Meadow Creek Solar Farm, Transmission Line and Battery Energy Storage System (BESS): Flora and fauna assessment

Prepared for Meadow Creek Solar Farm Pty Ltd

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- Matt Looby, Jess Chapman, Jack Furdson (assistance in the field).
- Julian Turner, Nina Matheis (mapping).
- Matt Looby (quality assurance).

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SUMMARY

Biosis Pty Ltd was commissioned by Meadow Creek Solar Farm Pty Ltd (MCSF) to undertake a flora and fauna assessment of the Meadow Creek Solar Farm project area (the study area). The study area consists of 576 hectares of land and an associated electricity transmission corridor located at 1033 Oxley-Meadow Creek Road, Meadow Creek, Victoria. The proposed solar farm is expected to have peak DC capacity of 330 Megawatts (MW). An overhead transmission line to the north of the property is proposed to transmit and distribute the electricity generated by the solar farm.

The solar farm comprises the following components:

- A network of PV solar panel arrays.
- Electrical collection systems, switchyard and control room.
- A battery energy storage system (BESS with a capacity of up to 1000 mWh).
- A management hub, including offices, amenities and equipment sheds.
- Parking and internal access roads.
- A temporary laydown area to accommodate the laydown of construction materials and infrastructure.

The overhead transmission line comprises the following components:

- Terminal substation and switching station.
- Poles and wires.

This flora and fauna investigation has assessed the potential biodiversity impacts of the solar farm and transmission line project components based on the current design. The assessment was undertaken at two spatial scales; a broad assessment of the project study area and a more detailed impact assessment of the proposed infrastructure area (i.e. where works and vegetation/habitat removal are proposed). Ecological assessments occurred through mid and late 2022, focussing on the study area as a whole. Additional fieldwork was undertaken in early 2024 focussing on specific areas of impact, following confirmation of a proposed footprint for the solar farm and transmission line.

Ecological values

Key ecological values identified within the study area (solar farm and transmission line) are as follows:

- Areas of patch vegetation representative of two endangered Ecological Vegetation Classes (EVCs) within the Victorian Riverina bioregion:
  - Plains Grassy Woodland EVC 55_61 in both derived and treed condition states.
  - Creekline Grassy Woodland EVC 68 along Sheep Station Creek and Hurdle Creek.
  - Many of the habitat zones that comprise these EVCs are in poor to moderate condition as a result of agricultural land uses, and contain large trees.
- Scattered paddock trees where the ground layer vegetation is introduced pasture. Most of these trees are large old specimens that support many large hollows.

- Known or potential habitat for *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) / and *Flora and Fauna Guarantee Act 1988* (FFG Act) listed fauna species, including:
  - Latham's Snipe *Gallinago hardwickii* (Vulnerable under the EPBC Act).
  - Gang-gang Cockatoo *Callocephalon fimbriatum* (Endangered under the EPBC Act, Endangered under FFG Act).
  - Blue-winged Parrot *Neophema chrysostoma* (Vulnerable under the EPBC Act).
  - Swift Parrot *Lathamus discolor* (Critically Endangered under the EPBC Act, Critically Endangered under the FFG Act).
  - White-throated Needletail *Hirundapus caudacutus* (Vulnerable under the EPBC Act, Vulnerable under the FFG Act).
  - Hooded Robin *Melanodryas cucullata* (Endangered under the EPBC Act, Vulnerable under the FFG Act).
  - Southern Whiteface *Aphelocephala leucopsis* (Vulnerable under the EPBC Act).
  - Painted Honeyeater *Grantiella picta* (Vulnerable under the EPBC Act, Vulnerable under the FFG Act).
  - Regent Honeyeater *Anthochaera phrygia* (Critically Endangered under the EPBC Act, Critically Endangered under the FFG Act)
  - Diamond Firetail *Stagonopleura guttata* (Vulnerable under the EPBC Act, Vulnerable under the FFG Act)
  - Brown Treecreeper *Climacteris picumnus* (Vulnerable under the EPBC Act)
  - Grey-headed Flying-fox *Pteropus poliocephalus* (Vulnerable under the EPBC Act, Vulnerable under the FFG Act)
  - A confirmed population of Sloane's Froglet *Crinia sloanei* (Endangered under the EPBC Act, Endangered under the FFG Act) along Sheep Station Creek.
- Potential habitat for FFG Act listed fauna species, including: Magpie Goose *Anseranas semipalmata* (Vulnerable), Australasian Shoveler *Spatula rhynchotis* (Vulnerable), Hardhead *Aythya australis* (Vulnerable), Blue-billed Duck *Oxyura australis* (Vulnerable), Little Eagle *Oxyura australis* (Vulnerable), Barking Owl *Ninox connivens* (Critically Endangered), Powerful Owl *Ninox strenua* (Vulnerable), Turquoise Parrot *Neophema pulchella* (Vulnerable), Grey-crowned Babbler *Pomatostomus temporalis* (Vulnerable), Speckled Warbler *Chthonicola sagittata* (Endangered), Brush-tailed Phascogale *Phascogale tapoatafa* (Vulnerable), Squirrel Glider *Petaurus norfolcensis* (Vulnerable), Murray River Turtle *Emydura macquarii* (Vulnerable) and Brown Toadlet *Pseudophryne bibronii* (Endangered).
- Canopy tree species associated with the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland threatened ecological community (Box - Gum Grassy Woodland, EPBC Act Critically Endangered). Due to high levels of modification to remnant woodlands and the sub-dominance of canopy eucalypt species (Yellow Box and Blakely's Red-gum), the community is not considered present within the study area.
- Woodland vegetation and bird species assemblages that represent the FFG Act listed Victorian Temperate Woodland Bird Community.
- Areas of established revegetation along Sheep Station Creek and shelter belts within the solar farm area.

- Watercourses (Sheep Station Creek and Hurdle Creek), minor waterways, seasonal drainage lines and farm dams that provide wetland and aquatic habitat.

Government legislation and policy

An assessment of the project in relation to key biodiversity legislation and policy is provided and summarised below.

Legislation / policy	Relevant ecological feature on site	Permit / approval required	Notes
Environment Protection and Biodiversity Conservation Act 1999	Known or potential habitat for 13 listed fauna species. Potential presence of one listed ecological community: White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland.	An EPBC referral is currently being prepared and will be submitted to the Australian Government Minister for the Environment to determine whether approval under the EPBC Act is required. This referral is being prepared concurrently with the planning application.	Though significant impacts to Sloane's Froglet are considered unlikely, the project will be referred to gain legal certainty on whether further assessment and approval under the EPBC Act is required.
Flora and Fauna Guarantee Act 1988	Listed fauna species and protected flora species recorded on site and adjacent roadsides. Victorian Temperate Woodland Bird Community.	Protected Flora Permit not required on private land but will be required if any protected species are impacted on public roadsides (e.g. at road access points or crossings of unused licenced government roads).	Site is private land with adjacent public road reserves and unused licenced government roads.
Planning and Environment Act 1987	All indigenous vegetation to be removed.	Planning permit required to remove, destroy or lop native vegetation. Permit application needs to address provisions of the Wangaratta Planning Scheme. The Minister for Planning is the responsible authority for solar farm development in Victoria. The project is being assessed under the Development Facilitation Program (DFP) accelerated pathway.	An assessment against Victoria's *Guidelines for the removal, destruction and lopping of native vegetation* is provided in Section 5 for a detailed risk pathway planning application. An assessment of roadsides covered by Vegetation Protection Overlay (VPO2) in the Wangaratta Planning Scheme is also provided in this report.
Environment Effects Act 1978	Proposed clearing of less than 10 hectares of native vegetation. Sloane's Froglet population present on site. Other threatened species / ecological community habitat.	The scale of impacts to native vegetation, threatened species and general impacts on other biodiversity values has been assessed in accordance with the Ministerial Guidelines for Assessment of Environmental Effects under	This determination is based on the scale of development and the strategies implemented to avoid and minimise impacts through design. Less than 10 hectares of native vegetation will be removed, and a significant proportion of a threatened species' habitat or

Legislation / policy	Relevant ecological feature on site	Permit / approval required	Notes
		the *Environment Effects Act 1978*. The project is not considered likely to trigger any criteria relating to biodiversity (individual and combined).	population will not be impacted. This assessment considers current design responses and the implementation of strict environmental management protocols to avoid indirect impacts on terrestrial, wetland, and aquatic habitats during construction and beyond. If these conditions cannot be guaranteed, this determination will need to be reconsidered.
Catchment and Land Protection Act 1994	Noxious weeds, pest animals.	Several established pest plants and animals occur or are likely to occur within the study area. These include Red Fox and European Rabbit. While not a declared pest animal, feral cats are also likely to be present.	Established pest species are a serious threat to primary production, Crown land, the environment and community health in Victoria. Meadow Creek Solar Farm has the responsibility to take all reasonable steps to prevent the spread of, and as far as possible eradicate, established pest species within the study area.
Water Act 1989	Any works or crossings that impact the bed, banks and riparian zones of Sheep Station Creek, Hurdle Creek and other "Determined" waterways / watercourses.	A Waterway Determination has been completed by Goulburn Murray Water (17 October 2022). A North East Catchment Management Authority (CMA) Works on Waterways permit will be required for works on these waterways and watercourses.	Consultation has occurred with North East CMA and Goulburn-Murray Water during the pre-application stage to obtain a Waterway Determination for unnamed hydo-features. Application for a Works on Waterways permit will be prepared, as required.

Guidelines for the removal, destruction or lopping of native vegetation (the Guidelines)

Based on the current design, the proposed development will require the removal of 2.181 hectares of native vegetation, including 33 large trees, from within location category 2. The 33 large trees proposed for removal include direct loss and assumed loss of trees. Therefore the planning permit application will be assessed on the detailed assessment pathway. The strategic biodiversity value score of the native vegetation to be removed is between 0.120 and 1.00.

Native vegetation and planted vegetation removal is required for a range of purposes during construction and operation of the project. This removal includes direct loss of vegetation (i.e. clearing) or assumed loss of vegetation due to Tree Protection Zone (TPZ) encroachment. Of the 33 large trees to be impacted, 10 large trees are considered assumed lost due to TPZ encroachment and it is conceivable these trees could be retained at the detailed design stage of the project.

In summary, vegetation removal or assumed vegetation/tree loss includes:

Solar panel array

- Scattered paddock tree and small derived woodland patch vegetation removal for solar panel array establishment.
- Removal of planted non-native vegetation for solar panel array establishment.

External site access

- Roadside native vegetation removal or assumed loss to establish or widen site access points from public roads (four of the eight external access points require some form of native vegetation removal or lopping, or assumed loss).

Internal access and firebreaks

- Removal of native and planted vegetation around the perimeter of the solar farm to establish firebreaks and all-weather access roads for emergency purposes.
- Removal or assumed loss of native vegetation in unmade licenced government roads to establish or widen internal access points.
- Removal of derived native vegetation at waterway and watercourse crossings for access roads, tracks and reticulation.

Transmission line

- Removal of scattered paddock trees and patch native vegetation to establish the transmission line connection between the solar farm site and the existing Glenrowan to Dederang transmission line, including the crossing at Hurdle Creek and one public roadside crossing. The transmission line creek and roadside crossing will potentially allow for retention of vegetation less than 8.5 metres in height, subject to detailed design.

Avoid and minimise statement

The steps that have been taken during the siting and design of the solar farm development to ensure that impacts on biodiversity from the removal of native vegetation have been avoided and minimised are detailed in Section 5 of this report in accordance with the DEECA Assessor's Handbook (DELWP 2018).

Specific site level impact avoidance and minimisation steps include:

- Mapping and assessing site biodiversity values and constraints early in the project design phase (in 2002) and using this information to inform project layout and design iterations between 2022 and 2024.
- As much as possible, locating infrastructure and services in previously disturbed vegetation and farmland with scattered trees. The non-treed areas of the site are grazed and have been subject to long term drainage and pasture improvement activities resulting in them supporting predominantly introduced vegetation with limited ecological values.
- Avoiding areas containing high densities of scattered paddock trees and woodland patch vegetation in the centre of the solar farm site.
- As much as possible, avoiding all linear corridors of remnant patch vegetation. Impacts to these areas are limited to five internal crossing points where roads are required to connect the eastern and western areas of the site and for access to the site from surrounding public roads.
- Avoiding established revegetation along Sheep Station Creek and within shelter belts which appears to have been planted for waterway protection and habitat creation.
- Minimising tree removal in areas covered by the VPO2 on surrounding public roadsides through using existing farm access gates and openings in roadside vegetation. Four of the eight external access points will require minor native vegetation removal and lopping with other external access points located to avoid vegetation removal.
- Providing buffers to Sheep Station Creek and other areas of higher quality potential Sloane's Froglet habitat. Including habitat improvement works along Sheep Station Creek as part of ongoing site management arrangements.
- Establishing buffers around retained habitat zones, and tree protection zone buffers around retained scattered trees.
- Aligning the proposed transmission line to use gaps in roadside vegetation and openings along Hurdle Creek to minimise the need for extensive tree or riparian vegetation removal. Multiple transmission line options have been investigated since 2022 with final preferred option being aligned to minimise impacts on the Hurdle Creek riparian corridor and roadside vegetation along the Docker-Carboor Road.
- Completing waterway/watercourse mapping, obtaining an official Waterway Determination and using flood modelling to assist in designing the solar panel array to minimise impacts on wetland habitats and waterways.
- Incorporation of wildlife friendly fencing adjacent to woodland patches to minimise fauna entanglement and allow for fauna movement.

Offset requirements

If a permit is granted, the offset requirements would be 0.549 general habitat units and 33 large trees. The large tree total includes the assumed losses noted above. The general offset must be within the North East catchment management authority area or the Wangaratta municipal district, and must have a minimum strategic biodiversity value score of 0.411.

Meadow Creek Solar Farm may choose to purchase the offset credits from the Victorian native vegetation credit register. A search of the Native Vegetation Credit Register indicates offsets that meet the above requirements are available, and an extract is provided in Appendix G.

Recommendations

Meadow Creek Solar Farm has engaged with project ecologists in the preliminary development stages of the project and during finalising project design through to the planning permit application process to ensure the impacts on biodiversity are minimised. This has resulted in the design avoiding most remnant patch vegetation where possible, minimised impacts on scattered trees and incorporation of appropriate buffers to Sheep Station Creek and other higher quality waterways and wetland habitats.

The biodiversity values identified in the current survey will need to be considered during the construction and operational phase of the project, and this report provides recommendations intended to minimise the ecological impacts of the project. Relevant points will need to be incorporated into a site-specific Construction and Operational Environmental Management Plan. This plan will address environmental inductions for contractors, vegetation retention and management, installation of temporary fencing/signage, drainage and sediment control and management/enhancement of retained threatened species habitats (e.g. habitat management for Sloane's Froglet along Sheep Station Creek). Furthermore, any landscape or screening plantings should include species selected from a mix of local EVCs (including locally indigenous plants) and non-indigenous and non-invasive native species that are suited to screening purposes and consider flammability requirements (as per the Meadow Creek Solar Farm, Landscape Strategy, June 2024).

1. Introduction

1.1. Project background

Biosis Pty Ltd was commissioned by Meadow Creek Solar Farm Pty Ltd (MCSF) to undertake a flora and fauna assessment of the Meadow Creek Solar Farm project area (the study area). The study area consists of 576 hectares of land and associated electricity transmission corridor located at 1033 Oxley-Meadow Creek Road, Meadow Creek, Victoria. The proposed solar farm is expected to have peak DC capacity of 330 Megawatts (MW). An overhead transmission line to the north of the property is proposed to transmit and distribute the electricity generated by the solar farm.

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The transmission line comprises the following components:

- Terminal substation and switching station.
- Poles and wires.

1.2. Scope of assessment

The objectives of this investigation are to:

- Describe the vascular flora (ferns, conifers, flowering plants), vertebrate fauna (mammals, birds, reptiles, frogs, fishes) and decapod crustacea (e.g. crayfish).
- Map native vegetation and other habitat features, including:
  - Collection of a species list(s), including relevant data on habitat for rare or threatened species, and define the general condition of any native vegetation present or directly adjacent to the site (e.g. local roadsides and riparian zones).
  - Determine and map the native vegetation within and adjacent to the study area according to Ecological Vegetation Class (EVC) with reference to DEECA's 2005 EVC mapping and recent aerial photography.
  - Record the presence of scattered trees and large trees, document their location and record their diameter at breast height as appropriate (i.e. to allow for the definition of potential tree protection zones).
  - Record and, where appropriate, map the extent of any major infestations of noxious weed species observed while also noting the presence and abundance of other weeds.

  - Assess broad fauna habitat types and identify significant fauna habitat features.
  - Evaluate waterways and wetland vegetation.
  - Take photographs and record photo location points of native vegetation, including any vegetation proposed for removal such as scattered trees.
- Conduct a vegetation quality (habitat hectare) assessment consistent with current DEECA standards.
- Review the implications of relevant biodiversity legislation and policy, including Victoria's Guidelines for the removal, destruction or lopping of native vegetation ('the Guidelines').
- Undertake targeted Sloane's Froglet threatened species surveys.
- Identify potential implications of the proposed development and provide recommendations to assist with solar farm development design considerations.
- Recommend any further assessments of the site that may be required, such as additional targeted searches for threatened species.

1.3. Location of the study area

The study area is located 20 kilometres south-east of Wangaratta and 18 kilometres east of Glenrowan (Figure 1). The study area includes two parts, the solar farm and the transmission line.

The study area encompasses 576 hectares of private farming land zoned as Farming Zone (FZ) and is located within a designated Bushfire Prone Area (BPA). Part of the transmission line is covered by a Flood Overlay (FO) and Land Subject to Inundation Overlay (LSIO). Adjacent public roadsides are covered by a Vegetation Protection Overlay (VPO2).

The study area (solar farm and transmission line) is within the:

- Victorian Riverina Bioregion.
- North East Catchment Management Authority jurisdiction (CMA).
- Rural City of Wangaratta municipality (Wangaratta Planning Scheme).
- Parish of Moyhu.

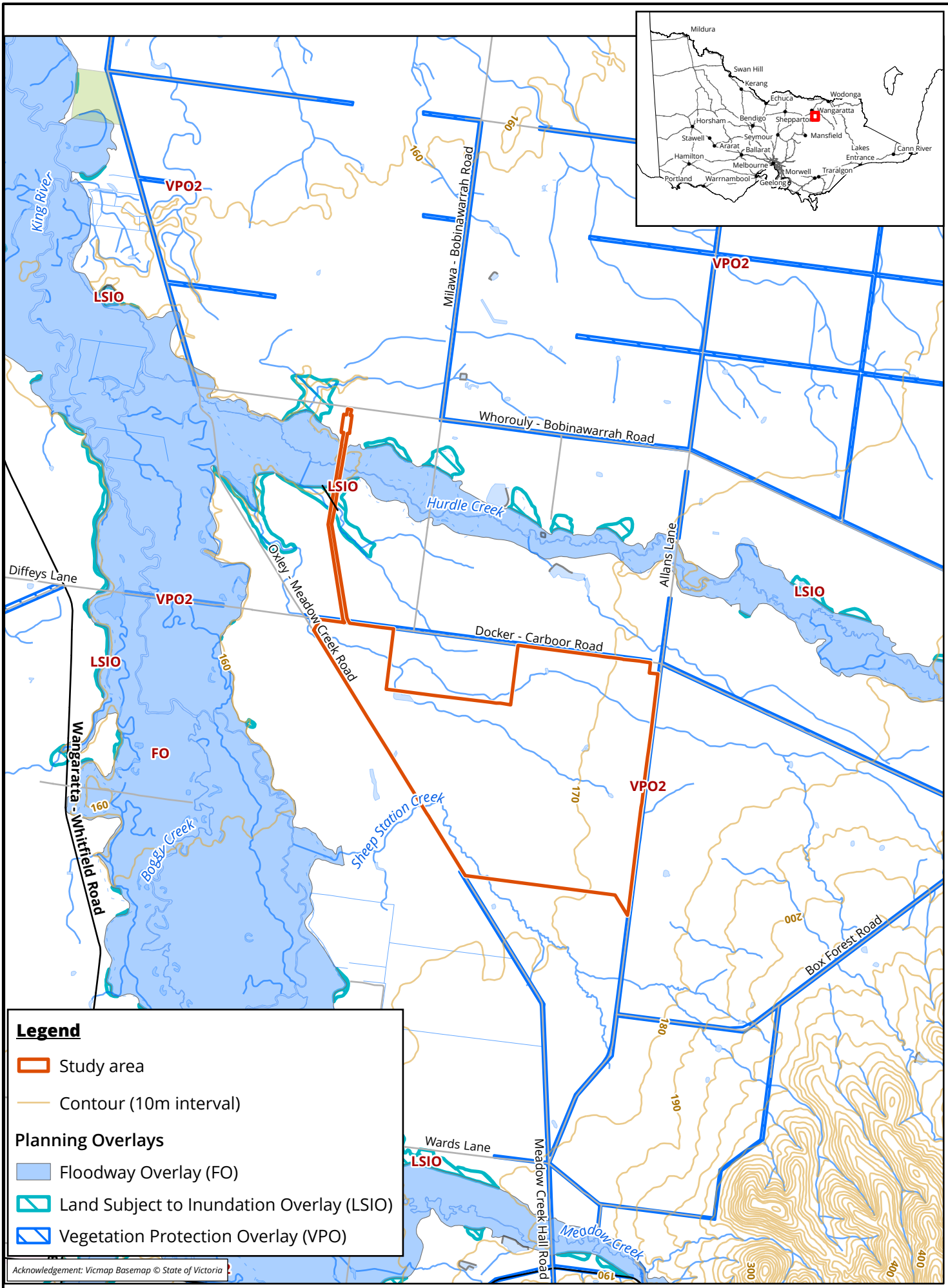

Figure 1 Location of the study area

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Matter: 37213
Date: 30 May 2024, Checked by: GZ, Drawn by: JPT, Last edited by: jturner
Layout: F1_Locality
Location: P:\37200s\37213\Mapping\37213_MeadowCreek_Ecology.aprx

0 500 1,000 1,500 2,000
Metres
Scale: 1:50,000 @ A4
Coordinate System GDA2020 MGA Zone 55

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2. Methods

2.1. Database review

In order to provide a context for the study area, information about flora and fauna from within 10 kilometres of the study area (the 'search area') was obtained from relevant biodiversity databases, many of which are maintained by the Victorian Government Department of Energy, Environment and Climate Action (DEECA) or the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW). Records from the following databases were collated and reviewed:

- DEECA's Victorian Biodiversity Atlas (VBA), including the 'VBA_FLORA25, FLORA100 & FLORA Restricted' and 'VBA_FAUNA25, FAUNA100 & FAUNA Restricted' datasets.
- DCCEEW's PMST for matters protected by the Commonwealth EPBC Act.

Other sources of biodiversity information were examined including:

- DEECA's NatureKit mapping tool.
- DEECA's Habitat Importance maps.
- DEECA's Native Vegetation Information Management (NVIM) system.
- Planning Scheme overlays relevant to biodiversity based on http://planningschemes.dpcd.vic.gov.au.

In addition to the desktop review of biodiversity databases, preliminary data collected by Red Gum Environmental Consulting in early 2022 was also reviewed. This information included vegetation and waterway mapping that appeared to be based on aerial imagery interpretation.

2.2. Definitions of threatened species or communities

Threatened species or communities include those species or communities that are listed under the EPBC Act and/or FFG Act. The conservation status of a species or ecological community is determined by its listing status under Commonwealth or State legislation / policy (Table 1).

Table 1 Conservation status of threatened species and ecological communities

Government level	Conservation status
National	Listed as nationally critically endangered, endangered or vulnerable under the EPBC Act
State	Listed as extinct, extinct in the wild, critically endangered, endangered, vulnerable or conservation dependent in Victoria under the FFG Act

Lists of threatened species generated from the databases are provided in Appendix B (flora) and Appendix C (fauna) and the species have been assessed to determine their likelihood of occurrence based on the process outlined below.

2.3. Determining likelihood of occurrence of threatened species

Likelihood of occurrence indicates the potential for a species or ecological community to occur regularly within the study area. It is based on expert opinion, information in relevant biodiversity databases and reports, and an assessment of the habitats on site. Likelihood of occurrence is ranked as negligible, low,

medium, high or recorded. The rationale for the rank assigned is provided for each species in Appendix B (flora) and Appendix C (fauna). Those species for which there is little or no suitable habitat within the study area are assigned a likelihood of low or negligible and are not considered further.

Only those species listed under the EPBC Act or the FFG Act (hereafter referred to as 'threatened species') are assessed to determine their likelihood of occurrence. The habitat value for threatened species is calculated by the Habitat Importance Modelling produced by DEECA (DELWP 2017a). Where threatened species are recorded in the study area this is noted in Appendix B (flora) and Appendix C (fauna).

Threatened species which have at least medium likelihood of occurrence are given further consideration in this report. The need for targeted survey for these species is also considered.

2.4. Site investigations

2.4.1. Flora and vegetation assessment

A preliminary site visit was undertaken by Matt Looby (Principal Ecologist) on 22 April 2022. A general flora assessment of the solar farm area was undertaken by Georgina Zacks (Senior Botanist), Jessica Chapman (Botanist) and Nicholas Lloyd (Botanist) on 24, 25 and 29 November and 15 December 2022. A general flora assessment of the transmission line area and the road reserves where crossing points are proposed surrounding the solar farm area was undertaken by Matt Looby and Nicholas Lloyd on 12 and 18 April 2024. A list of flora species was collected during all surveys. This list will be submitted to DEECA for incorporation into the Victorian Biodiversity Atlas (VBA). Planted species have not been recorded unless they are naturalised.

Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs, and grasses' (Clause 73.01).

The Guidelines classify native vegetation into two categories (DELWP 2017a):

- A **patch** of native vegetation (measured in hectares) is either:
  - An area of native vegetation, with or without trees, where at least 25% of the total perennial understorey cover is native plants.
  - An area with three or more native canopy trees where the drip line (i.e. the outermost boundary of a tree canopy) of each tree touches the drip line of at least one other tree, forming a continuous canopy.
  - Any mapped wetland included in the Current wetlands map, available in DEECA systems and tools.

Patch vegetation is classified into ecological vegetation classes (EVCs). An EVC contains one or more floristic (plant) communities, and represents a grouping of broadly similar environments. Definitions of EVCs and benchmarks (condition against which vegetation quality at the site can be compared) are determined by DEECA.

- A **scattered tree** is defined as a native canopy tree that does not form part of a patch of native vegetation.

A canopy tree is a mature tree that is greater than three metres in height and is normally found in the upper layer of a vegetation type. Ecological vegetation class descriptions provide a list of the typical canopy species. A scattered tree is defined as either small or large, and is determined using the large tree benchmark for the relevant EVC. The extent of a small scattered tree is the area of a circle with a 10 metre radius (i.e. 0.031

hectares), while the extent of a large scattered tree is a circle with a 15 metre radius (i.e. 0.070 hectares). A condition score is applied to each scattered tree based on information provided by DEECA's NVIM.

Vegetation Quality Assessments (VQAs) were completed in order to characterise the EVCs and EVC condition states broadly across the study area during fieldwork in 2022 (prior to finalisation of an impact footprint). The VQA method is consistent with DEECA's habitat hectare method (DSE 2004) and the Guidelines (DELWP 2017a). Following finalisation of an impact footprint for the project in 2024, further fieldwork was undertaken including completing VQAs in specific areas of proposed impact (e.g. crossing points from external public roads into the study area and across linear fence line vegetation within the study area).

During the VQAs completed in 2022 to characterise broad areas of patch vegetation (e.g. along linear woodland corridors along fencelines), large tree density and log density scores were calculated by averaging sampled areas within each EVC and condition state. During the April 2024 fieldwork, VQA scores were collected for specific areas of impact (e.g. road crossings). Site-specific VQA scores were compared with initial 2022 broadly representative VQA scores to ensure scores accurately represent vegetation on site.

For the purposes of this assessment the limit of the resolution for identification of a patch of native vegetation was taken to be 0.001 habitat hectares (Hha). That is, if a discrete patch native vegetation was present with sufficient cover but its condition and extent would not have resulted in the identification of at least 0.001 habitat hectares, the vegetation patch of vegetation was not mapped or included in the assessment.

Where relevant, notes were made on specific issues such as noxious weed infestations, evidence of management works (e.g. wetland drainage), current grazing impacts and the regeneration capacity of the vegetation.

Species nomenclature for flora follows VBA.

Point intercept flora transect surveys

During the flora and fauna assessment it was noted that some paddocks are subject to seasonal waterlogging and contain a patchy cover of native rushes (*Juncus* spp.) that colonise the paddocks from time to time. These rushes are actively controlled (slashing and spraying) as part of regular pasture maintenance. Additionally, the current flora and fauna assessment was conducted following a particularly wet winter. The preceding wet conditions encouraged the growth of opportunistic annual native species including Toad Rush *Juncus bufonius* and Lesser Loosetrife *Lythrum hyssopifolia*. To determine if paddocks support vegetation that meets the definition of patch vegetation under the Guidelines, point intercept flora transects were undertaken.

Point intercept flora transect surveys were undertaken on 15 December 2022 by Georgina Zacks (Consultant Botanist) and Jessica Chapman (Botanist). These surveys were completed in order to obtain a non-subjective estimate of the proportional cover of native and introduced vegetation within grazed paddocks across the solar farm portion of the study area.

The transects survey effort sampled grazed paddocks across the solar farm portion of study area. The perennial plant and other lifeform cover levels of grazed treeless paddock vegetation was collected according to a comprehensive life form schema using 15 allocated 50 metre × 1 metre point intercept transects (i.e. 750 data points across the site). A copy of the raw data results is provided in Appendix A. Locations of flora transects are provided in Figure 3. Photographs of all transect locations were taken.

The average cover of native plants (including perennial grasses, sub-shrubs, herbs/forbs and cryptogams) and non-native plants (including perennial and annual grass weeds, perennial and annual non-grass weeds) was calculated in order to confirm whether the cover of native vegetation within grazed paddocks was high

enough to meet the definition of patch vegetation as defined by the Guidelines (DELWP 2017). Another consideration for this Rush-dominated vegetation is whether it is exempt from the requirements of Clause 52.17 of the Planning Scheme as it is native 'regrowth' vegetation that is likely to be less than 10 years old (given regular control and pasture management), and has become established on land lawfully cleared in historical times.

2.4.2. Waterway and watercourse mapping and determination

As part of informing the solar farm design waterways and watercourses were mapped and a Waterway Determination was provided by Goulburn Murray Water. Natural and semi-natural drainage lines across farm paddocks were initially mapped using an uncorrected GPS-enabled tablet on 8 July 2022 by Matt Looby and Hannah Harbourd of Biosis. The intention of this mapping was to characterise these features and their habitat values for wetland and aquatic species. Background data was then provided to Goulburn Murray Water to request an official Waterway Determination. The Waterway Determination inspection covered the solar farm study area only and was conducted by Goulburn Murray Water. The results were provided to Biosis on 17 October 2022 (GMW ref A4507161, letter from Stephen Gemmill, Diversions Services East Manager). The official Waterway Determination identified one watercourse (Sheep Station Creek) and two waterways draining east to north-west across the solar farm site. The Waterway Determination assisted in identifying drainage features on the site that should be avoided, or where impacts should be minimised, during project design (Plate 1).

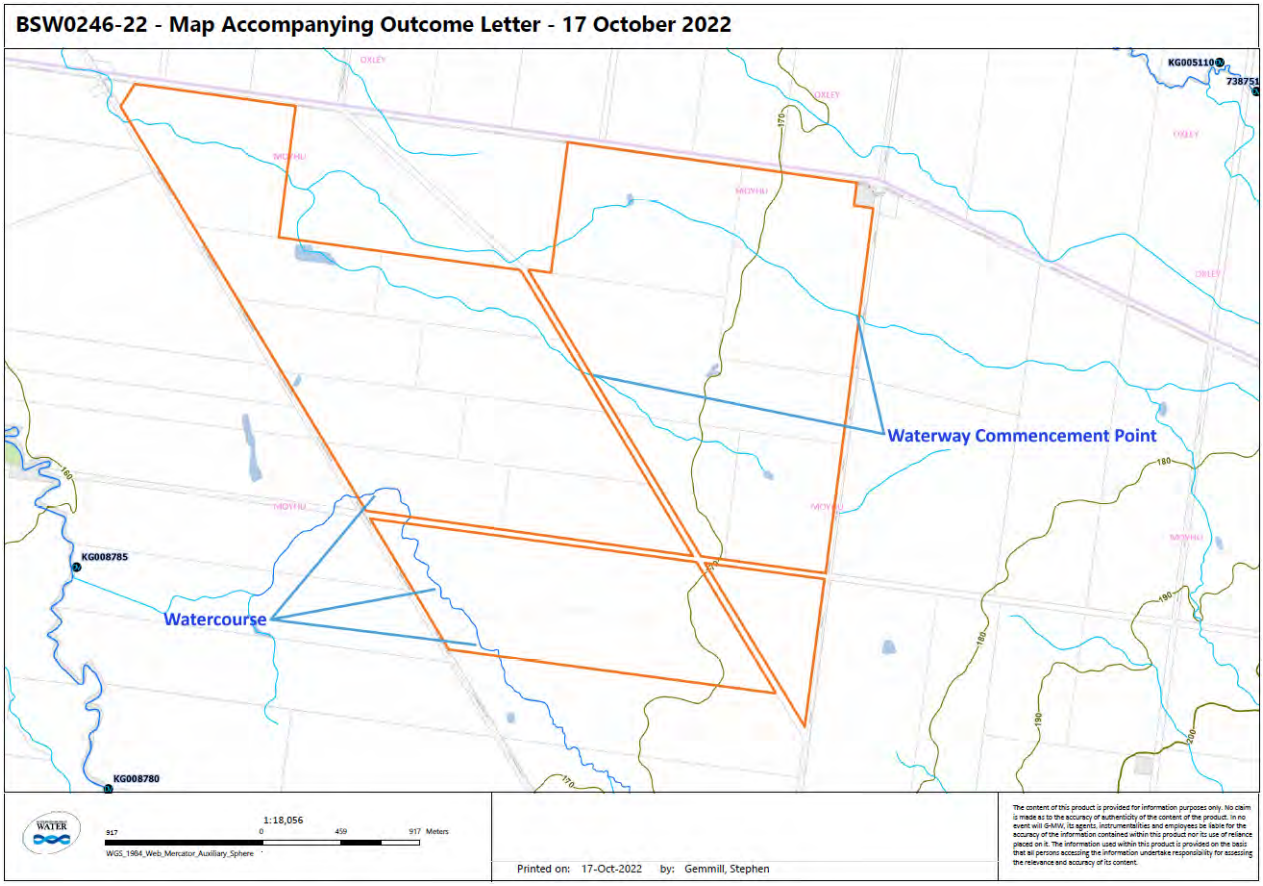


Plate 1 Waterway Determination results from Goulburn Murray Water, 17 October 2022.

2.4.3. Terrestrial fauna assessment

A desktop fauna assessment was undertaken by a zoologist to assess the fauna habitat values of the study area, and to determine the likelihood of threatened fauna species occurring. The desktop fauna assessment incorporated a review of database records of significant fauna, along with photographs and vegetation descriptions obtained during the flora assessment. Desktop assessments have been supplemented by the targeted survey work described below and habitat assessments by Matt Looby (Principal Ecologist, Biosis) over multiple site assessments during 2022, 2023 and 2024.

