is required to remove, destroy or lop any native vegetation under Clause 52.17 of the Planning Scheme.

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

Three weeds listed as noxious under the *Catchment and Land Protection Act 1994* were recorded during the assessment (Horehound, Sweet Briar and Bathurst Burr). Similarly, there is evidence that the study area is currently occupied by pest fauna species listed under the CaLP Act (European Rabbit *Oryctolagus cuniculus*). Listed noxious weeds and pests should be appropriately controlled throughout the study area.

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

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

4.6 *Water Act 1989* (Victoria)

Several irrigation channels are present within the study area. A 'works on waterways' permit from the Goulburn Broken CMA is likely to be required where any action impacts on waterways within the study area. Additionally, where structures are installed within or across waterways that potentially interfere with the passage of fish or the quality of aquatic habitat, these activities should be referred to DELWP with the Goulburn Broken CMA included for comment.

5 MITIGATION MEASURES

5.1 Avoid and Minimise Statement

An avoid and minimise statement will be developed following the determination of a development footprint.

5.2 Best Practice Mitigation Measures

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

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

6 FURTHER REQUIREMENTS

Further requirements associated with development of the study area, as well as additional studies or reporting that may be required, are provided in Table 3.

Table 3. Further requirements associated with development of the study area.

Relevant Legislation	Implications	Further Action
Environment Protection and Biodiversity Conservation Act 1999	The EPBC Act establishes a Commonwealth process for the assessment of proposed actions likely to have a significant impact on any matters of National Environment Significance (NES). There is suitable habitat within the study area for one ecological community (Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia) listed under the EPBC Act. Pending the outcome of targeted surveys for the community, a referral to the Commonwealth Environment Minister may be required.	Undertake an additional vegetation assessment to determine the presence of otherwise of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia which is listed under the EPBC Act (Section 4.1).
Flora and Fauna Guarantee Act 1988	There are confirmed records of FFG Act-listed Buloke and Grey Box - Buloke Grassy Woodland Community. There is also potential habitat for woodland birds associated with the FFG Act-listed Victorian Temperate Woodland Bird Community. However, as the study area is privately owned, a permit under the FFG Act is not required.	No further action required.
Planning and Environment Act 1987	A planning permit from the Greater Shepparton City Council is required to remove, destroy or lop any native vegetation under Clause 52.17 of the Planning Scheme Should the application fall under the detailed assessment pathway, the application is required to be referred to DELWP.	Prepare and submit a Planning Permit application.
Catchment and Land Protection Act 1994	Three weed species (Horehound, Sweet Briar and Bathurst Burr) and one pest species (European Rabbit) listed under the CaLP Act were recorded within the study area. To meet requirements under the CaLP Act, listed noxious weeds and pests should be appropriately controlled throughout the study area.	Listed noxious weeds and pests should be appropriately controlled throughout the study area
Wildlife Act 1975	Any persons engaged to conduct salvage and relocation or general handling of terrestrial fauna species must hold a current Management Authorisation.	Ensure wildlife specialists hold a current Management Authorisation.
Water Act 1989	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.	Obtain a 'works on waterways' permit from the Goulburn Broken CMA.

REFERENCES

ALA 2022. Atlas of Living Australia. URL: https://www.ala.org.au/. Atlas of Living Australia, Canberra, ACT.

DAWE 2022. Protected Matters Search Tool. [www Document] URL: http://www.environment.gov.au/epbc/pmst/index.html. Commonwealth Department of Agriculture, Water and the Environment, Canberra, ACT.

