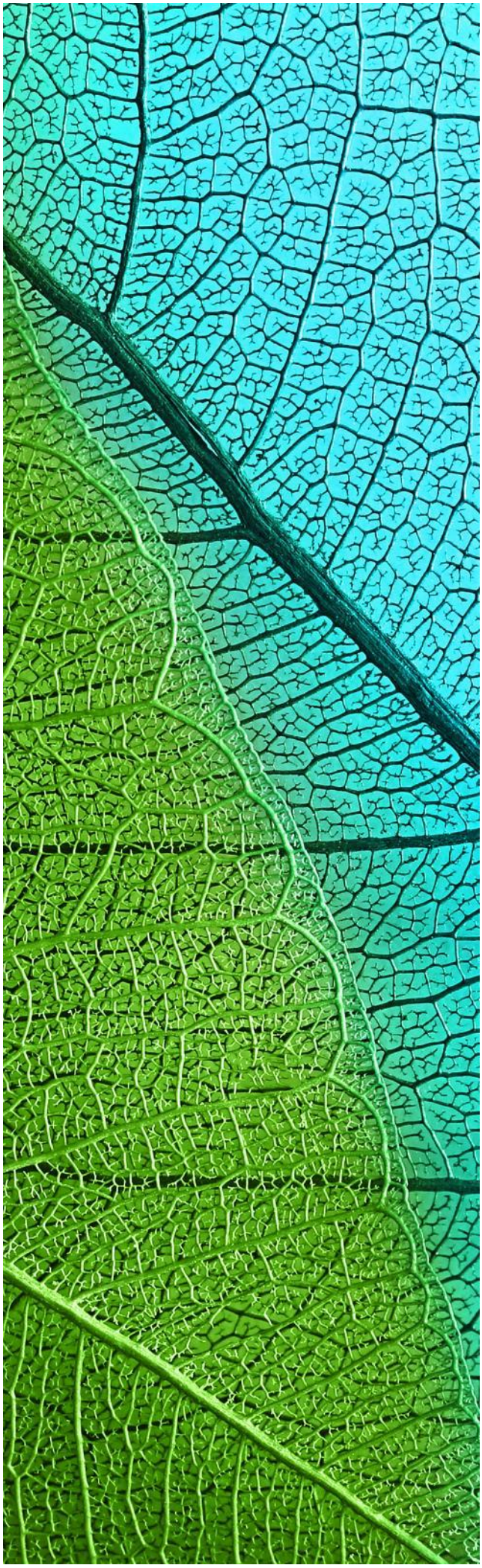

485 Cooper Street Epping

Flora and Fauna Assessment

Prepared for
The GPT Group

March 2023
Report No. 22076.01 (2.3)

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Contents

Tables

Figures

Appendices

1. Executive summary

Introduction

The GPT Group engaged Nature Advisory Pty Ltd, to conduct a detailed flora and fauna assessment of a 35-hectare area of land at 485 Cooper Street, Epping. This assessment builds on preliminary site-based information collected for a previous high-level overview assessment undertaken by Nature Advisory in April 2022. Following the flora and fauna assessment, targeted surveys for threatened flora and fauna species were recommended. Targeted surveys for Matted Flax-lily, Golden Sun Moth and Growling Grass Frog were undertaken. The specific area investigated, referred to herein as the 'study area', comprised all land within the cadastral boundary of the above address. A commercial/industrial development is proposed for the subject land.

This investigation was commissioned to provide detailed information on the extent and condition of native vegetation in the study area according to Victoria's *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017a), herein referred to as 'the Guidelines', as well as any potential impacts on flora and fauna matters listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This report outlines any implications under relevant national, state and local legislation and policy frameworks.

The Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) only applies to private land in relation to the commercial collection of grasstrees, tree-ferns and sphagnum moss. As the land addressed in this assessment is private land and the above-listed values no not occur in the locality, there are no implications under the FFG Act for any future development of the study area.

Assessment results

The majority of the study area is treeless open grassland, heavily dominated by introduced pasture grasses and broad-leaf weeds. Interspersed throughout the study area were various sized patches of native grassland vegetation. The highest quality native grassland vegetation was in the south-east of the study area.

Other areas of native vegetation included scattered patches of degraded escarpment shrubland associated with the walls of the two quarry voids, as well as along the escarpments beside Merri Creek. Some small patches of wetland and marsh are associated with damp areas at the bottoms of the two quarry voids and along drainage lines. Riparian woodland occurs along the length of the Merri Creek between the creek and the escarpments. One small patch of woodland occurs in the south-east of the study area.

Some 28 disjunct areas of native vegetation comprising *Heavier-soils* Plains Grassland (EVC 132_61), Escarpment Shrubland (EVC 895), Plains Grassy Woodland (EVC 55_61), Tall Marsh (EVC 821), Plains Grassy Wetland (EVC 125) and Riparian Woodland (EVC 641) were identified in the study area. Large trees in patches were restricted to vegetation along the bank of Merri Creek.

Two EPBC Act-listed ecological communities were found to be present in the study area. Habitat zones A, B, D, E and F were found to qualify as the *Natural Temperate Grassland of the Victorian Volcanic Plain* community (Critically Endangered) and Habitat Zone P was found to qualify as the *Grassy Eucalypt Woodland of the Victorian Volcanic Plain* community (Critically Endangered).

During targeted surveys for this investigation, no Matted Flax-lily, Golden Sun Moth or Growling Grass Frog were recorded within the study area.

Impacts and implications

The currently proposed development footprint will result in the loss of a total extent of 4.121 hectares of native vegetation as represented in Figure 2 and documented in the *Native Vegetation Removal* (NVR) report scenario test (Appendix 7).

The proposed development footprint would also result in the loss of approximately 1.144 hectares of *Natural Temperate Grassland of the Victorian Volcanic Plain* (NTGVVP) and 1.021 hectares of *Grassy Eucalypt Woodland of the Victorian Volcanic Plain* (GEWVVP).

The following Implications of findings under legislation and policy would apply to the development of the study area as proposed:

- The River Red Gum Protection Policy (Clause 22.10) of the Whittlesea Planning Scheme requires an arborist's report with any planning proposal for development on land which contains one or more River Red Gums and encourages that the majority of River Red Gums proposed for retention are sited in public open space reserves and/or road reserves. Under this policy, it is likely that the majority of River Red Gums present will need to be retained;
- The study area is subject to an Environmental Significance Overlay (ESO3) in the Whittlesea Planning Scheme, which is relevant to this assessment. A planning permit would be required under ESO3 for any proposed works in the Merri Creek corridor. As such a permit would be required to construct a wetland nearby the creek to service the proposed development;
- A planning permit under Clause 52.17 of the Whittlesea Planning Scheme will be required for the removal of native vegetation from the study area to facilitate development;
- Removal of native vegetation from the study area will trigger a referral to DELWP as it meets the criteria specified in Section 3.2.3, being the removal of more than 0.5 hectares;
- Under the Guidelines all offsets must be secured prior to the removal of native vegetation. Based on the results of the *Native Vegetation Removal* (NVR) report (Appendix 7), offsets required to compensate for the proposed removal of native vegetation from the study area are provided below.
    - 1.352 general habitat units and must include the following offset attribute requirements:
        - Minimum strategic biodiversity value of 0.449
        - Occur within the Melbourne Water CMA boundary or the Whittlesea City Council municipal district.
        - Include protection of no large trees.

    The offset target for the current proposal will be achieved via a third-party offset.

    An online search of the Native Vegetation Credit Register (NVCR) has shown that the required offset is currently available for purchase from a native vegetation credit owner (DELWP 2022e).

    Evidence that the required offset is available is provided in Appendix 8. The required offset would be secured following approval of the application to remove native vegetation.
- Based on the relevant guidelines, the proposed development is likely to result in a significant impact on EPBC Act-listed values presented below, which were both recorded in the developable portion of the study area.
    - Ecological communities:

- *Natural Temperate Grassland of the Victorian Volcanic Plain* (EPBC: Critically endangered); and
- *Grassy Eucalypt Woodland of the Victorian Volcanic Plain* (EPBC: Critically endangered).

- Proposed removal of native vegetation from the study area will not have any implications under the FFG Act; and
- Based on the relevant criteria in Section 3.4, a Referral to the state Minister for Planning is unlikely to be required under the EE Act for the aspects covered by the current investigation.

Recommendations to avoid and minimise impacts to biodiversity are provided in this report.

2. Introduction

The GPT Group engaged Nature Advisory Pty Ltd, to conduct a detailed flora and fauna assessment of a 35-hectare area of land at 485 Cooper Street, Epping. This assessment builds on preliminary site-based information collected for a previous high-level overview assessment undertaken by Nature Advisory in April 2022. The specific area investigated, referred to herein as the 'study area', comprised all land within the cadastral boundary of the above address. A commercial/industrial development is proposed for the subject land.

This investigation was commissioned to provide detailed information on the extent and condition of native vegetation in the study area according to Victoria's *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017a), herein referred to as 'the Guidelines', as well as any potential impacts on flora and fauna matters listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This report outlines any implications under relevant national, state and local legislation and policy frameworks.

Specifically, the scope of the investigation included:

- Reviewing existing information on the flora, fauna and native vegetation of the study area and surrounds was reviewed, including:
  - Victorian Biodiversity Atlas administered by the Department of Environment, Land, Water and Planning (DELWP);
  - The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Protected Matters Search Tool;
  - DELWP's *Native Vegetation Information Management* system (NVIM); and
  - DELWP's *NatureKit*.
- A site survey was undertaken involving:
  - Characterisation and broad-scale mapping of native vegetation on the site, as defined in Victoria's *Guidelines for the Removal, Destruction or lopping of Native Vegetation* (the 'Guidelines');
  - Assessment of native vegetation in accordance with the Guidelines, including habitat hectare assessment and/or scattered tree assessment;
  - Compilation of flora and fauna species lists for the site;
  - Assessment of the nature and quality of native fauna habitat; and
  - Determination of the likelihood of occurrence of EPBC Act-listed flora, fauna and communities on the site.
- Based on the outcomes of the initial flora and fauna assessment, targeted surveys for threatened species considered to be susceptible to impacts from the proposed development were recommended and undertaken.

This investigation was undertaken by Brett Macdonald (Senior Ecologist), Tessa Doherty (Botanist), Michael Sebastian (Zoologist), Emma Wagner (GIS) and Alan Brennan (Senior Ecologist and Director).

3. Planning and legislative considerations

This investigation and report address the application on the site of relevant legislation and planning policies that protect biodiversity. Local, state and Commonwealth controls are summarised below.

3.1. Local planning provisions

The study area is located within the Whittlesea local government area and is currently zoned Industrial 1 Zone (IN1Z) and Urban Floodway Zone (UFZ) in the Whittlesea Planning Scheme.

The study area is located within a Bushfire-prone Area.

Local planning provisions apply under the *Victorian Planning and Environment Act 1987*.

3.1.1. Local Planning Policies

Clause 22.10 - River Red Gum Protection Policy

Under Clause 22.10 (River Red Gum Protection Policy) of the Whittlesea Planning Scheme, it is policy to:

- Recognise the intrinsic value of River Red Gums in establishing character and identity in urban and rural areas.
- Request a comprehensive site analysis and arborist's report with any planning proposal for development on land which contains one or more River Red Gums.
- Encourage that the majority of River Red Gums proposed for retention are sited in public open space reserves and/or road reserves.
- Ensure that, where a tree is to be located in a lot, the lot is large enough to accommodate a suitable development envelope that does not disturb the tree or its root system.
- Ensure that, where feasible, areas of significant River Red Gum regeneration are protected in any development proposal.
- Encourage tree removal to be generally limited to only those trees independently assessed as presenting a danger to people and property.
- Appropriately protect trees identified for retention during the construction phase, and thereafter ensure that their health is regularly monitored by an appropriate environmental consultant when located on public land.
- Ensure that any tree nominated on a development and/or subdivision plan for protection is located within an appropriate tree protection zone. The protection zone must be large enough to ensure that the trunk and canopy remain intact and that the root system is not severely damaged or destroyed during the construction phase.
- Ensure that any planning permit for subdivision which contains a protected tree on a lot includes a requirement that the protected tree, protection envelope, development envelope and any conditions relating thereto be nominated on the relevant title.

Local provisions can override state provisions.

3.2. Overlays

The study area is subject to the following overlays in the Whittlesea City Council Planning Scheme:

- *Design and Development Overlay (DDO) and Schedule 2 to the DDO*– this overlay is considered to be irrelevant to the current investigation.
- *Land Subject to Inundation Overlay (LSIO)* - this overlay is considered to be irrelevant to the current investigation.