2.4.4. Targeted survey – Sloane's Froglet and nocturnal mammals

Based on the identification of potential habitat for the EPBC Act listed Sloane's Froglet during the preliminary site visit (April 2022), a targeted survey was recommended and then commissioned by Meadow Creek Solar Farm.

The targeted survey was undertaken on 18, 19 and 20 July 2022. Suitable Sloane's Froglet habitat was assessed during the day, and transects and survey points were established in habitat to be targeted during nocturnal surveys. Suitable habitat included permanent or semi-permanent farm dams, creeks and seasonally wet drainage lines within the study area (Figure 3).

Reference populations at the Wangaratta Common Nature Reserve (20 kilometres north-west of the study area) were visited directly prior to targeted surveys. These reference site checks confirmed conditions were considered optimal for survey with male Sloane's Froglet active and calling. Weather conditions on the three nights of targeted survey were considered favourable (Table 2).

Table 2 Weather data during Sloane's Froglet survey (Wangaratta weather station courtesy of Bureau of Meteorology, AWS 082138)

Survey Night	Date	Start time	Temperature at time of survey	Daily minimum temperature	Daily maximum temperature	Rainfall last 24 hours (mm)	Sunset
1	18 July 2022	1903	5.00ºC	1.4ºC	11.3ºC	4.6	1719h
2	19 July 2022	1822	3.4ºC	-3.7ºC	12.4 ºC	0.0	1720h
3	20 July 2022	1856	5.00ºC	-3.0ºC	14.7 ºC	0.0	1721h

Survey for Sloane's Froglet included observers listening for calls and scanning the area using torches to detect frogs within the transect area over a period of four hours each night at seven sites across the solar farm (Figure 3). Call playback was also utilised wherever suitable habitat was encountered and included a quiet listening period followed by call playback in accordance with relevant survey guidelines (e.g. Knight 2013). Call playback and listening locations are located in Figure 3.

The surveys were undertaken in July 2022 in order to coincide with the Sloane's Froglet breeding season when males would be making advertising calls. Transect surveys consisted of two observers moving through suitable habitat such as permanent or semi-permanent farm dams, seasonally wet depressions and creeklines (Figure 3). As the observers moved, visual encounter searches (Crump and Scott 1994) were undertaken for frogs perching on in-stream or fringing vegetation, logs, in wet soil cracks and on exposed banks. Nocturnal searches were undertaken using LED headlamps.

Nocturnal listening surveys were also undertaken at the same locations. At each listening point, two observers spent at least 10 minutes listening for calling frogs. Where no Sloane's Froglet were heard after 10 minutes, call play back was used to elicit a response for a further 2 minutes.

Measures to reduce the risk of spreading infectious pathogens such as chytrid fungus between sites were implemented where required (DECC 2008).

During the targeted frog survey opportunistic nocturnal spotlighting was also undertaken for arboreal mammals. These surveys were undertaken with LED headtorches and Olights.

All frog and nocturnal surveys were undertaken by Jack Fursdon and Jess Chapman from Biosis.

2.4.5. Permits

Biosis undertakes flora and fauna assessments under the following permits and approvals:

- Wildlife Authorisation issued by DEECA under the Victorian *Wildlife Act 1975* (Permit Number 10010193).
- Permit to Take/Keep Protected Flora issued by DEECA under the FFG Act (Permit Number 10010194).
- Permit to Take Protected Fish issued by DEECA under the FFG Act (Permit Number 10010195).
- Permit to Conduct Research in areas managed by the Parks Victoria issued by DEECA under the Victorian *National Parks Act 1975*, *Crown Land (Reserves) Act 1978* and *Parks Victoria Act 2018* (Permit Number 10010071).
- Permit to catch and release fish issued by the Victorian Fisheries Authority under the Victorian *Fisheries Act 1995* (Permit Number RP 1220, Personal File Number 13041).
- Approvals 18.21 and 20.21 issued by the Wildlife and Small Institutions Animal Ethics Committee of the Victorian Government.
- Scientific Procedures Fieldwork Licence issued by the Victorian Government Wildlife and Small Institutions Animal Ethics Committee (Licence Number 20020).

2.5. Qualifications

Ecological surveys provide a sampling of flora and fauna at a given time and season. There are a number of reasons why not all species will be detected at a site during survey, such as low abundance, patchy distribution, species dormancy, seasonal conditions, and migration and breeding behaviours. In many cases these factors do not present a significant limitation to assessing the overall biodiversity values of a site.

The current flora and fauna assessment was conducted across multiple seasons including late spring and early summer 2022, which is a reasonable time for ecological surveys on the drier northern plains of Victoria. The survey was undertaken following a particularly wet winter associated with La Niña driven weather systems across south-eastern Australia. The wet conditions contributed to the prolonged persistence of annual weed species, with dense cover in some locations making identification of native understorey species difficult at times. Despite this, the survey effort was considered sufficient to assess the general values of the study area given the modified condition and ongoing agricultural land use.

Native Vegetation Removal Reports are prepared through DEECA's NVIM system or requested through DEECA's Ensym NVR Tool Support team. Biosis supplies relevant site-based spatial information as inputs to DEECA and we are reliant on DEECA's output reports for all assessment pathway applications. Biosis makes

every effort to ensure site and spatial information entered into the NVIM, or supplied to DEECA, is an accurate reflection of proposed native vegetation removal.

2.6. Legislation and policy

The implications for the project were assessed in relation to key biodiversity legislation and policy including:

- Matters listed under the EPBC Act, associated policy statements, significant impacts guidelines, listing advice and key threatening processes
- Threatened taxa, communities and threatening processes listed under Section 10 of the FFG Act and associated action statements and listing advice
- Guidelines for the removal, destruction or lopping of native vegetation (DELWP 2017a)
- *Planning and Environment Act 1987* – specifically Clauses 12.01-2, 52.17 and 66.02 and Overlays in the Wangaratta Planning Scheme.
- *Environment Effects Act 1978*.
- Noxious weeds and pest animals lists under the *Catchment and Land Protection Act 1994* (CaLP Act).
- *Water Act 1989*.

2.7. Mapping

Meadow Creek Solar Farm supplied site plans of proposed solar farm layout and transmission line easement (P0050228_Meadow Creek Solar Farm_Revision_C, revision date 21 May 2024).

Mapping was conducted using hand-held GPS-enabled tablets and aerial photo interpretation. The accuracy of this mapping is therefore subject to the accuracy of the tablets (generally ± 5 metres) and dependent on the limitations of aerial photo rectification and registration.

Mapping has been produced using a Geographic Information System (GIS). Electronic GIS files which contain our flora and fauna spatial data are available to incorporate into design concept plans. However this mapping may not be sufficiently precise for detailed design purposes.

3. Results

The ecological features of the study area are described below and mapped in Figure 2.

Species recorded during the flora and fauna assessment are listed in Appendix B (flora) and Appendix C (fauna). Unless of particular note, these species are not discussed further.

Threatened species / communities recorded or predicted to occur in the local area are also provided in those appendices, along with an assessment of the likelihood of the species / community occurring within the study area.

3.1. Vegetation and fauna habitat

The majority of the study area, including the solar farm and transmission line, is highly modified due to extensive land clearing and pasture improvement. Remnant native vegetation within the study area occurs as fragmented woodland, generally in linear corridors along fence lines or drainage lines, or as scattered paddock trees. This pattern is typical across the local landscape where historical clearing for farming has significantly reduced native vegetation cover.

Sheep Station Creek runs through the south-west part of the solar farm and Hurdle Creek runs through the transmission line easement. Smaller, unnamed seasonal drainage lines occur across the study area, including natural and constructed drainage features. These features are likely to hold water on a seasonal basis and support a mix of native wetland plants (sedges and rushes), and areas dominated by introduced pasture and weeds. This wetland vegetation and the seasonal aquatic habitats within drainage lines provide habitat for waterbirds and frogs.

Several areas along these drainage lines have been revegetated with locally indigenous and non-indigenous native trees and shrubs, including one section of Blue Gum *E. globulus* plantation on Sheep Station Creek. Revegetation works have also occurred at various locations within the solar farm portion of the study area for the creation of shelter belts. The trees and shrubs within these shelter belts comprise locally-indigenous species, Australian native species and introduced ornamental species. Planted native and introduced vegetation provides foraging and nesting opportunities for woodland birds, bats and arboreal mammals.

Some paddocks are subject to seasonal waterlogging and contain a patchy cover of native rushes *Juncus* spp. that colonise the paddocks from time to time. These rushes are actively controlled through grazing, slashing and spraying as part of regular pasture maintenance, however provide habitat for common frog and waterbird species. Additionally, the current flora and fauna assessment was conducted in late spring following a particularly wet winter. The preceding wet conditions also encouraged the growth of opportunistic annual species including Toad Rush *Juncus bufonius* and Lesser Loostrife *Lythrum hyssopifolia* within cleared paddocks otherwise dominated by introduced pasture grasses.

Many drainage lines within the study area have a high prevalence of native Rushes *Juncus* spp. Rushes are common in wet and damp habitats, such as wetlands, creeklines, drainage lines and depressions with impeded drainage. They often act as colonisers of wet or waterlogged soils and can be problematic in agricultural settings by reducing the productivity of pasture or arable land. Rushes generally favour neutral to slightly acidic soils.

The study area was assessed during 2022, which was a particularly wet year across southern Australia. The cover of *Juncus* spp. within these seasonally wet depressions was high, however this is likely to not always be

the case. During drier years when conditions are less favourable for growth of Rushes, it is likely that introduced pasture grasses are able to outcompete *Juncus* spp. and their cover will be reduced, and that Rushes will be controlled as part of pasture management practices.

The cover of Rushes within the study area is likely to fluctuate with both environmental conditions and management activities. As perennial species, *Juncus* spp. within the study area may live for multiple years, however within the agricultural context of the study area it is likely that these Rushes are subject to regular control methods including chemical control or physical removal. Considering this, seasonally wet areas exclusively support Rushes as the only native species were not considered in patch vegetation mapping (see Figure 2). Where a seasonally wet area supported other native species indicative of true wetland vegetation (e.g. Spike Sedges *Eleocharis* spp., Swamp Wallaby-grasses *Amphibromus* spp. and/or Northern Water-ribbons *Cycnogeton multifructum*), these areas are included in patch vegetation mapping (Figure 2). These wetlands are considered to be a derived condition state of the original grassy woodland vegetation that once occurred across the study area.

Multiple farm dams occur across the study area and most have unrestricted livestock access, resulting in a general lack of dense fringing aquatic vegetation and high nutrient and turbidity levels. A large, fenced dam occurs in the north-west part of the solar farm and this dam supports some areas of fringing aquatic vegetation. Farm dams provide habitat and foraging opportunities for wetland birds, frogs and turtles, and are a water source for local wildlife populations.

Farm infrastructure such as tracks, buildings and sheds occur across the study area. Some woodland birds, common farmland birds and microbats may roost in farm buildings.

Photos of site and habitat features are provided in Appendix D.

3.2. Landscape context

Much of the land surrounding the study area has been subject to agricultural land use, and has been cleared for pasture and cropping, including nearby intensive cattle feedlots that are largely devoid of vegetation. As it is in the study area, native vegetation is restricted to scattered paddock trees, small remnant patches retained in paddocks or linear corridors along roads, fence lines and waterways in the surrounding landscape.

The study area is within the Ovens River catchment and the King River sub-catchment and intersects a number of waterways and watercourses. These include Sheep Station Creek, which occurs within the solar farm portion of the study area, and Hurdle Creek, which runs east to west through the transmission line easement. Other named and unnamed creeks and tributaries of the King River also flow through the study area and surrounding landscape. The King River is a perennial river which flows from the north-western slopes of the Alpine National Park in the Victorian Alpine region, and is located approximately 1 to 2 kilometres to the west of the study area. Information on Waterway Determinations is provided in Section 2.4.2 and Plate 1.

Hurdle Creek, Sheep Station Creek and the King River all support narrow corridors of fringing riparian vegetation which create habitat corridors through the otherwise substantially cleared landscape. Large tracts of remnant native vegetation occur to the south-east of the study area, composing State Forest and smaller sections of private land. These distance more intact stands of native vegetation have connectivity with the Alpine National Park (approximately 32 kilometres south of the study area) and are likely to support a number of threatened species.

Table 3 Summary of vegetation and habitat types within the study area

Vegetation or habitat type	Description	Location	Significant values
Plains Grassy Woodland EVC 55 **Bioregional Conservation Status (BCS): Endangered**	**HZ 1, 2 and 3 (intact):** Where this EVC is intact (i.e. treed not derived), the canopy trees form a woodland to 15 to 25 metres tall. The dominant canopy species is River Red-gum *E. camaldulensis* with the occasional Blakely's Red-gum *Eucalyptus blakelyi*, Yellow Box *E. melliodora,* Red Box *E. polyanthemos* and Apple Box *E. bridgesiana*. The variable understorey supports a range of common grasses and forbs including Jersey Cudweed *Laphangium luteoalbum*, Wallaby-grasses *Rytidosperma duttonianum* and *Rytidosperma racemosum* var. *racemosum*, and Slender Dock *Rumex brownii*. Additionally, opportunistic annual species including Toad Rush *Juncus bufonius* and Lesser Loostrife *Lythrum hyssopifolia* occur in the understorey. These species are likely in higher abundance at the time of assessment due to the antecedent wet conditions. Species indicative of seasonal waterlogging are also present in some areas, especially around farm dams and where natural and artificial drainage lines exist. These wetter areas support species including Tall Sedge *Carex appressa*, Poong'ort *Carex tereticaulis* and Common Swamp Wallaby-grass *Amphibromus nervosus*. **Derived condition state:** This EVC occurs in a derived condition state where the canopy has been historically removed and the perennial understorey vegetation cover is greater than 25 percent native. Some paddocks support shallow depressions where water is seasonally-held. Wetland plants have colonised these areas, including species such as Northern Water-ribbons *Cycnogeton multifructum*, Common Spike-sedge *Eleocharis acuta* and Rushes *Juncus* spp. The cover of these plants	The intact condition state of this EVC generally occurs in linear corridors along road reserves, internal fence lines and property boundaries. Wetter areas of this intact EVC occur around a farm dam in the south-east corner of the solar farm, and along a drainage line within the east/west oriented linear corridor of vegetation in the southern end of the solar farm. Derived patches of this EVC occur within seasonally wet depressions just to the east of Sheep Station Creek in the south-east of the solar farm.	Woodland vegetation associated with intact EVC 55 provides habitat for a range of woodland-dependent fauna including threatened woodland birds, bats, reptiles, arboreal mammals, ground-dwelling small and large marsupials and common farmland birds. Where EVC 55 occurs on seasonally wet soils it may also support common and threatened frog species. This EVC can be associated with the EPBC Act listed critically endangered *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* threatened ecological community. A determination of community presence within the study area is provided in Section 3.3.2.

Vegetation or habitat type	Description	Location	Significant values
	will fluctuate subject to water availability, and is likely to have supported a relatively high cover of wetland plants at the time of assessment considering the antecedent wet conditions. In both intact and derived condition states of this EVC, weed cover is high. This EVC is in moderate to poor condition throughout the study area due historical land clearing, land use (i.e. long term grazing), pasture management and weed invasion.		
Creekline Grassy Woodland EVC 68 **BCS: Endangered**	This EVC occurs as a tall riparian woodland to 30 metres tall, with a canopy dominated by River Red-gum. In some areas, recruitment of River Red-gum saplings forms a dense midstorey to 8 metres tall. The understorey vegetation is variable, but generally supports scattered native species including Knob Sedge *Carex inversa*, Weeping Grass *Microlaena stipoides* var. *stipoides,* Lesser Joyweed *Alternanthera denticulata* and Common Swamp Wallaby-grass *Amphibromus nervosus.* In some areas, there is a sparse native shrub cover to 2 metres tall due to previous revegetation works, with species including River Bottlebrush *Callistemon sieberi* and various Wattles *Acacia* spp. Cover of introduced species is high throughout this EVC, and is generally made up of introduced pasture grass Toowoomba Canary Grass *Phalaris aquatica.*	Occurs along Sheep Station Creek within the solar farm portion of the study area and along Hurdle Creek to the north in the transmission line portion of the study area.	This riparian vegetation provides important habitat and movement corridors for common and threatened fauna including woodland birds, bats, reptiles, arboreal mammals, ground-dwelling small and large marsupials, common farmland birds and frogs.
Predominantly introduced vegetation	Dominant groundcover species of these areas include pasture grasses and weeds such as Toowoomba Canary Grass, Wimmera Rye-grass *Lolium rigidum,* Paspalum *Paspalum dilatatum,* Curled Dock *Rumex crispus,* Clovers *Trifolium* spp. and Flatweed *Hypochaeris radicata*.	The majority of the study area, which has been used for agricultural purposes and is currently used mostly for cattle grazing and some cropping.	Pasture in the solar farm portion of the study area is regularly harrowed and fallen timber from scattered trees is removed limiting habitat opportunities for small birds, reptiles or small ground-dwelling mammals. Predominantly introduced vegetation offers limited habitat, except for common

Vegetation or habitat type	Description	Location	Significant values
			farmland birds, foraging for common wetland birds and grazing opportunities for mobile fauna such as large macropods.
Scattered trees	Scattered trees occur where the ground layer vegetation is predominantly introduced pasture and weeds. These scattered trees relicts of the former woodland vegetation and occur in small clusters or as isolated individuals. They are generally large old specimens that hollows suitable for wildlife nesting and denning.	Within paddocks throughout the study area (both solar farm and transmission line portions).	May be occasionally used for foraging and nesting/roosting by woodland birds and microbats.

3.3. Threatened species and ecological communities

3.3.1. Threatened species

Threatened species recorded or predicted to occur within 10 kilometres of the study area or from the relevant catchment (aquatic species) are listed in Appendix B (flora) and Appendix C (fauna). An assessment of the likelihood of these species occurring in the study area and an indication of where within the site (i.e. which habitats or features of relevance to the species) is included. A summary of those species recorded, or with a medium or higher likelihood of occurring in the study area, is provided in Table 4. Following completion of detailed on-ground surveys, no threatened flora species are considered likely to occur.

Table 4 Summary of EPBC and FFG Act listed species most likely to occur in the study area

Species name	Listing status	Area of value within the study area
Fauna		
Latham's Snipe *Gallinago hardwickii*	Vulnerable under EPBC Act	Wet pasture areas
Gang-gang Cockatoo *Callocephalon fimbriatum*	Endangered under EPBC Act	Woodland patches, scattered trees, roadside vegetation, planted vegetation and riparian corridors.
Blue-winged Parrot *Neophema chrysostoma*	Vulnerable under EPBC Act	Woodland and shelter belts across the study area
Swift Parrot *Lathamus discolor*	Critically Endangered under EPBC Act Critically Endangered under FFG Act	Woodland patches, winter-flowering trees, scattered trees, roadside vegetation, planted vegetation and riparian corridors.
White-throated Needletail *Hirundapus caudacutus*	Vulnerable under EPBC Act Vulnerable under FFG Act	Airspace above the study area.
Hooded Robin *Melanodryas cucullata*	Endangered under EPBC Act Vulnerable under FFG Act	Woodland patches and shelterbelt vegetation across the study area.
Southern Whiteface *Aphelocephala leucopsis*	Vulnerable under EPBC Act	Patch and shelterbelt vegetation across the study area.
Painted Honeyeater *Grantiella picta*	Vulnerable under EPBC Act Vulnerable under FFG Act	Woodland patches, mistletoe, scattered trees, roadside vegetation, planted vegetation and riparian corridors.
Regent Honeyeater *Anthochaera phrygia*	Critically Endangered under EPBC Act Critically Endangered under FFG Act	Woodland patches, winter-flowering trees, scattered trees, roadside vegetation, planted vegetation and riparian corridors.
Diamond Firetail *Stagonopleura guttata*	Vulnerable under EPBC Act Vulnerable under FFG Act	Woodland patches and shelterbelt vegetation across the study area.
Brown Treecreeper *Climacteris picumnus*	Vulnerable under EPBC Act	Woodland patches and shelterbelt vegetation across the study area.

Species name	Listing status	Area of value within the study area
Grey-headed Flying-fox *Pteropus poliocephalus*	Vulnerable under EPBC Act Vulnerable under FFG Act	Woodland patches, scattered trees, roadside vegetation, planted vegetation and riparian corridors.
Sloane's Froglet *Crinia sloanei*	Endangered under EPBC Act Endangered under FFG Act	Farm dams, creek lines and seasonal drainage lines.
Magpie Goose *Anseranas semipalmata*	Vulnerable under FFG Act	Farm dams, creek lines, seasonal drainage lines and wet pasture
Australasian Shoveler *Spatula rhynchotis*	Vulnerable under FFG Act	Farm dams and creek lines
Hardhead *Aythya australis*	Vulnerable under FFG Act	Farm dams and creek lines
Blue-billed Duck *Oxyura australis*	Vulnerable under FFG Act	Farm dams and creek lines
Little Eagle *Hieraaetus morphnoides*	Vulnerable under FFG Act	Woodland patches, scattered trees, roadside vegetation, planted vegetation and riparian corridors.
Barking Owl *Ninox connivens*	Critically Endangered under the FFG Act	Woodland patches, scattered trees, large hollow-bearing trees, roadside vegetation, planted vegetation and riparian corridors.
Powerful Owl *Ninox strenua*	Vulnerable under FFG Act	Woodland patches, scattered trees, large hollow-bearing trees, roadside vegetation, planted vegetation and riparian corridors.
Turquoise Parrot *Neophema pulchella*	Vulnerable under FFG Act	Woodland patches, scattered trees, hollow-bearing trees and stumps, roadside vegetation, planted vegetation and riparian corridors.
Grey-crowned Babbler *Pomatostomus temporalis*	Vulnerable under FFG Act	Woodland patches, roadside vegetation, planted vegetation and riparian corridors.
Speckled Warbler *Pyrrholaemus sagittatus*	Endangered under the FFG Act	Woodland patches and roadside vegetation.
Brush-tailed Phascogale *Phascogale tapoatafa*	Vulnerable under FFG Act	Woodland patches, scattered trees, hollow-bearing trees, roadside vegetation and riparian corridors.
Squirrel Glider *Petaurus norfolcensis*	Vulnerable under FFG Act	Woodland patches, scattered trees, hollow-bearing trees, roadside vegetation and riparian corridors.
Murray River Turtle *Emydura macquarii*	Critically Endangered under the FFG Act	Farm dams, creek lines and seasonal drainage lines.
Brown Toadlet *Pseudophryne bibronii*	Endangered under the FFG Act	Farm dams, creek lines and seasonal drainage lines.

3.3.2. Threatened ecological communities

EPBC Act listed threatened ecological communities

The EPBC Protected Matters Search Tool indicates three nationally significant threatened ecological communities (TECs) are predicted to occur within the search area:

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

The Buloke and Grey Box communities are not present in the study area as characteristic dominant tree species for each community were not recorded in woodland vegetation.

Throughout much of the study area and surrounds, the canopy of Plains Grassy Woodland EVC 55 vegetation is dominated by River Red-gum *E. camaldulensis*. These areas are inconsistent with the Box-Gum Grassy Woodland TEC due to non-dominance of the required canopy species. However, some patches of vegetation along roads immediately adjacent to the study area, and along licenced unused road reserves and in small patches within the study area were identified as having potential to qualify as the Box-Gum Grassy Woodland TEC where Blakely's Red-gum (*E. blakelyi*) and/or Yellow Box (*E. melliodora*) trees are co-dominant with River Red-gum or occur as sub-dominant canopy trees.

In many cases it was impossible to tell whether trees were River Red-gum or Blakely's Red-gum. The two species are incredibly similar morphologically and are known to intergrade with one another in north-east Victoria (VicFlora 2024). The main visual distinction between the two species occurs in the flower buds, so where fertile material was present a definitive identification was possible. However, there was generally an absence of fertile material on trees within the study area and in many cases a definitive identification was not possible. Consistent with a conservative approach, for the purposes of TEC determination, where the dominant tree identification could not be confirmed we have assumed that areas are dominated by Blakely's Red-gum. An assessment of areas of Plains Grassy Woodland EVC 55 where Blakely's Red-gum may be dominant was undertaken against the key diagnostic criteria for Box-Gum Grassy Woodland TEC (DEH 2006) as outlined below in Table 5 below.

Table 5 Justification for Box Gum Woodland within the study area (criteria from DEH 2006)

Criterion	Response	Justification
Is, or was, at least one of the overstorey species White Box, Yellow Box or Blakely's Red-gum?	Yes	Blakely's Red-gum and Yellow Box are present within EVC 55 within the study area. Where the canopy has been removed (i.e. vegetation is derived) a conservative approach has been taken and assumes that the original canopy was one of these species.
Does the patch have a predominantly native understorey? Requires 50% of the perennial vegetation ground cover to be made up of native species.	Within derived wetland habitat zones: Yes	Although weed cover is high in some areas, this is mostly made up of annual species which do not contribute to perennial vegetation cover. Perennial understorey cover is greater than 50% native due to presence of perennial wetland species such as Common Swamp-wallaby Grass *Amphibromus nervosus*, Common Spike-sedge *Eleocharis acuta* and Northern Water-ribbons *Cycnogeton multifructum*.
	Within habitat zones / condition states 1, 2, 3: No	Due to higher levels of historical disturbance and/or proximity to areas of higher disturbance, cover of perennial weed species is greater than 50% in these habitat zones and the cover of native species is reduced. These areas are not the community as they do not meet the condition threshold.
Is the patch greater than 0.1 hectares?	Yes	Of the derived wetland zones that answered yes above, one is greater than 0.1 hectare in size. All others are below 0.1 hectares. **The community is not present in these areas.**
Are there ≥ 12 native understorey species (excluding grasses) and one 'important species'	No	The habitat zone above >0.1 ha did not have more than 12 native understorey species present, excluding grasses. **Therefore the community is not present.**

Therefore, on the basis of the criteria for determining the presence of the Box Gum Woodland community (DEH 2006), the community is not considered present within the study area due to high levels of modification to remnant native vegetation.

FFG Act listed threatened ecological communities

Three FFG Act TECs are known from the local area including:

- Granite Foothills Spring Wetland (North-east Victoria) Community
- Grey Box - Buloke Grassy Woodland Community
- Victorian Temperate Woodland Bird Community.

The FFG Act listed Granite Foothills Spring Wetland and Grey Box - Buloke woodland communities do not occur in the study area due to lack of characteristic landscape settings and floristic elements. Some of the 24

species that compose the Temperate Woodland Bird Community occur, or are likely to occur, in remnant woodland on the site or adjacent roadsides including Diamond Firetail, Hooded Robin, Speckled Warbler, Grey-crowned Babbler, Swift Parrot, Turquoise Parrot and Brown Treecreeper.

3.4. Other ecological values

3.4.1. Aquatic species

There is the potential for listed threatened aquatic species to occur within the waterways located within the study area. Southern Pygmy Perch (*Nannoperca australis* Murray-Darling Basin lineage) has been recorded in the adjoining King River which is listed as Vulnerable under the EPBC Act. However, this species has generally disappearance from much of its former Victorian range north of the Great Dividing Range. Its presence would substantially rely on the semi-permanent retention of water in local creeks (or rapid re-colonisation from a source population following drying out of local creeks) and that pools /creeks support abundant macrophytes. Given Sheep Station Creek is a seasonal waterway and aquatic habitats in Hurdle Creek are highly modified due to livestock access this species is consider to have a low likelihood of occurring in local creeks. Trout Cod (*Maccullochella macquariensis)* and Murray Cod (*Maccullochella peelii)* listed as endangered and vulnerable, respectively under the EPBC Act are known to occur within the surrounding area, however most likely occur in the King River and not the small tributaries crossing the study area.

Hurdle Creek has various VBA fish records including River Blackfish (*Gadopsis marmoratus*), Two-spined Blackfish (*Gadopsis bispinosus*) and Mountain Galaxias (*Galaxias olidus*). There is a 'WaterWatch' site located on Hurdle Creek. The site has a Stream Invertebrate Grade Number- Average Level (SIGNAL) score of 2.5 and a weighted score of 5 (a score calculated based on the presence of certain macroinvertebrates). A SIGNAL score of 5 indicates 'moderate pollution'. For reference, a signal score higher than 6 would have indicated a 'healthy habitat' and a score of less than 4 would have indicated 'severe pollution'. The waterway Index Stream Condition Score (ISC) of the King River ranges from ISC 2010, ISC 1999 and ISC 2004.

3.4.2. DEECA mapped wetlands

There are two DEECA mapped wetlands within the solar farm portion of the study area. Wetland number 75062 is approximately 1.2 hectares and occurs in the north-eastern extent of the solar farm. The area supports a farm dam with fringing planted vegetation.

Wetland number 75029 approximately 17.3 hectares and primarily lies within a paddock outside the study area, along the northern boundary of the solar farm and extending slightly to the north into the road reserve of Docker-Carboor Road. The area is used as a grazing paddock, supporting scattered native trees and farm dams.

3.4.3. Waterways and watercourses

According to the Waterway Determination presented in Section 2.4.2 there is one watercourse (Sheep Station Creek) and two waterways (central and northern waterways) on the solar farm site. The Waterway Determination did not cover the transmission line corridor and is of less relevance as there will be limited ground and waterway disturbance for the overhead power line. The overhead transmission line will span Hurdle Creek to the north of the solar farm site with pole locations setback from the riparian zone of the creek.

Sheep Station Creek flows into the south-west corner of the solar farm site and passes through the site for 1200 metres. The creek is lined with revegetation, is mostly protected from livestock access and appears to

have a semi-permanent flow regime (Plate 2). The central determined waterway originates in the south-east part of the site and drains to a large dam in the north-west of the site. This waterway is highly modified and poorly defined as it traverses grazed paddocks (Plate 3).

The northern determined waterway enters the site from the east and travels in a westerly direction through the site, and adjacent land, before leaving the site at a culvert under Oxley-Meadow Creek Road. This waterway is also highly modified with several inline farm dams, some bed and bank definition and a sparse cover of native Rush species (Plate 4).

Plate 2 **Typical photo of Sheep Station Creek in the study area, this creek is mostly protected from livestock access and grazing with the immediate riparian zone supporting revegetation (22 April 2022)**

Plate 3 **Typical photo of the central determined waterway that has poorly defined bed and banks, and flows through grazed paddocks across the solar farm site (22 April 2022)**

Plate 4 **Typical photo of the northern determined waterway which has some bed and bank definition, and flows through grazed paddocks across the solar farm site (22 April 2022)**

3.4.4. Point intercept transect results

Results of the 15 point intercept transects are shown below in Table 6. Total native ground cover (including perennial, annual and non-vascular) ranged from 0 to 50 percent, with an average of 13.7 per cent cover (DELWP 2017). This comprised an average of 11.3 per cent annual native cover, an average of 2.3 percent perennial native cover and an average of 0.1 per cent non-vascular cover. In contrast, perennial introduced cover averaged 21.3 percent, therefore perennial understorey cover within grazed paddocks is approximately 10 per cent native and does not meet the definition of patch vegetation (DELWP 2017).

Table 6 Plant cover results from point intercept transects in grazed paddocks (see Figure 3 for point locations)

Cover type	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	Mean
Perennial native cover (%)	0	0	2	8	0	10	0	0	0	0	2	0	8	0	4	**2.3**
Annual native cover (%)	2	2	8	42	2	8	8	4	0	8	4	34	42	2	4	**11.3**
Cryptogam cover (%)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0.1**
Total native cover (%)	2	2	8	42	2	8	8	4	0	8	4	34	42	2	4	**13.7**
Perennial introduced cover (%)	42	14	12	18	12	18	18	42	38	8	12	6	8	48	24	**21.3**
Annual introduced cover (%)	36	66	54	10	78	24	46	26	38	62	46	34	36	40	44	**42.7**
Total introduced cover (%)	78	80	66	28	90	42	64	68	76	70	58	40	44	88	68	**64.0**

3.5. Sloane's Froglet targeted survey and nocturnal survey results

Sloane's Froglet is a small ground dwelling frog that superficially resembles other common species of *Crinia.* The species can be distinguished by the distinctive male call (ACC and OEH 2017).

Sloane's Froglet historical distribution includes north central Victoria through central western NSW to the Queensland border (Knight 2013, 2014, ACC and OEH 2017). Although historically infrequently recorded throughout its range, the species is considered to have undergone a population contraction in recent years. A number of factors have been attributed to this decline, which include habitat modification and reduction via agricultural and residential development (ACC and OEH 2017), predation by introduced fish (Knight 2014) and possibly the amphibian disease chytridiomycosis caused by the pathogen *Batrachochytrium dendrobatidis* (chytrid fungus) (ACC and OEH 2017).

The life-cycle of Sloane's Froglet is poorly understood but the breeding season is typically thought to commence in mid-April throughout winter and into early spring, with eggs being deposited on submerged vegetation and metamorphosis observed in spring (Knight 2014). Tadpoles are thought to take 11 weeks to reach metamorphosis but this may vary depending on water temperature (Anstis 2002).

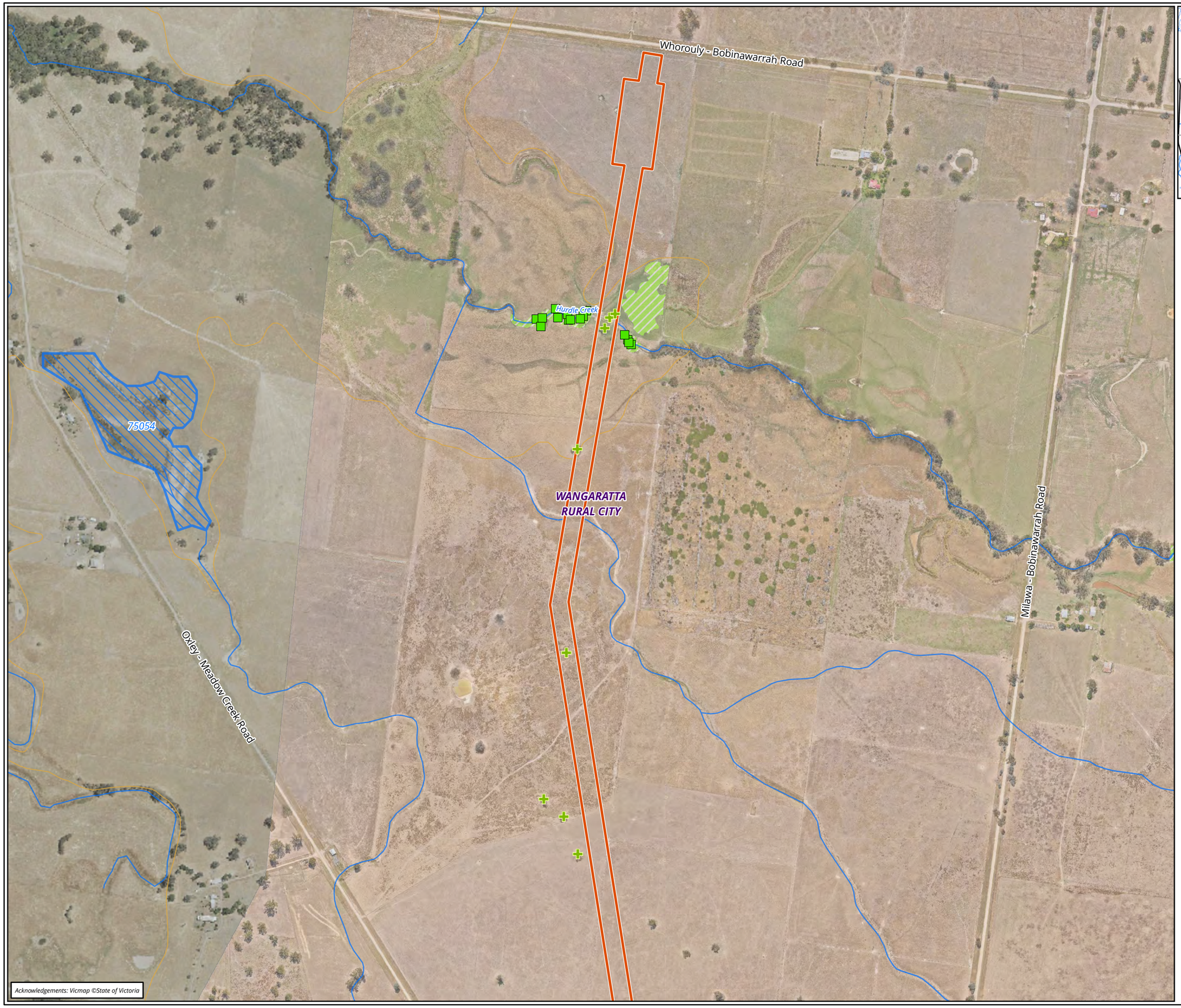
Sloane's Froglet was recorded at only one of the seven targeted survey locations in July 2022. The species was recorded along Sheep Station Creek within the solar farm study area (Figure 2 and Figure 3). Photos of Sloane's Froglet and its habitat along Sheep Station are provided below in Plate 5 and Plate 6.