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

DELWP 2018. *Assessor's handbook: Applications to remove, destroy or lop native vegetation*. October 2018. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2019a. *Flora and Fauna Guarantee Act 1988* Protected Flora List – November 2019 [www Document]. URL: https://www.environment.vic.gov.au/__data/assets/pdf_file/0011/50420/20191114-FFG-protected-flora-list.pdf. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2019b. *Flora and Fauna Guarantee Act 1988* Threatened List – Characteristics of Threatened Communities [www Document]. URL: https://www.environment.vic.gov.au/__data/assets/pdf_file/0018/50418/04072019-Flora-and-Fauna-Guarantee-Characteristics-of-Threatened-Communities-3.pdf. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2021a. *Flora and Fauna Guarantee Act 1988* Threatened List – August 2021 [www Document]. URL: https://www.environment.vic.gov.au/__data/assets/pdf_file/0024/115827/20191114-FFG-Threatened-List.pdf. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2021b. Victorian Biodiversity Atlas. Sourced from GIS layers: "VBA_FLORA25", "VBA_FLORA100", "VBA_FAUNA25", "VBA_FAUNA100". August 2021. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2022a. NatureKit Map [www Document]. URL: https://maps2.biodiversity.vic.gov.au/Html5viewer/index.html?viewer=NatureKit. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2022b. Native Vegetation Information Management Tool [www Document]. URL: https://nvim.delwp.vic.gov.au. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2022c. Ecological Vegetation Class (EVC) Benchmarks for each Bioregion [www Document]. URL: https://www.environment.vic.gov.au/biodiversity/bioregions-and-evc-benchmarks. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2022d. VicPlan Map [www Document]. URL: https://mapshare.maps.vic.gov.au/vicplan/. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2022e. Search for Native Vegetation Credit Register [www Document]. URL: https://nvcr.delwp.vic.gov.au/Home/Index. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DSE 2004. *Vegetation quality assessment manual: Guidelines for applying the habitat hectares scoring method.* Version 1.3. Victorian Department of Sustainability and Environment, Melbourne Victoria.

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

Ecology and Heritage Partners 2021. Ecological Investigations for the Proposed Tatura Structure Plan, Tatura, Victoria. Report prepared for Greater Shepparton City Council.

Gullan, P. 2017. Illustrated Flora Information System of Victoria (IFISV). Viridans Pty Ltd, Victoria.