- *Melbourne Airport Environs Overlay (MAEO) and Schedule 2 to the MAEO* - this overlay is considered to be irrelevant to the current investigation.
- *Development Plan Overlay (DPO) and Schedule 33 to the DPO* – The purpose of this overlay is to identify areas which require the form and conditions of future use and development to be shown on a development plan before a permit can be granted to use or develop the land. A planning permit application for the subdivision of land and/or the construction of buildings and works must be accompanied by:
    - A Native Vegetation Removal Plan and Offset Assessment of any native vegetation be removed, having regard to Victoria's Permitted Clearing of Native Vegetation Regulations, including the location of any necessary vegetation offsets and the requirements under the Flora and Fauna Guarantee Act 1988 and Environment Protection Biodiversity Conservation Act 1999.
    - A Design Response Statement which demonstrates how the environmental sustainability and visual amenity of the precinct has been considered by addressing the following matters:
        - Sufficient environmental buffers bordering the Merri Creek Park/Central Creek, allowing for, fire breaks and unimpeded access for management activities, including slashing and burning to reduce fire risk; and
        - Environmental buffer zones for fire breaks and, access for management activities including slashing and burning.
    - A plan identifying land adjacent to Merri Creek which will be provided for the Merri Creek Park, including an assessment of flora and fauna and Aboriginal cultural heritage significance within the land to be transferred.
- *Environmental Significance Overlay (ESO) and Schedule 3 to the ESO* - the ESO3 covers an area approximately encompassing the Merri Creek creekline. A permit is required to remove, destroy or lop any vegetation, including dead vegetation, except:
    - Noxious weeds listed under the CaLP Act;
    - A non-indigenous tree that has the capacity to adversely affect stream flow;
    - Removal of an environmental weed;
    - The control or removal of non-indigenous plants in preparation for revegetation works; or
    - Pruning of plants to maintain access or maintain a plant's horticultural health.

    Decision guidelines: Before deciding on an application the responsible authority may consider the following factors which are relevant to the current investigation:
    - The Merri Creek and Environs Strategy (once adopted by Council).
    - Any adopted guidelines or local policies for the Merri Creek.
    - The views of the Merri Creek Management Committee, Melbourne Water and Aboriginal Affairs Victoria Heritage Services Branch.
    - The relevant provisions of any adopted municipal Open Space Strategy and, in particular, the relevant open space category and preferred recreational uses and development guidelines.
    - The effect of the proposed removal of vegetation on the habitat value, wildlife corridor, and long-term viability of remnant and revegetated areas along the creek corridor.

- The significance of the native vegetation area, including significance of plant communities or significance plant and animal species supported.
- The reasons for removing the vegetation and the practicality of alternative options which do not require the removal of the native vegetation.
- The effect of the height, bulk, and general appearance of any proposed buildings and works on the environmental values and visual character of the creek.
- The need for landscaping or vegetation screening.
- The need to ensure that buildings or works do not disturb known sites of Aboriginal heritage or areas likely to contain Aboriginal heritage.
- The need to protect trees with Aboriginal trunk or branch scars.
- The need to retain vegetation and natural features which contributes to the health and water quality of the creek and the visual character of the creek corridor.
- The extent that buildings or works are designed to enhance or promote the environmental values of the creek and visual character of the creek corridor.
- The need for a retention pond that acts as a filter and collector of sediment and litter.

The study area is in an Area of Aboriginal Cultural Heritage Sensitivity and is in a Designated Bushfire Prone Area.

3.2.1. Exemptions

Exemptions listed in Table 52.17-7 relevant to the study area include:

- *Planted vegetation:* Native vegetation that is to be removed, destroyed or lopped that was either planted or grown as a result of direct seeding. This exemption does not apply to native vegetation planted or managed with public funding for the purpose of land protection or enhancing biodiversity.

3.2.2. Application requirements

Any application to remove, destroy or lop native vegetation must comply with the application requirements specified in the Guidelines (DELWP 2017a).

When assessing an application, Responsible Authorities are also obligated to refer to Clause 12.01-2 (Native vegetation management) in the Planning Scheme which in addition to the Guidelines, refers to the following:

- *Assessor's handbook – applications to remove, destroy or lop native vegetation* (Version 1.1) (DELWP 2018a).
- Statewide biodiversity information maintained by DELWP.

The application of the Guidelines (DELWP 2017a) are explained further in Appendix 1.

3.2.3. Referral to DELWP

Clause 66.02-2 of the planning scheme determines the role of DELWP in the assessment of native vegetation removal permit applications. If an application is referred, DELWP may make certain recommendations to the responsible authority in relation to the permit application.

Any application to remove, destroy or lop native vegetation must be referred to DELWP if:

- The impacts to native vegetation are in the Detailed Assessment Pathway;
- A property vegetation plan applies to the site; or
- The native vegetation is on Crown land which is occupied or managed by the responsible authority.

3.3. EPBC Act

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) protects a number of threatened species and ecological communities that are considered to be of national conservation significance. Any significant impacts on these species require the approval of the Australian Minister for the Environment.

If there is a possibility of a significant impact on nationally threatened species or communities or listed migratory species, a Referral under the EPBC Act should be considered. The Minister will decide after 20 business days whether the project will be a 'controlled action' under the EPBC Act, in which case it cannot be undertaken without the approval of the Minister. This approval depends on a further assessment and approval process (lasting between three and nine months, depending on the level of assessment).

Implications under the EPBC Act for the current proposal are discussed in Section 7.3.

3.4. EE Act

One or a combination of a number of criteria may trigger a requirement for a Referral to the Victorian Minister for Planning who will determine if an Environmental Effects Statement (EES) is required according to the *Ministerial Guidelines for Assessment of Environmental Effects under the* Environment Effects Act 1978 (DSE 2006).

The criteria related to flora, fauna and native vegetation which trigger a Referral are outlined below.

<u>One or more</u> of the following would trigger a Referral:

- Potential clearing of 10 hectares or more of native vegetation from an area that:
  - Is of an Ecological Vegetation Class identified as endangered by the Department of Sustainability and Environment (in accordance with Victoria's Native Vegetation Management Framework); or
  - Is, or is likely to be, of very high conservation significance (as defined in accordance with Victoria's Native Vegetation Management Framework); and
  - Is not authorised under an approved Forest Management Plan or Fire Protection Plan
- Potential long-term loss of a significant proportion (e.g. 1 to 5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria
- Potential long-term change to the ecological character of a wetland listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia'
- Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term

<u>Two or more</u> of the following would also trigger a Referral:

- Potential clearing of 10 hectares or more of native vegetation, unless authorised under an approved Forest Management Plan or Fire Protection Plan
- 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 as a result of loss or fragmentation of habitats; or
- Potential loss of critical habitat; or

Potential significant effects on habitat values of a wetland supporting migratory bird species.

Implications under the *Environment Effects Act 1978* (EE Act) for the current proposal are discussed in Section 7.5.

3.5. CaLP Act

The *Catchment and Land Protection Act 1994* (CaLP Act) requires that landowners (or a third party to whom responsibilities have been legally transferred) must eradicate regionally prohibited weeds and prevent the growth and spread of regionally controlled weeds.

Weed species listed on the CaLP Act that have been recorded in the study area are discussed in Section 7.6.

4. Existing information and methods

4.1. Existing information

Existing information used for this investigation is described below.

4.1.1. Existing reporting and documentation

The existing documentation below, relating to the study area was reviewed.

- Whittlesea Planning Scheme.

4.1.2. Native vegetation

Pre-1750 (pre-European settlement) vegetation mapping administered by DELWP was reviewed to determine the type of native vegetation likely to occur in the study area and surrounds. Information on Ecological Vegetation Classes (EVCs) was obtained from published EVC benchmarks. These sources included:

- Relevant EVC benchmarks for the Victorian Volcanic Plain bioregion[1] (DSE 2004a);
- *NatureKit* (DELWP 2020a).

4.1.3. Desktop review

Existing flora and fauna species records and information about the potential occurrence of listed matters were obtained from an area termed the 'search region', defined here as an area with a radius of ten kilometres from the approximate centre point of the study area (coordinates: latitude 37˚ 39' 49" S and longitude 144˚ 58' 47" E).

A list of the flora and fauna species recorded in the search region was obtained from the *Victorian Biodiversity Atlas* (VBA), a database administered by DELWP.

The online EPBC Act *Protected Matters Search Tool* (DAWE 2020a) was consulted to determine whether nationally listed species or communities potentially occurred in the search region based on habitat modelling.

4.2. Field methods

4.2.1. Flora and fauna assessment

The field assessment was conducted on the 8th August, 2022. During this assessment, the study area was surveyed was inspected in detail on foot.

Sites in the study area found to support native vegetation or with potential to support listed matters were broadly mapped through aerial photograph interpretation. Species and ecological communities listed as threatened under the EPBC Act were also mapped using the same method.

Following the initial survey, Whittlesea Council enquired about additional patches of native vegetation on site. A second site visit was undertaken on the 1st December 2022 to ground-truth these areas using the above methodology.

[1] A bioregion is defined as "a geographic region that captures the patterns of ecological characteristics in the landscape, providing a natural framework for recognising and responding to biodiversity values". In general bioregions reflect underlying environmental features of the landscape (DNRE 1997).

Native vegetation

Native vegetation is currently defined in Clause 73.01 of all Victorian planning schemes as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses'. The Guidelines (DELWP 2017a) further classify native vegetation as belonging to two categories:

- Patch; or
- Scattered tree.

The definitions of these categories are provided below, along with the prescribed DELWP methods to assess them. Further details on definitions of patches and scattered trees are provided in Appendix 1.

Patch

A patch of native vegetation is either:

- An area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native; or
- Any area with three or more native canopy trees[2] where the drip line[3] of each tree touches the drip line of at least one other tree, forming a continuous canopy; or
- Any mapped wetland included in the *Current wetlands map*, available at *MapShareVic* (DELWP 2020b).

Patch condition is assessed using the habitat hectare method (Parkes *et al.* 2003; DSE 2004b) whereby components of the patch (e.g. tree canopy, understorey and ground cover) are assessed against an EVC benchmark. The score effectively measures the percentage resemblance of the vegetation to its original condition.

The *Native Vegetation Information Management* (NVIM) system (DELWP 2020c) provides modelled condition scores for native vegetation to be used in certain circumstances.

Scattered tree

A scattered tree is:

- A native canopy tree[2] that does not form part of a patch.

Scattered trees are counted and mapped, the species identified and their circumference at 1.3 m above the ground is recorded.

Flora species and habitats

Records of flora species were made in conjunction with sampling methods used to undertake habitat hectare assessments of native vegetation described above. Specimens requiring identification using laboratory techniques were collected.

The potential for habitats to support listed flora species was assessed based on the criteria outlined below:

- The presence of suitable habitat for flora species such as soil type, floristic associations and landscape context; and

[2] A native canopy tree is a mature tree (i.e. it is able to flower) that is greater than 3 metres in height and is normally found in the upper layer of the relevant vegetation type.
[3] The drip line is the outermost boundary of a tree canopy (leaves and/or branches) where the water drips on to the ground.

- The level of disturbance of suitable habitats by anthropogenic disturbances and invasions by pest plants and animals.

Wherever appropriate, a precautionary approach was adopted in determining the likelihood of occurrence or flora listed under the EPBC Act. That is, where insufficient evidence was available on the potential occurrence of a listed species, it is assumed that it could be in an area of suitable habitat.

Fauna species and habitats

The techniques below were used to detect fauna species utilising the study area.

- Incidental searches for mammal scats, tracks and signs (e.g. diggings, signs of feeding and nests/burrows).
- Turning over logs/rocks and other ground debris for reptiles, frogs and mammals.
- Daytime bird observations.
- General searches for reptiles and frogs; including identification of frog calls in seasonally wet areas.

Fauna habitats are described using habitat components that include old-growth trees, fallen timber, leaf litter and surface rocks.

The study area's habitat connectivity (i.e. degree of isolation/fragmentation), including linkages to other habitats in the region, was determined using field observations, recent aerial photography and *NatureKit* (DELWP 2020a).

Wherever appropriate, a precautionary approach was adopted in determining the likelihood of occurrence or fauna listed under the EPBC Act. That is, where insufficient evidence was available on the potential occurrence of a listed species, it is assumed that it could be in an area of suitable habitat.

Threatened ecological communities

The study area was assessed against published descriptions of relevant listed ecological communities modelled to potentially occur in the study area.

Reviewed ecological community descriptions comprised identification criteria and condition thresholds from listing advice for EPBC Act communities.

4.2.2. Targeted surveys

Based on the outcomes of the initial flora and fauna assessment, targeted surveys were recommended for listed species determined to be susceptible to impacts from the proposed development. These species included the following:

- Matted Flax-lily (EPBC Act: Endangered; FFG Act: Critically endangered)
- Golden Sun Moth (EPBC Act: Vulnerable; FFG Act: Vulnerable)
- Growling Grass Frog (EPBC Act: Vulnerable; FFG Act: Vulnerable)

Matted Flax-lily

A targeted survey for Matted Flax-lily (MFL) was conducted by a botanist on 1st December 2022. The survey coincided with the flowering period for Matted Flax-lily (October to April), and timing was therefore considered to be optimal.

During the survey, areas identified to support suitable habitat for these species, namely all habitat zones containing Plains Grassy Woodland (EVC 55_61), Heavier-soils Plains Grassland (EVC 132_61) and

Escarpment Shrubland (EVC 895), were inspected thoroughly along transects spaced five metres apart in areas to be impacted.

The survey area was traversed on foot using the following method:

- Parallel transects spaced five metres apart were traversed and visually inspected for Matted Flax-lily. This methodology is in accordance with the relevant federal guidelines for this species (DEWHA 2009a). Transects were tracked using a handheld GPS.
- Any Matted Flax-lily plants located during the survey would be marked with a handheld GPS (accuracy 1-3 m).