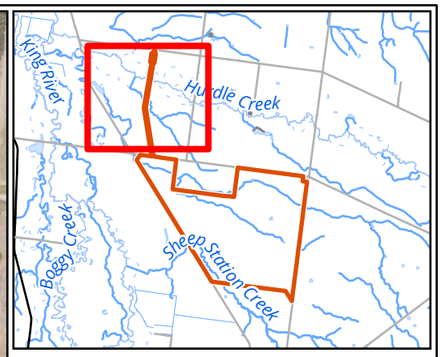
Plate 5 Sloane's Froglet recorded in Sheep Station Creek in July 2022.

Plate 6 **Sloane's Froglet habitat along the grazed section of Sheep Station Creek on the solar farm site, looking west towards Oxley-Meadow Creek Road. Habitat management works are recommended to enhance this area as part of ongoing solar farm site management.**

3.6. Further survey recommendations

Based on the current scope of development and impacts associated with the proposed solar farm, we do not recommend any further targeted surveys.





Legend

- Study area
- Scattered tree
- Large patch tree

Ecological Vegetation Classes (EVCs)

- 68 Creekline Grassy Woodland

Wetlands

- 5 - Permanent open freshwater

Figure 2.1 Ecological features of the project area

0 250

Metres

N

Scale: 1:7,500 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

Matter: 37213,
Date: 30 May 2024,
Checked by: MJAL, Drawn by: JPT, Last edited by: jturner
Layout: F2_EcoFeatures
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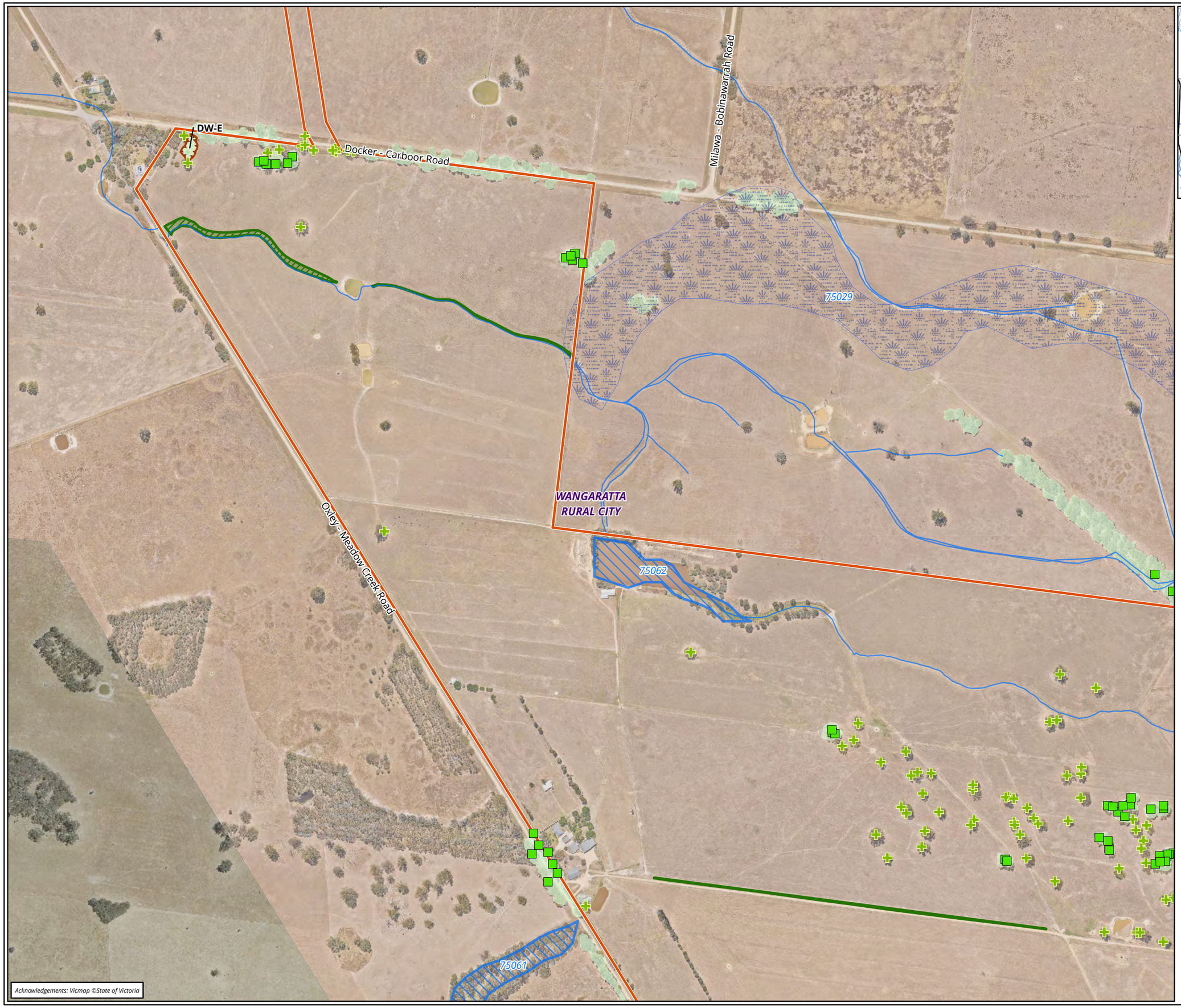

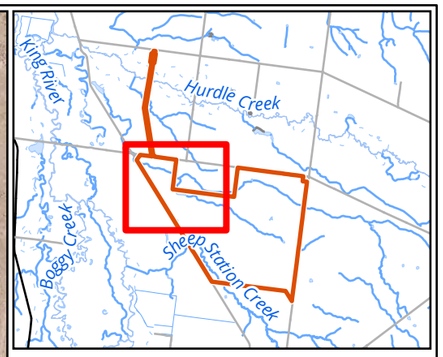

Legend

- Study area
- Scattered tree
- Large patch tree
- Juncus or pasture grass dominated seasonally wet area
- Derived wetland EVC 55

Ecological Vegetation Classes (EVCs)

- 55_61 Plains Grassy Woodland

Wetlands

- 2 - Freshwater meadow
- 5 - Permanent open freshwater

Figure 2.2 Ecological features of the project area

0 250

Metres

N

Scale: 1:6,250 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

Matter: 37213,
Date: 30 May 2024,
Checked by: MJAL, Drawn by: JPT, Last edited by: jturner
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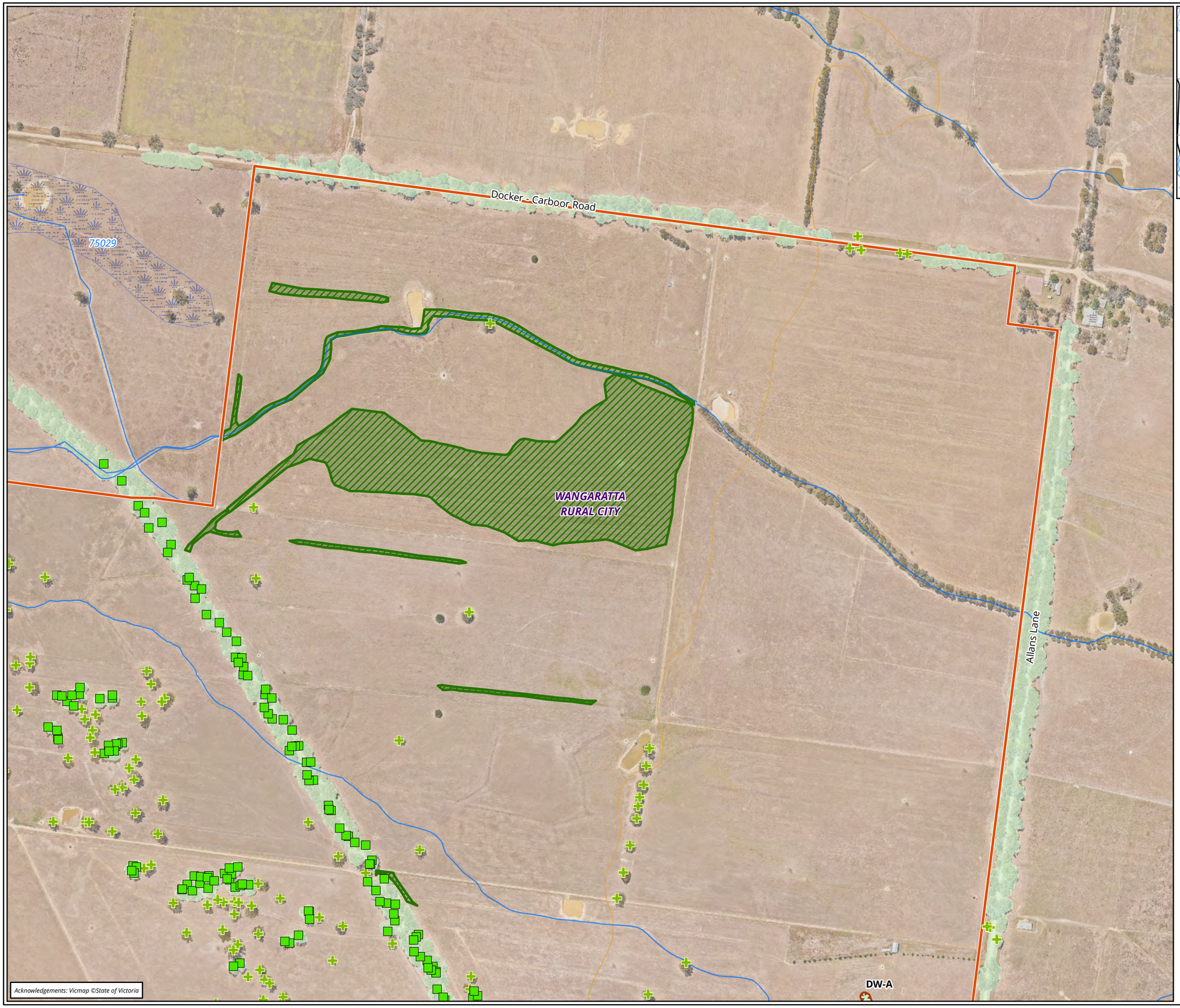

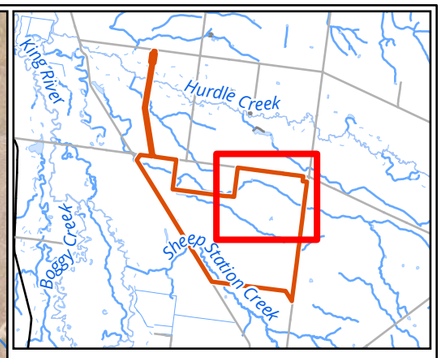

Legend

- Study area
- Scattered tree
- Large patch tree
- Juncus or pasture grass dominated seasonally wet area
- Derived wetland EVC 55

Ecological Vegetation Classes (EVCs)

- 55_61 Plains Grassy Woodland

Wetlands

- 2 - Freshwater meadow

Figure 2.3 Ecological features of the project area

0 250

Metres

N

Scale: 1:6,250 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

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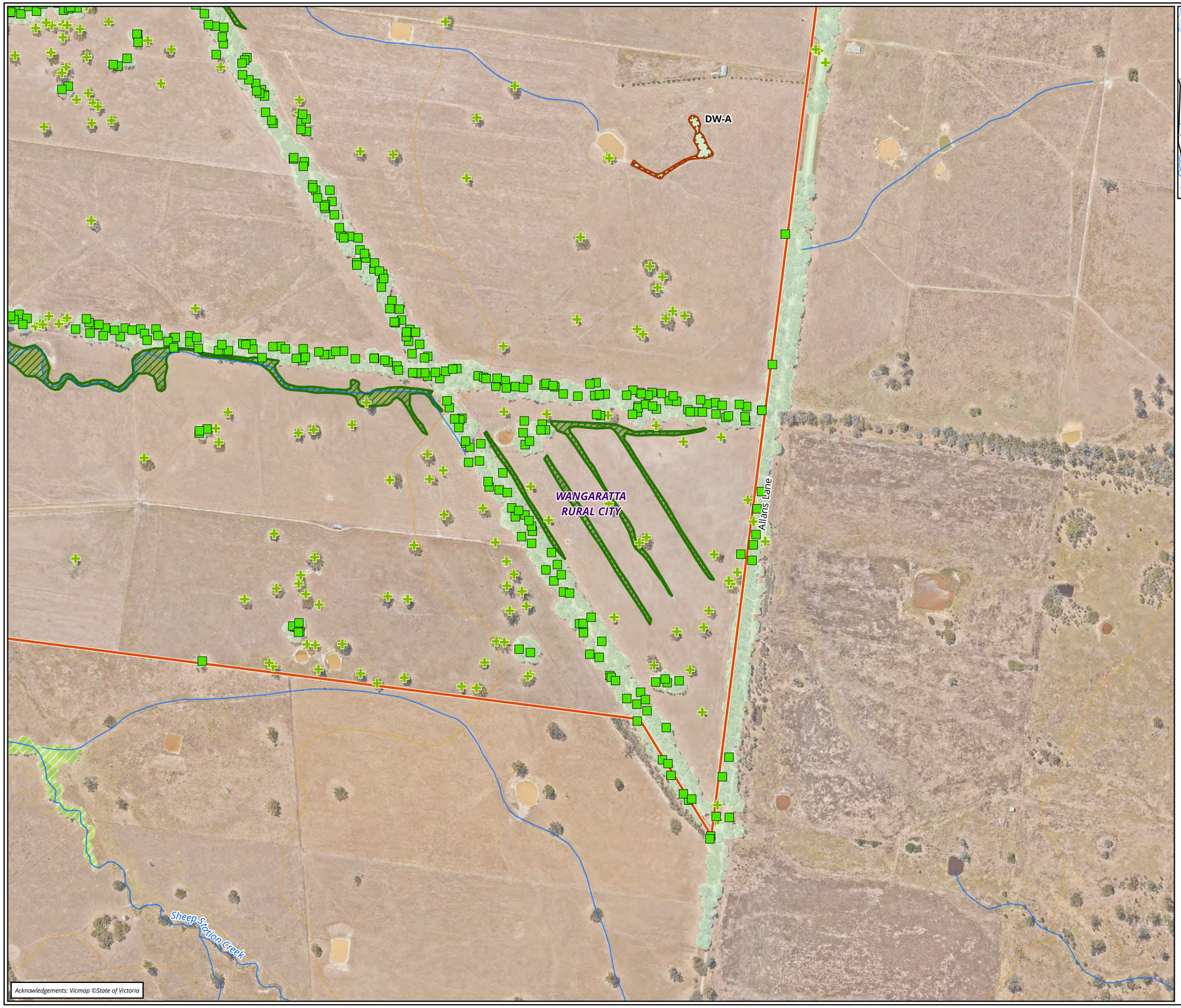

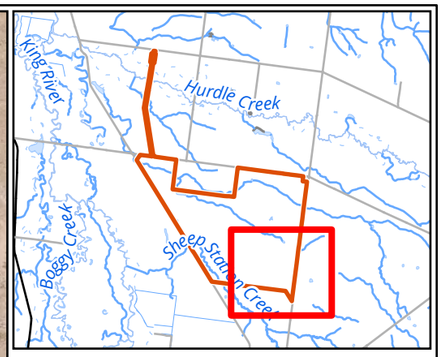

Legend

- Study area
- Scattered tree
- Large patch tree
- Juncus or pasture grass dominated seasonally wet area
- Derived wetland EVC 55

Ecological Vegetation Classes (EVCs)

- 55_61 Plains Grassy Woodland
- 68 Creekline Grassy Woodland

Figure 2.4 Ecological features of the project area

0 250

Metres

N

Scale: 1:6,250 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

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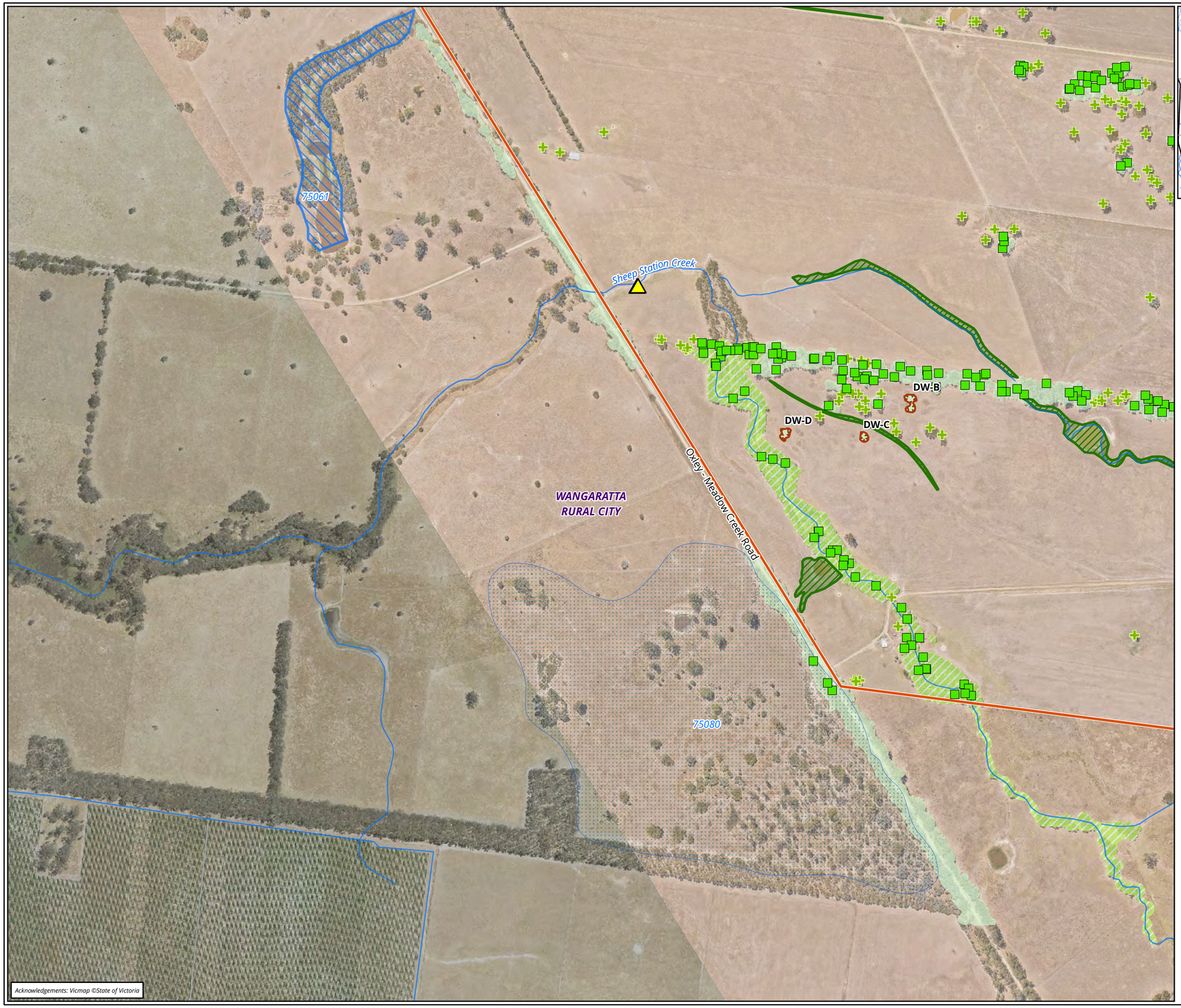

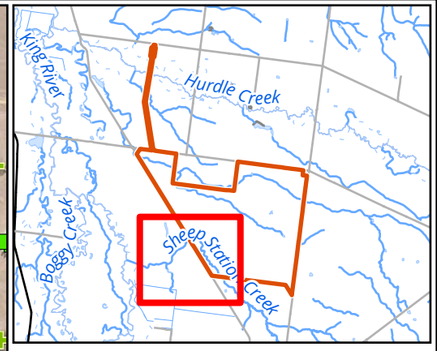

Legend

- Study area
- Fauna record - Sloane's froglet
- Scattered tree
- Large patch tree
- Juncus or pasture grass dominated seasonally wet area
- Derived wetland EVC 55

Ecological Vegetation Classes (EVCs)

- 55_61 Plains Grassy Woodland
- 68 Creekline Grassy Woodland

Wetlands

- 5 - Permanent open freshwater
- 99 - No Category

Figure 2.5 Ecological features of the project area

0 250

Metres

N

Scale: 1:6,250 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

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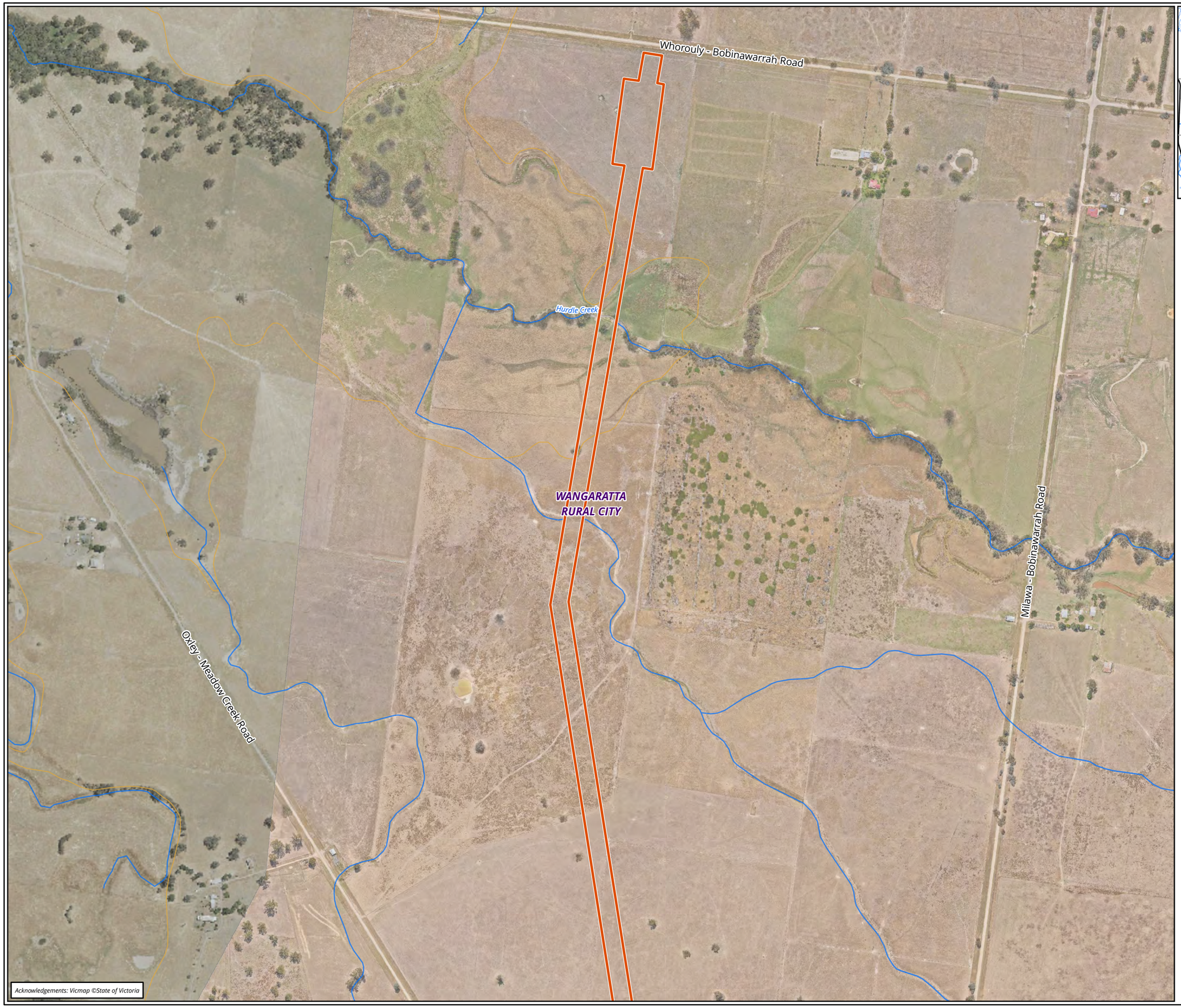

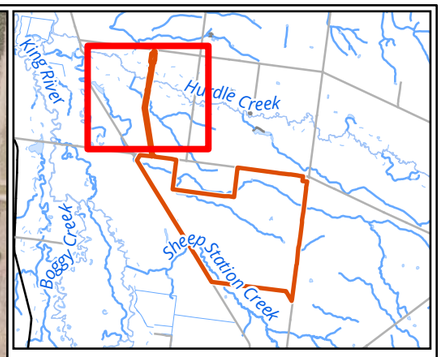

Legend

Study area

Figure 3.1 Targeted survey effort and point intercept locations

0 250

Metres

N

Scale: 1:7,500 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

Matter: 37213,
Date: 10 May 2024,
Checked by: MJAL, Drawn by: JPT, Last edited by: jturner
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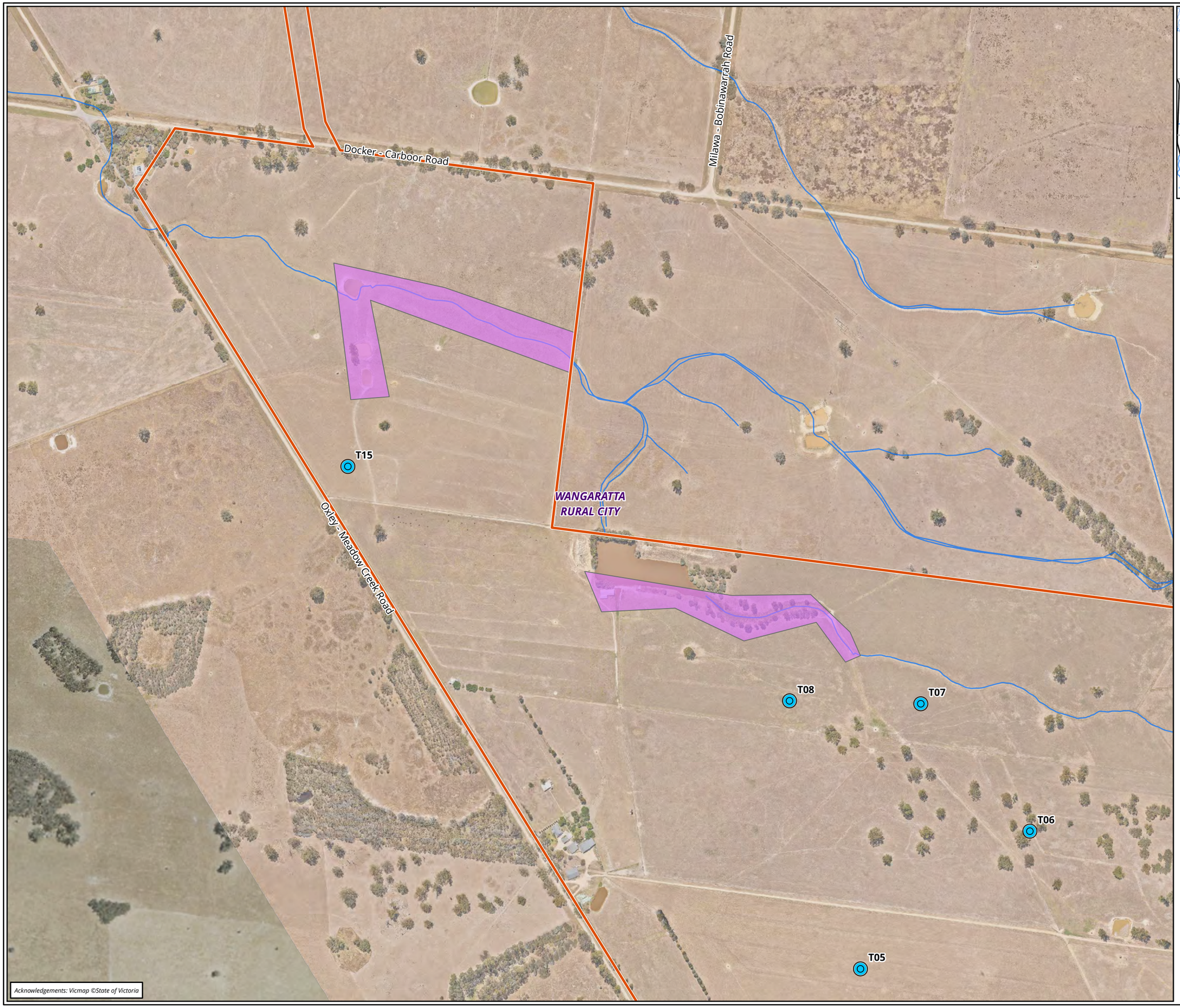

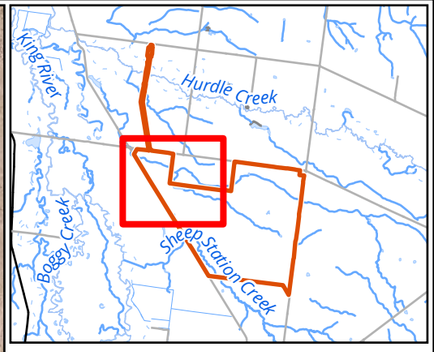

Legend

- Study area
- Sloane's Froglet targeted survey area
- Flora point intercept

Figure 3.2 Targeted survey effort and point intercept locations

0 250
Metres

N

Scale: 1:6,250 @ A3
Coordinate System: GDA2020 MGA Zone 55

biosis

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Date: 10 May 2024,
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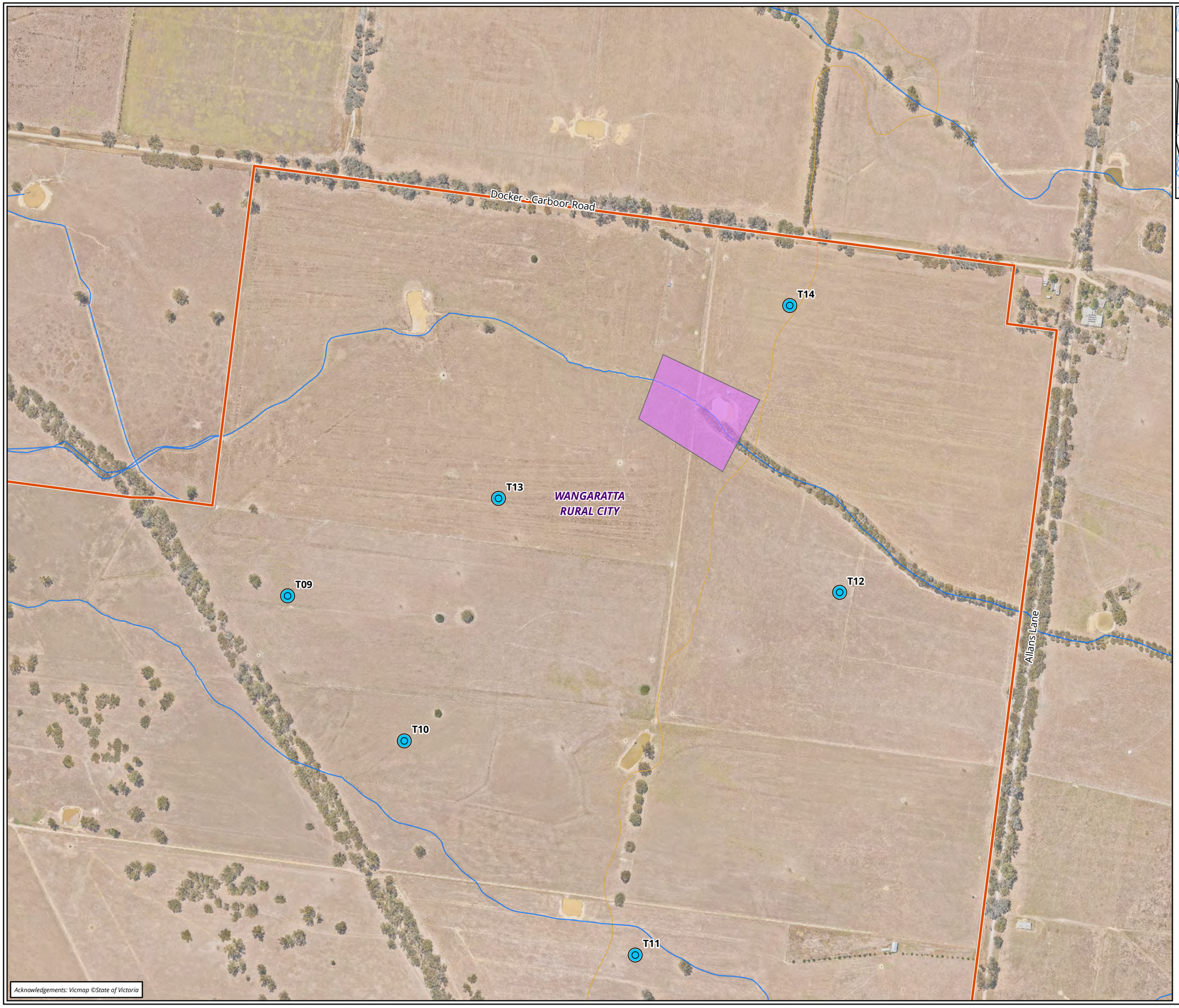

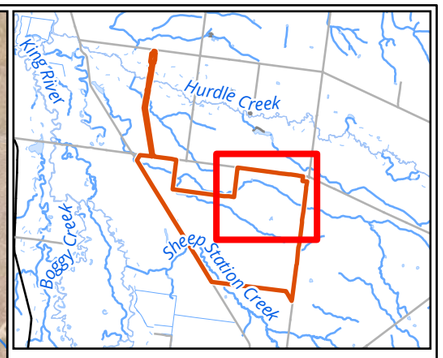

Legend

- Study area
- Sloane's Froglet targeted survey area
- Flora point intercept

Figure 3.3 Targeted survey effort and point intercept locations

0 250

Metres

N

Scale: 1:6,250 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

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Date: 10 May 2024,
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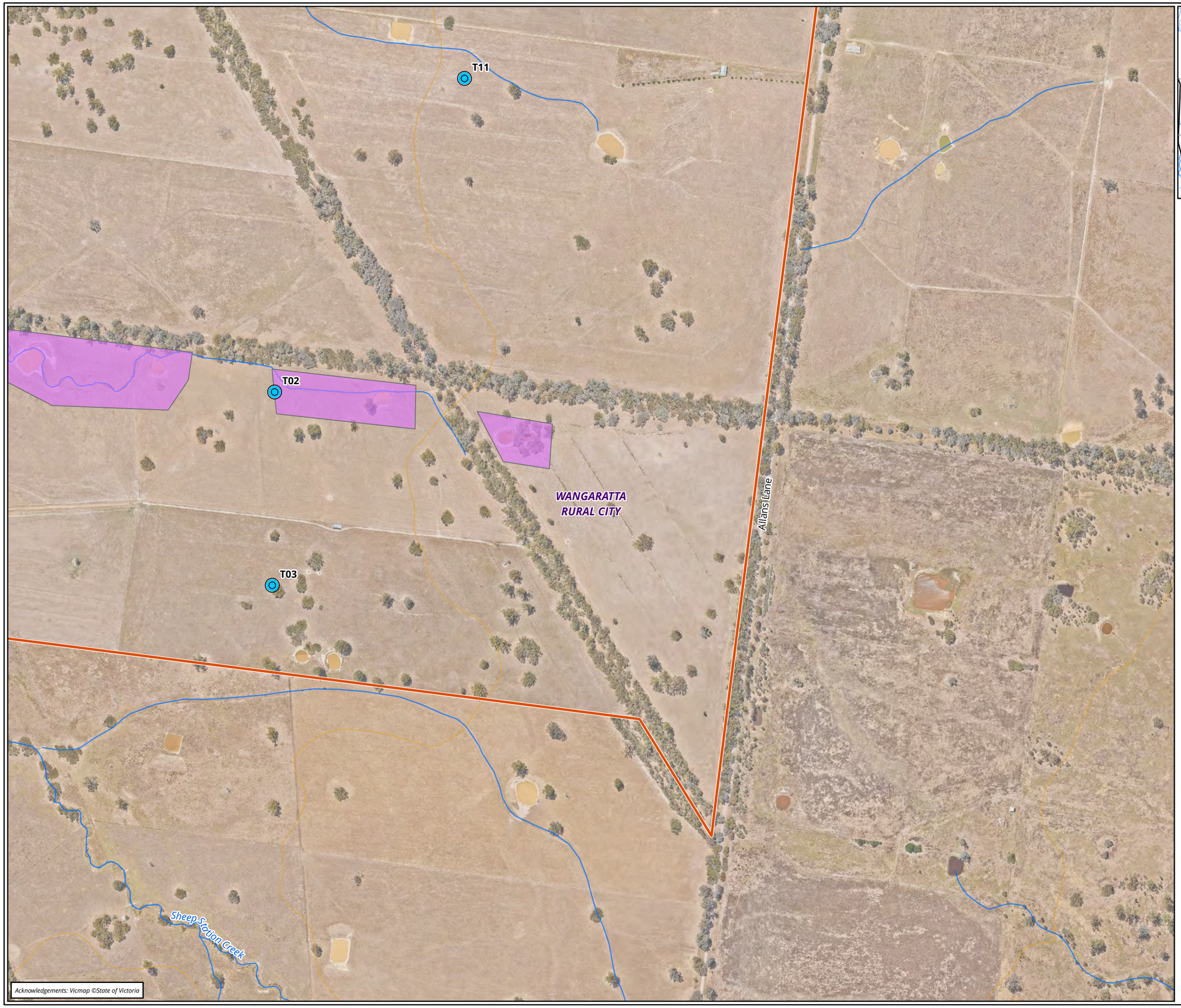

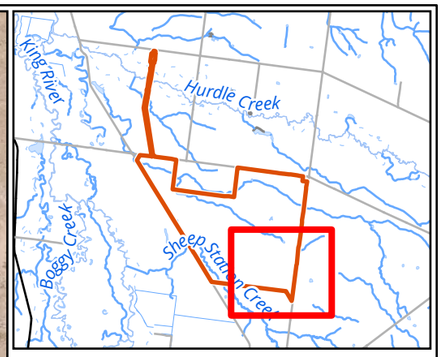

Legend

- Study area
- Sloane's Froglet targeted survey area
- Flora point intercept

Figure 3.4 Targeted survey effort and point intercept locations

0 250

Metres

N

Scale: 1:6,250 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

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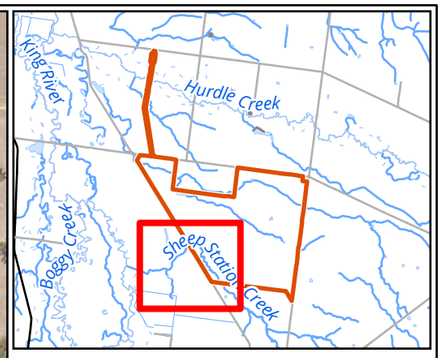

Legend

- Study area
- Sloane's Froglet targeted survey area
- Flora point intercept

Figure 3.5 Targeted survey effort and point intercept locations

0 250

Metres

N

Scale: 1:6,250 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

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4. Biodiversity legislation and government policy

This section provides an assessment of the project in relation to key biodiversity legislation and government policy. This section does not describe the legislation and policy in detail. Where available, links to further information are provided.