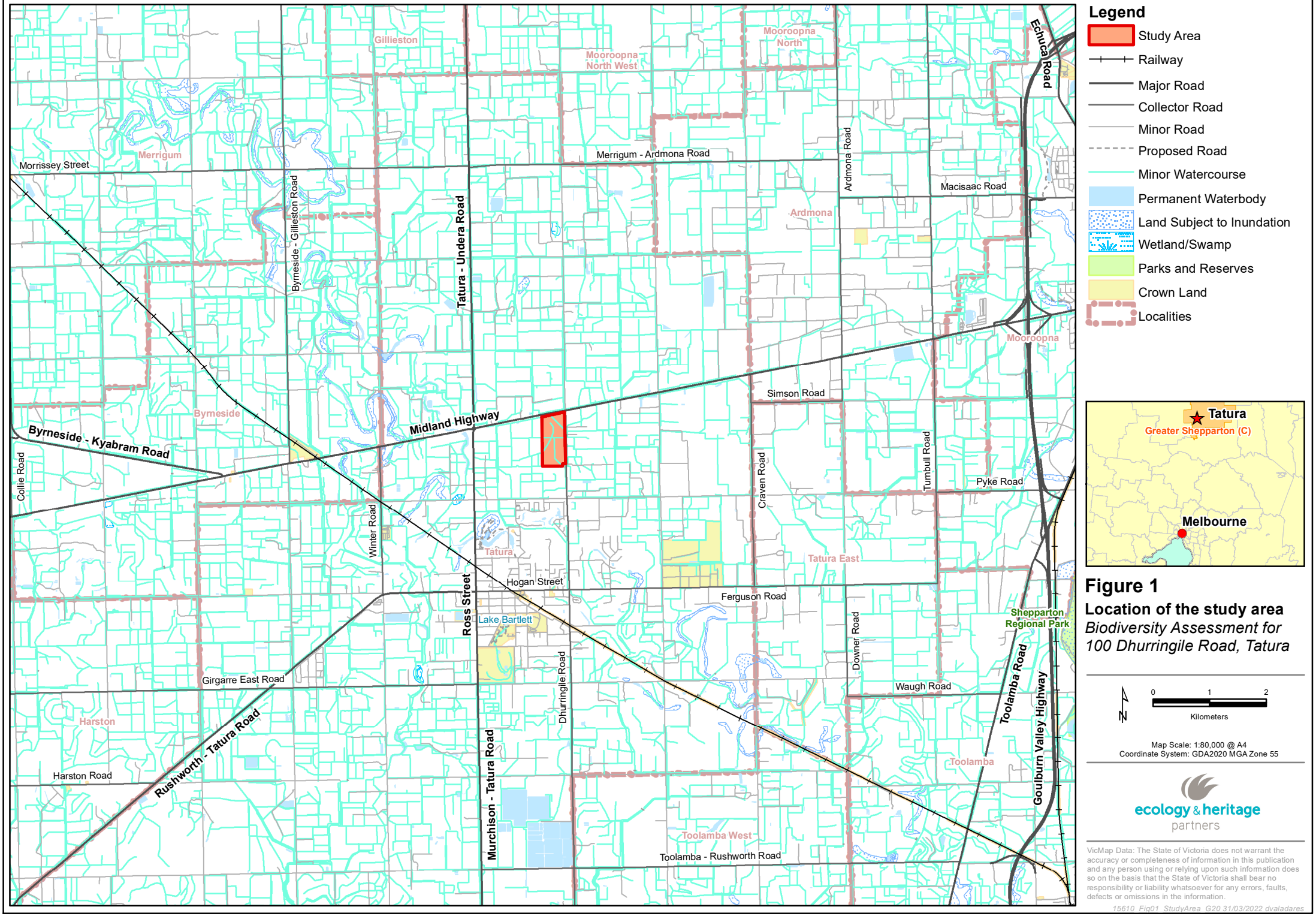


Figure 1

Location of the study area

Biodiversity Assessment for 100 Dhurringile Road, Tatura

Map Scale: 1:80,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

Figure 2

Ecological features

Biodiversity Assessment for 100 Dhurringile Road, Tatura

Legend

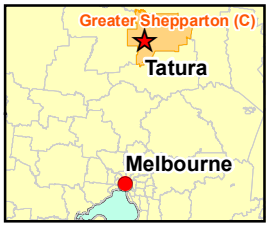
- Study Area
- Scattered Large Tree
- Scattered Small Tree
- Large Tree in patch

Ecological Vegetation Class

- Plains Woodland (EVC 803)

Threatened Ecological Community

- Potential Grey Box *(Eucalyptus microcarpa)* Grassy Woodland and Derived Native Grasslands of South-eastern Australia (EPBC Act)
- Grey Box - Buloke Grassy Woodland (FFG Act)



N

0 40 80

Metres

Map Scale: 1:4,200 @ A4
Coordinate System:
GDA2020 MGA Zone 55

15610_Fig02_EcoFeat_P_G20 10/05/2022 Melsley

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Aerial source: Nearmap 2022

APPENDIX 1 FLORA

Appendix 1.1 Flora Results

Legend:

ce Listed as threatened under the FFG Act (DELWP 2019a);

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

Table A1.1. Flora within the study area.

Scientific Name	Common Name	Notes
INDIGENOUS SPECIES		
Allocasuarina leuhmannii	Buloke	ce
Austrostipa spp.	Spear Grass	-
Eucalyptus leucoxylon	Yellow Gum	-
Eucalyptus melliodora	Yellow Box	-
Eucalyptus microcarpa	Grey Box	-
Rytidosperma spp.	Wallaby Grass	-
NON-INDIGENOUS OR INTRODUCED SPECIES		
Avena barbata	Bearded Oat	-
Avena fatua	Wild Oat	-
Avena spp.	Oat	-
Dactylis glomerata	Cocksfoot	-
Hordeum (monospecific)	Barley	-
Lolium spp.	Rye Grass	-
Marrubium vulgare	Horehound	*
Phalaris aquatica	Toowoomba Canary-grass	-
Plantago lanceolata	Ribwort	-
Polygonum arenastrum	Wireweed	-
Rosa rubiginosa	Sweet Briar	*
Xanthium spinosum	Bathurst Burr	*

Appendix 1.2 Habitat Hectare Assessment

Table A1.2. Habitat Hectare Assessment Table.