Golden Sun Moth

A detailed habitat assessment for Golden Sun Moth (GSM) of the study area was undertaken in April of 2022. Any areas of suitable habitat, comprising native vegetation and Chilean Needle-grass, were mapped. The results of this assessment formed the survey area for targeted surveys.

Surveys for GSM were undertaken in accordance with the method set out in the EPBC Act policy statement 3.12 – *Significant impact guidelines for the critically endangered golden sun moth (Synemon plana)* (DEWHA 2009).

The aim of the surveys was to identify whether GSM were present and to gather information on population size and distribution. As per the guidelines, this is achieved by undertaking a total of four surveys in areas of suitable habitat, walking 25m and 10m wide transects. The survey methods were adapted by replacing 50m transects with an additional 25m transect survey due to the small size of habitat patches.

A total of four surveys were conducted on the following dates:

- 20 December 2022 (25m transects)
- 27 December 2022 (25m transects)
- 06 January 2023 (10m transects)
- 09 January 2023 (10m transects)

Surveys were conducted in suitable conditions, specifically including the following:

- Surveys were timed to coincide with the GSM activity season, i.e. December to January
- Surveys were undertaken during suitable weather conditions, including the following:
    - Warm to hot days (above 20°C by 10 am);
    - During the warmest part of the day;
    - Clear to mostly cloudless sky;
    - Still or relatively still wind conditions during the survey period; and
    - At least two days since rain.
- Surveys were undertaken when male moths were flying. This was determined by visiting a reference site known to support a population of the species on the day of the survey of the study area. The reference sites were located off Barry Road, Broadmeadows
- Where practicable, surveys commenced at 10am and terminated before 3pm
- Transect locations were recorded using a hand-held GPS/ArcGIS mapping
- Surveying involved walking transects at the following spacings:

- During the first and second survey, transects were spaced 25 metres apart; and
- During the third and fourth survey, transects were spaced 10 metres apart.

- Surveys were at least one week apart.

Growling Grass Frog

Targeted surveys for Growling Grass Frog (GGF) were undertaken and completed during February 2023.

Surveys for GGF were undertaken in accordance with the survey guidelines outlined in the *Significant impact guidelines for the vulnerable growling grass frog (Litoria raniformis)* (DEWHA 2009) and the *Survey guidelines for Australia's threatened frogs* (DEWHA 2010).

Full details of the targeted survey methodology will be provided upon completion of the GGF targeted survey report.

4.3. Limitations of field assessment

The site assessment was carried out in late winter. The short duration and seasonal timing of field assessments can result in some species not being detected when they may occur at other times. Additionally, some flora species and life-forms may be undetectable at the time of the survey or unidentifiable due to a lack of flowers or fruit. The timing of the survey and condition of vegetation was otherwise considered suitable to ascertain the broad extent and condition of native vegetation and fauna habitats.

These limitations were not considered to compromise the validity of the current investigation, which was designed to provide a high-level assessment of biodiversity values at the site relevant to the current biodiversity policies and decision guidelines.

5. Assessment results

5.1. Site description

The study area for this investigation (Figure 1) was approximately 35 hectares of private land located at 485 Cooper Street, Epping and bordered by Merri Creek to the west, the Hume Freeway reserve to the east and agricultural and quarrying land to the north and south.

The study area supported heavy basaltic soils on an undulating landscape and the western third of the site steadily slopes downward to Merri Creek which forms the western boundary of the property. A large quarry void is situated in the north of the study area and another smaller one in the north-west. Steep, rocky escarpments line the southern portion of the creek.

It is understood that the study area was formerly part of a golf course, although little evidence of this former use remains. It is also understood that the site has not been managed ever since, apart from wildfire mitigation slashing in areas.

The majority of the study area is treeless open grassland, heavily dominated by introduced pasture grasses and broad-leaf weeds, particularly Toowoomba Canary-grass, Kikuyu, Cocksfoot and Chilean Needle-grass.

Interspersed throughout the study area were various sized patches of native grassland vegetation dominated by indigenous Kangaroo Grass, spear and wallaby grasses and various indigenous forbs. The highest quality native grassland vegetation was in the south-east of the study area.

Other areas of native vegetation included scattered patches of degraded escarpment shrubland associated with the walls of the two quarry voids. This was generally dominated by indigenous Lightwood, Sweet Bursaria and Tree Violet, occasional emergent River Red Gum trees and introduced weeds in the ground layers.

Vegetation along Merri Creek comprised indigenous Common Reed, other native aquatics and the noxious weed Spiny Rush, with indigenous and introduced shrubs scattered along its banks (e.g. River Bottle-brush, Woolly Tea-tree and Gorse).

Escarpments supported mostly indigenous and introduced trees and shrubs (e.g. River Red Gum, Tree Violet, Sweet Bursaria, Lightwood and African Box-thorn).

Native wetland vegetation also occurred in a drainage trench and the bottoms of the two quarry voids, although it was generally small and of low quality and variously dominated by Bulrush, Common Reed, Common Spike-sedge and introduced weeds.

Planted indigenous and non-indigenous eucalypts (Namely River Red Gum and Sugar Gum) were scattered throughout the study area, but were generally concentrated in the south-east.

The western quarter of the study area (sloping down to Merri Creek) was heavily dominated by the highly invasive introduced shrub Gorse, although patches of native grassland vegetation were scattered throughout in clearings in the Gorse.

The Cooper Street Grassland Nature Conservation Reserve is located on the western side of Merri Creek, to the north-west of the study area. Merri Creek Parklands lies less than two kilometres downstream. The Craigieburn Grassland Nature Conservation Reserve, less than three kilometres to the north-north-west, is also connected to the study area via Merri Creek.

The study area lies within the Victorian Volcanic Plain bioregion and falls within the Port Phillip and Western Port catchment (i.e. Melbourne Water CMA region).

5.2. Native vegetation

5.2.1. Patches of native vegetation

Pre–European EVC mapping (DELWP 2020a) indicated that the study area and surrounds would have supported Plains Grassland (EVC 132), Escarpment Shrubland (EVC 895), Plains Grassy Woodland (EVC 55), Stream Bank Shrubland (EVC 851) and Creekline Grassy Woodland (EVC 68) prior to European settlement based on modelling of factors including rainfall, aspect, soils and remaining vegetation.

Evidence on site, including floristic composition and soil characteristics, suggested that Heavier-soils Plains Grassland (EVC 132_61), Escarpment Shrubland (EVC 895), Plains Grassy Woodland (EVC 55_61), Tall Marsh (EVC 821), Plains Grassy Wetland (EVC 125) and Riparian Woodland (EVC 641) were present throughout the study area (Figure 1). Descriptions of these EVCs are provided in the EVC benchmarks in Appendix 6.

Some 28 largely disjunct areas of native vegetation ('sites') comprising the abovementioned EVCs were identified in the study area (Table 1). Large trees in patches were restricted to vegetation along the bank of Merri Creek, although these were not documented, as that part of the study area is not proposed to be developed.

Table 1: Description of native vegetation sites in the study area

Site	EVC	Description
AA	Riparian Woodland (EVC 641)	Associated with the Merri Creek channel. Comprised indigenous Common Reed, other native aquatics and the noxious weed Spiny Rush, but also indigenous and introduced shrubs scattered along its banks (e.g. River Bottle-brush, Woolly Tea-tree and Gorse). Moderate quality due to weedy understorey.
K, O, Q, R, S, X, Y & Z	Escarpment Shrubland (EVC 895)	Associated with Merri Creek banks escarpments and scattered patches associated with the walls of the two quarry voids. Supported mostly indigenous and introduced trees and shrubs (e.g. River Red-gum, Tree Violet, Sweet Bursaria, Hedge Wattle, Lightwood and African Box-thorn) with many introduced weeds in the ground layers. Patches S and Y are moderate quality, while the rest are low quality due to high weed cover.
L, P & V	Plains Grassy Woodland (EVC 55_61)	Zones L and P supported a few small River Red Gum trees, and both supported ground layers heavily dominated by native grasses, particularly Common Tussock-grass and Kangaroo Grass. Both zones supported a moderate diversity, though low cover, of indigenous forbs. Zone P was found to constitute the EPBC Act-listed community *Grassy Eucalypt Woodland of the Victorian Volcanic Plains* (GEWVVP). Zone V was a very small patch of River Red Gums (two mature, mostly recruits) and various grassy weeds. Low quality native vegetation due to high weed cover and lack of native species diversity.

Site	EVC	Description
A, B, C, D, E, F, H, I, T & U	*Heavier-soils* Plains Grassland (EVC 132_61)	Numerous scattered patches of moderate to high quality native grassland, dominated by by indigenous Kangaroo Grass, spear and wallaby grasses and various indigenous forbs including Pink Bindweed and Blue Devil. Introduced weed cover moderate to high. The highest quality native grassland vegetation was patches A, C and I, while the rest of the patches were moderate due to high weed cover. Patches A, B, D, E and F were found to constitute the EPBC listed community *Natural Temperate Grasslands of the Victorian Volcanic Plains* (NTGVVP).
G & J	Tall Marsh (EVC 821)	Deeper semi-permanent wetlands. Low quality native vegetation dominated by indigenous Bulrush, Common Reed and various introduced weeds. Patch J contained mostly Bulrush, whereas Patch G was dominated by both Bulrush and Common Reed.
M, W & AB	Plains Grassy Wetland (EVC 125)	Small ephemeral wetlands associated with the bottom of the quarries and shallow depressions. Variously dominated by indigenous Common Spike-sedge, Rush and various introduced weeds. Low quality due to high weed cover.

The habitat hectare assessment results for these habitat zones are provided in Table 2. More detailed habitat scoring results are presented in Appendix 2.

Table 2: Summary of habitat hectare assessment results

Habitat Zone	EVC no.	Area (ha)	Condition Score (out of 100)
A	132_61	0.586	39
B	132_61	0.123	27
C	132_61	0.053	22
D	132_61	0.261	31
E	132_61	0.074	31
F	132_61	0.099	31
G	821	0.046	33
H	132_61	0.386	27
I	132_61	0.061	19
J	821	0.061	41
K	895	0.091	27
L	55_61	0.381	24
M	125	0.058	34
N	895	0.005	20
O	895	0.162	20
P	55_61	1.021	25
Q	895	0.022	20
R	895	0.146	18

S	895	0.656	48
T	132_61	0.460	32
U	132_61	0.265	23
V	55_61	0.041	20
W	125	0.016	34
X	895	0.027	20
Y	895	0.371	N/A
Z	895	0.005	N/A
AA	641	1.400	N/A
AB	125	0.106	27
Total		**6.959**	

5.2.2. Scattered trees

A number of small scattered trees were mapped throughout the site, predominately comprising River Red Gums (Arbor Survey 2022).

5.3. Flora species

5.3.1. Species recorded

During the field assessment 53 plant species were recorded. Of these, 28 were indigenous and 25 were introduced or non-indigenous native in origin (Appendix 3).

5.3.2. Listed species

VBA records (DELWP 2022d) and the EPBC Protected Matters Search Tool (DAWE 2022a) indicated that within the search region there were records of, or there occurred potential suitable habitat for, 19 species listed under the Commonwealth EPBC Act. No flora species listed under the EPBC Act were recorded during the field survey.

The likelihood of occurrence in the study area of species listed under the EPBC Act is addressed in Table 3. Species considered 'likely to occur' are those that have a very high chance of being in the study area based on numerous records in the search region and suitable habitat in the study area. Species considered to have the 'potential to occur' are those for which suitable habitat exists, but recent records are scarce.

Any species listed under the FFG Act are not included in Table 2 as the study area is located on private land. Removal of species listed under the FFG Act only has implications on public land. Likelihood analysis was still conducted on species listed under the FFG Act and the following species were considered to have the 'potential to occur':

- Pale Swamp Everlasting (FFG: Critically Endangered)
- Tough Scurf-pea (FFG: Endangered)
- Glaucous Flax-lily (FFG: Endangered)
- Austral Crane's-bill (FFG: Critically Endangered)
- Large-flower Crane's-bill (FFG: Endangered)

- Pale-flower Crane's-bill (FFG: Endangered)
- Western Golden-tip (FFG: Endangered)

5.3.3. Results of targeted surveys

No Matted Flax-lily were recorded during targeted surveys at the site. This species is, therefore, considered unlikely to occur.