4.1. Commonwealth

4.1.1. Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act applies to developments and associated activities that have the potential to significantly impact on Matters of National Environmental Significance (MNES) protected under the Act.

Further information including a guide to the referral process is available at http://www.environment.gov.au/epbc/index.html

Matters of National Environmental Significance relevant to the project are summarised in Table 7. It includes an assessment against the EPBC Act policy statements published by the Australian Government which provide guidance on the practical application of EPBC Act.

Table 7 Assessment of project in relation to the EPBC Act

MNES	Project specifics	Assessment against significant impact guidelines
EPBC Act listed species	Nine EPBC Act listed flora and 32 EPBC Act listed fauna species have been recorded or predicted to occur in the project search area. The likelihood of these species occurring in the study area is assessed in Appendix B (flora and communities) and Appendix C (fauna).	No flora species are considered likely to occur. Targeted surveys for Sloane's Froglet were undertaken to provide more data on this species presence / absence and distribution within the study area. The species was recorded at the northern end of Sheep Station Creek within the study area. A significant impact assessment for this species is completed below. A number of other threatened fauna species, mainly woodland birds, may occur in the study area or occasionally use the study area. However, development is not likely to constitute a significant impact on these species.
EPBC Act listed ecological communities	Three EPBC Act listed ecological communities have been recorded or predicted to occur in the project search area, including: • Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions. • Grey Box Grassy Woodlands. • White Box – Yellow Box – Blakely's Red Gum Grassy Woodland.	Character species for the Grey Box Grassy Woodland and Buloke Woodlands communities do not occur within the study area. These communities are not present. Based on the key diagnostic characteristics of the community (Table 5), Plains Grassy Woodland EVC 55 vegetation within the study area does not qualify as Box Gum Woodland community. This is due to the sub-dominant

MNES	Project specifics	Assessment against significant impact guidelines
		occurrence of character canopy species (i.e. Blakely's Red-gum and Yellow Box), the highly modified condition of native understorey, and lack of native flora diversity and cover. This community is not considered present.
Migratory species	Thirteen migratory species have been recorded or predicted to occur in the project search area (Appendix C).	While some of these species would be expected to use the study area on occasion (e.g. Latham's Snipe), it does not provide important habitat for an ecologically significant proportion of any of these species.
Wetlands of international importance (Ramsar sites).	The study area is identified as being within the catchment of seven Ramsar sites: Banrock Station wetland complex, Barmah Forest, Gunbower Forest, Hattah-Kulkyne lakes, NSW Central Murray state forests, Riverland and The Coorong and Lakes Alexandrina and Albert wetland.	The study area does not drain directly into any Ramsar site and the development is not likely to result in a significant impact

4.1.2. Self-assessments against EPBC Act significant impact guidelines

Individual and combined self-assessments against the Significant Impact Criteria detailed in the Matters of National Environmental Significance: Significant impact guidelines version 1.1 (CoA 2013) have been undertaken for relevant threatened species where there is some risk of impact from the project.

Sloane's Froglet

An assessment of significant impacts on Sloane's Froglet is provided in Table 8 according to the Commonwealth's significant impact guidelines for an endangered species (CoA 2013). This assessment concludes the project is unlikely to lead to a significant impact on Sloane's Froglet. The assessment has been undertaken in the context of the key development design responses to minimise habitat loss, and the resultant unavoidable residual impacts. These avoid and minimise steps are:

- Avoidance of direct impacts to Sloane's Froglet habitat values, including:
  - Farm dams.
  - Sheep Station Creek and associated drainage features.
- Incorporation of appropriate buffers and habitat management into design, in order to reduce risk of indirect impacts, along waterways and watercourses that support higher quality habitat.
- Development and implementation of a site-specific Construction and Operational Environmental Management Plan that will outline:
  - Strict vehicle and contractor hygiene protocols
  - Monitoring and enforcement of hygiene protocols by the project manager.
  - All retained wet areas, farm dams and drainage lines should be fenced off to reduce the risk of persons or vehicles entering these areas and spreading chytrid fungus.
  - Habitat management options.

Table 8 Sloane's Froglet: self- assessment against Significant Impact Criteria for an endangered species (CoA 2013)

Significant Impact Criteria	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of a population	Unlikely	Sloane's Froglet was recorded in Sheep Station Creek within the study area during targeted surveys in July 2022. Meadow Creek Solar Farm has committed to avoiding all direct impacts to known and potential Sloane's Froglet habitat along Sheep Station Creek, and minimising impacts on drainage lines, farm dams and other waterways within the study area. Development buffers have also been incorporated for higher value potential habitat areas. Additionally, a site-specific CEMP will be developed which will outline site-specific methods of avoid and minimising impacts during construction. Construction activity near Sloane's Froglet habitat should occur in dry periods during summer-early autumn when seasonal water bodies have dried up and Sloane's Froglet have, for the most part, contracted back to summer refuge habitat (dams and permanently wet creeks). If these avoidance measures are adhered to, the chance of negatively impacting on the population of Sloane's Froglet within the study area to the point that the population begins to decline is unlikely, as the amount and quality of available habitat will remain relatively unchanged post-construction.
Reduce the area of occupancy of the species	Unlikely	The design of the solar farm layout has been developed to avoid and minimise direct impacts to areas of known or potential higher quality habitat for Sloane's Froglet. Additionally, buffers are incorporated into the design for higher quality habitat areas and a site-specific CEMP will include measures to avoid and minimise the risk of any indirect impacts to Sloane's Froglet habitat within and adjacent to the study area. Given the above, it is considered unlikely that the project will significantly impact on the area of occupancy for Sloane's Froglet in North East Victoria.
Fragment an existing population into two or more populations	Unlikely	The proposed solar farm and transmission line will not fragment or isolate habitat as blockage, removal or modification to wet areas will be minimised as part of the proposed works. Furthermore, Sloane's Froglet has the ability to cross small constructed features or disturbances (Knight 2013) and as such the installation of solar panels adjacent to areas of habitat will not act as a barrier for dispersal for individuals crossing dry land.

Significant Impact Criteria	Likelihood of significant impact	Justification
Adversely affect habitat critical to the survival of the species	Unlikely	Knight (2014) outlines the importance of a matrix of wetland types and sizes with suitable drainage lines and wet areas connecting these refuge habitats. With this matrix system in mind, during wet years the habitat present within the study area could be considered critical to the survival of the species as drainage systems (Sheep Station Creek, Hurdle Creek and other waterways) are connected through farm dams, wetlands and drainage lines through the agricultural landscape. However, in dry years these habitats will not be connected. Regardless, provided the impact avoidance, minimisation and mitigation measures outlined above are implemented it is considered unlikely that the proposed solar farm will adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of a population	Unlikely	Construction activities near Sloane's Froglet habitat should occur in dry periods during summer and early autumn when Sloane's Froglet have, for the most part, contracted back to summer refuge habitat. Given the avoidance and minimisation of habitat impacts as outlined above, it is unlikely that construction activities within adjacent terrestrial habitat during dry periods (summer-early autumn) would have an impact on the breeding cycle of a population. Breeding habitat will be retained across the solar farm study area in the form of creeks, drainage lines and farm dams.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	Provided mitigation measures outlined above are adhered to, higher quality habitat for Sloane's Froglet should remain unchanged after construction. As such it is unlikely that the species would experience a decline in response to habitat disturbance resulting from the solar farm development.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Unlikely	The proposed action will not 'open up' habitat that was previously inaccessible to invasive species and as such is unlikely to exacerbate the current level of invasive species threat operating within the study area to the point that they become harmful to Sloane's Froglet.

Significant Impact Criteria	Likelihood of significant impact	Justification
Introduce disease that may cause the species to decline	Unlikely	The risk of introduction of pathogens including chytrid fungus is high and strict vehicle and contractor protocols will need to be developed. These processes should be documented in the project's CEMP and will need to be monitored and enforced by the project manager. All retained wet areas, farm dams and drainage lines should be fenced and bunted off to reduce the risk of persons or vehicles entering these areas and spreading chytrid fungus. Provided these measures are implemented and enforced, the risk of introducing a disease that may cause the species to decline is unlikely.
Interfere with the recovery of a species	Unlikely	A national recovery plan for the Sloane's Froglet has not been prepared. Provided the impact avoidance, minimisation and mitigation measures outlined above are adhered to, impacts to this population and to the broader recovery of the species are unlikely to be significant.

Woodland birds, waterbirds and Grey-headed Flying-fox

Other Commonwealth threatened fauna species with some potential to be impacted by the project through native vegetation removal or landscape changes include:

- Latham's Snipe, vulnerable under EPBC Act and migratory species.
- Gang-gang Cockatoo, endangered under EPBC Act.
- Blue-winged Parrot, vulnerable under EPBC Act.
- Swift Parrot, critically endangered under EPBC Act.
- White-throated Needletail, vulnerable under EPBC Act, migratory.
- Hooded Robin, endangered under EPBC Act.
- Southern Whiteface, vulnerable under EPBC Act.
- Painted Honeyeater, vulnerable under EPBC Act.
- Regent Honeyeater, critically endangered under EPBC Act.
- Diamond Firetail, vulnerable under EPBC Act.
- Brown Treecreeper, vulnerable under EPBC Act.
- Grey-headed Flying-fox, vulnerable under EPBC Act.

A combined assessment against the Significant Impact Criteria detailed in the Matters of National Environmental Significance: Significant impact guidelines version 1.1 (CoA 2013) has been undertaken below for these threatened fauna species (Table 9) and for migratory species (Table 10). For this assessment vulnerable species have been combined with the critically endangered and endangered SIC assessments in

Table 9. These assessments conclude the project is unlikely to lead to a significant impact on other threatened fauna and migratory species.

Table 9 Threatened fauna: self-assessment against Significant Impact Criteria for critically endangered, endangered and vulnerable species (CoA 2013)

Combined preliminary SIC assessment for threatened fauna
Lead to a long-term decrease in the size of a population (critically endangered and endangered species)
Lead to a long-term decrease in the size of an important population of a species (vulnerable species)
Unlikely Threatened species, especially aerial species, vagrant birds and migrating wetland species are at low risk of long-term population decreases from the project as they would only occasionally utilise modified farmland habitat on the site (e.g. scattered paddock trees). Higher quality and connected habitats will be retained including large woodland patches, creeklines, riparian zones and groups of mature hollow-bearing trees. Construction and operation of the solar farm is unlikely to lead to population reductions through large scale habitat loss, threatened fauna mortality or displacement of resident populations.
Reduce the area of occupancy of the species (critically endangered and endangered species)
Reduce the area of occupancy of an important population (vulnerable species)
Unlikely Species likely to occur in the study area will not experience a reduced area of occupancy from the project as the solar farm will mostly occupy highly modified farmland that is not suitable habitat for many of these species. Higher quality and connected habitats that provide the best areas of occupancy will be retained, including large woodland patches, creeklines, riparian zones and groups of mature hollow-bearing trees.
Fragment an existing population into two or more populations (critically endangered and endangered species).
Fragment an existing important population into two or more populations (vulnerable species).
Unlikely Aerial species, vagrant birds and migrating wetland species may move through the landscape matrix to exploit favourable habitat patches and seasonal resources. Native vegetation and habitat removal will occur in highly fragmented areas and there is little to no potential that the project will fragment an existing population into two or more populations.
Adversely affect habitat critical to the survival of a species (all conservation status levels)
Unlikely Habitat within the study area with the potential to be critical habitat may be used for foraging, breeding, roosting, or dispersal. However, proportionate species populations affected by the project is not considered necessary for the long-term maintenance of species or to maintain genetic diversity and long-term evolutionary development, nor is that habitat necessary for reintroduction of populations or for species recovery. While habitat within the study area includes potential foraging, breeding, roosting and dispersal habitat, it is not considered to be habitat that is critical for the survival of these species nationally.
Disrupt the breeding cycle of a population (critically endangered and endangered species)
Disrupt the breeding cycle of an important population (vulnerable species)
Unlikely It is considered unlikely that the project would result in the disruption to the breeding cycle of a population of threatened fauna. Aerial species and vagrant birds may move through the landscape matrix to exploit favourable habitat patches and may occasionally breed in the local area. Native vegetation and habitat removal will occur in highly

Combined preliminary SIC assessment for threatened fauna

fragmented areas with limited breeding opportunities and resources for these species. There is little to no potential that the project will significantly disrupt the breeding cycle of these threatened fauna population.

Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline (all conservation status levels)

Unlikely

Removal of suboptimal habitat is unlikely to represent a significant loss of habitat for these species or contribute to their decline. Higher quality areas of habitat will be retained as a result of the project's avoidance and minimisation measures, and the nature of the project would not preclude these species from occupying habitats within the study area during favourable conditions.

Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat

Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

Unlikely.

The project would be subject to a CEMP that would include biosecurity measures to limit the likelihood of introducing invasive species during construction and operation of the project. It is unlikely that the project would result in the establishment of new invasive species. The proposal is unlikely to exacerbate the current level of invasive species populations utilising the area, such as cats and foxes.

Invasive weed species do have potential to reduce quality of habitat in wetland areas. The risk of introduction of weed species will be mitigated by the implementation of good soil transportation practices throughout works that will be detailed in the CEMP.

Introduce disease that may cause the species to decline (all conservation status levels)

Unlikely

The project is unlikely to introduce a disease that may cause these species to decline. The project would be subject to a CEMP that would include measures for biosecurity and hygiene control to limit the introduction of pathogens as a result of the construction and operation of the project.

Interfere with the recovery of the species (all conservation status levels)

Unlikely

The project may lead to the minor loss of potential foraging, nesting and breeding habitat for several of these species. These effects are considered unlikely to interfere with the recovery of local population of these species, and therefore species as a whole. The local area is not a focal point for threatened species recovery or reintroductions given it is farmland in a highly modified and fragmented landscape.

Table 10 Migratory species - self-assessment against Significant Impact Criteria for a migratory species

Combined preliminary SIC assessment for listed migratory species
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.
No. Internationally or nationally important habitat for migratory species is not located within the study area.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.
No. Important habitats in Australia for migratory shorebirds under the EPBC Act include those recognised as nationally or internationally important. As no such sites occur within the study area, the project would not impact upon important habitat for migratory species. Furthermore, the subject land is already located within a highly modified environment, dominated in land used for agricultural activities. As a part of the construction and operation management of the project a CEMP will be implemented to prevent spread of invasive species.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.
No. Most migratory species do not breed within Australia, as such, breeding could not be disrupted. Given migratory species populations are highly dispersed in Australia, the likelihood of impacting an ecologically significant proportion of the population is inherently low outside of impacting a known important site. Such a site is not known and unlikely to be present based on background research. Any individuals that could be impacted are unlikely to represent an ecologically significant proportion of a migratory species population. Therefore, it is unlikely the project will seriously disrupt the lifecycle of an ecologically significant proportion of a migratory species population.

On the basis of criteria outlined in the relevant Significant Impact Guidelines (CoA 2013) it is considered unlikely that a significant impact on a MNES would result from the proposed action. Meadow Creek Solar Farm intends to refer the proposed action to the Australian Government Minister for the Environment in order to gain legal certainty on whether the action will require further assessment and approval under the EPBC Act.

4.2. State

4.2.1. Flora and Fauna Guarantee Act 1988 (FFG Act)

The FFG Act is the key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes. Under the FFG Act a permit is required from DEECA to 'take' protected flora species. Permit exemptions under the FFG Act generally apply to the non-commercial removal of protected flora from private land, unless there is 'critical habitat' that has been declared on the land. Authorisation under the FFG Act is required to collect, kill, injure or disturb listed fish on private or public land.

Link for further information: https://www.environment.vic.gov.au/conserving-threatened-species/victorias-framework-for-conserving-threatened-species

The FFG Act defines public land as Crown land or land owned by, or vested in, a public authority, while private land is defined as any land other than public land. A public authority is defined in the FFG Act as a body established for a public purpose by or under any Act and includes:

- an administrative office
- a government department
- a municipal council
- a public entity
- a State-owned enterprise.

The study area is on private land, does not contain any declared 'critical habitat' for the purposes of the FFG Act and the flora species are not being taken for the purpose of commercial sale. A protected flora permit is therefore not required for any works on private land. The presence of habitat for threatened fauna will be considered by the Responsible Authority in determining its response to an application for native vegetation removal under Clause 52.17. No FFG Act listed threatened flora species were recorded within the study area. One FFG Act listed fauna species (Sloane's Froglet) was recorded.

For works on adjacent public roadside or Crown Land (e.g. unmade licenced roads) a protected flora permit may be required. Three protected flora species may be present on local roadside (Appendix B, Table 18), and a protected flora permit from DEECA would be required if any of these species will be affected by the project.

4.2.2. Catchment and Land Protection Act 1994 (CaLP Act)

The CaLP Act identifies and classifies certain species as noxious weeds or pest animals, and provides a system of controls on noxious species.

Declared noxious weeds identified in the study area are listed in Appendix B (Table 18).

Meadow Creek Solar Farm must take all reasonable steps to eradicate regionally prohibited weeds, prevent the growth and spread of regionally controlled weeds, and prevent the spread of and as far as possible eradicate established pest animals. The State is responsible for eradicating State prohibited weeds from all land in Victoria.

Further information is at http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds

4.2.3. Environment Effects Act 1978

The *Environment Effects Act 1978* establishes a process to assess the environmental impacts of a project. If applicable, the Act requires that an Environment Effects Statement (EES) be prepared by the proponent. The EES is submitted to the Minister for Planning and enables them to assess the potential environmental effects of the proposed development.

The general objective of the assessment process is *to provide for the transparent, integrated and timely assessment of the environmental effects of projects capable of having a significant effect on the environment* (DTP 2023).

The eighth edition of the 'Ministerial Guidelines for Assessment of Environmental Effects under the *Environment Effects Act 1978*' (DTP 2023) provides a range of criteria that can be used to determine whether an EES may be required for a project. These criteria relate to individual potential environmental effects and a combination of (two or more) potential environmental effects.

An assessment of the project against the individual and combined potential effects criteria based on the level of proposed impacts to biodiversity values indicates the project is not likely to trigger a referral to the Minister for Planning for an EES determination based on ecological impacts alone (Table 11). Other non-biodiversity related triggers are not considered here.

Table 11 Assessment of the project against biodiversity-related individual and combined EES referral criteria (DEECA 2023)

EES referral criteria	Project impact and response
Individual types of effects	
Potential removal, destruction or lopping of 10 ha or more of native vegetation that consists of, or comprises a combination of: • **an Ecological Vegetation Class classified as endangered;** • **an EVC that is classified as vulnerable (with a condition score of 0.5 or more) or rare (with a condition score of 0.6 or more); and** • **that is not authorised for removal under an approved forest management plan or fire protection plan.**	This criterion is not likely to be triggered as less than 10 ha of an endangered EVC will be impacted (EVC 55 and EVC 68 where some clearing may occur both have a Bioregional Conservation Status of endangered).
Potential clearing of an area determined as 'critical habitat' under the *Flora and Fauna Guarantee Act 1988.*	No critical habitat for flora or fauna occurs within the study area. This criterion is unlikely to be triggered.
Potential for loss of a significant proportion (e.g. 1 percent or greater) of known remaining habitat or population of a threatened species within Victoria	For threatened flora, this criterion is not likely to be triggered by the project. No threatened flora were recorded or are considered likely to occur in the study area. For threatened fauna, this criterion is unlikely to be triggered. While a small number of Sloane's Froglet were recorded within the study area during targeted survey, the population is unlikely to constitute a significant proportion of the known remaining population or habitat for the species. Impacts on other FFG listed fauna are considered low to negligible as higher quality and connected habitats likely to be occupied by these species will be retained, including large woodland patches, creeklines, riparian zones and groups of mature hollow-bearing trees.
Potential for long-term change to the ecological character of a wetland listed under the Ramsar Convention or in A Directory of Important Wetlands in Australia.	This criterion has negligible potential to be triggered as the project area is >100 kilometres from the closest listed Ramsar site (Barmah Forest) and will not directly impact on a DIWA wetland.

EES referral criteria	Project impact and response
Potential for extensive or major effects on the use and environmental values of water resources due to changes in water quality, water availability, stream flows, water system function, or regional groundwater levels, or the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term	This criterion is not likely to be triggered. Avoidance of alterations to current site water quality and quantity has been a key consideration throughout the design of the solar farm, in order to minimise impacts on Sloane's Froglet habitat. The design does not directly impact on any major aquatic habitat areas, and incorporates buffers to reduce risk of indirect impacts to key waterways and watercourses.
Potential for extensive or major effects to human health or the environment, or displacement of residents, from pollution or waste emitted to air, land, water or groundwater	This criterion has not been assessed. It is out of scope of the ecological assessment.
Potential for greenhouse gas emissions exceeding 200,000 tonnes of carbon dioxide equivalent per annum (direct and indirect) attributable to the operation of the facility	This criterion has not been assessed. It is out of scope of the ecological assessment.
A combination of potential environmental effects	
Potential removal, destruction or lopping of 10 hectares or more of native vegetation, unless it is authorised for removal under an approved forest management plan or fire protection plan	This criterion is not likely to be triggered as: • The proposed clearing is less than 10 hectares.
Matters listed under the *Flora and Fauna Guarantee Act 1988*: • **potential loss of a significant area of a listed ecological community; or** • **potential loss of a genetically important population of an endangered or threatened species (listed or nominated for listing), including from loss or fragmentation of habitats; or** • **potentially significant effects on habitat values of a wetland supporting migratory bird species**	This criterion is not likely to be triggered, as: • Members of the Victorian Temperate Woodland Bird Community may occasionally occupy the site. Impacts to this suite of birds is considered low to negligible as higher quality and connected habitats likely to be occupied by these species will be retained, including large woodland patches, creeklines, riparian zones and groups of mature hollow-bearing trees. • The population of Sloane's Froglet is unlikely to be considered genetically important and higher quality habitat will be retained and remain functional. • Migratory species (e.g. Latham's Snipe) may occasionally forage on the site in wet pasture. There are not likely to be effects on a defined wetland used by this species or habitat for other migratory species as a result of the project.
Potential for extensive or major effects on landscape values of regional importance, especially: • **where recognised by a planning scheme overlay;** • **declared as a distinctive area and landscape under the *Planning and Environment Act 1987*; or** • **within or adjoining land reserved under the *National Parks Act 1975*.**	This criterion is not likely to be triggered as: • There are no landscape values of regional importance (as recognised by a planning scheme overlay) within the study area. There is a VPO on adjacent roadside vegetation but this provision highlights local rather than regional values. • The area is not declared as a distinctive area and landscape under the *Planning and Environment Act 1987* • The works will not impact any land reserved under the *National Parks Act 1975*.

EES referral criteria	Project impact and response
Potential for extensive or major effects to the environment due to changes in land stability, disturbance of acid sulphate soils or project-induced soil erosion over the short or long term	This criterion has not been assessed. It is out of scope of the ecological assessment.
Potential for extensive or major effects on social or economic well-being due to direct or indirect displacement of non-residential land use activities	This criterion has not been assessed. It is out of scope of the ecological assessment.
Potential for extensive displacement of residents or severance of residents' access to their community resources	This criterion has not been assessed. It is out of scope of the ecological assessment.
Potential for significant effects on the amenity of a substantial number of residents, due to extensive or major, long-term changes in visual, noise and traffic conditions	This criterion has not been assessed. It is out of scope of the ecological assessment.
Potential for extensive or major effects on Aboriginal cultural heritage values protected under the *Aboriginal Heritage Act 2006*	This criterion is subject to the results of the project Cultural Heritage Management Plan (CHMP) management conditions.
Potential for extensive or major effects on cultural heritage places and sites listed on the Victorian Heritage Register or the Victorian Heritage Inventory under the *Heritage Act 2017*	This criterion is not likely to be triggered, there is low potential for cultural heritage places and no registered sites within the study area.

Based on an assessment of individual and combined referral criterion related to ecological values, it is considered unlikely that an EES referral on the grounds of potential significant effects on biodiversity would be required for the project. The guidelines are not binding, and the decision as to whether an EES is required is ultimately at the discretion of the Minister for Planning.

4.2.4. Planning and Environment Act 1987 (incl. Planning Schemes)

The *Planning and Environment Act 1987* controls the planning and development of land in Victoria, and provides for the development of planning schemes for all municipalities.

Of particular relevance to the development proposal are controls relating to the removal, destruction or lopping of native vegetation contained within the Wangaratta Planning Scheme (the Scheme), including permit requirements. The Scheme (Clause 73.01) defines 'native vegetation' as 'Plants that are indigenous to Victoria, including trees, shrubs, herbs, and grasses'. It is an objective of Clause 12.01-2 of the State Planning Policy Framework (Native Vegetation Management) that removal of native vegetation results in no net loss in the contribution made by native vegetation to Victoria's biodiversity.

Clause 52.17 (Native Vegetation) requires a planning permit to remove, destroy or lop native vegetation including some dead native vegetation. Decision guidelines that must be considered by the referral or responsible authority are contained in Section 7 of the Guidelines, and referred to in Clause 52.17-4. Clause 52.17 does not apply if a Native Vegetation Precinct Plan corresponding to the land is incorporated in the Scheme. It should be noted that where native vegetation does not meet the definition of a patch or scattered

tree, as described in Section 3.1, the Guidelines do not apply. However, a permit may still be required to remove, destroy or lop native vegetation under the provisions of the Scheme.

Under Clause 66.02 a permit application to remove, destroy or lop native vegetation is required to be referred to DEECA as a recommending referral authority if any of the following apply:

- The class of application is on the detailed assessment pathway.
- A property vegetation precinct plan applies to the site, or.
- The native vegetation is on Crown land occupied or managed by the Responsible Authority.

The need for a permit to remove native vegetation may also be triggered by overlays within the Scheme. The location of the overlays in relation to the study area can be determined via the following link: https://www.planning.vic.gov.au/planning-schemes/browse-planning-schemes

A small section of the transmission easement (where it intersects with Hurdle Creek) is subject to a Flood Overlay (FO) and Land Subject to Inundation Overlay (LSIO). Both these overlays have permit requirements to construct a building or construct or carry out works (buildings and works) if works cannot avoid these areas.

Much of the vegetation on the roadsides surrounding the solar farm is covered by a Vegetation Protection Overlay – Schedule 2 (VPO). A response to the application requirements of this VPO is provided below.

Application requirements

Table 12 Application requirements under the Vegetation Protection Overlay – Schedule 2

Application Requirements	Response
Indicate the purpose and total extent of all proposed works	The purpose of vegetation removal is for the construction and ongoing operation of the Meadow Creek Solar Farm. The total extent of all proposed vegetation removal is outlined in Figure 4 (see annotations), Section 5 and Appendix F. Roadside vegetation removal is required to improve site access for construction, operation and emergency management from adjacent public roads.
Demonstrate that the need for works has been reduced to the minimum extent that is reasonable and practicable given the circumstances of the proposed works	Vegetation removal within areas protected by the VPO2 is restricted to access roads crossing from the solar farm site into the surrounding roads, and for the transmission line easement (Figure 4). As much as possible, these areas have been placed within existing areas of disturbance (e.g. existing farm access gates) so that vegetation removal from within the road reserve has been minimised. Roadside vegetation removal is required to improve site access for construction, operation and emergency management from adjacent public roads.

Victoria's Guidelines for the removal, destruction or lopping of native vegetation

The Guidelines are incorporated into the Victoria Planning Provisions and all planning schemes in Victoria (DELWP 2017a). The Guidelines replaced the previous incorporated document titled Permitted clearing of native vegetation – Biodiversity assessment guidelines (DEPI 2013) on 12 December 2017.

The purpose of the Guidelines is to guide how impacts to biodiversity should be considered when assessing a permit application to remove, destroy or lop native vegetation. The objective for the guidelines in Victoria is 'No net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation'.

A detailed assessment of the implications for the project under the Guidelines is provided in Section 5 of this report. Under the Guidelines, there are three assessment pathways for assessing an application for a permit to remove native vegetation: basic, intermediate and detailed.

A detailed determination of the assessment pathway for the planning application relevant to the proposed development is provided in Section 5.2. In summary, the planning application for removal of native vegetation must meet the requirements of, and be assessed in, the detailed assessment pathway.

5. Victoria's Guidelines for the removal, destruction or lopping of native vegetation

The Guidelines were introduced in December 2017. They set out and describe the application of Victoria's statewide policy in relation to assessing and compensating for the removal of native vegetation in order to achieve the objective of 'no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation'.

This objective is to be achieved through Victoria's planning system using an assessment approach that relies on strategic planning and the permit and offset system. The key policy for achieving no net loss to biodiversity is the three-step approach of avoid, minimise and offset:

- **Avoid** the removal, destruction or lopping of native vegetation to ensure that the important biodiversity values of native vegetation continue to be delivered into the future.
- **Minimise** impacts resulting from the removal of native vegetation that cannot be avoided.
- Provide an **offset** to compensate for the biodiversity impact resulting from the removal of native vegetation.

The proposed removal of native vegetation is required for the delivery of the solar farm project based on its current design. Native vegetation and planted vegetation removal is required for a range of purposes during construction and operation of the project. This removal includes direct loss of vegetation (i.e. clearing) or assumed loss of vegetation due to Tree Protection Zone (TPZ) encroachment. In summary, vegetation removal includes:

- Scattered paddock tree and small derived woodland patch vegetation removal for solar panel array establishment.
- Removal of planted non-native vegetation for solar panel array establishment.
- Roadside native vegetation removal to establish or widen site access points from public roads.
- Removal of native vegetation in unmade licenced government roads to establish or widen internal access points.
- Removal of native and planted vegetation around the perimeter of the solar farm to establish firebreaks and all-weather access roads for emergency purposes.
- Removal of derived native vegetation at waterway and watercourse crossings for access roads, tracks and reticulation.
- Removal of scattered paddock trees and patch native vegetation to establish the transmission line connection between the solar farm site and the existing Glenrowan to Dederang transmission line.

The steps that have been taken during the siting and design of the solar farm development to ensure that impacts on biodiversity from the removal of native vegetation have been avoided and minimised are summarised below in accordance with the DEECA Assessor's Handbook (DELWP 2018). Detail on how avoidance and minimisation has been achieved in relation to the native vegetation values described in Appendix 1D (DELWP 2018) is provided in Table 13.

More detail on the values of trees to be removed in provided in Appendix E.2 and Figure 5.

Strategic level planning

The solar farm site has been chosen due to its proximity to electrical transmission infrastructure. See planning reports for further strategic justification.