Vegetation Zone		PW1	PW2	PW3
Bioregion		Victorian_Riverina	Victorian_Riverina	Victorian_Riverina
EVC / Tree		Plains Woodland	Plains Woodland	Plains Woodland
EVC Number		803	803	803
EVC Conservation Status		Endangered	Endangered	Endangered
Patch Condition	Large Old Trees /10	3	10	0
	Canopy Cover /5	3	3	3
	Under storey /25	5	5	5
	Lack of Weeds /15	9	2	2
	Recruitment /10	0	0	0
	Organic Matter /5	5	4	4
	Logs /5	0	0	0
	Treeless EVC Multiplier	1.00	1.00	1.00
	Subtotal =	25.00	24.00	14.00
Landscape Value /25		10	1	1
Habitat Points /100		35	25	15
Habitat Score		0.35	0.25	0.15

Appendix 1.3 Scattered Trees and Large Trees in Patches

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

Tree ID (Figure 2)	Species Name	Common Name	DBH (cm)	Type
1	*Eucalyptus microcarpa*	Grey Box	120	Large Tree in patch
2	*Eucalyptus microcarpa*	Grey Box	92	Large Tree in patch
3	*Eucalyptus microcarpa*	Grey Box	96	Large Tree in patch
4	*Eucalyptus microcarpa*	Grey Box	129	Large Tree in patch
5	*Eucalyptus microcarpa*	Grey Box	90	Large Tree in patch
6	*Eucalyptus microcarpa*	Grey Box	171	Large Tree in patch
7	*Eucalyptus microcarpa*	Grey Box	167	Scattered Large Tree
8	*Eucalyptus microcarpa*	Grey Box	122	Scattered Large Tree
9	*Eucalyptus* sp.	Stag	123	Scattered Large Tree
10	*Eucalyptus leucoxylon*	Yellow Gum	82	Scattered Large Tree
11	*Eucalyptus* sp.	Stag	81	Scattered Large Tree
12	*Eucalyptus leucoxylon*	Yellow Gum	100	Scattered Large Tree
13	*Eucalyptus microcarpa*	Grey Box	87	Scattered Large Tree
14	*Eucalyptus microcarpa*	Grey Box	86	Scattered Large Tree
15	*Eucalyptus microcarpa*	Grey Box	111	Scattered Large Tree
16	*Eucalyptus microcarpa*	Grey Box	85	Scattered Large Tree
17	*Eucalyptus* sp.	Stag	65	Scattered Small Tree
18	*Eucalyptus microcarpa*	Grey Box	109	Large Tree in patch
19	*Eucalyptus microcarpa*	Grey Box	87	Large Tree in patch
20	*Eucalyptus microcarpa*	Grey Box	76	Large Tree in patch
21	*Eucalyptus microcarpa*	Grey Box	73	Large Tree in patch
22	*Eucalyptus microcarpa*	Grey Box	86	Scattered Large Tree
23	*Eucalyptus* sp.	Stag	104	Scattered Large Tree
24	*Eucalyptus* sp.	Stag	42	Scattered Small Tree
25	*Eucalyptus* sp.	Stag	82	Scattered Large Tree
26	*Eucalyptus* sp.	Stag	41	Scattered Small Tree
27	*Eucalyptus microcarpa*	Grey Box	71	Scattered Large Tree
28	*Eucalyptus* sp.	Stag	88	Scattered Large Tree
29	*Eucalyptus microcarpa*	Grey Box	104	Large Tree in patch
30	*Eucalyptus microcarpa*	Grey Box	73	Large Tree in patch
31	*Eucalyptus* sp.	Stag	74	Scattered Large Tree
32	*Eucalyptus microcarpa*	Grey Box	84	Scattered Large Tree