Table 3: Listed flora species and the likelihood of their occurrence in the study area

Common Name	Scientific name	EPBC	Habitat	Number of records	Date of last record	Likelihood of occurrence
River Swamp Wallaby-grass	*Amphibromus fluitans*	Vulnerable	River Swamp Wallaby-grass grows mostly in permanent swamps and also lagoons, billabongs, dams and roadside ditches. The species requires moderately fertile soils with some bare ground; conditions that are caused by seasonally-fluctuating water levels (DAWE 2020).	4	28/10/2020	No suitable habitat in study area. **Unlikely to occur.**
Charming Spider-orchid	*Caladenia amoena*	Endangered	Typically found in grassy dry forest; Eucalyptus melliodora (Box Ironbark) on sandy loams derived from sandstone and mudstone. Known from two localities, one at Plenty and the other at Wattle Glen (Todd 2000).	1	22/08/1996	No suitable habitat in study area. No recent records nearby. **Unlikely to occur.**
Matted Flax-lily	*Dianella amoena*	Endangered	Lowland grassland and grassy woodlands on well-drained to seasonally waterlogged fertile sandy loams to heavy cracking soils derived from sedimentary or volcanic Geology. It is widely distributed from eastern to south-western Victoria (DAWE 2020).	655	8/10/2020	Although, suitable habitat present in the study area and many recent records nearby, no individuals were recorded during targeted surveys undertaken for this investigation. **Unlikely to occur.**
Small Golden Moths	*Diuris basaltica*	Endangered	Grows in herb-rich native grasslands, dominated by Kangaroo Grass (Themeda triandra) on heavy basaltic soils, often embedded with basalt boulders. All locations that the species is known to occur form part of the 'Natural Temperate Grassland of the Victorian Volcanic Plain' (DAWE 2020).	None	N/A	Suitable habitat in study area but it is marginal and no recent records nearby. **Unlikely to occur.**
Sunshine Diuris	*Diuris fragrantissima*	Endangered	Native grasslands dominated by Kangaroo Grass, on heavy basalt soils, often with embedded basalt boulders. The sole remaining natural population at Sunshine occurs in a small (0.1 ha) remnant of Western (Basalt) Plains Grassland (DAWE 2020).	None	N/A	Suitable habitat in study area but it is marginal. Only known from one population near Sunshine. No recent records nearby. **Unlikely to occur.**
Trailing Hop-bush	*Dodonaea procumbens*	Vulnerable	Grows in low lying, often winter wet areas in woodland, low open-forest heathland and grasslands on sands and clays. Largely confined to SW of Victoria (DAWE 2020).	None	N/A	Suitable habitat in study area but it is marginal and no recent records nearby. **Unlikely to occur.**

Common Name	Scientific name	EPBC	Habitat	Number of records	Date of last record	Likelihood of occurrence
Clover Glycine	*Glycine latrobeana*	Vulnerable	Found across south-eastern Australia in native grasslands, dry sclerophyll forests, woodlands and low open woodlands with a grassy ground layer. In Victoria, populations occur in lowland grasslands, grassy woodlands and sometimes in grassy heath (DAWE 2020).	5	2/10/2015	Suitable habitat in study area but it is marginal and few recent records nearby. **Unlikely to occur.**
Adamson's Blown-grass	*Lachnagrostis adamsonii*	Endangered	Confined to slow moving creeks, swamps, flats, depressions or drainage lines that are seasonally inundated or waterlogged and usually moderately to highly saline. Appear to favour sites that have some shelter from the wind (DAWE 2020).	2	1/01/1990	No suitable habitat in study area. Lack of recent records. **Unlikely to occur.**
Spiny Peppercress	*Lepidium aschersonii*	Vulnerable	The Spiny Peppercress occurs in periodically wet sites such as gilgai depressions and the margins of freshwater and saline marshes and shallow lakes, usually on heavy clay soil. Almost all sites receive some degree of soil waterlogging or seasonal flooding (Carter 2010).	None	N/A	Suitable habitat in study area but it is marginal. No recent records nearby. **Unlikely to occur.**
Basalt Peppercress	*Lepidium hyssopifolium* s.s.	Endangered	Known to establish on open, bare ground with limited competition from other plants. Previously recorded from Eucalypt woodland with a grassy ground cover, low open Casuarina woodland with a grassy ground cover and tussock grassland. Now generally found amongst exotic pasture grasses and beneath exotic trees (DAWE 2020).	3	21/05/2018	No suitable habitat in study area. Few recent records. **Unlikely to occur.**
White Sunray	*Leucochrysum albicans subsp. tricolor*	Endangered	Occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils. Plants can be found in natural or semi-natural vegetation and grazed or ungrazed habitat. Bare ground is required for germination. The unpalatability of this species is likely to protect it in heavily grazed areas where patches of bare ground are likely to develop, favouring recruitment (DAWE 2020).	1	24/11/2016	No suitable habitat in study area. Only one recent nearby record. **Unlikely to occur.**
Spiny Rice-flower	*Pimelea spinescens subsp. spinescens*	Critically Endangered	Occurs in grassland or open shrubland on basalt derived soils, usually comprising black or grey clays. Plants from more northerly populations occur on red clay complexes, while plants from southern populations occur on heavy grey-black clay loams. Topography is generally flat but populations may occur on slight rises or in slightly wettish depressions (Carter & Walsh 2006).	None	N/A	Suitable habitat in study area but it is marginal and no recent records nearby. **Unlikely to occur.**

Common Name	Scientific name	EPBC	Habitat	Number of records	Date of last record	Likelihood of occurrence
Round-leaf Pomaderris	*Pomaderris vacciniifolia*	Critically Endangered	Occurs in damp forest and herb-rich foothill forest north-east of Melbourne in the upper catchments of the Yarra, Plenty and Yea rivers (DAWE 2020).	None	N/A	No suitable habitat in study area. No recent records. **Unlikely to occur.**
Green-striped Greenhood	*Pterostylis chlorogramma*	Vulnerable	Occurs in mixed Box-Stringybark forest with a shrubby understorey, often with Pteridium esculentum as a major component on sandy or clay loam soils (Duncan et al. 2009).	None	N/A	No suitable habitat in study area. No recent records. **Unlikely to occur.**
Leafy Greenhood	*Pterostylis cucullata*	Vulnerable	Tea-tree scrubs on tall sandy and calcareous dunes, in moist, open or even deep shaded locations (Jones 1994).	None	N/A	No suitable habitat in study area. No recent nearby records. **Unlikely to occur.**
Button Wrinklewort	*Rutidosis leptorhynchoides*	Endangered	In Victoria restricted to open stands of plains grassland and grassy woodlands, on fertile clays to clay loams, usually in areas where the grass cover is more open, either as a result of recurrent fires or grazing by native macropods or stock. It also occurs on low rises with shallow, stony soils at less than 100 m above sea level (NSW OEH 2012).	None	N/A	Suitable habitat in study area but it is marginal and no recent records nearby. **Unlikely to occur.**
Large-headed Fireweed	*Senecio macrocarpus*	Vulnerable	In Victoria, Large-fruit Fireweed occurs most commonly in grasslands on red-brown earth soils. It may also occur in grassy woodlands and open woodlands predominantly in the Western (Basalt) Plains grassland on red brown earth soils found on recent Quaternary (basalt) deposits (DAWE 2020).	None	N/A	Suitable habitat in study area but it is marginal and no recent records nearby. **Unlikely to occur.**
Swamp Fireweed	*Senecio psilocarpus*	Vulnerable	Herb-rich winter-wet swamps on volcanic clays or peaty soils (Walsh 1999). Known from approximately 10 sites between Wallan, about 45 km north of Melbourne, and Honans Scrub in south-eastern South Australia (TSSC 2008).	None	N/A	Suitable habitat in study area but it is highly degraded. No recent records nearby. **Unlikely to occur.**
Swamp Everlasting	*Xerochrysum palustre*	Vulnerable	Grows in wetlands including sedge-swamps and shallow freshwater marshes, often on heavy black clay soils. Commonly associated genera include *Amphibromus, Baumea, Carex, Chorizandra, Craspedia, Eleocharis, Isolepis, Lachnagrostis, Lepidosperma, Myriophyllum, Phragmites australis, Themea triandra* and *Villarsia* (DAWE 2020).	1	29/11/2005	Suitable habitat in study area but it is highly degraded. Only one recent record nearby. **Unlikely to occur.**

Notes: EPBC = Threatened species status under EPBC Act (EX = presumed extinct in the wild; CR = critically endangered; EN = endangered; VU = vulnerable).

5.4. Fauna habitats

The study area supported four fauna habitat types.

- Treed vegetation;
- Open grassy paddocks;
- Rocky escarpments; and
- Aquatic habitat.

Treed Vegetation: Occurred in the study area in several areas and as several habitat types, as follows:

- Planted indigenous and non-indigenous eucalypts (Namely River Red Gum and Sugar Gum), which were generally concentrated in the south-east of the study area; and
- Woodland stands of River Red Gum, Lightwood and Sweet Bursaria along the banks of the Merri Creek in the west of the study area; and

These treed habitat types support numerous bird species and invertebrates and provide shelter for Eastern Grey Kangaroos. Some of the trees in the south-east of the area were observed to have tree hollows. Considered moderate to poor quality fauna habitat overall and unlikely to support listed threatened species.

Open grassy paddocks: Occurred throughout the vast majority of the study area and heavily dominated by introduced pasture grasses and broad-leaf weeds. Several isolated patches dominated by indigenous grassland species, such as Kangaroo Grass, spear and wallaby grasses and various forbs. Occurs on cracking clay-rich soils with light to moderate outcropping basalt rock.

This habitat type was considered to be of moderate quality for grassland dependant fauna.

Rocky escarpments: Rocky escarpment, covered by escarpment shrubland, was associated with the upper banks of the Merri Creek and the two quarry voids in the north of the study area. Generally dominated by Lightwood, Sweet Bursaria and Tree Violet, with occasional emergent River Red Gum trees. Considered moderate quality fauna habitat overall but unlikely to support listed threatened species.

Aquatic habitat: This habitat occurred in several parts of the study area in three forms; Merri Creek, a drainage trench and the bottom of the larger quarry void. Merri Creek was considered the highest quality aquatic habitat, which is well known to support a large population of the EPBC Act-listed Growling Grass Frog. The other aquatic habitat types may also serve as seasonal breeding habitat for Growling Grass Frog.

5.5. Fauna species

5.5.1. Species recorded

During the field assessment 36 fauna species were recorded. This included 28 bird (eight introduced), four mammals (two introduced), three frogs, and one reptile (Appendix 4).

5.5.2. Listed species

The review of existing information (including VBA records (DELWP 2020d) and the results of the EPBC Protected Matters Search Tool (DAWE 2020a)) indicated that within the search region there were records of, or there occurred potential suitable habitat for, 22 fauna species listed under the Commonwealth EPBC Act. The likelihood of occurrence of these species in the study area was assessed and the results are presented in Table 5.

This analysis of potential occurrence of listed fauna species excludes:

- Marine fauna given that the study area is inland
- Migratory oceanic bird species (such as albatrosses and petrels) and migratory shorebirds given that the study area is inland.

Species considered 'likely to occur' are those that have a very high chance of being in the study area given the existence of numerous records in the search region and suitable habitat in the study area. Using the precautionary approach, species considered to have the 'potential to occur' are those for which suitable habitat exists, but recent records are scarce. This analysis indicates that four listed fauna species are likely to occur or have the potential to occur. These species are:

- Grey-headed Flying-fox (EPBC: Vulnerable);
- Latham's Snipe (EPBC: Migratory);
- Swift Parrot (EPBC: Critically endangered);
- White-throated Needletail (EPBC: Vulnerable and Migratory).

The susceptibility of these species to impacts from development is discussed in Section 5.5.5.

5.5.3. Results of targeted surveys for GSM

No GSM were recorded in the study area during the four surveys undertaken as part of this investigation. All surveys were conducted in suitable weather conditions for detecting flying moths as is evidenced by moths being present on reference sites on the same days as surveys. Detailed information about the conditions at the time of each survey is outlined in Table 4. Given this, GSM are now considered unlikely to occur on site.

Table 4: Results of the GSM surveys at the study area

Date	20/12/2022	27/12/2022	6/01/2023	9/01/2023
Survey type	25m	25m	10m	10m
Reference site	Broadmeadows Valley Park	Broadmeadows Valley Park	Broadmeadows Valley Park	Broadmeadows Valley Park
Survey start time	11:45am	11:05	10:30	11:00
Survey duration	2 hours	1:40	2 hours	1 hour
GSM recorded? Y/N	N	N	N	N
Temp on site (°C)	25	31 - 34	25	27-30
Cloud cover %	0	0	50	0
Wind direction	S	NNW	ESE	NW
Average Wind strength	Gentle	Gentle	Gentle	Gentle
Ground conditions (dry/damp/wet)	Dry	Dry	Dry	Dry
Humidity	47%	43%	39%	54%

5.5.4. Results of targeted surveys for GGF

No GGF were recorded in the study area during the targeted surveys undertaken as part of this investigation. Full details of survey results will be provided upon completion of the GGF targeted survey report.