Site level planning

Site level impact avoidance and minimisation steps include:

- Mapping and assessing site biodiversity values and constraints early in the project design phase (in 2002) and using this information to inform project layout and design iterations between 2022 and 2024.
- As much as possible, locating infrastructure and services in previously disturbed vegetation and farmland with scattered trees. The non-treed areas of the site are grazed and have been subject to long term drainage and pasture improvement activities resulting in them supporting predominantly introduced vegetation with limited ecological values.
- Avoiding areas containing high densities of scattered paddock trees and woodland patch vegetation in the centre of the solar farm site.
- As much as possible, avoiding all linear corridors of remnant patch vegetation. Impacts to these areas are limited to five internal crossing points where roads are required to connect the eastern and western areas of the site and for access to the site from surrounding public roads.
- Avoiding established revegetation along Sheep Station Creek and within shelter belts which appears to have been planted for waterway protection and habitat creation.
- Minimising tree removal in areas covered by the VPO2 on surrounding public roadsides through using existing farm access gates and openings in roadside vegetation. Four of the eight external access points will require minor native vegetation removal and lopping with other external access points located to avoid vegetation removal.
- Providing a minimum 15 metres and up to 50 metres to Sheep Station Creek and other areas of higher quality potential Sloane's Froglet habitat. Including habitat improvement works along Sheep Station Creek as part of ongoing site management arrangements.
- Establishing buffers around retained habitat zones, and tree protection zone buffers around retained scattered trees.
- Aligning the proposed transmission line to use gaps in roadside vegetation and openings along Hurdle Creek to minimise the need for extensive tree or riparian vegetation removal. Multiple transmission line options have been investigated since 2022 with final preferred option being aligned to minimise impacts on the Hurdle Creek riparian corridor and roadside vegetation along the Docker-Carboor Road.
- Completing waterway/watercourse mapping, obtaining an official Waterway Determination and using flood modelling to assist in designing the solar panel array to minimise impacts on wetland habitats and waterways.
- Incorporation of wildlife friendly fencing (e.g. no barbed-wire) adjacent to woodland patches to minimise fauna entanglement and allow for fauna movement.

Table 13 Summary of avoid and minimise steps in accordance with the Assessor's Handbook (DELWP 2018)

Value (Appendix 1D of DELWP 2018)	Notes on avoid and minimise steps
Land and water protection	**Site value –** Vegetation along Hurdle Creek, Sheep Station Creek and unnamed ephemeral waterways provides land and water protection functions. Scattered trees in the landscape are considered to provide reduced land and water protection values as they are in areas that are regularly disturbed through grazing and other agricultural activities. **Response -** Impacts to riparian vegetation and revegetation along Sheep Station Creek will be avoided through buffers to development. Impacts to riparian vegetation along Hurdle Creek have been minimised by aligning the transmission line to utilise a gap in the riparian corridor. The Waterway Determination process has assisted in designing the panel array to retain key water flow paths through the site, and to retain farm dams and areas of higher quality seasonal wetland habitat.
Landscape values	**Site value –** The local landscape is generally highly modified and used for agricultural purposes. **Response –** Construction of a solar farm allows for ongoing agri-voltaic land uses (e.g. grazing and farmland nature conservation activities) where they are compatible with energy generation.
Protection under the Aboriginal Heritage Act 2006	**Site value –** Areas of cultural heritage sensitivity and Aboriginal material located on site. **Response -** A Cultural Heritage Management Plan is being prepared for the project.
Extent	**Site value –** The amount of vegetation to be removed is 2.181 hectares and 33 large trees (including assumed losses) from a fragmented agricultural landscape. **Response –** Extent is most likely to be considered medium to higher value due to number of trees. Avoidance has been achieved as documented in the 'avoid and minimise' statement above.
Condition	**Site value –** Condition scores for all scattered trees are low (0.20). Patch vegetation scores are also in the low to medium range. **Response –** Scattered trees have low condition score meaning they are considered poor condition native vegetation. Impacts to patch vegetation is minor and is mostly associated with road access points crossing roadside vegetation. This roadside vegetation is also disturbed and supports a predominantly introduced understorey (dominated by annual and perennial introduced grasses).
Strategic Biodiversity Value (SBV)	**Site value –** The SBV score of the native vegetation to be removed ranges between 0.120 and 1.00. **Response –** The range of SBVs is representative of the level of disturbance and presence of small areas of remnant patch vegetation within an endangered EVC.

Value (Appendix 1D of DELWP 2018)	Notes on avoid and minimise steps
Large Trees	**Site value –** Large trees occur in patches and as scattered trees across the study area. **Response –** 11 large patch trees and 22 large scattered trees will be removed or assumed lost for the project. Information on each tree, and photos of individual scattered trees, is included in Appendix E. Direct impacts to large trees in patches have been minimised where possible, however are required in some locations for construction of access roads to link east and western portions of the study area. In some instances, these impacts are a result of TPZ encroachment rather than direct large tree removal.
Ecological Vegetation Class	**Site value –** Vegetation removal is from two endangered woodland EVCs (Creekline Grassy Woodland and Plains Grassy Woodland). **Response –** Native vegetation removal within these endangered EVCs has been minimised through project design responses.
Sensitive wetland and coastal areas	**Site value –** There are two DEECA mapped wetlands within the solar farm portion of the study area. Wetland number 75062 is approximately 1.2 hectares and occurs in the north-eastern extent of the solar farm. Wetland number 75029 approximately 17.3 hectares and primarily lies within a paddock outside the study area. **Response –** Wetland number 75062 has been considered in project design and will not be directly impacted. Construction of a boundary access track will occur adjacent to the western boundary of Wetland number 75029, which at the time of assessment supported predominantly introduced pasture grasses. Other sensitive wetland habitats including Sheep Station Creek will be protected through riparian buffer as part of development design.
Habitat for rare or threatened species	**Site value –** Modelled species habitats occur. **Response –** Species offsets have not been triggered and the percentage of habitat value affected by the native vegetation removal is zero for most modelled species. The project will impact 0.0001% of the modelled habitat value for five species (Appendix F). This indicates that the proportional impact on modelled species habitat for rare and threatened species is well below any thresholds for a significant impact on Victoria's biodiversity (refer to page 15 of the Guidelines, DELWP 2017).

DEECA has provided biodiversity information tools to assist with determining the assessment pathway associated with the removal of native vegetation and the contribution that native vegetation within the study area makes to Victoria's biodiversity.

All planning permit applications to remove native vegetation are assigned to an assessment pathway determined by the extent and location of proposed native vegetation removal. The assessment pathway will dictate the information to be provided in a planning permit application and the decision guidelines the responsible authority or DEECA as a referral authority will use to assess the permit application.

The biodiversity information tools have two components:

Site-based information

The site-based information is observable at a particular site. Biosis has collected the requisite site-based information for the assessment against the Guidelines.

Landscape scale information

Landscape scale information requires consideration of information beyond the site. This information is managed by DEECA and can be accessed via the NVIM.

The following section summarises the results of the site-based assessment and the outputs generated by the Native Vegetation Removal Report, which identifies the assessment pathway on which the planning application will be assessed. The full Native Vegetation Removal Report can be viewed in Appendix F.

5.1. Proposed removal of native vegetation

The extent of native vegetation patches, the location of large trees within patches and any scattered trees were mapped within the study area (Figure 2) and the condition was assessed in relation to standard methods provided by DSE (2004) and pre-determined EVC benchmarks: https://www.environment.vic.gov.au/biodiversity/bioregions-and-evc-benchmarks.

The proposed removal of native vegetation was assessed in accordance with the design provided by Urbis (P0050228_Meadow Creek Solar Farm_Revision_C, revision date 21 May 2024).

The development proposes to remove 2.181 hectares of native vegetation, and 33 large trees (Figure 4 and Figure 5). Additionally, five small scattered trees are to be removed. Vegetation removal is required for a range of development activities including the solar panel array, external site access, internal access roads, the transmission line and fire/emergency management. Figure 4 provides an overview of vegetation removal requirements, including annotations of roadside vegetation impacts for access points. Spatial data (shapefiles) of proposed vegetation removal were submitted to DEECA's native vegetation support team, who provided a Native Vegetation Removal Report for the project. This is provided in Appendix F and summarised in the following sections.

5.1.1. Indirect impacts and Tree Protection Zone encroachment

We have adopted a tiered approach to the consideration of potential for indirect impacts to adjacent large trees based on the levels of impacts associated with different components of the project. Where significant levels of ground disturbance and/or soil compaction are likely to result from a proposed component of construction work, encroachment into adjacent trees' TPZs has been considered. Where this encroachment is greater than 10%, the tree has been deemed lost (in accordance with the Guidelines). This applies for the following scope of construction works:

- Construction of main internal access roads, where ground disturbance will occur during construction and there is high potential for soil compaction over time through ongoing operation of the solar farm.

Where the levels of ground disturbance and compaction are much lower, we have assumed that works have low capacity to impact on adjacent trees' health. In these instances, encroachment into adjacent TPZs has not been considered. This applies to the following scope of construction works:

- Solar panel array installation, where ground disturbance during construction will be highly localised and limited to pile driving for installation of the solar panels.

- Internal boundary roads, for which ground disturbance during construction will be minor.

5.1.2. Vegetation quality assessment

A continuous area of the same EVC is termed a 'habitat zone'. Different habitat zones exist where there are different EVCs present, discrete (non-continuous) patches of the same EVC, or where the same EVC is present in different condition states. Vegetation Quality Assessments (VQAs) were completed in order to characterise the EVCs and EVC condition states broadly across the study area during fieldwork in 2022 (prior to finalisation of an impact footprint). Following finalisation of an impact footprint for the project in 2024, further fieldwork was undertaken including completing VQAs in specific areas of proposed impact (e.g. crossing points from external public roads into the study area, across linear corridors of vegetation along fencelines within the study area).

Multiple habitat zones were identified across the study area (Figure 2). Specific VQA scores for individual areas of impact have been applied in impact calculations. The results of the vegetation quality assessment are provided in Appendix E.

The locations of large trees within patches and scattered trees are shown in Figure 2. The circumference of large patch trees and scattered trees proposed for removal is provided in Appendix E.

5.1.3. Scattered trees

For applications that propose to remove scattered trees, the extent of scattered trees is calculated using the standard extents described in Section 2.4.1. A condition score is applied to each scattered tree based on information provided by DEECA's NVIM. The locations of scattered trees to be removed (22 total comprising 17 large and five small scattered trees) and retained within the study area are shown in Figure 4 and further details for each scattered tree to be removed (e.g. photo, size, extent and circumference) are provided in Appendix E and Figure 5.

Hurdle Creek

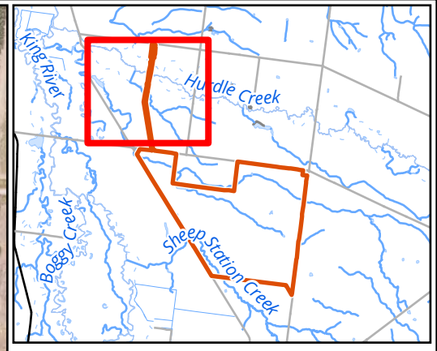
Whorouly - Bobinawarrah Road

Hurdle Creek transmission line crossing

WANGARATTA RURAL CITY

Oxley - Meadow Creek Road

Milawa - Bobinawarrah Road



Legend

- Study area
- Works footprint

Ecological Vegetation Class (EVC)

- 68 Creekline Grassy Woodland

Trees (proposed removal)

- Large scattered tree
- Large patch tree

Trees (proposed retention)

- Large scattered tree
- Large patch tree

Figure 4.1 Vegetation proposed for removal

0 250

Metres

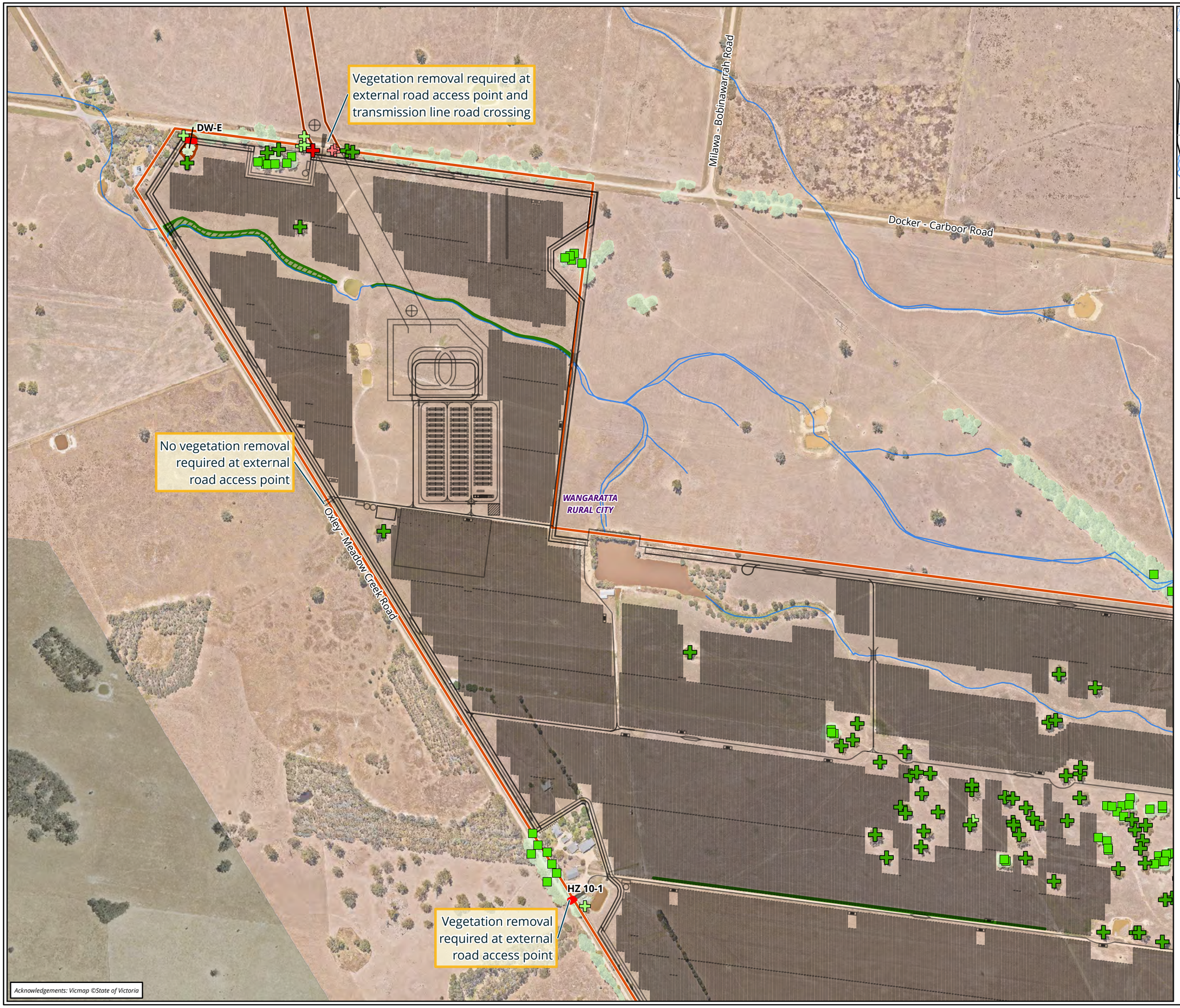
N

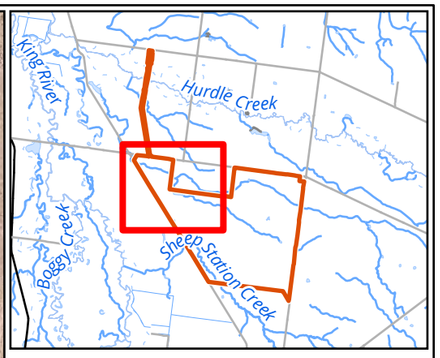
Scale: 1:7,500 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

Matter: 37213,
Date: 14 August 2024,
Checked by: MJAL, Drawn by: JPT, Last edited by: jturner
Layout: F4_VegRemoval
Location: P:\37200s\37213\Mapping\
37213_MeadowCreek_Ecology.aprx





Legend

- Study area
- Works footprint
- Patch vegetation proposed for removal
- Juncus or pasture grass dominated seasonally wet area
- Derived wetland EVC 55

Ecological Vegetation Class (EVC)

- 55_61 Plains Grassy Woodland

Trees (proposed removal)

- Small scattered tree
- Large scattered tree
- Large patch tree

Trees (proposed retention)

- Small scattered tree
- Large scattered tree
- Large patch tree

Figure 4.2 Vegetation proposed for removal

0 250

Metres

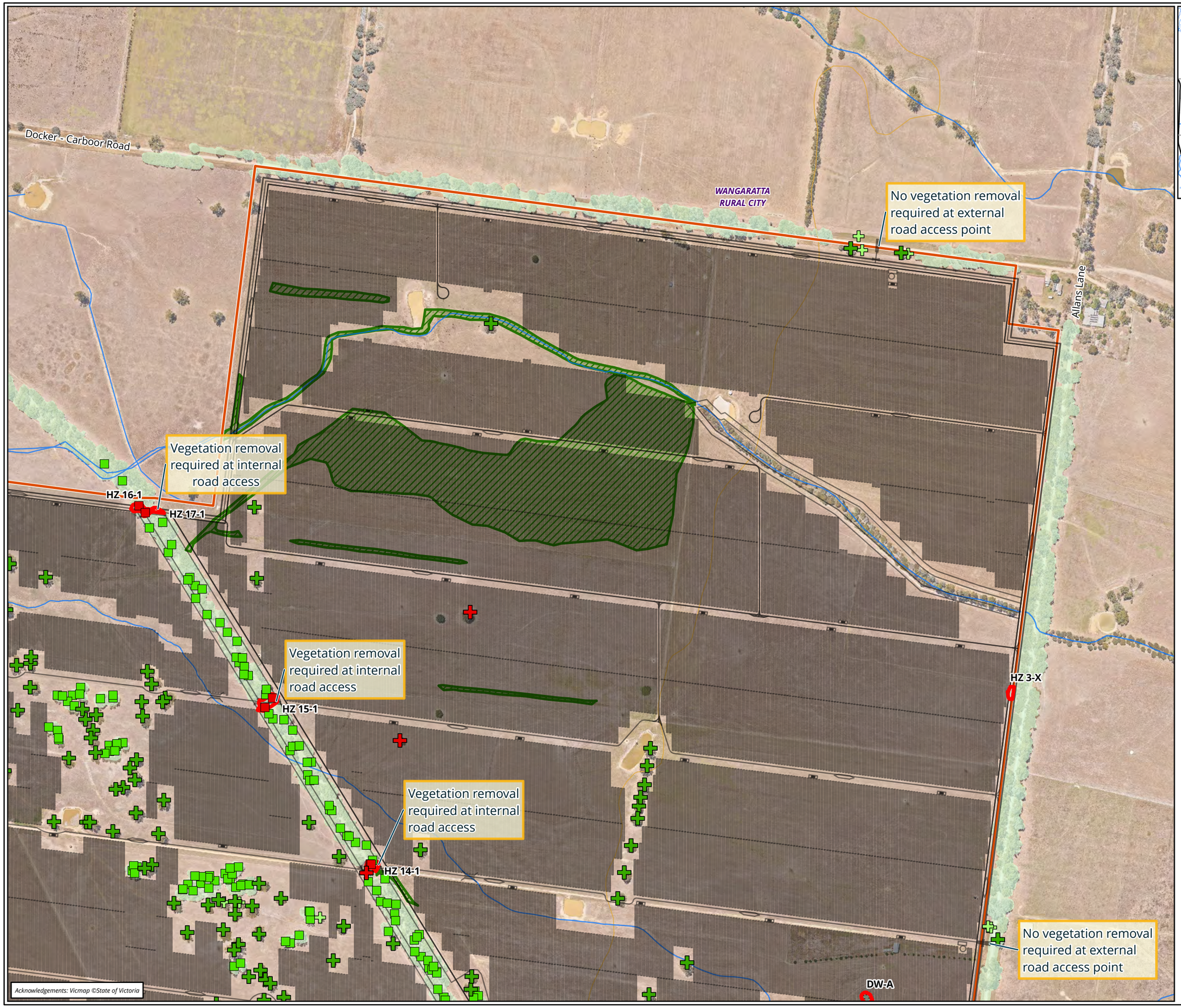
N

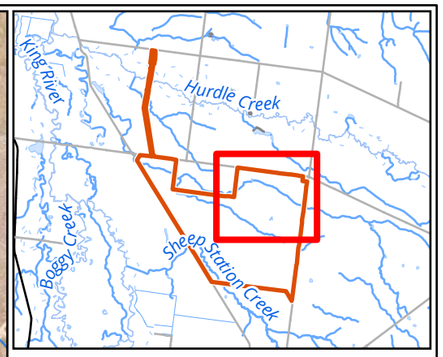
Scale: 1:6,250 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

Matter: 37213,
Date: 14 August 2024,
Checked by: MJAL, Drawn by: JPT, Last edited by: jturner
Layout: F4_VegRemoval
Location: P:\37200s\37213\Mapping\
37213_MeadowCreek_Ecology.aprx





Legend

- Study area
- Works footprint
- Patch vegetation proposed for removal
- Juncus or pasture grass dominated seasonally wet area
- Derived wetland EVC 55

Ecological Vegetation Class (EVC)

- 55_61 Plains Grassy Woodland

Trees (proposed removal)

- Large scattered tree
- Large patch tree

Trees (proposed retention)

- Small scattered tree
- Large scattered tree
- Large patch tree

Figure 4.3 Vegetation proposed for removal

0 250

Metres

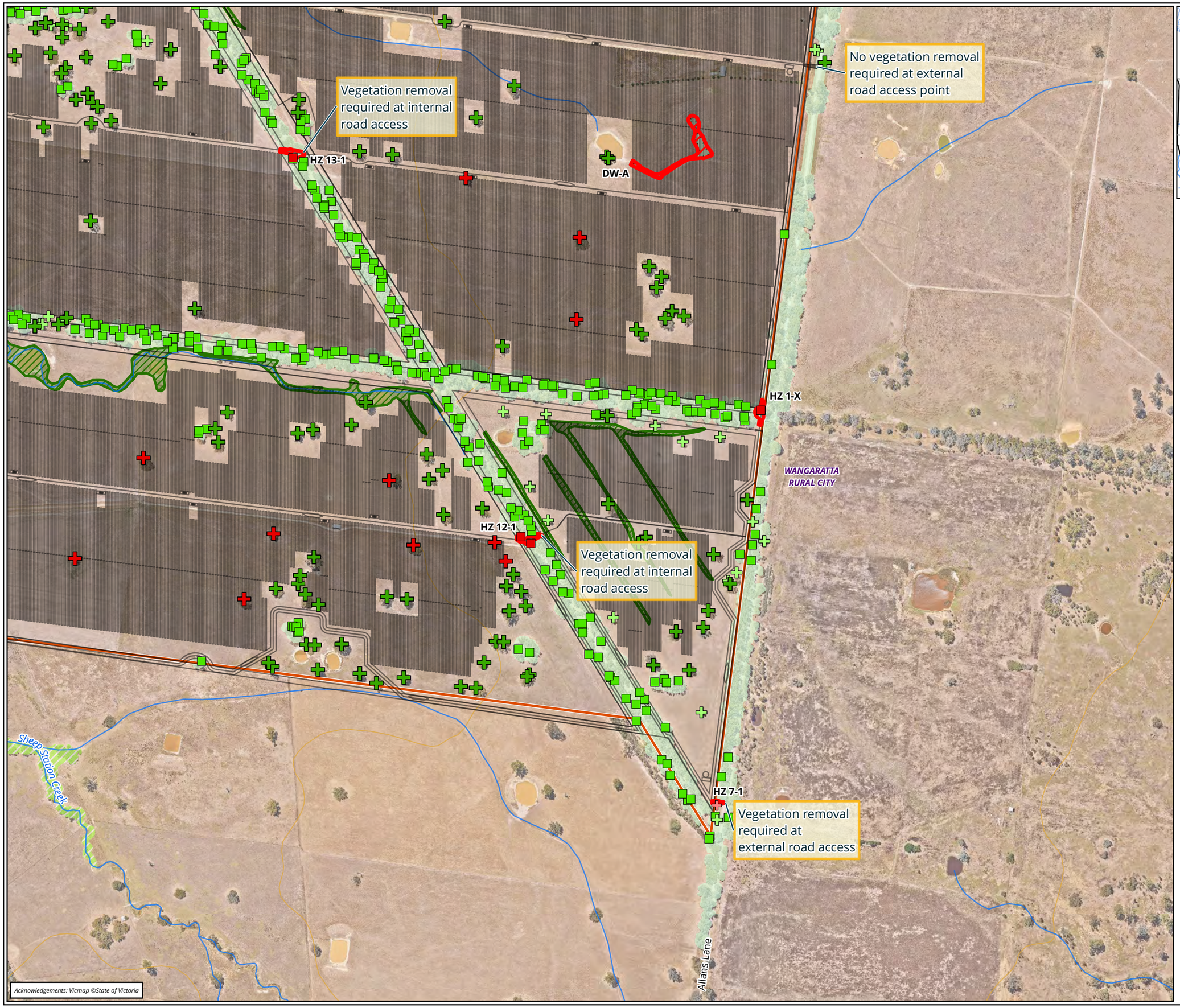
N

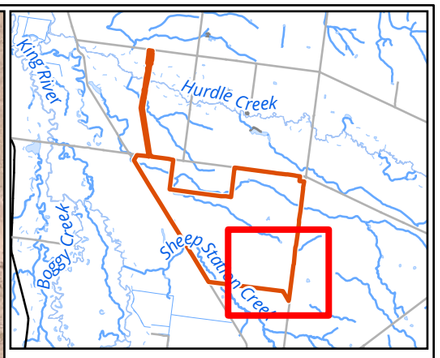
Scale: 1:6,250 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

Matter: 37213,
Date: 14 August 2024,
Checked by: MJAL, Drawn by: JPT, Last edited by: jturner
Layout: F4_VegRemoval
Location: P:\37200s\37213\Mapping\37213_MeadowCreek_Ecology.aprx





Legend

- Study area
- Works footprint
- Patch vegetation proposed for removal
- Juncus or pasture grass dominated seasonally wet area
- Derived wetland EVC 55

Ecological Vegetation Class (EVC)

- 55_61 Plains Grassy Woodland
- 68 Creekline Grassy Woodland

Trees (proposed removal)

- Small scattered tree
- Large scattered tree
- Large patch tree

Trees (proposed retention)

- Small scattered tree
- Large scattered tree
- Large patch tree

Figure 4.4 Vegetation proposed for removal

0 250

Metres

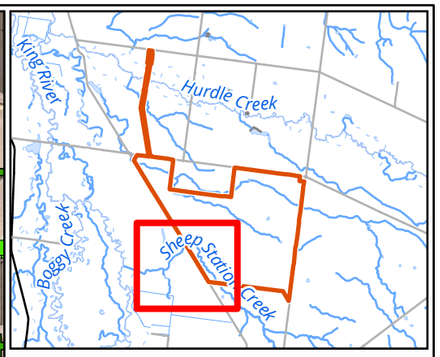
N

Scale: 1:6,250 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

Matter: 37213,
Date: 14 August 2024,
Checked by: MJAL, Drawn by: JPT, Last edited by: jturner
Layout: F4_VegRemoval
Location: P:\37200s\37213\Mapping\
37213_MeadowCreek_Ecology.aprx



Legend

- Study area
- Works footprint
- Patch vegetation proposed for removal
- Juncus or pasture grass dominated seasonally wet area
- Derived wetland EVC 55

Ecological Vegetation Class (EVC)

- 55_61 Plains Grassy Woodland
- 68 Creekline Grassy Woodland

Trees (proposed removal)

- Small scattered tree
- Large scattered tree
- Large patch tree

Trees (proposed retention)

- Small scattered tree
- Large scattered tree
- Large patch tree

Figure 4.5 Vegetation proposed for removal

0 250

Metres

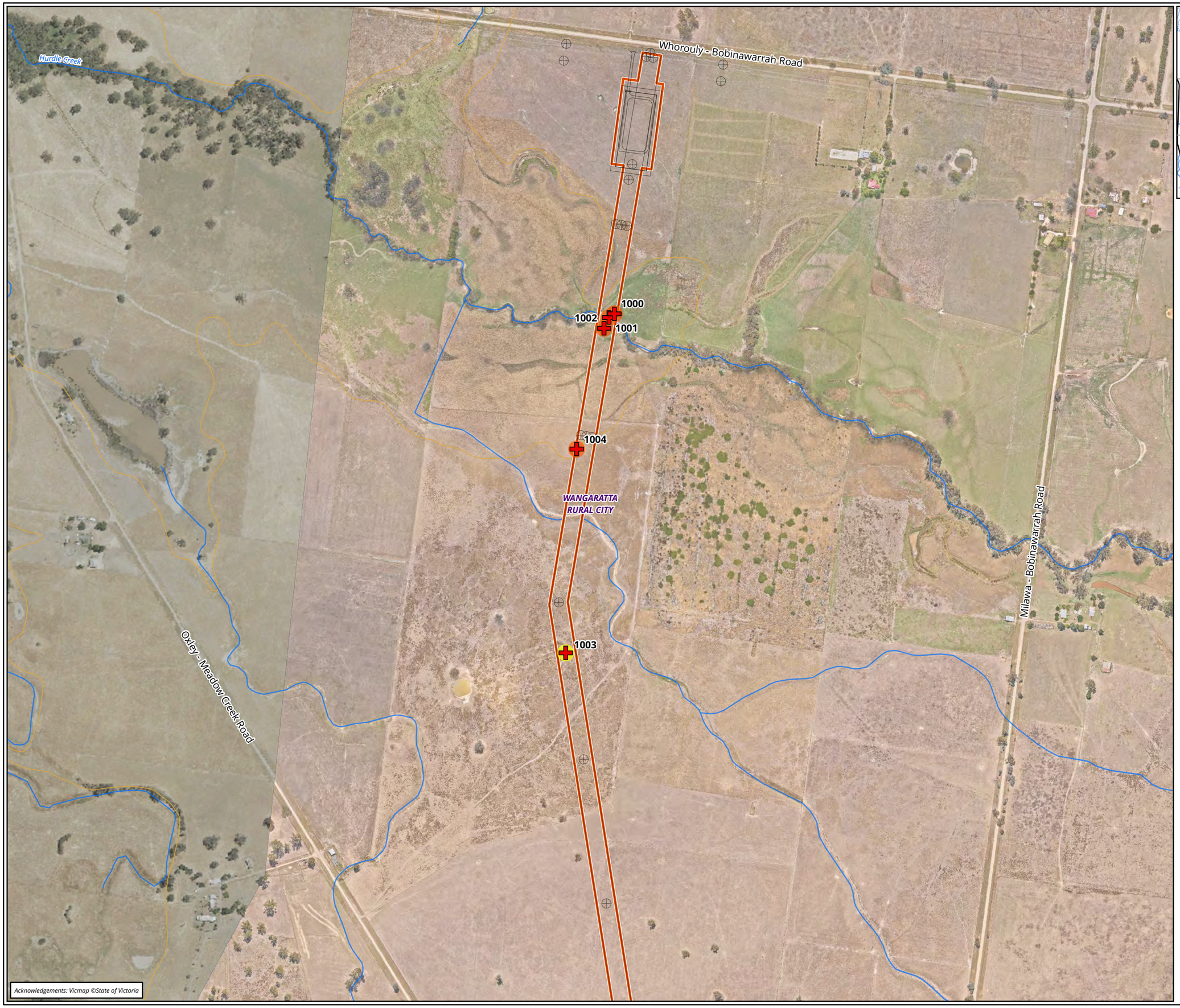
N

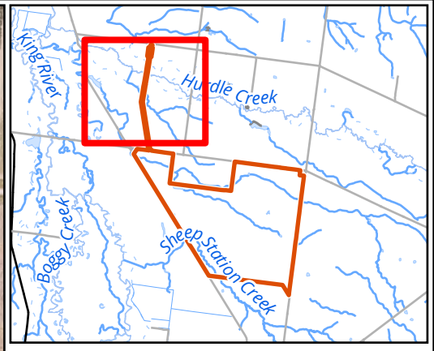
Scale: 1:6,250 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

Matter: 37213,
Date: 14 August 2024,
Checked by: MJAL, Drawn by: JPT, Last edited by: jturner
Layout: F4_VegRemoval
Location: P:\37200s\37213\Mapping\
37213_MeadowCreek_Ecology.aprx





Legend

- Study area
- Works footprint

Trees (proposed removal)

- Large scattered tree
- Large patch tree

Tree value

- Medium
- Low

Figure 5.1 Tree removal values

0 250

Metres

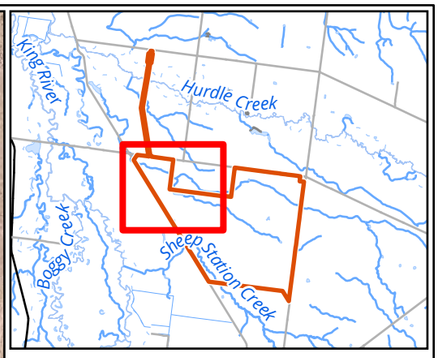
N

Scale: 1:7,500 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

Matter: 37213,
Date: 30 May 2024,
Checked by: MJAL, Drawn by: JPT, Last edited by: jturner
Layout: F5_TreeRemoval_Values
Location: P:\37200s\37213\Mapping\
37213_MeadowCreek_Ecology.aprx



Legend

- Study area
- Works footprint

Trees (proposed removal)