Tree ID (Figure 2)	Species Name	Common Name	DBH (cm)	Type
33	*Eucalyptus microcarpa*	Grey Box	79	Scattered Large Tree
34	*Eucalyptus microcarpa*	Grey Box	113	Scattered Large Tree
35	*Eucalyptus* sp.	Stag	88	Scattered Large Tree
36	*Eucalyptus* sp.	Stag	67	Scattered Small Tree
37	*Eucalyptus microcarpa*	Grey Box	88	Scattered Large Tree
38	*Eucalyptus microcarpa*	Grey Box	66	Scattered Small Tree
39	*Eucalyptus* sp.	Stag	70	Scattered Large Tree
40	*Eucalyptus microcarpa*	Grey Box	78	Scattered Large Tree
41	*Eucalyptus microcarpa*	Grey Box	71	Scattered Large Tree
42	*Eucalyptus microcarpa*	Grey Box	86	Large Tree in patch
43	*Eucalyptus microcarpa*	Grey Box	83	Scattered Large Tree
44	*Eucalyptus microcarpa*	Grey Box	155	Scattered Large Tree
45	*Eucalyptus microcarpa*	Grey Box	69	Scattered Small Tree
46	*Eucalyptus microcarpa*	Grey Box	84	Scattered Large Tree
47	*Eucalyptus* sp.	Stag	47	Scattered Small Tree
48	*Eucalyptus microcarpa*	Grey Box	73	Scattered Large Tree
49	*Eucalyptus microcarpa*	Grey Box	99	Large Tree in patch
50	*Eucalyptus microcarpa*	Grey Box	129	Large Tree in patch
51	*Eucalyptus microcarpa*	Grey Box	80	Large Tree in patch
52	*Eucalyptus microcarpa*	Grey Box	81	Large Tree in patch
53	*Eucalyptus microcarpa*	Grey Box	72	Large Tree in patch
54	*Eucalyptus microcarpa*	Grey Box	83	Large Tree in patch
55	*Eucalyptus microcarpa*	Grey Box	81	Large Tree in patch
56	*Eucalyptus* sp.	Stag	70	Large Tree in patch
57	*Eucalyptus microcarpa*	Grey Box	71	Large Tree in patch
58	*Eucalyptus microcarpa*	Grey Box	82	Large Tree in patch
59	*Eucalyptus microcarpa*	Grey Box	81	Large Tree in patch
60	*Eucalyptus microcarpa*	Grey Box	89	Large Tree in patch
61	*Eucalyptus microcarpa*	Grey Box	90	Large Tree in patch
62	*Eucalyptus microcarpa*	Grey Box	92	Large Tree in patch
63	*Eucalyptus microcarpa*	Grey Box	75	Large Tree in patch
64	*Eucalyptus microcarpa*	Grey Box	85	Large Tree in patch
65	*Eucalyptus* sp.	Stag	75	Scattered Large Tree
66	*Eucalyptus* sp.	Stag	73	Scattered Large Tree
67	*Allocasuarina leuhmannii*	Buloke	67	Scattered Large Tree
68	*Eucalyptus leucoxylon*	Yellow Gum	128	Scattered Large Tree

Tree ID (Figure 2)	Species Name	Common Name	DBH (cm)	Type
69	*Eucalyptus leucoxylon*	Yellow Gum	91	Scattered Large Tree
70	*Eucalyptus microcarpa*	Grey Box	84	Scattered Large Tree
71	*Eucalyptus leucoxylon*	Yellow Gum	133	Scattered Large Tree
72	*Eucalyptus microcarpa*	Grey Box	78	Scattered Large Tree
73	*Eucalyptus microcarpa*	Grey Box	109	Scattered Large Tree
74	*Eucalyptus microcarpa*	Grey Box	89	Scattered Large Tree
75	*Eucalyptus microcarpa*	Grey Box	95	Scattered Large Tree
76	*Eucalyptus* sp.	Stag	89	Scattered Large Tree
77	*Eucalyptus microcarpa*	Grey Box	84	Large Tree in patch
78	*Eucalyptus microcarpa*	Grey Box	74	Large Tree in patch
79	*Eucalyptus microcarpa*	Grey Box	134	Large Tree in patch
80	*Eucalyptus* sp.	Stag	73	Scattered Large Tree
81	*Eucalyptus microcarpa*	Grey Box	124	Large Tree in patch
82	*Eucalyptus microcarpa*	Grey Box	109	Scattered Large Tree
83	*Eucalyptus* sp.	Stag	74	Scattered Large Tree
84	*Eucalyptus* sp.	Stag	68	Scattered Small Tree
85	*Eucalyptus* sp.	Stag	65	Scattered Small Tree
86	*Eucalyptus* sp.	Stag	54	Scattered Small Tree
87	*Eucalyptus* sp.	Stag	85	Scattered Large Tree
88	*Eucalyptus* sp.	Stag	138	Scattered Large Tree
89	*Eucalyptus* sp.	Stag	57	Scattered Small Tree
90	*Eucalyptus* sp.	Stag	50	Scattered Small Tree
91	*Eucalyptus* sp.	Stag	58	Scattered Small Tree
92	*Eucalyptus* sp.	Stag	48	Scattered Small Tree
93	*Eucalyptus microcarpa*	Grey Box	74	Large Tree in patch
94	*Eucalyptus* sp.	Stag	75	Scattered Large Tree
95	*Eucalyptus* sp.	Stag	60	Scattered Small Tree
96	*Eucalyptus microcarpa*	Grey Box	95	Large Tree in patch