Table 5: Listed fauna species and the likelihood of their occurrence in the study area

Common Name	Scientific name	EPBC-T	EPBC-M	Habitat	Number of records	Date of last record	Likelihood of occurrence
Australasian Bittern	*Botaurus poiciloptilus*	EN		Terrestrial wetlands, including a range of wetland types but prefers permanent water bodies with tall dense vegetation, particularly those dominated by sedges, rush, reeds or cutting grass (Marchant & Higgins 1990).	3	20/12/1986	Marginal habitat in study area and no recent records – **unlikely to occur**
Double-banded Plover	*Charadrius bicinctus*		M (Bonn A2H)	Inhabits wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands (Marchant & Higgins 1993).	1	10/04/2004	No suitable habitat in study area – **unlikely to occur**
Eastern Barred Bandicoot	*Perameles gunnii*	VU		The habitat of the Eastern Barred Bandicoot (mainland) is perennial tussock grassland and eucalypt woodland with a grassy ground layer (Dufty 1994b; Seebeck 1995a, 2001). Drainage lines and areas of high vegetative cover have been identified as prime habitat. The key determining factor for persistence of this species appears to be high structural complexity and heterogeneity within the environment, reflected in its absence from agricultural areas but persistence in rubbish dumps and other variable habitats.	2	5/06/2003	Long extinct in the Port Phillip region – **very unlikely to occur**
Eastern Quoll	*Dasyurus viverrinus*	EN		Probably extinct in mainland Australia. Inhabits a range of of open forest, scrubland and heath (Menkhorst 1995).	4	1/01/1910	Long extinct in the Port Phillip region – **very unlikely to occur**
Eltham Copper Butterfly	*Paralucia pyrodiscus lucida*	EN		Its occurrence is dependent upon a close association between a dwarfed form of the Sweet Bursaria and colonies of a Notoncus sp. of ant, with the species unable to survive without the presence of the Notoncus ant (SWIFFT 2019). In the Eltham area of its range, this Butterfly appears to require well-drained gentle slopes, with a north to west aspect. Its known habitat is sparse dry woodland (Webster 2003).	1	1/01/1922	No suitable habitat in study area – **unlikely to occur**
Fork-tailed Swift	*Apus pacificus*		M (CAMBA, ROKAMBA, JAMBA)	The species can occur in wet sclerophyll forest but mainly prefers open forest or plains. It is almost exclusively aerial and feeds up to hundreds on metres above the ground, but can feed among open forest canopy. The species breeds internationally and seldom roosts in trees (Higgins 1999).	3	22/12/2006	No suitable habitat in study area – **unlikely to occur**
Glossy Ibis	*Plegadis falcinellus*		M (Bonn A2S)	Prefer freshwater inland wetlands, in particular, permanent or ephemeral water bodies and swamps with abundant vegetation (Marchant & Higgins 1990).	4	28/12/2006	Marginal habitat in study area – **unlikely to occur**
Golden Sun Moth	*Synemon plana*	VU		Areas that are, or have been native grasslands or grassy woodlands. It is known to inhabit degraded grasslands with introduced grasses being dominant, with a preference for the native wallaby grass being present (DEWHA 2009). Also known to be closely associated with exotic grass species, with populations found in grassland almost entirely composed of Chilean needlegrass (Richter et al. 2013).	3968	20/12/2019	Although, suitable grassland habitat exists in the study area and numerous recent records were found within the search region, no individuals were detected during targeted surveys – **unlikely to occur**
Grassland Earless Dragon	*Tympanocryptis pinguicolla*	EN		The species is confined to native tussock grassland on basalt plains north and west of Melbourne, with no confirmed sightings in Victoria since the 1960's (Robertson & Cooper 2000).	None	N/A	No records – unlikely to occur
Grey-headed Flying-fox	*Pteropus poliocephalus*	VU		Brisbane, Newcastle, Sydney and Melbourne are occupied continuously. Elsewhere, during spring, they are uncommon south of Nowra and widespread in other areas of their range. Roosts in aggregations of various sizes on exposed branches. Roost sites are typically located near water, such as lakes, rivers or the coast. Roost vegetation includes rainforest patches, stands of Melaleuca, mangroves and riparian vegetation, but colonies also use highly modified vegetation in urban and suburban areas (DAWE 2020).	18	18/02/2020	May occasionally forage in eucalypts in study area – **potential to occur**
Growling Grass Frog	*Litoria raniformis*	VU		Permanent, still or slow flowing water with fringing and emergent vegetation in streams, swamps, lagoons and artificial wetlands such as farm dams and abandoned quarries (Clemann & Gillespie 2004).	277	31/12/2019	Although, suitable wetland habitat exists in the study area and numerous recent records were found within the search region, no individuals were

Common Name	Scientific name	EPBC-T	EPBC-M	Habitat	Number of records	Date of last record	Likelihood of occurrence
							detected during targeted surveys – **unlikely to occur**
Latham's Snipe	*Gallinago hardwickii*		M (Bonn A2H, ROKAMBA, JAMBA, CAMBA)	Occurs in wide variety of permanent and ephemeral wetlands; it prefers open freshwater wetlands with dense cover nearby, such as the edges of rivers and creeks, bogs, swamps, waterholes. The species is wide spread in southeast Australia and most of its population occurs in Victoria, except in the northwest of the state (Naarding 1983; Higgins & Davies 1996).	90	28/02/2019	Suitable wetland habitat in study area and numerous recent records – **likely to occur**
Painted Honeyeater	*Grantiella picta*	VU		Inhabits box-ironbark forests and woodlands and mainly feeds on the fruits of mistletoe. Strongly associated with mistletoe around the margins of open forests and woodlands. Can also be found in farmland containing remnant treed vegetation. Occurs at few localities. Uncommon breeding migrant from further north, arriving in October and leaving in February (Higgins et al. 2001; Tzaros 2005).	1	21/12/1990	No suitable habitat in study area – **unlikely to occur**
Plains-wanderer	*Pedionomus torquatus*	CR		This species is highly sensitive to changes in grassland cover and density. Typically inhabits treeless native grasslands with sparse cover, with a preference for grasslands composed of wallaby grass and spear grass (Marchant & Higgins 1993). Habitat becomes unsuitable when grassland becomes dense (CA 2016). Evidence suggests it avoids areas of tree cover, with no records of the species within 300m of trees (>10m high) in their strongholds in New South Wales or Victoria (CA 2016).	8	23/09/1991	No suitable habitat in study area – **unlikely to occur**
Regent Honeyeater	*Anthochaera phrygia*	CR		Inhabits dry box-ironbark eucalypt forests near rivers and creeks on inland slopes of the Great Dividing Range. Can also occur in small remnant patches or in mature trees in farmland or partly cleared agricultural land (Higgins et al. 2001).	9	16/01/2001	No suitable habitat in study area – **unlikely to occur**
Rufous Fantail	*Rhipidura rufifrons*		M (Bonn A2H)	In east and south-east Australia, mainly inhabits tall wet sclerophyll forests, often in gullies. When on passage in warmer months, they are sometimes recorded in drier sclerophyll forests and woodlands, as well as parks and gardens (Higgins et al. 2006). Virtually absent from south-eastern Australia during winter (Higgins et al. 2006).	5	27/03/2008	No suitable habitat in study area – **unlikely to occur**
Satin Flycatcher	*Myiagra cyanoleuca*		M (Bonn A2H)	Mostly found in eucalypt forest, particularly tall wet forests and woodland within gullies (Higgins et al. 2006). Also inhabits eucalypt woodland comprising an open understorey and a grassy ground layer (Higgins et al. 2006). Generally absent from rainforest (Higgins et al. 2006).	3	17/01/1989	No suitable habitat in study area – **unlikely to occur**
Spot-tailed Quoll	*Dasyurus maculatus maculatus*	EN		Rainforest, wet and dry forest, coastal heath and scrub and River Red Gum woodlands along inland rivers (Menkhorst 1995).	2	1/01/1910	No suitable habitat in study area – **unlikely to occur**
Striped Legless Lizard	*Delma impar*	VU		Grassland specialist. Known to occur in some areas dominated by introduced species such as Harding Grass Phalaris aquatica, Serated Tussock Nasella trichotoma and Flatweed Hypocharis radicata and at sites with a history of grazing and pasture improvement. shelter in grass tussocks, thick ground cover, soil cracks, under rocks, spider burrows, and under ground debris such as timber. The majority of sites in Victoria and NSW occur on cracking clay soils with some surface rock which provide shelter for the species (DAWE 2020).	3	4/03/1990	Suitable habitat for the species occurs on site, particularly in the southeast and the far north. However, records in the search area are more than 30 years old and from the Craigieburn Grassland Reserve, which is not connected to this site - **Unlikely to occur**
Superb Parrot	*Polytelis swainsonii*	VU		Occurs in eucalypt dominated forests and woodlands, namely comprised of River Red Gum, Yellow Box and Grey Box, with seasonal occurrences in box-pine and Boree woodland (Baker-Gabb 2011). The species range extends along major riverine systems and the inland slopes of the Great Divide, stretching from central Victoria to north of Tamworth in NSW. Breeds in hollow branch or trunk of tall eucalypts within 9 km of feeding areas. Mostly feeds in box woodlands and wooded farmlands; less often in riparian forests (Higgins 1999).	1	1/01/1930	No suitable habitat in study area – **unlikely to occur**

Common Name	Scientific name	EPBC-T	EPBC-M	Habitat	Number of records	Date of last record	Likelihood of occurrence
Swift Parrot	*Lathamus discolor*	CR		Prefers a select range of eucalypts in Victoria, including Yellow Gum, Grey Box, White Box, Red Ironbark and Yellow Box, as well as River Red Gum when this species supports abundant 'lerp' (Saunders & Tzaros 2011). The species is also known to forage within planted stands of Spotted Gum and Sugar Gum (Nature Advisory; unpublished data). Breeds in Tasmania and migrates to the mainland of Australia for the autumn, winter and early spring months. It lives mostly north of the Great Dividing Range, passing through two areas of Victoria on migration: the Port Phillip district and Gippsland (Emison et al. 1987; Higgins 1999; Kennedy & Tzaros 2005). Though it is also not uncommonly sighted in urban areas (Nature Advisory; unpublished data). Occurrence of this species on the mainland can substantially change from year to year depending on food availability, giving potential for this species to occur almost anywhere throughout its range (Emison et al. 1987).	72	7/04/2019	May occasionally forage in eucalypts in study area – **potential to occur**
White-throated Needletail	*Hirundapus caudacutus*	VU	M (CAMBA, ROKAMBA, JAMBA)	Aerial, over all habitats, but probably more over wooded areas, including open forest and rainforest. Often over heathland and less often above treeless areas such as grassland and swamps or farmland (Higgins 1999).	11	25/01/2019	Highly mobile aerial species that can occur over most habitats – **potential to occur as a flyover**

Notes: EPBC-T = threatened species status under EPBC Act (EX = presumed extinct in the wild; CR = critically endangered; EN = endangered; VU = vulnerable); **EPBC-M**: migratory status under the EPBC Act (M = listed migratory taxa; Bonn Convention (A2H) - Convention on the Conservation of Migratory Species of Wild Animals – listed as a member of a family; Bonn Convention (A2S) - Convention on the Conservation of Migratory Species of Wild Animals - species listed explicitly; CAMBA - China- Australia Migratory Birds Agreement; JAMBA - Japan-Australia Migratory Birds Agreement; ROKAMBA - Republic of Korea Australia Migratory Birds Agreement).

5.5.5. Susceptibility of listed fauna to impacts

The following analysis identifies the susceptibility to development of listed fauna species which may utilise the study area. This analysis includes consideration of the factors below.

- The mobility of the species; and
- The availability and extent of other suitable habitat in the region and the degree to which each species may rely on habitat in the study area.

Birds (non-migratory)

One listed non-migratory bird species is considered to have the potential to occur in the study area. The susceptibility of this species to possible impacts from any development in the study area is discussed below.

- **Swift Parrot** (EPBC: Critically endangered)

Swift Parrot may occasionally forage on the planted Sugar Gums and River Red Gums in the study area on their annual winter-feeding routes throughout south-east Australia, but these are not preferred food tree species and would only potentially serve as short foraging stops along the way to the box-ironbark forests of central Victoria and the Spotted Gum forests of south-east NSW. Given this, it is unlikely that development of the study area would have an impact on this species.

Migratory Birds

Two listed migratory bird species (excluding oceanic species and shorebirds) has the potential to occur in the study area. The susceptibility of this species to possible impacts from any development in the study area is discussed below.

- **White-throated Needletail** (EPBC: Vulnerable, Migratory)

White-throated Needletails are extremely mobile and highly aerial birds. They can fly over most habitats as they pursue insects, and could therefore potentially fly over the study area at some point during the warmer months when the species migrates to Australia from East Asia. However, unless they roost in an area, they are not normally very reliant on or tied to the terrestrial habitats they fly over. The species was not observed to be roosting on site and suitable roosting habitat (forests and woodlands with thick foliage and/or tree hollows) was lacking. Given this, and the extreme mobility of the species, it is unlikely that development of the study area would impact this species.

- **Latham's Snipe** (EPBC: Migratory)

This species forages on well vegetated fringes of wetlands and drainage lines and may occasionally seasonally forage in the aquatic habitat in the study area. Given the limited occurrence of such habitat in the study area and its varying quality for the species, development of the site would unlikely pose a significant threat to Latham's Snipe.

Mammals

One listed mammal species is considered to have the potential to occur in the study area. The susceptibility of this species to possible impacts from any development in the study area is discussed below.

- **Grey-headed Flying-fox** (EPBC: Vulnerable)

This nocturnal fruit bat forages on a wide variety of flowering eucalypts and native and introduced cultivated fruit trees. It may occasionally forage on the planted and non-planted eucalypts in the study

area when they are in flower. Given the limited occurrence of such eucalypts in the study area, it is highly unlikely that development of the site would pose a significant threat to Grey-headed Flying-fox.