- Small scattered tree
- Large scattered tree
- Large patch tree

Tree value

- Low

Figure 5.2 Tree removal values

0 250

Metres

N

Scale: 1:6,250 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

Matter: 37213,
Date: 30 May 2024,
Checked by: MJAL, Drawn by: JPT, Last edited by: jturner
Layout: F5_TreeRemoval_Values
Location: P:\37200s\37213\Mapping\
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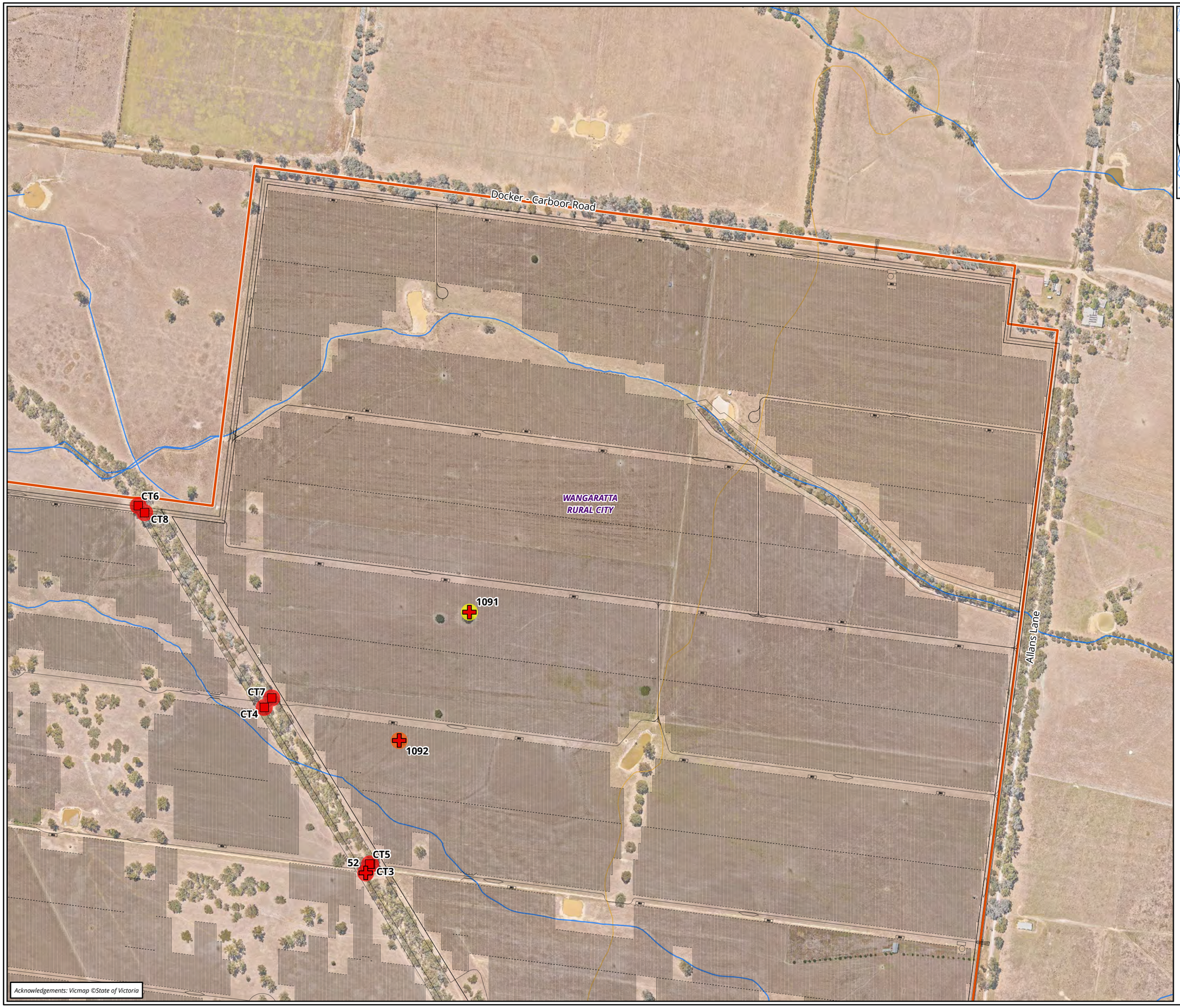

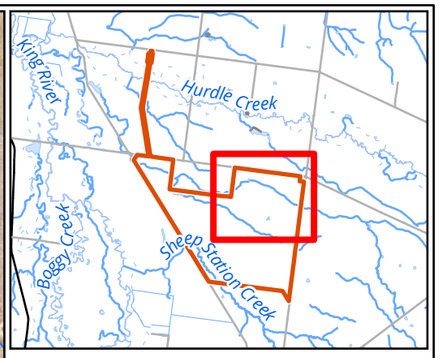

Legend

- Study area
- Works footprint

Trees (proposed removal)

- Large scattered tree
- Large patch tree

Tree value

- High
- Medium
- Low

Figure 5.3 Tree removal values

0 250

Metres

N

Scale: 1:6,250 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

Matter: 37213,
Date: 30 May 2024,
Checked by: MJAL, Drawn by: JPT, Last edited by: jturner
Layout: F5_TreeRemoval_Values
Location: P:\37200s\37213\Mapping\
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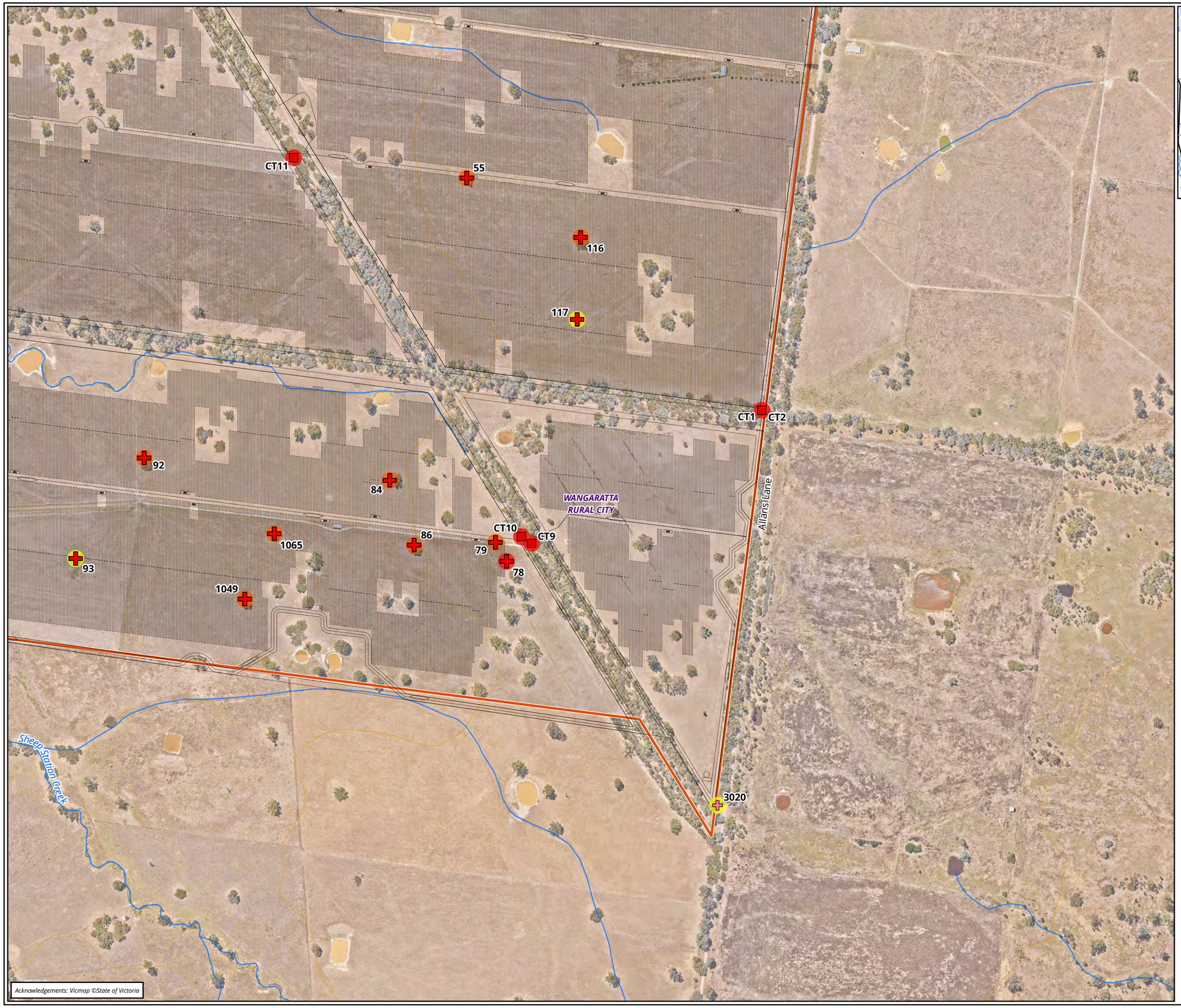

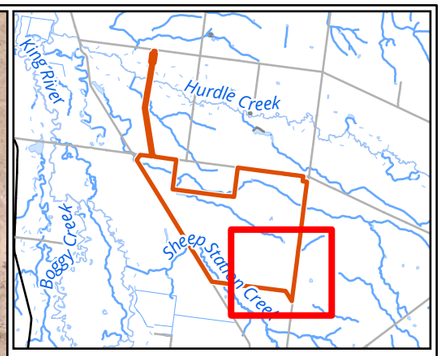

Legend

- Study area
- Works footprint

Trees (proposed removal)

- Small scattered tree
- Large scattered tree
- Large patch tree

Tree value

- High
- Medium
- Low

Figure 5.4 Tree removal values

0 250

Metres

N

Scale: 1:6,250 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

Matter: 37213,
Date: 30 May 2024,
Checked by: MJAL, Drawn by: JPT, Last edited by: jturner
Layout: F5_TreeRemoval_Values
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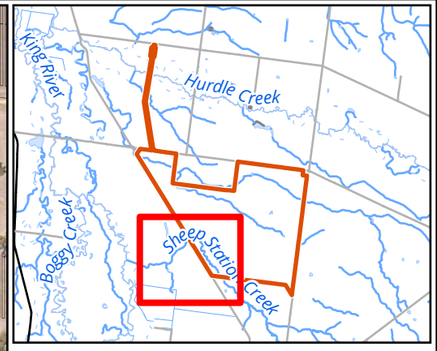

Legend

- Study area
- Works footprint

Trees (proposed removal)

- Small scattered tree
- Large scattered tree
- Large patch tree

Tree value

- Medium
- Low

Figure 5.5 Tree removal values

0 250

Metres

N

Scale: 1:6,250 @ A3

Coordinate System: GDA2020 MGA Zone 55

biosis

Matter: 37213,
Date: 30 May 2024,
Checked by: MJAL, Drawn by: JPT, Last edited by: jturner
Layout: F5_TreeRemoval_Values
Location: P:\37200s\37213\Mapping\
37213_MeadowCreek_Ecology.aprx

5.2. Determining the assessment pathway

Applications to remove native vegetation are categorised into one of three assessment pathways: basic, intermediate or detailed. Two factors are used to determine the assessment pathway for a permit application, the **location** and **extent** of the native vegetation proposed to be removed. Location has been divided into three possible categories by DEECA, and has been pre-determined by DEECA for all locations in Victoria. The location of a particular site is determined using the location map available in the Native Vegetation Information Management (NVIM) system (http://nvim.depi.vic.gov.au).

The extent of native vegetation proposed to be removed determines the assessment pathway by considering the following:

- The total area (hectares) of native vegetation (including any patches and scattered trees) proposed to be removed
- Whether any large trees are proposed to be removed, either as scattered trees or occurring in patches.

It is proposed to remove 2.181 hectares of native vegetation and 33 large trees from within location category 2, therefore the application for removal of this native vegetation must meet the requirements of, and be assessed in, the detailed assessment pathway. These requirements are provided in Appendix F.

5.3. Offset requirements

In order to ensure a gain to Victoria's biodiversity that is equivalent to the loss resulting from the proposed removal of native vegetation, compensatory offsets are required. Losses and gains are measured in general or species habitat scores or units. The offset must also include at least one large tree for every large tree removed.

For a detailed assessment pathway application, the species-general offset test will determine if a general offset, species offset or combination of both is required.

The results of the species-general offset test are provided in Appendix F and summarised in Table 14.

Table 14 Summary of DEECA Native Vegetation Removal Report

Attribute	Outcome	Notes
Location category	2	The native vegetation is in an area mapped endangered Ecological Vegetation Classes (as per the statewide EVC map)
Native vegetation removal extent	2.181 hectares	Extent includes patch vegetation, large trees in patches and scattered trees
Assessment pathway	Detailed	>0.5 hectares and including one or more large trees
Strategic Biodiversity Value Score	0.120 – 1.00	Range over multiple patches
Modelled habitat for threatened species	Yes	Extent is below the proportional impact threshold to trigger offsets for any rare or threatened species habitat.
Offset type	General	General habitat units required

Attribute	Outcome	Notes
Offset amount: general habitat units	0.549 units	-
General offset vicinity	North East CMA or Wangaratta Rural City Council	The offset site must be located within the same Catchment Management Authority boundary or municipal district as the native vegetation to be removed.
General offset minimum Strategic Biodiversity Value Score	0.411	The offset must have a minimum SBV of 0.411
Large tree attributes	33 large trees	The offset must include protection of at least one large tree for every large tree to be removed.

5.4. Proposed offset strategy

Meadow Creek Solar Farm may choose to purchase the offset credits from the Victorian native vegetation credit register. A search of the Native Vegetation Credit Register indicates offsets that meet the above requirements are available, and an extract is provided in Appendix G.

6. Key ecological values and recommendations

The site supports patches of vegetation from two different EVCs represented in a range of condition states within paddocks, along Sheep Station Creek and Hurdle Creek, and adjacent to road reserves and fencelines within and surrounding the study area. Some of these patches, particularly large areas connected to other vegetation, contain significant ecological value for a range of fauna species as habitat or dispersal corridors in a fragmented landscape. Where Yellow Box and Blakely's Red-gum occur as canopy species (or in the absence of fertile material on Blakely's Red-gum they have been assumed to occur), these areas do not represent the EPBC Act listed Box-Gum Grassy Woodland community due to their highly modified state. The site supports areas along Sheep Station Creek that have been revegetated as well as planted shelter belts supporting native and non-native species.

Remnant woodland and scattered trees are likely to provide habitat for several of the woodland bird species that make up the Victorian Temperate Woodland Bird community listed under the FFG Act. The EPBC Act listed Sloane's Froglet was recorded in Sheep Station Creek during targeted surveys, and suitable habitat for the species occurs in farm dams and some drainage lines across the study area. Many scattered trees occur throughout the study area, including River Red-gum, Yellow Box, Blakely's Red-gum, Red Box and dead stags.

Biosis has been involved in the design of the Meadow Creek Solar Farm from the preliminary development phase, resulting in several iterations of the development footprint to minimise impacts to the immediate and surrounding environment.

A summary of potential implications of development of the study area and recommendations to minimise impacts of the project is provided in Table 15.

Table 15 Summary of key ecological values, potential implications of developing the study area and recommendations to minimise ecological impacts during the design phase.

Ecological feature (Figure 2)	Implications of development	Recommendations
Native vegetation	The permanent removal of 2.181 ha of vegetation, comprised of patch vegetation, 5 small scattered trees, 22 large scattered trees and 11 large trees within patches. The application will be assessed on the detailed assessment pathway.	Identify and implement appropriate general and large tree offsets for vegetation losses as outlined in Section 5.3.
Threatened species and ecological communities	Removal of known/potential habitat for significant species (as identified in Table 4), including confirmed presence of Sloane's Froglet.	Avoid and minimise removal of larger and more connected patches of remnant native vegetation. Buffer construction activity away from waterways and drainage lines within the study area. Habitat management works for Sloane's Froglet along Sheep Station Creek (see Figure 4).
Aquatic habitat features	Potential alterations to runoff, site drainage and hydrology.	Avoid/minimise removal of terrestrial and/or aquatic habitat by designing to avoid or minimise instream works.

Ecological feature (Figure 2)	Implications of development	Recommendations
		Protect key values (including waterways) by retaining features and including appropriate buffers into design. Habitat management works along Sheep Station Creek (see Figure 4).
Habitat connectivity	Roadside and riparian vegetation. Aquatic linkage along waterways and watercourses.	Allow appropriate buffers to these areas and minimise crossings that can cause habitat disruption. Incorporation of wildlife friendly fencing for linear woodland patches (no barbed-wire near woodland patches). Design waterway crossings (including temporary crossings) in accordance with relevant guidelines from North East CMA and in accordance with guidelines for fish friendly waterway crossings (Witheridge 2002, Fairfull & Witheridge 2003). Any landscape plantings should include species selected from a mix of local EVCs (including locally indigenous plants) and non-indigenous and non-invasive native species that are suited to screening purposes and consider flammability requirements.

6.1.1. Construction and post-construction management

The biodiversity values identified in this assessment will need to be considered during the construction and operational phase of the project, and this report provides recommendations intended to minimise the ecological impact during these project phases. Relevant points will be incorporated into the site-specific Construction and Operational Environmental Management Plan. This plan will address environmental inductions for contractors, vegetation retention and management, installation of temporary fencing/signage, drainage and sediment control and management/enhancement of retained threatened species habitats. Furthermore, any landscape or screening plantings should include species selected from a mix of local EVCs (including locally indigenous plants) and non-indigenous and non-invasive native species that are suited to screening purposes and consider flammability requirements (as per the Meadow Creek Solar Farm, Landscape Strategy, June 2024).

Specific measures include are outlined in Table 16 and noted on Figure 4.

Table 16 Suggested mitigation measures to be included and documented in the project EMP

Actions	Outcomes	Timing	Responsibility
Site selection and project planning stage			
Avoid and minimise removal of native vegetation and fauna habitat for solar panel array and transmission line	General site responsiveness during design phase of the project, consultation with project ecologists based on preliminary mapping of biodiversity values	Completed during design phase	Meadow Creek Solar Farm and project ecologists
External and internal site access	Locate all tracks, where possible, on existing cleared areas or farm tracks and access points at existing farm gates off well-formed rural roads.	Completed during design phase but will require further refinement at detailed design	Meadow Creek Solar Farm and construction contractor
Habitat connectivity	Retention of larger linear woodland patches, large groups of scattered trees and locating access points that require vegetation removal to minimise impacts. Incorporation of wildlife friendly fencing adjacent to woodland patches (no barb-wire) to minimise entanglement and allow for fauna movement. Landscaping as per the Meadow Creek Solar Farm, Landscape Strategy, June 2024.	Completed during design phase but will require further refinement at detailed design	Meadow Creek Solar Farm and construction contractor
Construction and operation			
Construction Environmental Management	Construction and Operational Environmental Management Plan to be prepared.	Prior to construction	Meadow Creek Solar Farm and/or construction contractor

Actions	Outcomes	Timing	Responsibility
No go areas to protected retained vegetation	Installation of appropriate exclusion fencing around trees and vegetation to be retained in, or directly adjacent to, the development site: • The radius of the tree protection zone (TPZ) is calculated for each tree by multiplying its diameter at breast height (DBH) by 12 (i.e. TPZ = DBH x 12) in accordance with the Standards Australia Committee (2009). Alternatively, the agreed maximum 15 metre buffer could be applied to trees according to DELWP (2018) to make TPZ fence establishment simpler prior to construction. • A TPZ should not be less than 2 metres or greater than 15 metres, except where crown protection is required (Standards Australia Committee 2009). • Appropriate signage such as 'No Go Zone' or 'Environmental Protection Area' should be installed. • Identify the location of any 'No Go Zones' in site inductions. • Fencing should be star pickets with high visibility bunting.	Prior to construction	Meadow Creek Solar Farm and/or construction contractor
Wetland and waterway protection	Installation of appropriate exclusion fencing and sediment controls around retained waterways, watercourses and wetlands vegetation.	Prior to construction	Meadow Creek Solar Farm and/or construction contractor
Sloane's Froglet habitat management	Habitat management works for Sloane's Froglet along Sheep Station Creek, including livestock protection of the riparian zone and sparse revegetation. The objective of these works should be to enhance the riparian zone at the northern end of the creek within the solar farm (Figure 4). Revegetation works should not significantly increase shading of the waterway edges so suitable open habitat is retained for the species.	Prior to and during construction	Meadow Creek Solar Farm and/or construction contractor to be advised by a project ecologist
Stockpiles & laydown areas	All material stockpiles, vehicle parking and machinery storage will be located within cleared areas or areas proposed for clearing, and not in areas of retained native vegetation.	Prior to and during construction	Meadow Creek Solar Farm and/or construction contractor

Actions	Outcomes	Timing	Responsibility
Wildlife rescue during tree removal and any dam de-watering	A licenced wildlife salvage team should be on-site during tree removal to catch and relocate (if appropriate) any wildlife encountered in hollow-bearing trees or dams.	During construction	Meadow Creek Solar Farm and/or construction contractor
Supplementary habitat and relocation of removed trees	Where practical and if unlikely to damage retained vegetation, all scattered hollow-bearing trees to be removed should be placed in areas of retained vegetation to provide additional fauna habitat. This could enhance revegetation along Sheep Station Creek. Alternatively, these trees could be offered to local CMAs for waterway re-snagging projects.	During construction	Meadow Creek Solar Farm and/or construction contractor
Screening plantings and landscaping	Landscaping as per the Meadow Creek Solar Farm, Landscape Strategy, June 2024. A mix of species from local EVCs (including locally indigenous plants) and non-indigenous and non-invasive native species that are suited to screening purposes and consider flammability requirements is considered appropriate for this site.	During construction and maintained for the project operational life.	Meadow Creek Solar Farm and/or construction contractor to be advised by landscaper and project ecologist.
Soil erosion/sedimentation	• Dust suppression measures should be implemented during construction. • Implementation of temporary stormwater controls during construction is necessary to ensure that discharges to Sheep Station Creek, Hurdle Creek and other drainage channels are consistent with existing conditions. • Sediment and erosion control measures should be implemented prior to construction works commencing (e.g. silt fences, sediment traps), to protect Sheep Station Creek, Hurdle Creek and other drainage channels. These should conform to relevant guidelines, should be maintained throughout the construction period and should be carefully removed following the completion of works. • Sediment controls should be monitored weekly or after rainfall events.	Prior to and during construction	Meadow Creek Solar Farm and/or construction contractor

Actions	Outcomes	Timing	Responsibility
Weed control on site and to protect retained vegetation	• Sterile exotic crops or native ground cover species should be considered, where practical, if plantings are required beneath solar panels to minimise the impact of weed incursion into retained native vegetation. • Control of woody weeds should occur in retained native vegetation. • Weed control measures should be monitored annually to assess their effectiveness.	During construction and operation of the solar farm	Meadow Creek Solar Farm, construction contractor

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APPENDICES

Appendix A. Survey methods

Appendix A.1. Flora survey methods

Transects

Point intercept transects were completed in order to obtain a non-subjective estimate of the proportional cover of native and non-native vegetation within grazed paddocks across the solar farm portion of the study area.

The perennial plant and other lifeform cover levels of grazed treeless paddock vegetation was collected according to a comprehensive life form schema using 15 allocated 50 metre × 1 metre point intercept transects (i.e. 750 data points across the site). The raw data is provided below in Table 17.

The transect survey effort sampled grazed paddocks across the solar farm portion of study area. Locations of flora transects are provided in Figure 3. Photographs of all transect locations were taken.

The average cover of native plants (including perennial and annual grasses, sub-shrubs, herbs/forbs and cryptogams) was calculated in order to confirm whether the cover of scattered native vegetation within grazed paddocks was high enough to meet the definition of patch vegetation as defined by the Guidelines (DELWP 2017).

Table 17 Point intercept transect results. N = native grass, A = annual native forb, F = perennial native forb, S = native sub-shrub, W = annual non-grass weed, X = perennial non-grass weed, G = annual grass weed, P = perennial grass weed, C = cryptogams, O = litter/logs, B = bare soil/rock.

50 m transect	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Bearing (degrees)	**218**	**119**	**151**	**322**	**206**	**125**	**257**	**250**	**298**	**120**	**34**	**195**	**58**	**237**	**64**
1	G	O	G	P	G	O	G	G	P	G	G	U	A	G	G
2	P	G	X	B	X	X	X	G	G	G	G	B	G	G	G
3	P	P	G	X	G	G	A	B	B	G	B	G	G	G	G
4	G	P	G	B	U	O	B	G	G	B	B	G	A	X	G
5	G	A	O	X	G	G	X	B	P	G	B	U	G	G	P
6	G	B	B	X	G	B	P	G	G	G	G	B	G	P	A
7	G	G	G	U	G	B	P	B	B	G	U	B	U	B	B
8	G	G	G	A	G	O	B	P	G	G	B	G	U	U	B
9	P	G	G	U	G	G	B	P	G	G	P	U	A	G	P
10	P	B	G	J	G	B	G	U	B	W	G	X	B	B	G
11	G	X	G	U	G	X	G	B	P	G	F	B	U	G	P
12	P	B	G	U	P	B	P	G	P	G	G	U	B	P	G
13	G	P	G	P	G	A	G	B	P	B	B	G	X	G	P
14	P	G	G	B	G	B	G	G	G	G	G	G	U	P	G
15	P	G	G	P	G	B	G	G	B	G	A	P	G	P	G
16	G	G	O	J	G	B	B	G	G	O	X	G	A	P	B
17	B	G	G	B	G	B	G	P	G	B	G	U	A	P	X
18	B	G	B	B	G	B	G	P	X	G	B	G	G	P	B
19	G	B	B	G	G	G	G	O	B	B	O	U	U	P	G
20	G	G	U	J	G	B	G	G	P	X	G	B	A	P	X
21	B	G	B	U	G	B	B	P	P	G	G	B	U	P	G
22	P	G	G	P	G	B	P	P	B	X	B	G	P	P	X
23	G	G	G	G	P	X	G	P	G	G	B	G	J	P	B
24	X	G	G	A	G	U	P	A	P	G	B	G	J	P	G
25	B	G	B	U	G	B	B	B	B	G	G	B	G	P	A
26	X	G	G	O	B	G	G	B	G	X	G	G	U	G	G
27	P	G	G	G	G	X	G	B	G	G	R	G	U	P	B

50 m transect	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
28	C	G	B	U	B	G	G	P	G	G	B	B	G	P	G
29	G	P	B	B	G	X	B	B	P	W	G	G	U	P	G
30	G	G	G	U	G	X	G	B	P	W	G	U	G	P	X
31	G	G	U	O	G	A	G	P	G	G	G	U	G	P	B
32	B	X	U	O	B	X	X	P	P	B	G	U	A	X	G
33	B	G	P	G	G	O	B	P	B	B	G	X	G	G	G
34	B	G	G	B	X	X	A	P	G	A	G	B	U	G	X
35	O	O	U	U	G	G	G	B	G	G	P	A	U	O	G
36	G	X	G	G	G	G	A	G	G	P	G	B	U	G	B
37	X	G	G	P	G	G	G	B	B	G	G	B	G	G	F
38	P	G	B	U	G	P	B	G	G	B	P	G	U	G	B
39	P	G	P	U	G	G	B	X	B	G	B	G	W	B	B
40	P	G	P	U	G	B	A	X	P	B	B	U	G	G	G
41	B	G	G	P	G	G	X	P	G	B	G	U	W	G	G
42	U	G	G	U	X	G	G	G	B	G	G	G	P	O	X
43	P	G	X	A	G	A	G	P	G	B	P	U	W	G	G
44	P	G	J	J	G	N	R	P	P	U	B	U	W	G	B
45	P	B	G	U	G	F	G	P	P	W	P	B	J	G	X
46	P	O	G	U	O	F	G	P	P	U	B	U	P	G	G
47	G	G	G	B	G	B	B	P	B	W	G	B	G	P	X
48	G	G	O	U	G	N	G	P	P	U	G	U	B	P	G
49	P	O	O	U	P	F	B	G	P	G	B	U	J	P	B
50	P	G	P	U	G	B	O	B	P	G	B	G	A	G	F

Appendix B. Flora

The following abbreviations and symbols are relevant to this Appendix.

Code	Meaning	Reference
National listings (EPBC Act)		
EX	Extinct	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
CR	Critically endangered	
EN	Endangered	
VU	Vulnerable	
PMST	Protected Matters Search Tool	
State listings (FFG Act)		
x	Extinct	Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act)
cr	Critically endangered	
e	Endangered	
v	Vulnerable	
t	Threatened	
P	Protected (public land only)	

Appendix B.1. Flora species recorded from the study area

Table 18 Flora species recorded from the study area

Status	Scientific Name	Common Name
Indigenous species		
	Acacia dealbata	Silver Wattle
	Acacia dealbata subsp. *dealbata*	Silver Wattle
	Acacia melanoxylon	Blackwood
P	*Acacia pravissima*	Ovens Wattle
	Alisma plantago-aquatica	Water Plantain
	Alternanthera denticulata s.s.	Lesser Joyweed
	Amphibromus nervosus	Common Swamp Wallaby-grass
	Amyema miquelii	Box Mistletoe
	Anthosachne scabra s.s.	Common Wheat-grass
P	*Azolla rubra*	Pacific Azolla
	Bolboschoenus spp.	Club Sedge
	Bothriochloa macra	Red-leg Grass
	Bursaria spinosa	Sweet Bursaria
	Callistemon sieberi	River Bottlebrush
	Carex appressa	Tall Sedge
	Carex inversa	Knob Sedge
	Carex tereticaulis	Poong'ort
	Chloris truncata	Windmill Grass
	Cycnogeton multifructum	Northern Water-ribbons
	Cycnogeton spp.	Water Ribbons
	Dianella spp.	Flax Lily
	Dysphania pumilio	Clammy Goosefoot
	Eleocharis acuta	Common Spike-sedge
	Eleocharis spp.	Spike Sedge
	Epilobium billardiereanum subsp. *billardiereanum*	Smooth Willow-herb
	Eragrostis brownii	Common Love-grass
	Eragrostis elongata	Close-headed Love-grass
	Eragrostis parviflora	Weeping Love-grass
	Eucalyptus blakelyi	Blakely's Red-gum
	Eucalyptus bridgesiana s.s.	But But
	Eucalyptus camaldulensis subsp. *camaldulensis*	River Red-gum
	Eucalyptus camphora subsp. *humeana*	Mountain Swamp-gum
	Eucalyptus melliodora	Yellow Box
	Eucalyptus polyanthemos	Red Box
	Euphorbia drummondii s.l.	Flat Spurge
	Geranium spp.	Crane's Bill
	Hypericum gramineum	Small St John's Wort
	Juncus bufonius	Toad Rush

Status	Scientific Name	Common Name
	Juncus spp.	Rush
	Lachnagrostis filiformis s.s.	Common Blown-grass
P	*Laphangium luteoalbum*	Jersey Cudweed
	Leptospermum brevipes	Slender Tea-tree
	Leptospermum obovatum	River Tea-tree
	Lomandra filiformis subsp. *coriacea*	Wattle Mat-rush
	Ludwigia peploides subsp. *montevidensis*	Clove-strip
	Lythrum hyssopifolia	Small Loosestrife
	Melicytus dentatus s.s.	Tree Violet
	Microlaena stipoides var. *stipoides*	Weeping Grass
	Persicaria lapathifolia	Pale Knotweed
	Persicaria prostrata	Creeping Knotweed
	Phragmites australis	Common Reed
	Portulaca oleracea	Common Purslane
	Rumex brownii	Slender Dock
	Rytidosperma duttonianum	Brown-back Wallaby-grass
	Rytidosperma fulvum	Copper-awned Wallaby-grass
	Rytidosperma racemosum var. *racemosum*	Slender Wallaby-grass
	Rytidosperma spp.	Wallaby Grass
Introduced species		
	Acacia baileyana	Cootamundra Wattle
	Acetosella vulgaris	Sheep Sorrel
	Agrostis capillaris	Brown-top Bent
	Arctotheca calendula	Cape Weed
	Briza maxima	Large Quaking-grass
	Briza minor	Lesser Quaking-grass
	Bromus catharticus	Prairie Grass
	Bromus diandrus	Great Brome
	Bromus hordeaceus	Soft Brome
	Casuarina cunninghamiana subsp. *cunninghamiana*	River Oak
	Centaurium erythraea	Common Centaury
	Chenopodium album	Fat Hen
RC	*Cirsium vulgare*	Spear Thistle
RC	*Crataegus monogyna*	Hawthorn
	Cucumis myriocarpus subsp. *myriocarpus*	Paddy Melon
	Cynodon dactylon var. *dactylon*	Couch
	Cynosurus echinatus	Rough Dog's-tail
	Cyperus eragrostis	Drain Flat-sedge
	Digitaria sanguinalis	Summer Grass
RC	*Dittrichia graveolens*	Stinkwort
	Echinochloa crus-galli	Barnyard Grass

Status	Scientific Name	Common Name
RC	*Echium plantagineum*	Paterson's Curse
	Ehrharta longiflora	Annual Veldt-grass
	Erigeron bonariensis	Flaxleaf Fleabane
Planted	*Eucalyptus globulus*	Southern Blue-gum
Planted	*Eucalyptus sideroxylon* subsp. *sideroxylon*	Mugga
Planted	*Eucalyptus viminalis* subsp. *viminalis*	Manna Gum
	Euphorbia maculata	Eyebane
	Fraxinus angustifolia subsp. *angustifolia*	Desert Ash
	Galium aparine	Cleavers
	Holcus lanatus	Yorkshire Fog
	Hordeum hystrix	Mediterranean Barley-grass
	Hordeum spp.	Barley Grass
RC	*Hypericum perforatum* subsp. *veronense*	St John's Wort
	Hypochaeris radicata	Flatweed
	Isolepis levynsiana	Tiny Flat-sedge
	Lactuca serriola	Prickly Lettuce
	Lepidium africanum	Common Peppercress
	Lolium rigidum	Wimmera Rye-grass
	Lysimachia arvensis	Pimpernel
	Malva parviflora	Small-flower Mallow
	Melia azedarach	White Cedar
	Modiola caroliniana	Red-flower Mallow
R	*Nassella neesiana*	Chilean Needle-grass
	Panicum capillare	Common Millet
	Panicum gilvum	Sweet Panic
	Paspalum dilatatum	Paspalum
	Paspalum distichum	Water Couch
	Phalaris aquatica	Toowoomba Canary-grass
	Plantago lanceolata	Ribwort
	Polygonum aviculare s.s.	Hogweed
	Prunus spp.	Prunus
	Quercus robur	English Oak
	Ranunculus muricatus	Sharp Buttercup
RC	*Rosa rubiginosa*	Sweet Briar
RC	*Rubus anglocandicans*	Common Blackberry
	Rumex conglomeratus	Clustered Dock
	Rumex crispus	Curled Dock
	Setaria parviflora	Slender Pigeon-grass
	Sherardia arvensis	Field Madder
RC	*Silybum marianum*	Variegated Thistle
	Solanum nigrum s.s.	Black Nightshade

Status	Scientific Name	Common Name
	Sonchus asper s.s.	Rough Sow-thistle
	Sonchus oleraceus	Common Sow-thistle
	Symphyotrichum subulatum	Aster-weed
	Trifolium angustifolium var. *angustifolium*	Narrow-leaf Clover
	Trifolium subterraneum	Subterranean Clover
	Ulmus spp.	Elm
	Verbena bonariensis var. *bonariensis s.s.*	Purple-top Verbena
	Vulpia bromoides	Squirrel-tail Fescue
RC	*Xanthium spinosum*	Bathurst Burr

Appendix B.2. Listed flora species

The following table includes threatened flora species that have potential to occur within the study area. The list of threatened species is sourced from the VBA and PMST (accessed on 15 June 2023 and 30 April 2024 respectively). Where years are specified for the most recent database records, these refer to records from the VBA unless otherwise specified. Where no year is specified, the PMST has predicted that the species has potential to occur. A proportion of the flora habitat descriptions have been reproduced with permission from the Royal Botanic Gardens Victoria (RBGV 2020).