Appendix 1.4 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/policy. The values in this table correspond to Columns 5 to 7 in Table A1.4.3.

EPBC (*Environment Protection and Biodiversity Conservation Act 1999*):		FFG (*Flora and Fauna Guarantee Act 1988*):	
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 8 in Table A1.4.3.

1	Known Occurrence	• Recorded within the study area recently (i.e. within ten years).
2	High Likelihood	• Previous records of the species in the local vicinity; and/or, • The study area contains areas of high-quality habitat.
3	Moderate Likelihood	• Limited previous records of the species in the local vicinity; and/or • The study area contains poor or limited habitat.
4	Low Likelihood	• Poor or limited habitat for the species, however other evidence (such as lack of records or environmental factors) indicates there is a very low likelihood of presence.
5	Unlikely	• No suitable habitat and/or outside the species range.

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

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likelihood of occurrence in study area	Rationale for occurrence likelihood
NATIONAL SIGNIFICANCE							
Amphibromus fluitans	River Swamp Wallaby-grass	-	#	VU	-	5	No suitable habitat
Brachyscome muelleroides	Mueller Daisy	-	#	VU	en	5	No suitable habitat
Lepidium monoplocoides	Winged Pepper-cress	-	#	EN	en	5	No suitable habitat
Pimelea spinescens subsp. *spinescens*	Spiny Rice-flower	-	#	CR	cr	4	Potential habitat, but very unlikely due to agricultural disturbance and no previous records within 10km of the study area
Sclerolaena napiformis	Turnip Copperburr	-	#	EN	cr	4	Potential habitat, but very unlikely due to agricultural disturbance and no previous records within 10km of the study area
Senecio macrocarpus	Large-fruit Fireweed	-	#	VU	cr	4	Potential habitat, but very unlikely due to agricultural disturbance and no previous records within 10km of the study area
Senecio psilocarpus	Swamp Fireweed	-	#	VU	-	5	No suitable habitat

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likelihood of occurrence in study area	Rationale for occurrence likelihood
Swainsona murrayana	Slender Darling-pea	-	#	VU	en	4	Potential habitat, but very unlikely due to agricultural disturbance and no previous records within 10km of the study area
Swainsona plagiotropis	Red Swainson-pea	-	#	VU	en	4	Potential habitat, but very unlikely due to agricultural disturbance and no previous records within 10km of the study area
STATE SIGNIFICANCE							
Allocasuarina luehmannii	Buloke	13	2018	-	vu	1	Present within the study area
Cyperus leptocarpus	Button Rush	4	1993	-	en	4	Poor and very limited habitat within the study area.
Dianella tarda	Late-flower Flax-lily	1	2011	-	cr	4	Potential habitat within the study area. Unlikely due to agricultural disturbance
Diplachne fusca subsp. *fusca*	Brown Beetle-grass	5	1992	-	en	5	No suitable habitat
Myoporum montanum	Waterbush	3	2002	-	en	4	Poor and very limited habitat within the study area.