5.6. Listed ecological communities

The EPBC Protected Matters Search Tool (DAWE 2020a) indicated that six ecological communities listed under the EPBC Act had the potential to occur in the search region (Table 6). Their occurrence in the study area was determined based on an assessment of the native vegetation present against published descriptions and condition thresholds for these communities.

Table 6: EPBC Act listed ecological communities and likelihood of occurrence in the study area

Ecological Community	EPBC Status	Occurrence in the study area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Occurs in the study area as Habitat Zone P.
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Does not occur in the study area.
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Does not occur in the study area.
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Occurs in the study area as habitat zones A, B, D, E & F.
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Does not occur in the study area.
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Does not occur in the study area.

Habitat zones A, B, D, E & F were found to meet all of the qualifying criteria for the *Natural Temperate Grassland of the Victorian Volcanic Plain* community and Habitat Zone P was found to meet the all of the qualifying criteria for the treeless variant of the *Grassy Eucalypt Woodland of the Victorian Volcanic Plain* community.

Figure 1: Study area and native vegetation

Project: 485 Cooper Street, Epping
Client: The GPT Group
Date: 24/02/2023

Study area

Native vegetation (NA, 2022)

- Escarpment Shrubland (EVC 895)
- Plains Grassland - Heavier-soils (EVC 132_61)
- Plains Grassy Wetland (EVC 125)
- Plains Grassy Woodland (EVC 55)
- Riparian Woodland (EVC 641)
- Tall Marsh (EVC 821)

EPBC Act listed community

- GEWVVP
- NTGVVP

Trees mapped by arborist

- Large tree in patch
- Small scattered tree

N

Metres
0 75

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6. Assessment of impacts

6.1. Proposed development

A commercial/industrial development is proposed for the subject land.

To determine impacts to native vegetation, the proposed development master plan was overlaid with the native vegetation mapped as part of this investigation. Native vegetation occurring in the following locations was considered to be removed based on the proposed development plan:

- Direct removal:
  - Native vegetation within all proposed building envelopes
  - Native vegetation within all proposed driveways
- Consequential removal:
  - Native vegetation within 10 metres of all proposed building envelopes
  - Native vegetation 2 metres on either side of all proposed lot boundaries (to address the future fence exemption of Clause 52.17)

Impacts to trees

In accordance with the *Assessor's Handbook* (DELWP 2018a), a tree is deemed lost when earthworks encroach on more than 10% of the Tree Protection Zone (TPZ). A TPZ is defined as an area around the trunk of the tree that has a radius of 12 × the DBH (to a maximum of 15 metres but no less than 2 metres). Dead trees are treated in the same manner.

6.2. Impacts of proposed development

The current layout of the development assumes full removal of vegetation outside the ESO3 area along the Merri Creek with some impacts within the ESO area (see Figure 2).

6.2.1. Native vegetation

The current development footprint assumes full removal of all vegetation within the development footprint area. This will result in the loss of a total extent of approximately 4.121 hectares of native vegetation as represented in Figure 2 and documented in the *Native Vegetation Removal* (NVR) report scenario test (Appendix 7).

The native vegetation to be removed is in an area mapped as an endangered Ecological Vegetation Class.

There is an understanding that no native vegetation has been approved for removal on the property within the last five years.

6.2.2. River Red Gums

A total of 40 River Red Gums were mapped on site, including five large trees and 35 small trees (Arbor Survey 2022). Of these, nine small trees are proposed for removal (Figure 3). Under the Guidelines, only scattered trees and large trees in patches are mapped and included in the total removal used to produce offset requirements. Three of the nine River Red Gums are classified as small, scattered trees and have been included in the removal totalling 0.093 hectares. The remaining six trees are captured within patches of native vegetation.

6.2.3. Modelled species important habitat

The current proposal footprint will not have a significant impact on any habitat for any rare or threatened species as determined in Appendix 7.

6.2.4. Listed flora species

No listed flora species are expected to be impacted by the proposed development in the study area.

6.2.5. Listed fauna species

Fauna habitat in the form of treed vegetation (indigenous and non-indigenous), rocky escarpment, open grassland and aquatic habitat will be lost.

The analysis of susceptibility of listed fauna species to impacts presented in Section 5.5.2 identified that no listed flora species are expected to be impacted by the proposed development in the study area.

6.2.6. Threatened ecological communities

The proposed development footprint would result in the loss of approximately 1.144 hectares of *Natural Temperate Grassland of the Victorian Volcanic Plain* (NTGVVP) and 1.021 hectares of *Grassy Eucalypt Woodland of the Victorian Volcanic Plain* (GEWVVP).

6.2.7. Merri Creek corridor

The Merri Creek, which is an important habitat corridor for many native flora and fauna species, runs along the western boundary of the property. This area, and the associated terrestrial buffer, is proposed to be secured as a conservation area. The conservation area will ensure the protection of the biodiversity values it supports and maintain connectivity to other areas of the Merri Creek and its catchment. A habitat linkages plan showing this in included in Figure 4. A management strategy will be prepared and detailed in a Conservation Management Plan, which will provide guidance for the protection, maintenance and enhancement of the vegetation and habitat within the conservation area.

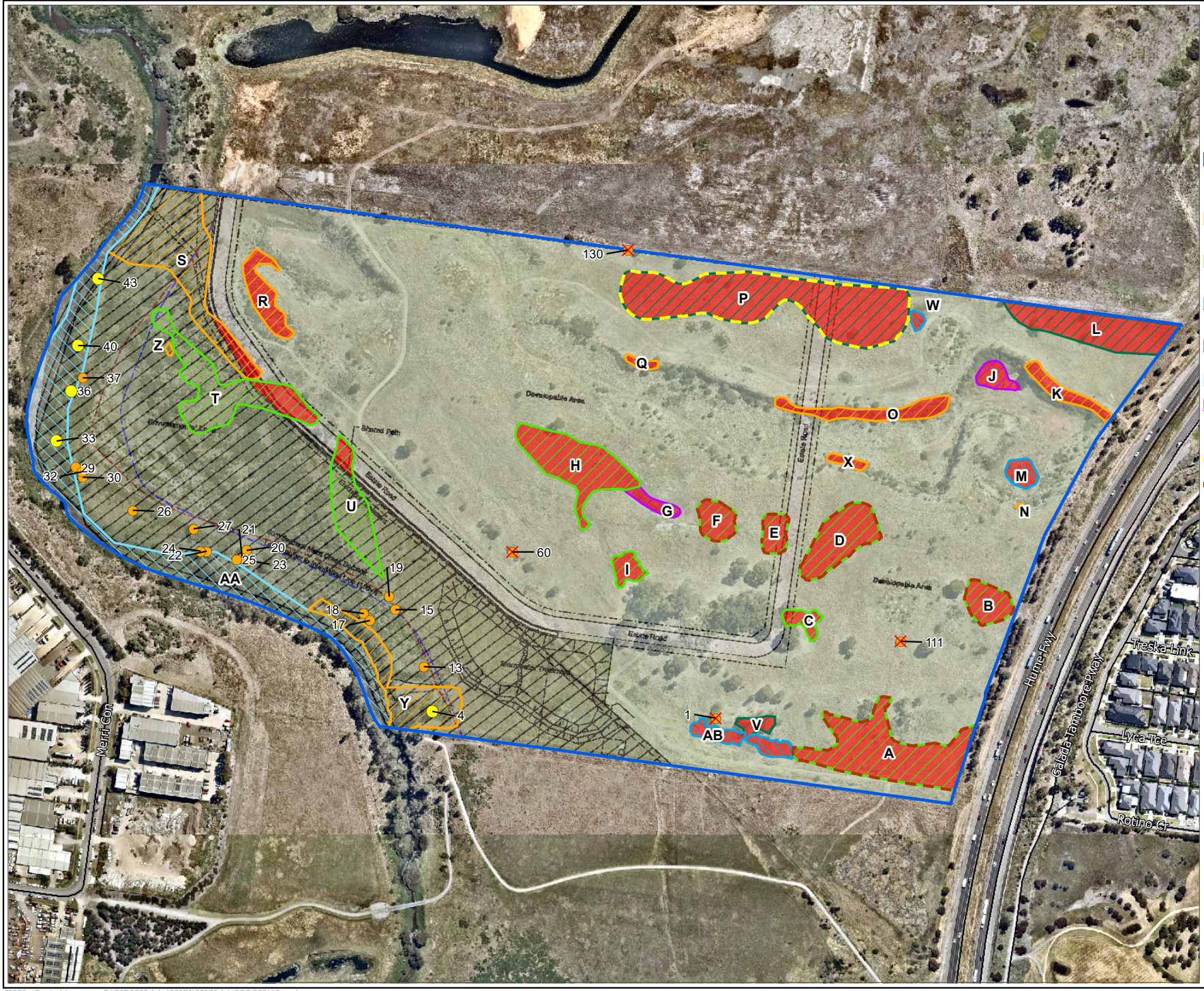

Figure 2: Native vegetation to be removed

Project: 485 Cooper Street, Epping
Client: The GPT Group
Date: 24/02/2023

Study area

Native vegetation (NA, 2022)

- Escarpment Shrubland (EVC 895)
- Plains Grassland - Heavier-soils (EVC 132_61)
- Plains Grassy Wetland (EVC 125)
- Plains Grassy Woodland (EVC 55)
- Riparian Woodland (EVC 641)
- Tall Marsh (EVC 821)

EPBC Act listed community

- GEWVVP
- NTGVVP

Trees mapped by arborist

- Large tree in patch
- Small scattered tree
- Tree to be removed
- Native vegetation to be removed

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Figure 3: River Red-gum impacts

Project: 485 Cooper Street, Epping
Client: The GPT Group
Date: 24/02/2023

Study area

Native vegetation (NA, 2022)

- Escarpment Shrubland (EVC 895)
- Plains Grassland - Heavier-soils (EVC 132_61)
- Plains Grassy Wetland (EVC 125)
- Plains Grassy Woodland (EVC 55)
- Riparian Woodland (EVC 641)
- Tall Marsh (EVC 821)

River Red-gum records (Arborist)

- Large tree in patch
- Small scattered tree
- Small tree in patch
- River Red-gum to be removed

N

Metres
0 75

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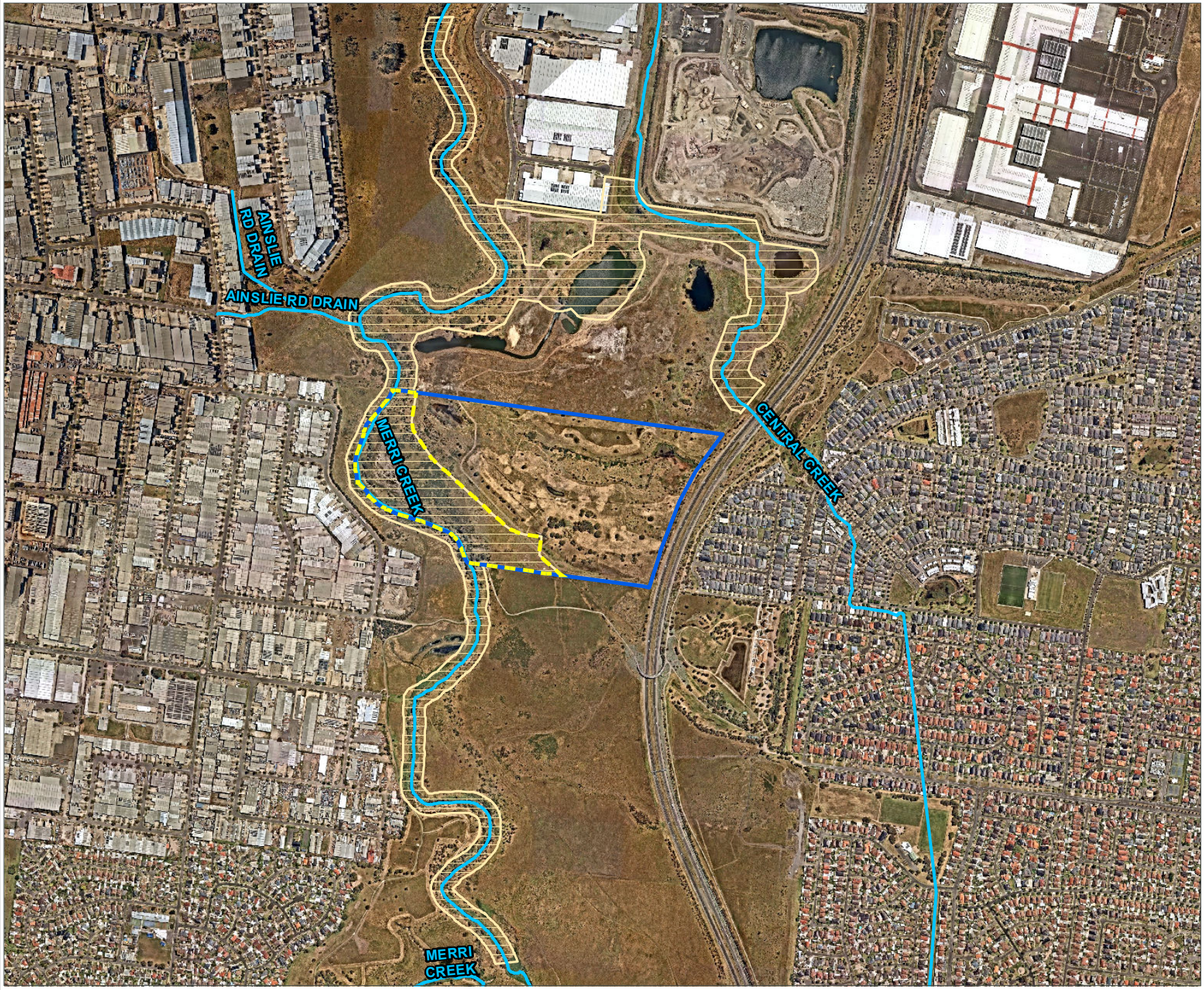

Figure 4: Habitat linkages

Project: 485 Cooper Street, Epping
Client: The GPT Group
Date: 2/03/2023

- Conservation area
- Property boundary
- Merri Creek
- Habitat linkage

N

Metres
0 200

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7. Implications of findings under legislation and policy

7.1. Summary of planning implications

A planning permit under Clause 52.17 of the Whittlesea Planning Scheme would certainly be required for the removal of any native vegetation from the study area.