Table 19 Threatened flora species recorded or predicted to occur within 10km of the study area

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
National significance								
Amphibromus fluitans	River Swamp Wallaby-grass	VU			PMST	Swampy areas, mainly along the Murray River between Wodonga and Echuca with scattered records from southern Victoria.	**Low**	Suitable habitat in wetland areas and farm dams are heavily grazed but the study area does provide possible habitat. There are records of this species in the Wangaratta area within 20 km of Meadow Creek. This species is known to persist in modified wetland habitats and farm dams in NE Victoria and southern NSW.
Caladenia concolor	Crimson Spider-orchid	VU	e		PMST	Open, grassy understorey in Box Ironbark and dry foothill forests.	**Negligible**	No previous records, no suitable Box Ironbark forest within the study area
Glycine latrobeana	Clover Glycine	VU	v	2011	PMST	Grasslands and grassy woodlands, particularly those dominated by Kangaroo Grass.	**Low**	Suitable habitat in grassy woodland vegetation in the study area is highly modified and heavily grazed making it generally unsuitable for this grazing sensitive palatable species. The adjacent roadsides may support this species.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Lepidium monoplocoides	Winged Peppercress	EN	e		PMST	A variety of grassland, wetland and floodplain communities on finely textured soils; sometimes in exposed, sparsely vegetated sites, on dry and eroded clay scolds.	**Negligible**	There is limited suitable habitat for this species in the study area and the location is well beyond the known distribution of this species in northern Victoria.
Myriophyllum porcatum	Ridged Water-milfoil	VU	cr		PMST	Ephemeral wetlands, rock pools, farm dams and watercourse shallows.	**Low**	Some ephemeral wetland habitat present, however condition highly modified due to historical and ongoing agricultural land use. No previous records within the search area.
Pomaderris subplicata	Concave Pomaderris	VU	cr	2004	PMST	Known only from the vicinity of Carboor growing in dry woodland, on a southeast facing steep rocky slope.	**Low**	Landscape setting and the highly modified nature of the study area makes it unlikely that this restricted species would occur in the study area. The adjacent roadsides may support this species.
Prasophyllum validum	Sturdy Leek-orchid	VU			PMST	PMST result is Prasophyllum validum, however that species in VIC is categorised under *Prasophyllum* aff. *validum* which is not EPBC listed.	**Negligible**	Species *P. validum* is endemic to South Australia.
Swainsona murrayana	Slender Darling-pea	VU	e		PMST	Around lakes and on flats that are subject to seasonal inundation.	**Negligible**	No previous records within the search area, no suitable habitat within the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Swainsona recta	Mountain Swainson-pea	EN	cr	1895	PMST	Open woodlands with grassy understorey.	**Low**	The highly modified nature of the study area makes it unlikely that this restricted species would occur in the study area.
State significance								
Acianthus collinus	Hooded Mosquito-orchid		cr	2010		Open forests on well-drained sandy or clay loam soils.	**Low**	The highly modified and grazed nature of the study area makes it unlikely that this orchid species would persist in the study area. This species may occur in adjacent roadside vegetation.
Billardiera scandens s.s.	Velvet Apple-berry		e	2011		Common in heathland, woodland and forests from near sea level to the subalps.	**Low**	The landscape setting and highly modified and grazed nature of the study area makes it unlikely that this species would occur in the study area. This species may occur in adjacent roadside vegetation.
Craspedia haplorrhiza	Plains Billy-buttons		e	1993		Heavy soils or loamy sands, particularly on floodplains and seasonally wet depressions.	**Low**	Woodland areas with seasonally waterlogged soils support suitable habitat for this species however local records are over 25 years old and the study area is subject to grazing practices that degrade habitat. As the species was not recorded during the detailed survey effort across the study area, the species is considered to have a low likelihood of occurrence.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Cyperus leptocarpus	Button Rush		e	1998		Open, damp places such as sandy stream-banks or drying lake margins.	**Low**	Creeklines and margins in the study area may provide habitat for this species. However, as the species was not recorded during the detailed survey effort across the study area, the species is considered to have a low likelihood of occurrence.
Diuris punctata var. punctata	Purple Diuris		e	1993		Fertile, loamy soils and periodically wet areas in lowland grasslands, grassy woodlands, heathy woodlands and open heathlands.	**Low**	The highly modified and grazed nature of the study area makes it unlikely that this orchid species would persist in the study area. This species may occur in adjacent roadside vegetation.
Eucalyptus cinerea subsp. victoriensis	Beechworth Silver Stringybark		e	1894		Range of sites from around low-lying areas to sandplains and low ridges and slopes, always on poor soil.	**Low**	This obvious species was not recorded in the study area and the landscape setting is unlikely to be suitable for this species.
Goodenia macbarronii	Narrow Goodenia		e	2018		Sandy to clay/silt soils in areas that are moist or wet year round, such as spring-soaks and alluvial fans of drainage lines, and including disturbed areas.	**Low**	Recent records in the search area and suitable habitat occurs adjacent to permanently wet soaks and drainage lines that are afforded some protection from trampling by cattle. However, as the species was not recorded during the detailed survey effort across the study area, the species is considered to have a low likelihood of occurrence.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	FFG					
Lespedeza juncea	Chinese Lespedeza		e	1905		Seasonally inundated sandy soils and along watercourses.	**Low**	Most suitable riparian habitat is heavily grazed and modified making it unsuitable for this species to persist. Furthermore, local database records are all over 25 years old.
Pultenaea foliolosa	Small-leaf Bush-pea		e	2011		Confined to small areas in the north-east, from the Warby Range to Myrtleford and Wodonga areas, and in Gippsland near Briagolong and north of Dargo, usually in dry, open-forest.	**Low**	Some suitable habitat in small areas in woodland patch vegetation that have some protection from gazing. However, as the species was not recorded during the detailed survey effort across the study area, the species is considered to have a low likelihood of occurrence.

Appendix B.3. Threatened ecological communities

The following table includes the threatened ecological communities that have potential to occur within the project area. The list of threatened ecological communities has been compiled with reference to characteristics of FFG Act threatened communities (SAC 2013) and predictive output from the PMST (accessed on 12 May 2022).

Table 20 Threatened ecological communities predicted to occur within 10 km of the project area.

Community Name	Conservation status	Source	Description
National significance			
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	PMST	**Not present, no Buloke trees present.**
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	PMST	**Not present, no Grey Box trees present.**
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	PMST	**Potentially present, Yellow Box and Blakely's Red-gum trees occur in the local area.**
State significance			
Creekline Grassy Woodland (Goldfields) Community	Threatened	EVC mapping	**Not present, EVC 68 in the study area does not occur within a Goldfields Box Ironbark Forest context.**
Grey Box - Buloke Grassy Woodland Community	Threatened	EVC mapping	**Not present, no Grey Box or Buloke trees present.**
Northern Plains Grassland Community	Threatened	EVC mapping	**Not present, no naturally occurring native grasslands were recorded.**
Victorian Temperate Woodland Bird Community	Threatened	Geographic distribution	**Potentially present, woodland bird assemblages occur in the local area.**

Appendix C. Fauna

The following abbreviations and symbols are relevant to this Appendix:

Code	Meaning	Reference
National listings (EPBC Act)		
EX	Extinct	Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)
CR	Critically endangered	
EN	Endangered	
VU	Vulnerable	
NT	Near threatened	
CD	Conservation dependent	
PMST	Protected Matters Search Tool	
State listings (FFG Act)		
x	Extinct	Victorian Flora and Fauna Guarantee Act 1988 (FFG Act)
cr	Critically endangered	
e	Endangered	
v	Vulnerable	
t	Threatened	
P	Protected (fish only)	
Pest animal status (CaLP Act and Fisheries Act)		
PS	Declared pest animal	Victorian Catchment and Land Protection Act 1994 (CaLP Act)
N	Declared noxious aquatic species	Victorian Fisheries Act 1995
Other		
*****	Introduced species	Victorian Biodiversity Atlas (VBA)
‡‡	New record of aquatic species for catchment	
D	Diadromous species (migrates between freshwater and saltwater during lifecycle)	
E	Euryhaline species (capable of occurring in marine and freshwater environments)	
P	Present but abundance not recorded	

Appendix C.1. Fauna species recorded from the study area

Table 21 Vertebrate fauna recorded from the study area

Status	Scientific Name	Common Name
Indigenous species		
	Acanthiza chrysorrhoa	Yellow-rumped Thornbill
	Accipiter cirrocephalus	Collared Sparrowhawk
	Alisterus scapularis	Australian King-Parrot
	Anas gracilis	Grey Teal
	Anas superciliosa	Pacific Black Duck
	Anthochaera carunculata	Red Wattlebird
	Anthus australis	Australian Pipit
	Aquila audax	Wedge-tailed Eagle
	Ardea pacifica	White-necked Heron
	Artamus cyanopterus	Dusky Woodswallow
	Cacatua galerita	Sulphur-crested Cockatoo
	Cacatua sanguinea	Little Corella
	Chenonetta jubata	Australian Wood Duck
	Chrysococcyx lucidus	Shining Bronze-Cuckoo
	Cisticola exilis	Golden-headed Cisticola
	Colluricincla harmonica	Grey Shrike-thrush
	Coracina novaehollandiae	Black-faced Cuckoo-shrike
	Corcorax melanorhamphos	White-winged Chough
	Cormobates leucophaea	White-throated Treecreeper
	Corvus mellori	Little Raven
	Coturnix pectoralis	Stubble Quail
	Cracticus nigrogularis	Pied Butcherbird
	Crinia signifera	Common Froglet
EN, e	*Crinia sloanei*	Sloane's Froglet
	Dacelo novaeguineae	Laughing Kookaburra
	Egretta novaehollandiae	White-faced Heron
	Elanus axillaris	Black-shouldered Kite
	Eolophus roseicapilla	Galah
	Eurystomus orientalis	Oriental Dollarbird
	Falco berigora	Brown Falcon
	Falco cenchroides	Nankeen Kestrel
	Falco peregrinus	Peregrine Falcon
	Gerygone olivacea	White-throated Gerygone
	Grallina cyanoleuca	Magpie-lark
	Gymnorhina tibicen	Australian Magpie
	Haliastur sphenurus	Whistling Kite
	Hirundo neoxena	Welcome Swallow
	Lampropholis guichenoti	Garden Skink

Status	Scientific Name	Common Name
	Limnodynastes dumerilii dumerilii	Pobblebonk Frog
	Litoria ewingii	Southern Brown Tree Frog
	Macropus giganteus	Eastern Grey Kangaroo
	Malurus cyaneus	Superb Fairy-wren
	Manorina melanocephala	Noisy Miner
	Merops ornatus	Rainbow Bee-eater
	Myiagra inquieta	Restless Flycatcher
	Ninox boobook	Southern Boobook
	Ocyphaps lophotes	Crested Pigeon
	Oriolus sagittatus	Olive-backed Oriole
	Pachycephala rufiventris	Rufous Whistler
	Pardalotus striatus	Striated Pardalote
	Pelecanus conspicillatus	Australian Pelican
	Petaurus breviceps	Sugar Glider
	Petrochelidon ariel	Fairy Martin
	Petroica boodang	Scarlet Robin
	Petroica phoenicea	Flame Robin
	Phaps chalcoptera	Common Bronzewing
	Philemon citreogularis	Little Friarbird
	Philemon corniculatus	Noisy Friarbird
	Platycercus elegans	Crimson Rosella
	Platycercus elegans flaveolus	Yellow Rosella
	Platycercus eximius	Eastern Rosella
	Psephotus haematonotus	Red-rumped Parrot
	Pseudechis porphyriacus	Red-bellied Black Snake
	Ptilotula penicillata	White-plumed Honeyeater
	Rhipidura albiscapa	Grey Fantail
	Rhipidura leucophrys	Willie Wagtail
	Tadorna tadornoides	Australian Shelduck
	Threskiornis spinicollis	Straw-necked Ibis
	Todiramphus sanctus	Sacred Kingfisher
	Trichosurus vulpecula	Common Brush-tailed Possum
Introduced species		
	Acridotheres tristis	Common Myna
	Cyprinus carpio	European Carp
	Gambusia holbrooki	Eastern Gambusia
	Lepus europaeus	European Brown Hare
	Oryctolagus cuniculus	European Rabbit
	Sturnus vulgaris	Common Starling
	Vulpes vulpes	Red Fox

Appendix C.2. Listed fauna species

The following table includes a list of threatened fauna species that have potential to occur within the study area. The list of threatened species is sourced from the VBA and PMST (accessed on 15 June 2023 and 30 April 2024 respectively). Where years are specified for the most recent database records, these refer to records from the VBA unless otherwise specified. Where no year is specified, the PMST has predicted that the species has potential to occur.

Table 22 Threatened fauna species recorded or predicted to occur within 10 km of the study area

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
National significance									
Pedionomus torquatus	Plains-wanderer	CR	cr	cr		PMST	Native grassland with a sparse, open structure.	**Negligible**	Lack of natural grassland habitat.
Gallinago hardwickii	Latham's Snipe	VU	nt			PMST	A migrant to Australia from July to April occurring in a wide variety of permanent and ephemeral wetlands. Prefers open freshwater wetlands with nearby cover, but also recorded on the edges of creeks and rivers, river-pools and floodplains. Forages in soft mud at edge of wetlands and roosts in a variety of vegetation around wetlands including tussock grasslands, reeds and rushes, tea-tree scrub, woodlands and forests.	**Medium**	May occasionally use wet pasture areas.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
Rostratula australis	Australian Painted-snipe	EN	cr	cr	2012	PMST	Shallows of well-vegetated freshwater wetlands.	**Low**	Lack of suitable wetland habitat.
Botaurus poiciloptilus	Australasian Bittern	EN	en	cr	1981	PMST	Shallow freshwater and brackish wetlands with abundant emergent aquatic vegetation.	**Low**	Lack of suitable wetland habitat in the study area and no recent local records, most farm dams are devoid of dense wetland vegetation such as Cumbungi.
Falco hypoleucos	Grey Falcon	VU	en	v		PMST	Lightly timbered plains and Acacia scrub.	**Low**	Lack of nearby records.
Callocephalon fimbriatum	Gang-gang Cockatoo	EN		e	2008	PMST	S Vic to E NSW. Forests and woodlands from coast to alpine areas. Autumn-winter dispersal from highlands to lower elevations. Forages in eucalypts, acacias and some exotic garden trees and shrubs.	**High**	Could forage in woodland vegetation and shelterbelts across the study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
Polytelis swainsonii	Superb Parrot	VU	en	e	1933	PMST	Red-gum and box-dominated forests and woodlands.	**Low**	No recent nearby records of this species.
Neophema chrysostoma	Blue-winged Parrot	VU			1978	PMST	A range of coastal, sub-coastal and semi-arid regions throughout south-eastern Australia. Favor heathy woodland for breeding, particularly sites recently disturbed by fire or logging. Nests in tree hollows in coastal eucalypt forests and woodlands. Feeds on seeds of a range of native grasses and herbs. Flocks of several thousand occasionally recorded in winter, when majority of Tasmanian population migrates to Victoria.	**Medium**	Could forage in woodland vegetation and shelterbelts across the study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
Lathamus discolor	Swift Parrot	CR	en	cr	1997	PMST	A range of forests and woodlands, especially those supporting nectar-producing tree species. Also well-treed urban areas.	**Medium**	Could forage in woodland vegetation and shelterbelts across the study area.
Hirundapus caudacutus	White-throated Needletail	VU	vu	v	2018	PMST	An almost exclusively aerial species within Australia, occurring over most types of habitat, particularly wooded areas.	**Medium**	Species likely to operate in airspace above the site occasionally.
Tringa nebularia	Common Greenshank	EN	vu	e		PMST	A variety of ephemeral and permanent inland wetlands and sheltered coastal wetlands.	**Negligible**	Lack of suitable wetland and foraging habitat in the study area and no recent nearby records.
Calidris ferruginea	Curlew Sandpiper	CR	en	cr		PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	**Negligible**	Lack of suitable wetland and foraging habitat in the study area and no recent nearby records.
Calidris acuminata	Sharp-tailed Sandpiper	VU				PMST	Prefers muddy edges of shallow fresh or brackish wetlands with inundated or emergent low vegetation. Occasionally use flooded paddocks and other ephemeral wetlands.	**Negligible**	Lack of suitable wetland and foraging habitat in the study area and no recent nearby records.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
Melanodryas cucullata	Hooded Robin	EN	nt	v	2019	PMST	Woodlands of eucalypt, Mallee, semi-cleared farmland.	**Medium**	Could forage and nest in local roadsides, shelterbelts and fragmented woodlands.
Aphelocephala leucopsis	Southern Whiteface	VU			1996	PMST	Open grassy woodlands and shrublands	**Medium**	Could forage and nest in local roadsides, shelterbelts and fragmented woodlands.
Pycnoptilus floccosus	Pilotbird	VU		v		PMST	E Vic to SE NSW. Largely ground-dwelling among leaf litter, logs and lower storey vegetation of wet sclerophyll forests and rainforest. Less often, alpine and coastal woodlands.	**Negligible**	No suitable tall wet forest habitat present in the study area.
Grantiella picta	Painted Honeyeater	VU	vu	v	2019	PMST	Dry open woodlands and forests. Typically forages for fruit and nectar in mistletoes and in tree canopies.	**Medium**	Could forage in woodland vegetation and shelterbelts across the study area but there is a low abundance of Mistletoe on the site.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
Anthochaera phrygia	Regent Honeyeater	CR	cr	cr	2018	PMST	A range of dry woodlands and forests dominated by nectar-producing tree species.	**Medium**	Could forage in woodland vegetation and shelterbelts across the study area but there is a low abundance of winter-flowering eucalypts in the study area with most trees present being Red-gum species.
Stagonopleura guttata	Diamond Firetail	VU	nt	v	2019	PMST	Open forests and woodlands with a grassy ground layer.	**Medium**	Could forage and nest in local roadsides, shelterbelts and fragmented woodlands.
Climacteris picumnus	Brown Treecreeper	VU	nt		2021	PMST	Often observed feeding on insects as it spirals up trees or when hopping along the ground or on fallen litter. Generally inhabits open eucalypt forests, woodlands and Mallee, often where there are stands of dead trees.	**Medium**	Could forage and nest in local roadsides, shelterbelts and fragmented woodlands.
Dasyurus maculatus maculatus	Spot-tailed Quoll	EN	en	e	1995	PMST	Rainforest and wet and dry sclerophyll forests and woodlands.	**Low**	Lack of suitable or extensive forested habitat in the study area.
Petauroides volans	Southern Greater Glider	EN	vu	v	1996	PMST	Wet and damp sclerophyll forest with large hollow-bearing trees.	**Low**	Lack of suitable tall forest or foothill forest habitat in the study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
Petaurus australis	Yellow-bellied Glider	VU		v		PMST	Sclerophyll forest with large hollow-bearing trees, prefers mature eucalypt dominated forest and woodland. Distributed along South-eastern Australia.	**Low**	Lack of suitable tall forest or foothill forest habitat in the study area.
Pteropus poliocephalus	Grey-headed Flying-fox	VU	vu	v		PMST	Rainforest, wet and dry sclerophyll forest, woodland and urban areas.	**Medium**	Could forage in woodland vegetation and shelterbelts across the study area
Aprasia parapulchella	Pink-tailed Worm-Lizard	VU	en	e		PMST	Woodland and grassland with partially buried rocks.	**Negligible**	Lack of suitable woodland or grassland habitat with rocky substrate in the study area
Delma impar	Striped Legless Lizard	VU	en	e	2020	PMST	Natural temperate grassland, grassy woodland and exotic grassland.	**Low**	Lack of suitable woodland or grassland habitat within the study area and most areas have been subject to cultivation.
Crinia sloanei	Sloane's Froglet	EN		e		PMST	Adults are most common in woodlands, floodplains, grasslands, and open and disturbed areas.	**Recorded**	Species recorded in Sheep Station Creek during targeted surveys.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
Litoria raniformis	Growling Grass Frog	VU	en	v	1962	PMST	Still or slow-flowing waterbodies and surrounding terrestrial vegetation. [NOTE Due to recent taxonomic changes: Nth Vic GGF is L. raniformis raniformis and Sth Vic GGF L. raniformis major. No legislative implications]	**Negligible**	Lack of suitable habitat in the study area and the species is likely to be regionally extinct.
Galaxias rostratus	Flat-headed Galaxias	CR	vu	v		PMST	Still or slow-moving waters of rivers, billabongs, lakes and swamps.	**Negligible**	No suitable aquatic habitat or permanent large waterways and wetlands in the study area.
Maccullochella macquariensis	Trout Cod	EN	cr	e	2019	PMST	Streams characterised by a high abundance of large woody debris.	**Negligible**	No suitable aquatic habitat or permanent large waterways and wetlands in the study area.
Maccullochella peelii	Murray Cod	VU	vu	e	2019	PMST	A diverse range of stream habitats in the Murray-Darling basin; principally the main channels of rivers and their major tributaries.	**Negligible**	No suitable aquatic habitat or permanent large waterways and wetlands in the study area.
Macquaria australasica	Macquarie Perch	EN	en	e	2018	PMST	Streams with clear water and deep, rocky holes with abundant cover.	**Negligible**	No suitable aquatic habitat or permanent large waterways and wetlands in the study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
Nannoperca australis (Murray-Darling lineage)	Southern Pygmy Perch (Murray-Darling lineage)	VU	vu	v	2007		Well-vegetated, slow-flowing or still waters including streams, lakes, billabongs and other types of wetlands. The species is found in populations upstream of the Avoca River, and recently been discovered in tributaries of the upper Lachlan and upper Murray River catchments.	**Low**	This species has generally disappeared from much of its former Victorian range north of the Great Dividing Range. Its presence would substantially rely on the semi-permanent retention of water in local creeks (or rapid re-colonisation from a source population following drying out of local creeks) and that pools /creeks support abundant macrophytes. Given Sheep Station Creek is a seasonal waterway and aquatic habitats in Hurdle Creek are likely to be highly modified due to livestock access this species is consider to have a low likelihood of occurring in local creeks.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
Synemon plana	Golden Sun Moth	VU	cr	v	2011	PMST	Natural temperate grassland, grassy woodland and pasture supporting spear grasses and wallaby grasses and exotic grassland dominated by Chilean needle grass.	**Low**	Lack of suitable woodland or grassland habitat within the study area and most areas have been subject to cultivation and are dominated by introduced pasture. No extensive stands of the introduced Chilean Needle-grass were noted on the site.
Keyacris scurra	Key's Matchstick Grasshopper	EN		e		PMST	Native grassland and open grassy woodland	**Low**	Lack of suitable woodland or grassland habitat within the study area and most areas have been subject to cultivation and are dominated by introduced pasture.
State significance									
Geopelia cuneata	Diamond Dove		nt	v	1981		Drier woodlands and scrub, spinifex and mulga.	**Low**	Lack of suitable habitat and probably a vagrant irregular visitor to NE Victoria during inland droughts.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
Lewinia pectoralis	Lewin's Rail		vu	v	1981		Swamps, dense riparian vegetation and saltmarsh.	**Low**	Lack of suitable wetland habitat in the study area and no recent local records, most farm dams are devoid of dense wetland vegetation.
Burhinus grallarius	Bush Stone-curlew		en	cr	1995		Open woodland, treed farmland.	**Low**	Woodland habitat is highly fragmented and this species is likely to be locally extinct.
Egretta garzetta	Little Egret		en	e	1991		Swamps, billabongs, floodplain pools, mudflats, mangroves and channels; breeds in trees standing in water.	**Low**	Lack of suitable wetland habitat in the study area.
Ardea intermedia plumifera	Plumed Egret		en	cr	2004		Densely-vegetated freshwater wetlands including lakes, swamps and billabongs. Breeds in trees standing in water.	**Low**	Lack of suitable wetland habitat in the study area and no recent local records, most farm dams are devoid of dense wetland vegetation.
Ixobrychus dubius	Australian Little Bittern		en	e	1989		Freshwater swamps, lakes and rivers with dense reedbeds, saltmarsh and coastal lagoons.	**Low**	Lack of suitable wetland habitat in the study area and no recent local records, most farm dams are devoid of dense wetland vegetation.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
Anseranas semipalmata	Magpie Goose		nt	v	2005		Swamps, lakes, sewage ponds, flooded pasture, dams.	**Medium**	Could occasionally forage in wet pasture or drainage lines.
Spatula rhynchotis	Australasian Shoveler		vu	v	1999		Variety of wetlands, with a preference for large, permanent, freshwater lakes/swamps with dense fringing vegetation.	**Medium**	Could occasionally occur on farm dams in the study area.
Aythya australis	Hardhead		vu	v	1980		Deep freshwater swamps and wetlands, with abundant aquatic and terrestrial vegetation for roosting. Can occur in sheltered estuaries.	**Medium**	Could occasionally occur on farm dams in the study area.
Oxyura australis	Blue-billed Duck		en	v	1977		Open or densely vegetated wetlands.	**Medium**	Could occasionally occur on farm dams in the study area.
Biziura lobata	Musk Duck		vu	v	1989		Deep, permanent freshwater wetlands with areas of open water and patches of dense aquatic vegetation.	**Low**	Farm dams in the study area are unlikely to be large enough to support this species.
Accipiter novaehollandiae	Grey Goshawk		vu	e	1976		Rainforest, gallery forest, tall wet forest and woodland. Also partially cleared agricultural land.	**Low**	Woodland habitat is highly fragmented in the study area.
Hieraaetus morphnoides	Little Eagle		vu	v	2006		Woodland and open areas. Rabbits are a key component of their diet. Nesting occurs in mature	**Medium**	Could occasionally forage over the site.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
							trees in open woodland or riparian vegetation.		
Haliaeetus leucogaster	White-bellied Sea-Eagle		vu	e	1997		Coastal areas such as beaches and estuaries, inland wetlands and major inland streams.	**Low**	Site is a reasonable distance from large inland rivers and lakes.
Falco subniger	Black Falcon		vu	cr	1981		Woodlands, open country and around terrestrial wetlands areas, including rivers and creeks. Mostly hunts over open plains and undulating land with large tracts of low vegetation. Primarily occurs in arid and semi-arid zones in the north, north-west and west of Victoria, though can be forced into more coastal areas by droughts and subsequent food shortages.	**Low**	Woodland habitat is highly fragmented in the study area.
Ninox connivens	Barking Owl		en	cr	2018		Eucalypt forests and woodlands.	**Medium**	Could occasionally forage over the site.
Ninox strenua	Powerful Owl		vu	v	2010		Eucalypt forests and woodlands, well-treed urban areas.	**Medium**	Could occasionally forage over the site.
Neophema pulchella	Turquoise Parrot		nt	v	2011		Woodlands and associated grasslands.	**Medium**	Could forage and nest in local roadsides, shelterbelts and fragmented woodlands

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
Actitis hypoleucos	Common Sandpiper		vu	v		PMST	Migrates to Australia from Eurasia in August where it inhabits a wide variety of coastal and inland wetlands with muddy margins before departing north in March.	**Negligible**	Lack of suitable wetland and foraging habitat in the study area and no recent nearby records.
Coracina maxima	Ground Cuckoo-shrike		vu	e	1914		Open woodland, farmland, mulga, spinifex with scattered trees.	**Low**	Lack of suitable habitat and recent records.
Pomatostomus temporalis	Grey-crowned Babbler		en	v	2000		Open forests and woodlands.	**Medium**	Could forage and nest in local roadsides, shelterbelts and fragmented woodlands
Pyrrholaemus sagittatus	Speckled Warbler		vu	e	1981		Eucalypt woodland with rocky gullies, ridges, tussock grasses and a sparse shrub understorey.	**Medium**	Could forage and nest in local roadsides, shelterbelts and fragmented woodlands
Phascogale tapoatafa	Brush-tailed Phascogale		vu	v	1979		Drier sclerophyll forests and woodlands.	**Medium**	Could forage and reside in local roadsides, shelterbelts and fragmented woodlands
Petaurus norfolcensis	Squirrel Glider		en	v	2005		Drier woodlands, riverine woodland and coastal forest.	**High**	Likely to occur in local roadside vegetation.
Vermicella annulata	Bandy Bandy		vu	e	1999		Grassy woodland, Mallee and spinifex-covered sandhills.	**Low**	Lack of suitable intact woodland, dry forest or rocky habitat used by this species in NE Victoria.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
Emydura macquarii	Murray River Turtle		vu	cr	2016		A medium sized freshwater turtle that inhabits inland river systems including the Murray-Darling catchment.	**High**	This species is likely to occur in farm dams and creeks, especially the large fenced dam in the north-west part of the solar farm study area
Pseudophryne bibronii	Brown Toadlet		en	e	1962		A wide variety of woodland, forest and grassland habitats, where it shelters under leaf litter and other debris in moist soaks and depressions. Breeds in swamps and inundated habitats, and along creek lines.	**Medium**	This species may occur in creeklines and seasonally wet areas across the study area.

Appendix C.3. Migratory species (EPBC Act listed)

Table 23 Migratory fauna species recorded or predicted to occur within 10 km of the study area

Scientific name	Common name	Most recent record
Migratory species		
Gallinago hardwickii	Latham's Snipe	PMST
Plegadis falcinellus	Glossy Ibis	1989
Hirundapus caudacutus	White-throated Needletail	2018
Apus pacificus	Fork-tailed Swift	1971
Numenius madagascariensis	Eastern Curlew	PMST
Actitis hypoleucos	Common Sandpiper	PMST
Tringa nebularia	Common Greenshank	PMST
Calidris ferruginea	Curlew Sandpiper	PMST
Calidris acuminata	Sharp-tailed Sandpiper	PMST
Calidris melanotos	Pectoral Sandpiper	PMST
Motacilla flava	Yellow Wagtail	PMST
Rhipidura rufifrons	Rufous Fantail	2000
Myiagra cyanoleuca	Satin Flycatcher	PMST

Appendix D. Photos of the study area

Photo 1 **Small and isolated patches of Plains Grassy Woodland vegetation within grazed paddocks of the solar farm (HZ1). View to east. Photo taken 25 November 2022.**

Photo 2 **Long linear corridor of Plains Grassy Woodland vegetation along fence line within the solar farm study area (HZ2). View to north-west. Photo taken 25 November 2022.**

Photo 3 **Plains Grassy Woodland vegetation around a farm dam within the solar farm study area (HZ3). View to west. Photo taken 25 November 2022.**

Photo 4 **Derived Plains Grassy Woodland vegetation within grazed paddocks within the solar farm study area. Photo taken 29 November 2022.**

Photo 5 **Creekline Grassy Woodland EVC 68 along Sheep Station Creek within the solar farm study area. View to north-west. Photo taken 25 November 2022.**

Photo 6 **Creekline Grassy Woodland EVC 68 and the highly modified riparian zone along Hurdle Creek within the transmission line study area. View to north-west. Photo taken 12 April 2024, looking east.**

Photo 7 **Typical farm dam with poor water quality and limited fringing vegetation, these dams are open to livestock grazing and trampling. Photo taken 22 April 2022, looking north-west.**

Photo 8 **Predominantly introduced vegetation in grazed paddocks within the solar farm study area. View to north. Photo taken 25 November 2022.**

Photo 9 **Planted shelter belt vegetation within the solar farm study area.**

Photo 10 **Blue Gum plantation near Sheep Station Creek on western side of solar farm study area. Photo taken 22 April 2022 looking north.**

Photo 11 **Rushes (*Juncus* spp.) associated with grazed pastured in the solar farm area. Photo taken 22 April 2022.**

Appendix E. Vegetation impact assessment results

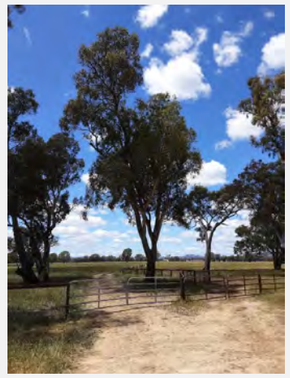
Appendix E.1. Quantification and significance of losses

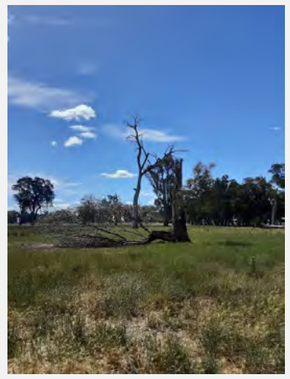
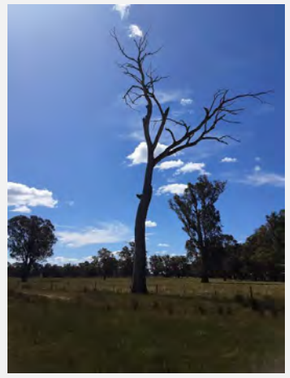
Table 24 **Vegetation quality assessment results for native vegetation within the study area including all conditions states, noting only some of these zones will be impacted and have been used in the project Native Vegetation Removal Report.**

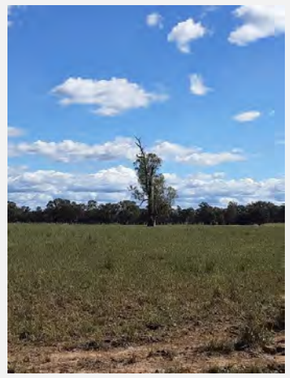
Habitat Zone ID / condition state			1 (small patches isolated in paddocks)	2 (linear corridors along fences)	3 (farm dam, some native understorey)	Derived wetland	Road reserves (9)	Road reserves (10)	Road reserves (7, 8)	Solar Farm (HZ1)	Solar Farm (HZ2)	Transmission line crossing (HZ1)	Transmission line crossing (HZ2)	Transmission line crossing (HZ3)	HZ12	HZ13	HZ14	HZ15	HZ16	HZ 4,5,6
EVC #: Name			EVC 55_61	EVC 55_61	EVC 55_61	EVC 55_61 derived wetland	EVC 55_61	EVC 55_61	EVC 55_61	EVC 68	EVC 68	EVC 68	EVC 68	EVC 68	EVC 55_61	EVC 55_61	EVC 55_61	EVC 55_61	EVC 55_61	EVC 55_61
		Max Score	**Score**	**Score**	**Score**	**Score**	**Score**	**Score**	**Score**	**Score**	**Score**	**Score**	**Score**	**Score**	**Score**	**Score**	**Score**	**Score**	**Score**	**Score**
Site Condition	Large Trees	10	10	10	9	0	6	10	8	7	0	10	10	0	10	10	10	10	8	10
	Tree Canopy Cover	5	5	5	3	0	3	3	3	5	0	5	5	0	5	5	5	5	5	3
	Lack of Weeds	15	2	2	2	7	2	2	2	2	2	0	0	0	0	0	0	0	0	2
	Understorey	25	0	5	5	5	5	5	5	5	5	15	5	5	5	5	5	5	0	5
	Recruitment	10	0	0	0	0	5	5	5	5	0	3	0	0	5	5	5	5	0	3
	Organic Matter	5	3	4	2	3	3	3	3	5	3	3	3	2	3	3	3	3	3	3
	Logs	5	0	2	5	0	0	0	0	2	0	2	2	0	4	2	0	2	5	2
	Total Site Score		20	28	26	15	24	28	26	31	10	38	25	7	32	30	28	30	21	28
Landscape Value	Patch Size	10	1	6	1	1	1	1	6	6	1	1	1	1	6	6	6	6	6	6
	Neighbourhood	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Distance to Core Area	5	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1
	Total Landscape Score		2	7	2	2	2	2	7	7	2	1	1	1	7	7	7	7	7	7
Habitat points = #/100		100	22	35	28	17	26	30	33	38	12	39	26	8	39	37	35	37	28	35
CONDITION SCORE		1	0.22	0.35	0.28	0.17	0.26	0.30	0.33	0.38	0.12	0.39	0.26	0.08	0.39	0.37	0.35	0.37	0.28	0.35

Appendix E.2. Trees data and scattered tree photos

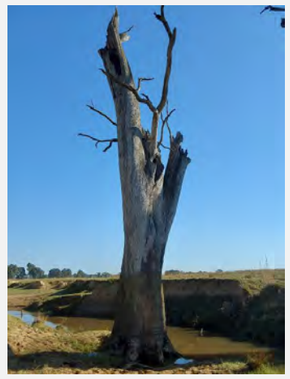
Table 25 Scattered trees deemed lost within the study area

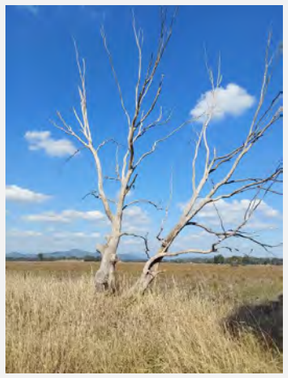
Tree #	Scientific name	Common name	Tree value (see Figure 5)	Circumference (cm)	Size	Status	Tree photo (taken 24-29 November 2022, 15 December 2022 and 12 April 2024)
52	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	286	Large	Assumed lost – indirect impact	
55	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	412	Large	Lost – direct impact	
62	Dead	N/A	See Figure 5	456	Large	Lost – direct impact	