Data Sources: Victorian Biodiversity Atlas (DELWP 2021b); Protected Matters Search Tool (DAWE 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 (*Environment Protection and Biodiversity Conservation Act 1999*):		FFG (*Flora and Fauna Guarantee Act 1988*):	
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	• Known resident in the study area based on site observations, database records, or expert advice; and/or, • Recent records (i.e. within five years) of the species in the local area (DELWP 2018); and/or, • The study area contains the species' preferred habitat.
2	Moderate Likelihood	• The species is likely to visit the study area regularly (i.e. at least seasonally); and/or, • Previous records of the species in the local area (DELWP 2018); and/or, • The study area contains some characteristics of the species' preferred habitat.
3	Low Likelihood	• The species is likely to visit the study area occasionally or opportunistically whilst en route to more suitable sites; and/or, • There are only limited or historical records of the species in the local area (i.e. more than 20 years old); and/or,

		• The study area contains few or no characteristics of the species' preferred habitat.
4	Unlikely	• No previous records of the species in the local area; and/or, • The species may fly over the study area when moving between areas of more suitable habitat; and/or, • Out of the species' range; and/or, • No suitable habitat present.

Table A2.1.3. Significant fauna within 10 kilometres of the study area.

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	Likelihood of occurrence in the study area	Rationale for occurrence likelihood
NATIONAL SIGNIFICANCE							
Australasian Bittern	*Botaurus poiciloptilus*	2009	2	EN	cr	4	No suitable habitat.
Australian Painted-snipe	*Rostratula australis*	1988	3	EN	cr	4	No suitable habitat.
Curlew Sandpiper	*Calidris ferruginea*	1978	1	CR	cr	4	No suitable habitat.
Eastern Curlew	*Numenius madagascariensis*	#	-	CR	cr	4	No suitable habitat
Flathead Galaxias	*Galaxias rostratus*	#	-	CR	vu	4	No suitable habitat.
Gang-gang Cockatoo	*Callocephalon fimbriatum*	#	-	EN	-	3	May visit the study area en route to more suitable habitat.
Golden Sun Moth	*Synemon plana*	#	-	VU	vu	4	Potential presence within the high-quality Plains Woodland remnant within the study area. However, the nearest documented records of the species near Nagambie (several kilometres to the south west of the study area). Additionally, there are no locally confirmed records and it is outside of the species distributional range based on DEWHA (2008)
Grey Falcon	*Falco hypoleucos*	#	-	VU	vu	3	May visit the study area occasionally or on an opportunistic basis.
Grey-headed Flying-fox	*Pteropus poliocephalus*	#	-	VU	vu	3	May visit the study area en route to more suitable habitat.
Growling Grass Frog	*Litoria raniformis*	1788	1	VU	vu	4	No suitable habitat

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	Likelihood of occurrence in the study area	Rationale for occurrence likelihood
Macquarie Perch	*Macquaria australasica*	#	-	EN	en	4	No suitable habitat
Murray Cod	*Maccullochella peelii*	2009	3	VU	en	4	No suitable habitat.
Painted Honeyeater	*Grantiella picta*	#	-	VU	vu	3	Some suitable habitat; may visit the area opportunistically.
Pink-tailed Worm-lizard	*Aprasia parapulchella*	#	-	VU	en	4	No suitable habitat.
Plains-wanderer	*Pedionomus torquatus*	#	-	CR	cr	4	No suitable habitat.
Regent Honeyeater	*Anthochaera phrygia*	1958	1	CR	cr	4	Outside species range.
Regent Parrot	*Polytelis anthopeplus monarchoides*	2005	1	VU	vu	3	May visit the study area occasionally or on an opportunistic basis.
Silver Perch	*Bidyanus bidyanus*	2009	2	CR	en	4	Outside species range.
Sloane's Froglet	*Crinia sloanei*	#	-	EN	en	4	Potential low-quality habitat but no records within 10 kilometres of the study area.
Striped Legless Lizard	*Delma impar*	#	-	VU	en	4	Potential habitat, although very unlikely due to agricultural disturbance. Edge of species range.
Superb Parrot	*Polytelis swainsonii*	#	-	VU	en	4	No suitable habitat, edge of species range.
Swift Parrot	*Lathamus discolor*	#	-	CR	cr	3	May visit the study area occasionally or on an opportunistic basis.
Trout Cod	*Maccullochella macquariensis*	#	-	EN	en	4	No suitable habitat.
White-throated Needletail	*Hirundapus caudacutus*	1991	3	VU	vu	3	May visit the study area occasionally or on an opportunistic basis.