The River Red Gum Protection Policy (Clause 22.10) of the Whittlesea Planning Scheme requires an arborist's report with any planning proposal for development on land which contains one or more River Red Gums and encourages that the majority of River Red Gums proposed for retention are sited in public open space reserves and/or road reserves. A total of 40 River Red Gums were recorded on site by the arborist. Of these, 31 will be retained on site including all five large trees and 26 small trees. This equates to a 78% overall retention of River Red Gums on site.

The study area is subject to the ESO3 overlay in the Whittlesea City Council Planning Scheme. A permit would be required under ESO3 for any proposed works in the Merri Creek corridor (including works associated with any wetland).

7.2. Implications under the Guidelines

7.2.1. Avoid and minimise statement

In accordance with the Guidelines, all applications to remove native vegetation must provide an avoid and minimise statement that describes any efforts undertaken to avoid the removal of, and minimise the impacts to biodiversity and other values of native vegetation, and how these efforts were focused on areas of native vegetation with the highest value. Efforts to avoid and minimise impacts to native vegetation in the current application are presented as follows:

- Strategic level planning – the study area has not been subject to any regional or landscape scale strategic planning process that avoided and minimised impacts to native vegetation across a region or landscape.
- Site level planning – the proponent indicates that the proposed development has been sited to avoid and minimise impacts to native vegetation and fauna habitat along the Merri Creek. It was understood that the area closest to the creek was of the highest value for retention given the presence of an ESO (which is lacking from the remainder of the site).
- Furthermore, the proponent indicates that no feasible opportunities exist to further avoid and minimise impacts to native vegetation without undermining the key objectives of the proposal.

7.2.2. Assessment pathway

The assessment pathway is determined by the location category and extent of native vegetation as detailed for the study area as follows:

- **Location Category:** Location 2
- **Extent of native vegetation:** A total of 4.121 hectares of native vegetation (including no large trees).

Based on the extent of native vegetation removal being ≥ 0.5 hectares, the Guidelines stipulate that the proposal is to be assessed under the **Detailed** assessment pathway, as determined by the following matrix:

Table 7: Assessment pathway matrix

Extent of native vegetation	Location Category		
	Location 1	Location 2	Location 3
< 0.5 hectares and not including any large trees	Basic	Intermediate	Detailed
< 0.5 hectares and including one or more large trees	Intermediate	Intermediate	Detailed
≥ 0.5 hectares	Detailed	**Detailed**	Detailed

This proposal **would** trigger a referral to DELWP based on the above criteria.

7.2.3. Offset requirements

Offsets required to compensate for the proposed removal of native vegetation from the study area are as follows:

1.352 general habitat units and must include the following offset attribute requirements:

- Minimum strategic biodiversity value (SBV) of 0.449.
- Occur within the Port Phillip and Westernport CMA boundary or the Whittlesea municipal district.

Under the Guidelines all offsets must be secured prior to the removal of native vegetation.

7.2.4. Offset statement

The offset target for the current proposal will be achieved via a third-party offset.

An online search of the Native Vegetation Credit Register (NVCR) has shown that the required offset is currently available for purchase from a native vegetation credit owner (DELWP 2022e).

Evidence that the required offset is available is provided in Appendix 8. The required offset would be secured following approval of the application to remove native vegetation.

7.3. EPBC Act

The EPBC Act protects a number of threatened species and ecological communities that are considered to be of national conservation significance. Any significant impacts on these species require the approval of the Australian Minister for the Environment.

Based on the relevant guidelines, the proposed development is likely to result in a significant impact on EPBC Act-listed values presented below, which were both recorded in the developable portion of the study area.

- Ecological communities:
  - Natural Temperate Grassland of the Victorian Volcanic Plain (EPBC: Critically endangered); and
  - Grassy Eucalypt Woodland of the Victorian Volcanic Plain (EPBC: Critically endangered).

A Referral under the EPBC Act will be required for the abovementioned values.

7.4. FFG Act

There are no implications under the FFG Act as there is no public land in the study area.

7.5. EE Act

The *Ministerial Guidelines for Assessment of Environmental Effects under the* Environment Effects Act 1978 (DSE 2006), identifies criteria which trigger a Referral to the State Minister for Planning.

Based on the relevant criteria in Section 3.4, a Referral is unlikely to be required under the EE Act for the aspects covered by the current investigation.

7.6. CaLP Act

The *Catchment and Land Protection Act 1994* (CaLP Act) requires that landowners (or a third party to whom responsibilities have been legally transferred) must eradicate regionally prohibited weeds and prevent the growth and spread of regionally controlled weeds.

Property owners who do not eradicate Regionally prohibited weeds or prevent the growth and spread of Regionally controlled weeds for which they are responsible, may be issued with a Land Management Notice or Directions Notice that requires specific control work to be undertaken.

In accordance with the *Catchment and Land Protection Act 1994*, the noxious weed species listed below, which were recorded in the study area, must be controlled.

- Montpellier Broom
- Artichoke Thistle
- Gorse
- Chilean Needle-grass
- Lobed Needle-grass

Precision control methods that minimise off-target kills (e.g. spot spraying) should be used in environmentally sensitive areas (e.g. within or near native vegetation, waterways, etc.).

7.7. Construction mitigation recommendations

Recommendations to mitigate impacts to vegetation during construction are provided below:

- Establish appropriate vegetation protection zones around areas of native vegetation to be retained prior to works.
- Establish appropriate TPZs around scattered native trees to be retained prior to works.
- Ensure all construction personnel are appropriately briefed prior to works, and that no construction personnel, machinery or equipment are placed inside vegetation zones/TPZs.
- A suitably qualified zoologist is required to undertake the relevant pre-clearance surveys for native fauna. Details of the necessary pre-clearance fauna surveys are outlined below.
    - All planted trees to be removed during the week prior to removal to identify the presence of any nests or hollows. If considered necessary based on the results of the pre-clearance survey, a suitably qualified zoologist should be on site during any tree removal works to capture and relocate any misplaced fauna that may be present.
    - Prior to any earthworks occurring along the rocky escarpments, as it is likely these areas provide habitat for many native reptiles, including snakes and skinks, as well as potentially supporting small mammals and/or toadlets.

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Appendix 1: Details of the assessment process in accordance with the Guidelines for the removal, destruction or lopping of native vegetation (DELWP 2017a)

Purpose and objective

Policies and strategies relating to the protection and management of native vegetation in Victoria are defined in the State Planning Policy Framework (SPPF). The objective identified in Clause 12.01 of all Victorian Planning Schemes is 'To ensure that there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation'.

This is to be achieved through the following three-step approach, as detailed in the Guidelines:

1. Avoid the removal, destruction or lopping of native vegetation.
2. Minimise impacts from the removal, destruction or lopping of native vegetation that cannot be avoided.
3. Provide an offset to compensate for the biodiversity impact from the removal, destruction or lopping of native vegetation.

Note: While a planning permit may still be required, if native vegetation does not meet the definition of either a patch or a scattered tree, an offset under the Guidelines is not required.

Assessment pathways

The first step in determining the type of assessment required for any site in Victoria is to determine the assessment pathway for the proposed native vegetation removal. The three possible assessment pathways for applications to remove native vegetation in Victoria are:

- Basic;
- Intermediate; or
- Detailed.

This assessment pathway is determined by two factors:

- **Location Category**, as determined using the states' Location Map. The location category indicates the potential risk to biodiversity from removing a small amount of native vegetation. The three location categories are defined as:
  - Location 1 – shown in light blue-green on the Location Map; occurring over most of Victoria.
  - Location 2 – shown in dark blue-green on the Location Map; includes areas mapped as endangered EVCs and/or sensitive wetlands and coastal areas.
  - Location 3 – shown in brown on the Location Map; includes areas where the removal of less than 0.5 hectares of native vegetation could have a significant impact on habitat for rare and threatened species.
- **Extent of native vegetation** – The extent of any patches and scattered trees proposed to be removed (as well as the extent of any past native vegetation removal), with consideration as to whether the proposed removal includes any large trees. Extent of native vegetation is determined as follows:
  - **Patch** – the area of the patch in hectares.
  - **Scattered Tree** – the extent of a scattered tree is dependent on whether the scattered tree is small or large. A tree is considered to be a large tree if it is greater or equal to the large tree benchmark diameter at breast height (DBH) for the relevant bioregional EVC. Any scattered

tree that is not a large tree is a small scattered tree. The extent of large and small scattered trees is determined as follows:

Large scattered tree – the area of a circle with a 15-metre radius, with the trunk of the tree at the centre.

Small scattered tree – the area of a circle with a ten-metre radius, with the trunk of the tree at the centre.

The assessment pathway for assessing an application to remove native vegetation is then determined as detailed in the following matrix table:

Extent of native vegetation	Location Category		
	Location 1	Location 2	Location 3
< 0.5 hectares and not including any large trees	Basic	Intermediate	Detailed
< 0.5 hectares and including one or more large trees	Intermediate	Intermediate	Detailed
≥ 0.5 hectares	Detailed	Detailed	Detailed

Note: If the native vegetation to be removed includes more than one location category, the higher location category is used to determine the assessment pathway.

Landscape scale information – strategic biodiversity value

The strategic biodiversity value (SBV) is a measure of a location's importance to Victoria's biodiversity, relative to other locations across the state. It is represented as a score between 0 and 1 and determined from the Strategic biodiversity value map, available from *NVIM* (DELWP 2020c).

Landscape scale information – habitat for rare or threatened species

Habitat importance for rare or threatened species is a measure of the importance of a location in the landscape as habitat for a particular rare or threatened species, in relation to other habitat available for that species. It is represented as a score between 0 and 1 and is determined from the Habitat importance maps, administered by DELWP.

This includes two groups of habitat:

- **Highly localised habitats** – Limited in area and considered to be equally important, therefore having the same habitat importance score.
- **Dispersed habitats** – Less limited in are and based on habitat distribution models.

Habitat for rare or threatened species is used to determine the type of offset required in the detailed assessment pathway.

Biodiversity value

A combination of site-based and landscape scale information is used to calculate the biodiversity value of native vegetation to be removed. Biodiversity value is represented by a general or species habitat score, detailed as follows.

Firstly, the extent and condition of native vegetation to be removed are combined to determine the habitat hectares as follows:

Habitat hectares = extent of native vegetation x condition score

Secondly, the habitat hectare score is combined with a landscape factor to obtain an overall measure of biodiversity value. Two landscape factors exist as follows:

- **General landscape factor** – determined using an adjusted strategic biodiversity score, and relevant when no habitat importance scores are applicable;
- **Species landscape factor** – determined using an adjusted habitat importance score for each rare or threatened species habitat mapped at a site in the Habitat importance map.

These factors are then used as follows to determine the biodiversity value of a site:

General habitat score = habitat hectares x general landscape factor

Species habitat score = habitat hectares x species landscape factor

Offset requirements

A native vegetation offset is required for the approved removal of native vegetation. Offsets conform to one of two types and each type incorporates a multiplier to address the risk of offset:

- A **general offset** is required when the removal of native vegetation does not have a significant impact on any habitat for rare or threatened species (i.e. the proportional impact is below the species offset threshold). In this case a multiplier of 1.5 applies to determine the general offset amount.

General offset (amount of general habitat units) = general habitat score x 1.5

- A **species offset** is required when the removal of native vegetation has a significant impact on habitat for a rare or threatened species (i.e. the proportional impact is above the species offset threshold). In this case a multiplier of 2 applies to determine the species offset amount.

Species offset (amount of species habitat units) = Species habitat score x 2

Note: if native vegetation does not meet the definition of either a patch or scattered tree an offset is not required.