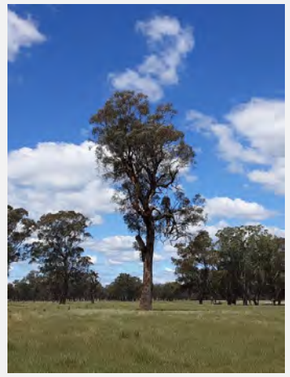
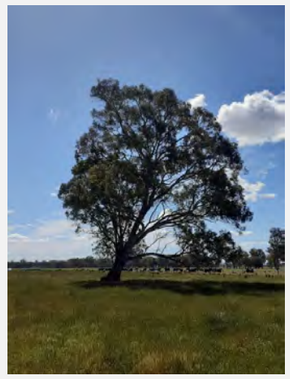
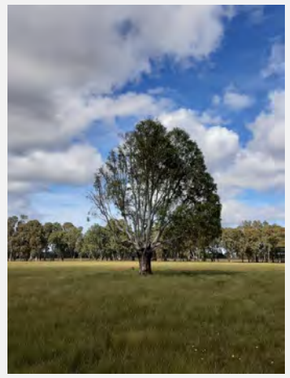
Tree #	Scientific name	Common name	Tree value (see Figure 5)	Circumference (cm)	Size	Status	Tree photo (taken 24-29 November 2022, 15 December 2022 and 12 April 2024)
78	*Eucalyptus blakelyi*	Blakely's Red-gum	See Figure 5	377	Large	Lost – direct impact	
79	Dead	N/A	See Figure 5	393	Large	Lost – direct impact	
84	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	440	Large	Lost – direct impact	

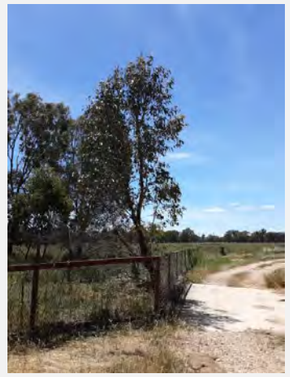
Tree #	Scientific name	Common name	Tree value (see Figure 5)	Circumference (cm)	Size	Status	Tree photo (taken 24-29 November 2022, 15 December 2022 and 12 April 2024)
86	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	496	Large	Lost – direct impact	
92	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	377	Large	Lost – direct impact	
93	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	361	Large	Lost – direct impact	

Tree #	Scientific name	Common name	Tree value (see Figure 5)	Circumference (cm)	Size	Status	Tree photo (taken 24-29 November 2022, 15 December 2022 and 12 April 2024)
116	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	547	Large	Lost – direct impact	
117	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	261	Large	Lost – direct impact	
803	Dead	N/A	See Figure 5	314	Large	Lost – direct impact	

Tree #	Scientific name	Common name	Tree value (see Figure 5)	Circumference (cm)	Size	Status	Tree photo (taken 24-29 November 2022, 15 December 2022 and 12 April 2024)
1000	Dead	N/A	See Figure 5	503	Large	Lost – direct impact	
1001	Dead	N/A	See Figure 5	408	Large	Lost – direct impact	
1002	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	638	Large	Lost – direct impact	

Tree #	Scientific name	Common name	Tree value (see Figure 5)	Circumference (cm)	Size	Status	Tree photo (taken 24-29 November 2022, 15 December 2022 and 12 April 2024)
1003	Dead	N/A	See Figure 5	201	Large	Lost – direct impact	
1004	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	456	Large	Lost – direct impact	
1011	Dead	N/A	See Figure 5	160	Small	Assumed lost – indirect impact	

Tree #	Scientific name	Common name	Tree value (see Figure 5)	Circumference (cm)	Size	Status	Tree photo (taken 24-29 November 2022, 15 December 2022 and 12 April 2024)
1049	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	346	Large	Lost – direct impact	
1065	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	324	Large	Lost – direct impact	
1091	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	314	Large	Lost – direct impact	No photo available
1092	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	305	Large	Lost – direct impact	

Tree #	Scientific name	Common name	Tree value (see Figure 5)	Circumference (cm)	Size	Status	Tree photo (taken 24-29 November 2022, 15 December 2022 and 12 April 2024)
1100	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	47	Small	Assumed lost – indirect impact	
2000	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	123	Small	Lost – direct impact	
2001	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	141	Small	Lost – direct impact	

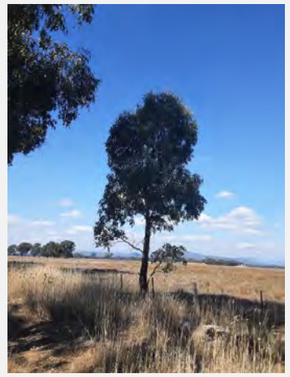
Tree #	Scientific name	Common name	Tree value (see Figure 5)	Circumference (cm)	Size	Status	Tree photo (taken 24-29 November 2022, 15 December 2022 and 12 April 2024)
2002	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	72	Small	Lost – direct impact	
3020	*Eucalyptus camaldulensis*	River Red-gum	See Figure 5	41	Small	Assumed lost – indirect impact	

Table 26 Large trees within patches deemed lost within the study area (see Appendix D for patch vegetation photos)

Scientific name	Common name	Circumference (cm)	Multi-stemmed?	Status
Eucalyptus melliodora	Yellow Box	251	Yes	Lost – direct impact
Eucalyptus melliodora	Yellow Box	408	No	Lost – direct impact
Eucalyptus camaldulensis	River Red-gum	478	No	Assumed lost – indirect impact
Eucalyptus camaldulensis	River Red-gum	308	No	Assumed lost – indirect impact
Eucalyptus camaldulensis	River Red-gum	305	No	Assumed lost – indirect impact
Eucalyptus camaldulensis	River Red-gum	342	No	Assumed lost – indirect impact
Eucalyptus camaldulensis	River Red-gum	355	No	Assumed lost – indirect impact
Eucalyptus camaldulensis	River Red-gum	352	No	Assumed lost – indirect impact
Eucalyptus camaldulensis	River Red-gum	493	No	Assumed lost – indirect impact
Eucalyptus camaldulensis	River Red-gum	346	No	Assumed lost – indirect impact
Eucalyptus camaldulensis	River Red-gum	295	No	Assumed lost – indirect impact

Appendix F. Native vegetation removal report

Native vegetation removal report

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

Date of issue: **31/05/2024**
Time of issue: **10:37 am**

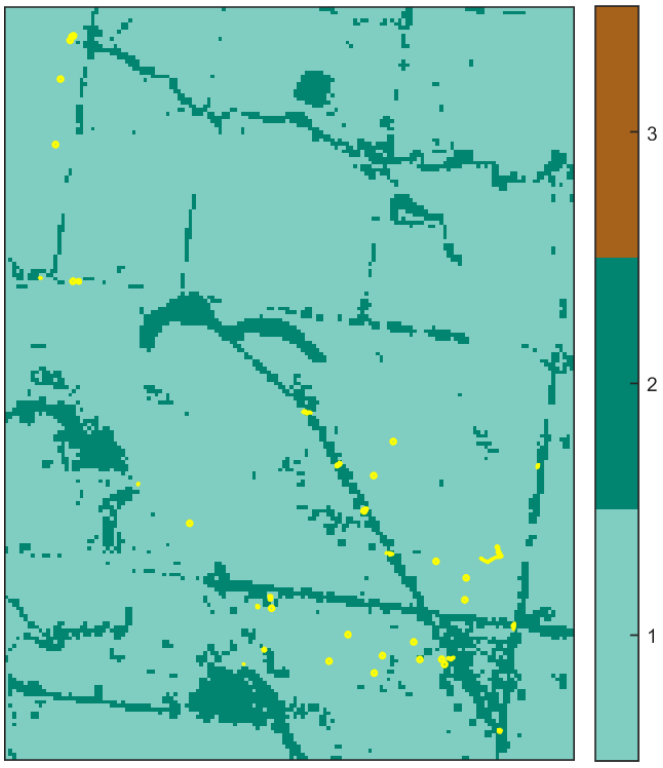
Report ID: BIO_2024_043

Project ID	37213_VegClearing_20240527_v2

Assessment pathway

Assessment pathway	**Detailed Assessment Pathway**
Extent including past and proposed	2.181 ha
Extent of past removal	0.000 ha
Extent of proposed removal	2.181 ha
No. Large trees proposed to be removed	33
Location category of proposed removal	Location 2 The native vegetation is in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map). Removal of less than 0.5 hectares of native vegetation in this location will not have a significant impact on any habitat for a rare or threatened species.

1. Location map



Offset requirements if a permit is granted

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

General offset amount[1]	0.549 general habitat units
Vicinity	North East Catchment Management Authority (CMA) or Wangaratta Rural City Council
Minimum strategic biodiversity value score[2]	0.411
Large trees	33 large trees

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

Appendix 1 includes information about the native vegetation to be removed

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

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

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

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

Next steps

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

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

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

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

- The assessment pathway and reason for the assessment pathway
- A description of the native vegetation to be removed (partly met)
- Maps showing the native vegetation and property (partly met)
- Information about the impacts on rare or threatened species.
- The offset requirements determined in accordance with section 5 of the Guidelines that apply if approval is granted to remove native vegetation.

Additional application requirements must be met including:

- Topographical and land information
- Recent dated photographs
- Details of past native vegetation removal
- An avoid and minimise statement
- A copy of any Property Vegetation Plan that applies
- A defendable space statement as applicable
- A statement about the Native Vegetation Precinct Plan as applicable
- A site assessment report including a habitat hectare assessment of any patches of native vegetation and details of trees
- An offset statement that explains that an offset has been identified and how it will be secured.

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

For more information contact the DELWP Customer Service Centre 136 186

www.delwp.vic.gov.au

Appendix 1: Description of native vegetation to be removed

The species-general offset test was applied to your proposal. This test determines if the proposed removal of native vegetation has a proportional impact on any rare or threatened species habitats above the species offset threshold. The threshold is set at 0.005 per cent of the mapped habitat value for a species. When the proportional impact is above the species offset threshold a species offset is required. This test is done for all species mapped at the site. Multiple species offsets will be required if the species offset threshold is exceeded for multiple species.

Where a zone requires species offset(s), the species habitat units for each species in that zone is calculated by the following equation in accordance with the Guidelines:

Species habitat units = extent x condition x species landscape factor x 2, where the species landscape factor = 0.5 + (habitat importance score/2)

The species offset amount(s) required is the sum of all species habitat units per zone

Where a zone does not require a species offset, the general habitat units in that zone is calculated by the following equation in accordance with the Guidelines:

General habitat units = extent x condition x general landscape factor x 1.5, where the general landscape factor = 0.5 + (strategic biodiversity value score/2)

The general offset amount required is the sum of all general habitat units per zone.

Native vegetation to be removed

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	**Type**	**BioEVC**	**BioEVC conservation status**	**Large tree(s)**	**Partial removal**	**Condition score**	**Polygon Extent**	**Extent without overlap**	**SBV score**	**HI score**	**Habitat units**	**Offset type**
1-DW	Patch	vriv0055_61	Endangered	0	no	0.170	0.006	0.006	0.380		0.001	General
2-DW	Patch	vriv0055_61	Endangered	0	no	0.170	0.194	0.194	0.432		0.035	General
10-1	Patch	vriv0055_61	Endangered	0	no	0.300	0.006	0.006	0.120		0.002	General
9-1	Patch	vriv0055_61	Endangered	0	no	0.260	0.002	0.002	0.730		0.001	General
7-1	Patch	vriv0055_61	Endangered	0	no	0.330	0.012	0.012	0.880		0.006	General
1-X	Patch	vriv0055_61	Endangered	2	no	0.350	0.041	0.041	0.980		0.021	General
3-X	Patch	vriv0055_61	Endangered	0	no	0.350	0.018	0.018	0.990		0.010	General
16-1	Patch	vriv0055_61	Endangered	1	no	0.280	0.026	0.026	0.479		0.008	General
17-1	Patch	vriv0055_61	Endangered	1	no	0.280	0.028	0.028	0.390		0.008	General
15-1	Patch	vriv0055_61	Endangered	2	no	0.370	0.062	0.062	0.990		0.034	General

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
14-1	Patch	vriv0055_61	Endangered	2	no	0.350	0.028	0.028	0.440		0.011	General
13-1	Patch	vriv0055_61	Endangered	1	no	0.370	0.042	0.042	0.644		0.019	General
12-1	Patch	vriv0055_61	Endangered	2	no	0.390	0.042	0.042	1.000		0.025	General
3-ST	Scattered Tree	vriv0068	Endangered	0	no	0.200	0.031	0.031	0.430		0.007	General
4-ST	Scattered Tree	vriv0055_61	Endangered	0	no	0.200	0.031	0.017	0.380		0.003	General
5-ST	Scattered Tree	vriv0055_61	Endangered	0	no	0.200	0.031	0.017	0.380		0.004	General
6-ST	Scattered Tree	vriv0055_61	Endangered	0	no	0.200	0.031	0.015	0.380		0.003	General
7-ST	Scattered Tree	vriv0055_61	Endangered	0	no	0.200	0.031	0.021	0.880		0.006	General
9-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	0.440		0.015	General
10-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	1.000		0.021	General
11-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	0.430		0.015	General
12-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	0.430		0.015	General
13-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.064	0.475		0.014	General
14-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	0.295		0.014	General
15-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	1.000		0.021	General
16-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	0.440		0.015	General

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
17-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	0.440		0.015	General
18-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	0.430		0.015	General
19-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	0.430		0.015	General
20-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	0.430		0.015	General
21-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	0.430		0.015	General
22-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	0.390		0.015	General
23-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	0.440		0.015	General
24-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	0.430		0.015	General
26-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	0.380		0.015	General
27-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	0.440		0.015	General
28-ST	Scattered Tree	vriv0068	Endangered	1	no	0.200	0.070	0.068	0.440		0.015	General
29-ST	Scattered Tree	vriv0055_61	Endangered	1	no	0.200	0.070	0.070	0.440		0.015	General
30-ST	Scattered Tree	vriv0068	Endangered	1	no	0.200	0.070	0.053	0.440		0.011	General
31-ST	Scattered Tree	vriv0068	Endangered	1	no	0.200	0.070	0.055	0.440		0.012	General
3-DW	Patch	vriv0055_61	Endangered	0	no	0.170	0.045	0.045	0.390		0.008	General

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	**Type**	**BioEVC**	**BioEVC conservation status**	**Large tree(s)**	**Partial removal**	**Condition score**	**Polygon Extent**	**Extent without overlap**	**SBV score**	**HI score**	**Habitat units**	**Offset type**
4-DW	Patch	vriv0055_61	Endangered	0	no	0.170	0.020	0.020	0.390		0.004	General

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

This table lists all rare or threatened species' habitats mapped at the site.

Species common name	Species scientific name	Species number	Conservation status	Group	Habitat impacted	% habitat value affected
Mugga	*Eucalyptus sideroxylon subsp. sideroxylon*	504493	Rare	Dispersed	Habitat importance map	0.0001
Button Rush	*Lipocarpha microcephala*	502020	Vulnerable	Dispersed	Habitat importance map	0.0001
Yarran Wattle	*Acacia omalophylla*	500069	Endangered	Dispersed	Habitat importance map	0.0001
Western Silver Wattle	*Acacia decora*	500027	Vulnerable	Dispersed	Habitat importance map	0.0001
Crimson Spider-orchid	*Caladenia concolor*	504347	Endangered	Dispersed	Habitat importance map	0.0001
Narrow Goodenia	*Goodenia macbarronii*	501513	Vulnerable	Dispersed	Habitat importance map	0.0001
Northern Sandalwood	*Santalum lanceolatum*	503005	Endangered	Dispersed	Habitat importance map	0.0001
Veiled Fringe-sedge	*Fimbristylis velata*	501369	Rare	Dispersed	Habitat importance map	0.0001
Cottony Cassinia	*Cassinia ozothamnoides*	501560	Vulnerable	Dispersed	Habitat importance map	0.0000
Deane's Wattle	*Acacia deanei subsp. paucijuga*	504201	Rare	Dispersed	Habitat importance map	0.0000
Dookie Daisy	*Brachyscome gracilis*	505494	Vulnerable	Dispersed	Habitat importance map	0.0000
Tick Indigo	*Indigofera adesmiifolia*	503780	Vulnerable	Dispersed	Habitat importance map	0.0000
Umbrella Grass	*Digitaria divaricatissima var. divaricatissima*	501045	Vulnerable	Dispersed	Habitat importance map	0.0000
Western Golden-tip	*Goodia medicaginea*	501518	Rare	Dispersed	Habitat importance map	0.0000
Squirrel Glider	*Petaurus norfolcensis*	11137	Endangered	Dispersed	Habitat importance map	0.0000
Dark Wire-grass	*Aristida calycina var. calycina*	503630	Rare	Dispersed	Habitat importance map	0.0000
Riverina Bitter-cress	*Cardamine moirensis*	505032	Rare	Dispersed	Habitat importance map	0.0000
Purple Diuris	*Diuris punctata*	501084	Vulnerable	Dispersed	Habitat importance map	0.0000
Grey Falcon	*Falco hypoleucos*	10236	Endangered	Dispersed	Habitat importance map	0.0000

Grey Grass-tree	*Xanthorrhoea glauca subsp. angustifolia*	507229	Endangered	Dispersed	Habitat importance map	0.0000
Late-flower Flax-lily	*Dianella tarda*	505085	Vulnerable	Dispersed	Habitat importance map	0.0000
Grey-crowned Babbler	*Pomatostomus temporalis temporalis*	10443	Endangered	Dispersed	Habitat importance map	0.0000
Murray-Darling Rainbowfish	*Melanotaenia fluviatilis*	4774	Vulnerable	Dispersed	Habitat importance map	0.0000
Small-leaf Bush-pea	*Pultenaea foliolosa*	502848	Rare	Dispersed	Habitat importance map	0.0000
Dense Mint-bush	*Prostanthera decussata*	502739	Rare	Dispersed	Habitat importance map	0.0000
Superb Parrot	*Polytelis swainsonii*	10277	Endangered	Dispersed	Habitat importance map	0.0000
Southern Pygmy Perch (Murray-Darling lineage)	*Nannoperca australis (Murray-Darling lineage)*	903231	Vulnerable	Dispersed	Habitat importance map	0.0000
Bush Stone-curlew	*Burhinus grallarius*	10174	Endangered	Dispersed	Habitat importance map	0.0000
Regent Honeyeater	*Anthochaera phrygia*	10603	Critically endangered	Dispersed	Habitat importance map	0.0000
Murray Cod	*Maccullochella peelii*	4871	Vulnerable	Dispersed	Habitat importance map	0.0000
Dwarf Brooklime	*Gratiola pumilo*	503753	Rare	Dispersed	Habitat importance map	0.0000
Waterbush	*Myoporum montanum*	502240	Rare	Dispersed	Habitat importance map	0.0000
Lewin's Rail	*Lewinia pectoralis pectoralis*	10045	Vulnerable	Dispersed	Habitat importance map	0.0000
Brolga	*Grus rubicunda*	10177	Vulnerable	Dispersed	Habitat importance map	0.0000
Buloke	*Allocasuarina luehmannii*	500678	Endangered	Dispersed	Habitat importance map	0.0000
Painted Honeyeater	*Grantiella picta*	10598	Vulnerable	Dispersed	Habitat importance map	0.0000
Barking Owl	*Ninox connivens connivens*	10246	Endangered	Dispersed	Habitat importance map	0.0000
Rough-grain Love-grass	*Eragrostis trachycarpa*	501197	Rare	Dispersed	Habitat importance map	0.0000
Golden Sun Moth	*Synemon plana*	15021	Critically endangered	Dispersed	Habitat importance map	0.0000
Bearded Dragon	*Pogona barbata*	12177	Vulnerable	Dispersed	Habitat importance map	0.0000
Black Falcon	*Falco subniger*	10238	Vulnerable	Dispersed	Habitat importance map	0.0000

Golden Cowslips	*Diuris behrii*	501061	Vulnerable	Dispersed	Habitat importance map	0.0000
Swift Parrot	*Lathamus discolor*	10309	Endangered	Dispersed	Habitat importance map	0.0000
Intermediate Egret	*Ardea intermedia*	10186	Endangered	Dispersed	Habitat importance map	0.0000
Lace Monitor	*Varanus varius*	12283	Endangered	Dispersed	Habitat importance map	0.0000
Hardhead	*Aythya australis*	10215	Vulnerable	Dispersed	Habitat importance map	0.0000
Australasian Shoveler	*Anas rhynchotis*	10212	Vulnerable	Dispersed	Habitat importance map	0.0000
Square-tailed Kite	*Lophoictinia isura*	10230	Vulnerable	Dispersed	Habitat importance map	0.0000
Grey Goshawk	*Accipiter novaehollandiae novaehollandiae*	10220	Vulnerable	Dispersed	Habitat importance map	0.0000

Habitat group

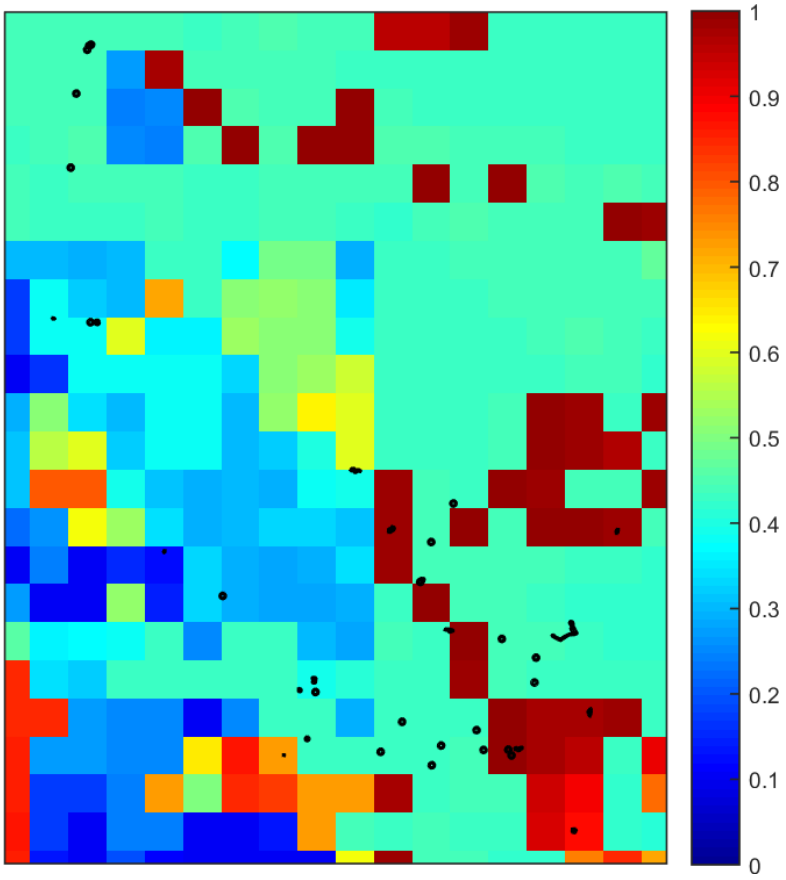
- Highly localised habitat means there is 2000 hectares or less mapped habitat for the species
- Dispersed habitat means there is more than 2000 hectares of mapped habitat for the species

Habitat impacted

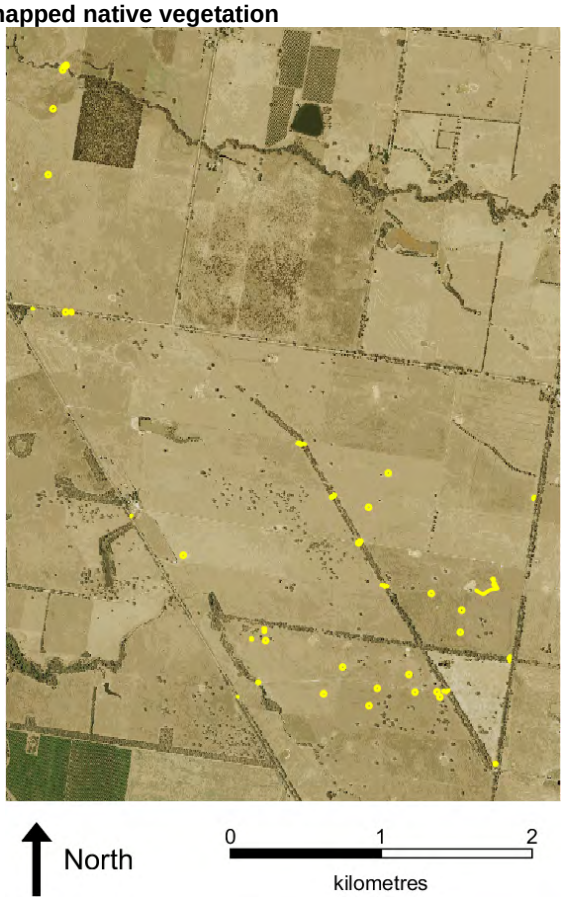
- Habitat importance maps are the maps defined in the Guidelines that include all the mapped habitat for a rare or threatened species
- Top ranking maps are the maps defined in the Guidelines that depict the important areas of a dispersed species habitat, developed from the highest habitat importance scores in dispersed species habitat maps and selected VBA records
- Selected VBA record is an area in Victoria that represents a large population, roosting or breeding site etc.

Appendix 3 – Images of mapped native vegetation

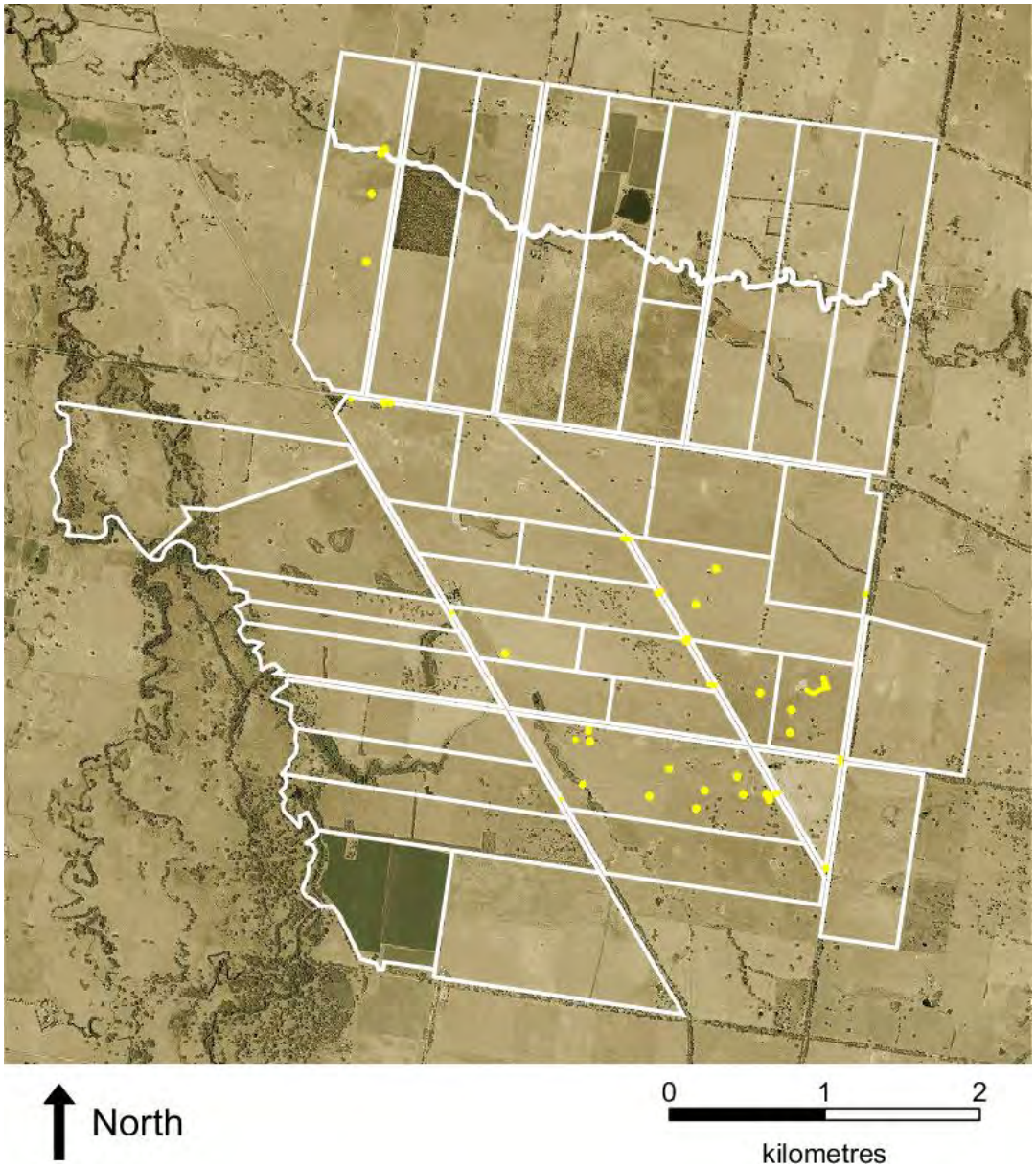
2. Strategic biodiversity values map



3. Aerial photograph showing mapped native vegetation



4. Map of the property in context



Yellow boundaries denote areas of proposed native vegetation removal.

Appendix G. Offset search results

Report of available native vegetation credits

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

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

Date and time: 29/05/2024 02:17 **Report ID: 24554**

What was searched for?

General offset

General habitat units	Strategic biodiversity value	Large trees	Vicinity (Catchment Management Authority or Municipal district)	
0.549	0.411	33	CMA	North East

Details of available native vegetation credits on 29 May 2024 02:17

These sites meet your requirements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
VC_CFL-3074_01	15.284	2890	North East	Towong Shire	Yes	Yes	No	VegLink
VC_CFL-3789_01	15.354	607	North East	Towong Shire	Yes	Yes	No	VegLink

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

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

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

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

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

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

LT - Large Trees *CMA - Catchment Management Authority* *LGA - Municipal District or Local Government Authority*

Next steps

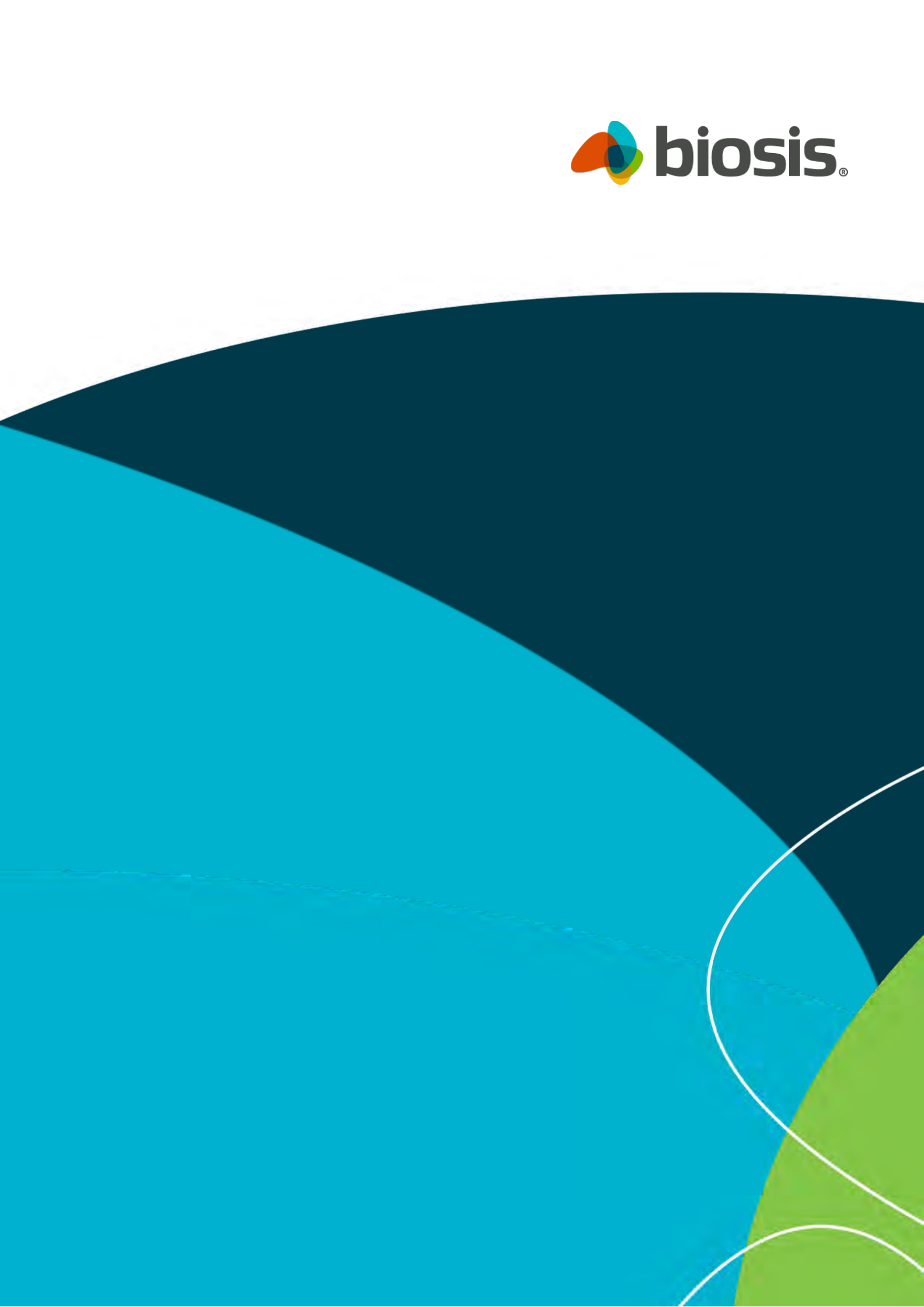
If applying for approval to remove native vegetation
Attach this report to an application to remove native vegetation as evidence that your offset requirement is currently available.

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

Broker contact details

Broker Abbreviation	Broker Name	Phone	Email	Website
Abezco	Abzeco Pty. Ltd.	(03) 9431 5444	offsets@abzeco.com.au	www.abzeco.com.au
Baw Baw SC	Baw Baw Shire Council	(03) 5624 2411	bawbaw@bawbawshire.vic.gov.au	www.bawbawshire.vic.gov.au
Bio Offsets	Biodiversity Offsets Victoria	0452 161 013	info@offsetsvictoria.com.au	www.offsetsvictoria.com.au
Contact NVOR	Native Vegetation Offset Register	136 186	nativevegetation.offsetregister@delwp.vic.gov.au	www.environment.vic.gov.au/native-vegetation
Ecocentric	Ecocentric Environmental Consulting	0410 564 139	ecocentric@me.com	Not avaliable
Ethos	Ethos NRM Pty Ltd	(03) 5153 0037	offsets@ethosnrm.com.au	www.ethosnrm.com.au
Nillumbik SC	Nillumbik Shire Council	(03) 9433 3316	offsets@nillumbik.vic.gov.au	www.nillumbik.vic.gov.au
TFN	Trust for Nature	8631 5888	offsets@tfn.org.au	www.trustfornature.org.au
VegLink	Vegetation Link Pty Ltd	(03) 8578 4250 or 1300 834 546	offsets@vegetationlink.com.au	www.vegetationlink.com.au
Yarra Ranges SC	Yarra Ranges Shire Council	1300 368 333	biodiversityoffsets@yarraranges.vic.gov.au	www.yarraranges.vic.gov.au

For more information contact the DEECA Customer Service Centre 136 186 or the Native Vegetation Credit Register at nativevegetation.offsetregister@delwp.vic.gov.au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