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	Likelihood of occurrence in the study area	Rationale for occurrence likelihood
STATE SIGNIFICANCE							
Australasian Shoveler	*Spatula rhynchotis*	2019	59	-	vu	3	May visit the study area en route to more suitable habitat.
Australian Gull-billed Tern	*Gelochelidon macrotarsa*	1977	3	-	en	4	No suitable habitat.
Australian Little Bittern	*Ixobrychus dubius*	1989	3	-	en	4	No suitable habitat.
Barking Owl	*Ninox connivens*	1991	1	-	cr	3	May visit the study area en route to more suitable habitat.
Black Falcon	*Falco subniger*	2013	1	-	cr	3	May visit the study area occasionally or on an opportunistic basis.
Black-tailed Godwit	*Limosa limosa*	1983	1	-	cr	4	No suitable habitat. May fly over en route to more suitable habitat.
Blue-billed Duck	*Oxyura australis*	2001	10	-	vu	4	No suitable habitat. May fly over en route to more suitable habitat.
Brolga	*Antigone rubicunda*	1987	1	-	en	4	No suitable habitat. May fly over en route to more suitable habitat.
Bush Stone-curlew	*Burhinus grallarius*	1993	7	-	cr	3	Potential habitat, although very unlikely due to agricultural disturbance.
Caspian Tern	*Hydroprogne caspia*	2001	1	-	vu	4	No suitable habitat
Common Greenshank	*Tringa nebularia*	1992	3	-	en	4	No suitable habitat
Diamond Dove	*Geopelia cuneata*	1991	1	-	vu	4	No suitable habitat.
Diamond Firetail	*Stagonopleura guttata*	1991	2	-	vu	4	Potential habitat although unlikely due to agricultural disturbance.

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	Likelihood of occurrence in the study area	Rationale for occurrence likelihood
Eastern Great Egret	*Ardea alba modesta*	2019	21	-	vu	3	May visit the study area en route to more suitable habitat.
Freckled Duck	*Stictonetta naevosa*	2005	10	-	en	3	May visit the study area en route to more suitable habitat.
Grey-crowned Babbler	*Pomatostomus temporalis*	1991	2	-	vu	4	No resident population likely given the small highly modified nature of the habitat.
Hardhead	*Aythya australis*	2018	64	-	vu	4	No suitable habitat. May fly over en route to more suitable habitat.
Hooded Robin	*Melanodryas cucullata*	1992	2	-	vu	3	Potential low quality habitat, although very unlikely due to agricultural disturbance and lack of recent records.
Lace Monitor	*Varanus varius*	2014	1	-	en	4	Potential low quality habitat but unlikely to reside in the study area
Little Eagle	*Hieraaetus morphnoides*	1997	8	-	vu	3	Some suitable habitat; may visit the area occasionally or opportunistically.
Little Egret	*Egretta garzetta*	2000	3	-	en	4	No suitable habitat. May fly over en route to more suitable habitat.
Marsh Sandpiper	*Tringa stagnatilis*	2001	5	-	en	4	No suitable habitat.
Murray-Darling Rainbowfish	*Melanotaenia fluviatilis*	2011	4	-	en	4	No suitable habitat.
Musk Duck	*Biziura lobata*	2005	37	-	vu	4	No suitable habitat. May fly over en route to more suitable habitat.

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	Likelihood of occurrence in the study area	Rationale for occurrence likelihood
Pacific Golden Plover	*Pluvialis fulva*	1987	1	-	vu	4	Outside of species range; no suitable habitat.
Plumed Egret	*Ardea intermedia plumifera*	2001	16	-	cr	4	No suitable habitat. May fly over en route to more suitable habitat.
Speckled Warbler	*Pyrrholaemus sagittatus*	1958	1	-	en	4	No suitable habitat. May fly over en route to more suitable habitat.
Square-tailed Kite	*Lophoictinia isura*	1999	1	-	vu	4	No suitable habitat. May fly over en route to more suitable habitat.
Turquoise Parrot	*Neophema pulchella*	1980	2	-	vu	4	May visit the study area occasionally or on an opportunistic basis.
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	1982	1	-	en	4	No suitable habitat.
Wood Sandpiper	*Tringa glareola*	1989	8	-	en	4	No suitable habitat. May fly over en route to more suitable habitat.