Offset attributes

Offsets must meet the following attribute requirements, as relevant:

- General offsets

- **Offset amount** – general offset = general habitat score x 1.5
- **Strategic biodiversity value (SBV)** – the offset has at least 80% of the SBV of the native vegetation removed
- **Vicinity** – the offset is in the same CMA boundary or municipal district as the native vegetation removed
- Habitat for rare and threatened species – N/A
- **Large trees** – the offset include the protection of at least one large tree for every large tree to be removed

- Species offsets
  - **Offset amount** – species offset = species habitat score x 2
  - Strategic biodiversity value (SBV): N/A
  - Vicinity: N/A
  - **Habitat for rare and threatened species** – the offset comprises mapped habitat according to the Habitat importance map for the relevant species
  - **Large trees** – the offset include the protection of at least one large tree for every large tree to be removed

Appendix 2: Detailed habitat hectare assessment results

Habitat Zone			A	B	C	D	E	F	G	H	I	J
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number			132_61	132_61	132_61	132_61	132_61	132_61	821	132_61	132_61	821
Total area of Habitat Zone (ha)			0.586	0.123	0.053	0.261	0.074	0.099	0.046	0.386	0.061	0.061
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Lack of Weeds	/15	7	7	4	7	7	7	11	4	4	7
	Understorey	/25	10	5	5	5	5	5	5	5	5	15
	Recruitment	/10	3	0	0	3	3	3	0	3	0	0
	Organic Matter	/5	5	5	4	5	5	5	5	5	2	5
	Logs	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36
	Site Condition subtotal		*34*	*23*	*18*	*27*	*27*	*27*	*29*	*23*	*15*	*37*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1	1	1
	Neighbourhood	/10	1	0	0	0	0	0	0	0	0	0
	Distance to Core	/5	3	3	3	3	3	3	3	3	3	3
Total Condition Score		**/100**	**39**	**27**	**22**	**31**	**31**	**31**	**33**	**27**	**19**	**41**

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004).

Habitat Zone			K	L	M	N	O	P	Q	R	S	T
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number			895	55_61	125	895	895	55_61	895	895	895	132_61
Total area of Habitat Zone (ha)			0.091	0.381	0.058	0.005	0.162	1.021	0.022	0.146	0.656	0.460
Site Condition	Large Old Trees	/10	N/A	0	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	2	0	N/A	0	0	0	0	0	5	N/A
	Lack of Weeds	/15	4	7	4	4	0	7	0	0	7	4
	Understorey	/25	5	5	10	5	5	5	5	5	5	5
	Recruitment	/10	5	5	3	3	5	5	5	5	5	0
	Organic Matter	/5	4	3	5	2	4	3	4	2	5	5
	Logs	/5	0	0	N/A	0	0	0	0	0	3	N/A
	Site condition standardising multiplier*		1.15	1.00	1.36	1.15	1.15	1.00	1.15	1.15	1.15	1.36
	Site Condition subtotal		*23*	*20*	*30*	*16*	*16*	*20*	*16*	*14*	*35*	*19*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1	8	8
	Neighbourhood	/10	0	0	0	0	0	1	0	0	1	1
	Distance to Core	/5	3	3	3	3	3	3	3	3	4	4
Total Condition Score		**/100**	**27**	**24**	**34**	**20**	**20**	**25**	**20**	**18**	**48**	**32**

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004).

Habitat Zone			U	V	W	X	Y	Z	AA	AB
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number			132_61	55_61	125	895	895	895	641	125
Total area of Habitat Zone (ha)			0.265	0.041	0.016	0.027	0.371	0.005	1.400	0.106
Site Condition	Large Old Trees	/10	N/A	0	N/A	N/A	Not assessed - no impacts	Not assessed - no impacts	Not assessed - no impacts	N/A
	Tree Canopy Cover	/5	N/A	3	N/A	0				N/A
	Lack of Weeds	/15	4	0	4	4				4
	Understorey	/25	5	5	10	5				5
	Recruitment	/10	0	5	3	3				3
	Organic Matter	/5	5	3	5	2				5
	Logs	/5	N/A	0	N/A	0				N/A
	Site condition standardising multiplier*		1.36	1.00	1.36	1.15				1.36
	Site Condition subtotal		*19*	*16*	*30*	*16*				23
Landscape Context	Patch Size	/10	1	1	1	1				1
	Neighbourhood	/10	0	0	0	0				0
	Distance to Core	/5	3	3	3	3				3
Total Condition Score		**/100**	**23**	**20**	**34**	**20**				29

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004).

Appendix 3: Flora species recorded in the study area and listed threatened species known to occur in the search region

Origin	Common name	Scientific name	EPBC	FFG-T	CaLP Act	Recorded
#	Sticky Wattle	*Acacia howittii*				
	Lightwood	*Acacia implexa*				X
	Hedge Wattle	*Acacia paradoxa*				X
	Bacchus Marsh Wattle	*Acacia rostriformis*		L		
	Sheep's Burr	*Acaena spp.*				X
	River Swamp Wallaby-grass	*Amphibromus fluitans*	VU			
	Plump Swamp Wallaby-grass	*Amphibromus pithogastrus*		L		
	Elongate Woodruff	*Asperula charophyton*				
	Woodruff	*Asperula spp.*				X
	Kneed Spear-grass	*Austrostipa bigeniculata*				X
	Velvet Apple-berry	*Billardiera scandens s.s.*				
	Tall Club-sedge	*Bolboschoenus fluviatilis*				
*	Large Quaking-grass	*Briza maxima*				X
	Sweet Bursaria	*Bursaria spinosa*				X
	Charming Spider-orchid	*Caladenia amoena*	EN	L		
	Winged Water-starwort	*Callitriche umbonata*				
	Milky Beauty-heads	*Calocephalus lacteus*				X
	Slender Bitter-cress	*Cardamine tenuifolia*				
	Green-top Sedge	*Carex chlorantha*				
	Curly Sedge	*Carex tasmanica*		L		
*	Kikuyu	*Cenchrus clandestinus*				X
	Leafy Twig-sedge	*Cladium procerum*				
	Small Milkwort	*Comesperma polygaloides*		L		
	Slender Bindweed	*Convolvulus angustissimus subsp. omnigracilis*				X
	Pale Swamp Everlasting	*Coronidium gunnianum*				
#	Spotted Gum	*Corymbia maculata*				
*	Hawthorn	*Crataegus monogyna subsp. monogyna*				X
	Tough Scurf-pea	*Cullen tenax*		L		
*	Artichoke Thistle	*Cynara cardunculus* subsp. *flavescens*			C	X
*	Couch	*Cynodon dactylon var. dactylon*				X
*	Rough Dog's-tail	*Cynosaurus echinatus*				X
*	Cocksfoot	*Dactylis glomerata*				X

Origin	Common name	Scientific name	EPBC	FFG-T	CaLP Act	Recorded
	Slender Tick-trefoil	*Desmodium varians*				
	Black-anther Flax-lily	*Dianella admixta*				X
	Matted Flax-lily	*Dianella amoena*	EN	L		
#	Swamp Flax-lily	*Dianella callicarpa*				
	Flax-lily	*Dianella longifolia var. grandis*				
	Kidney-weed	*Dichondra repens*				X
	Small Golden Moths	*Diuris basaltica*	EN	L		
	Purple Diuris	*Diuris punctata*		L		
#	Trailing Hop-bush	*Dodonaea procumbens*	VU			
	Common Spike-sedge	*Eleocharis acuta*				X
	Pale Spike-sedge	*Eleocharis pallens*				
	Rough-grain Love-grass	*Eragrostis trachycarpa*				
	River Red Gum	*Eucalyptus camaldulensis var. camaldulensis*				X
*	Sugar Gum	*Eucalyptus cladocalyx*				X
#	Southern Blue-gum	*Eucalyptus globulus subsp. globulus*				
	Melbourne Yellow-gum	*Eucalyptus leucoxylon subsp. connata*				
#	Large-fruit Yellow-gum	*Eucalyptus leucoxylon subsp. megalocarpa*		L		
	Mugga	*Eucalyptus sideroxylon subsp. sideroxylon*				
	Studley Park Gum	*Eucalyptus X studleyensis*				
	Yarra Gum	*Eucalyptus yarraensis*				
	Blue Devil	*Eryngium ovinum*				X
*	Montpellier Broom	*Genista monspessulana*			C	X
	Austral Crane's-bill	*Geranium solanderi var. solanderi s.s.*				
	Large-flower Crane's-bill	*Geranium sp. 1*		L		
	Pale-flower Crane's-bill	*Geranium sp. 3*				
	Clover Glycine	*Glycine latrobeana*	VU	L		
	Raspwort	*Gonocarpus spp.*				X
	Western Golden-tip	*Goodia medicaginea*				
#	Rosemary Grevillea	*Grevillea rosmarinifolia*				
*	Spiny Rush	*Juncus acutus* subsp. *acutus*			C	X
	Rush	*Juncus sp.*				X
	Yarra Burgan	*Kunzea leptospermoides*				
	Adamson's Blown-grass	*Lachnagrostis adamsonii*	EN	L		
	Common Blown-grass	*Lachnagrostis filiformis*				X

Origin	Common name	Scientific name	EPBC	FFG-T	CaLP Act	Recorded
	Purple Blown-grass	*Lachnagrostis punicea subsp. punicea*				
	Truncate Leionema	*Leionema bilobum subsp. bilobum*				
*	Common Peppercress	*Lepidium africanum*				X
	Basalt Peppercress	*Lepidium hyssopifolium s.s.*	EN	L		
	Variable Sword-sedge	*Lepidosperma laterale*				X
	White Sunray	*Leucochrysum albicans subsp. tricolor*	EN	L		
	Yellow Sea-lavender	*Limonium australe var. australe*				
	Oval Wedge-fern	*Lindsaea trichomanoides*		L		
	Wattle Mat-rush	*Lomandra filiformis*				X
*	African Box-thorn	*Lycium ferocissimum*			C	X
	Small Loosestrife	*Lythrum hyssopifolia*				X
#	Giant Honey-myrtle	*Melaleuca armillaris subsp. armillaris*				
	Tree Violet	*Melicytus dentatus s.l.*				X
	Weeping Grass	*Microlaena stipoides var. stipoides*				
	Plains Yam-daisy	*Microseris scapigera s.s.*				
*	Lobed Needle-grass	*Nassella charruana*			S	X
*	Chilean Needle-grass	*Nassella neesiana*			R	X
*	Serrated Tussock	*Nasella trichotoma*			C	X
	Austral Tobacco	*Nicotiana suaveolens*				
*	Common Prickly-pear	*Opuntia stricta*			C	X
	Grassland Wood-sorrel	*Oxalis perennans*				X
*	Yellow Watercrown Grass	*Paspalidium flavidum*				
*	Paspalum	*Paspalum dilatatum*				X
	Yellow Star	*Pauridia vaginata var. brevistigmata*				
	Inland Sickle-fern	*Pellaea calidirupium*				
	Slender Knotweed	*Persicaria decipiens*				X
*	Toowoomba Canary-grass	*Phalaris aquatica*				X
	Common Reed	*Phragmites australis*				X
	Plains Picris	*Picris barbarorum*				
	Spiny Rice-flower	*Pimelea spinescens subsp. spinescens*	CR	L		
*	Ribwort	*Plantago lanceolata*				X
	Glandular Blanket-fern	*Pleurosorus subglandulosus*				
	Basalt Tussock-grass	*Poa labillardierei var (Volcanic Plains)*				
	Basalt Podolepis	*Podolepis linearifolia*				

Origin	Common name	Scientific name	EPBC	FFG-T	CaLP Act	Recorded
*	Annual Beard-grass	*Polypogon monspeliensis*				X
	Common Purslane	*Portulaca oleracea*				X
	Maroon Leek-orchid	*Prasophyllum frenchii*	EN	L		
#	Snowy Mint-bush	*Prostanthera nivea var. nivea*				
	Leafy Greenhood	*Pterostylis cucullata*	VU	L		
	Leafy Greenhood	*Pterostylis cucullata subsp. cucullata*		L		
	Brackish Plains Buttercup	*Ranunculus diminutus*				
#	Fragrant Saltbush	*Rhagodia parabolica*				
*	Sweet Briar	*Rosa rubiginosa*			C	X
*	Blackberry	*Rubus fruticosus spp. agg.*			C	X
*	Curled Dock	*Rumex crispus*				X
	Button Wrinklewort	*Rutidosis leptorhynchoides*	EN	L		
	Porphyry Wallaby-grass	*Rytidosperma aff. caespitosum (South-west swamps)*				
	Wallaby Grass	*Rytidosperma spp.*				X
	Black Roly-poly	*Sclerolaena muricata var. muricata*				
	Annual Fireweed	*Senecio glomeratus subsp. longifructus*				
	Large-headed Fireweed	*Senecio macrocarpus*	VU	L		
	Swamp Fireweed	*Senecio psilocarpus*	VU			
*	Rat-tail Grass	*Sporobolus africanus*				X
	Spiral Sun-orchid	*Thelymitra matthewsii*	VU	L		
	Kangaroo Grass	*Themeda triandra*				X
	Rye Beetle-grass	*Tripogonella loliiformis*				
	Bulrush	*Typha spp.*				X
*	Gorse	*Ulex europaeus*			C	X
#	Floating Bladderwort	*Utricularia gibba*				
	Tufted Bluebell	*Wahlenbergia communis*				X
	Swamp Everlasting	*Xerochrysum palustre*	VU	L		

Notes: EPBC = threatened species status under the EPBC Act (CR = critically endangered; EN = endangered; VU = vulnerable); **FFG-T** = listed as threatened (L) under the FFG Act; **CaLP Act**: declared noxious weeds under the CaLP Act (S = State Prohibited Weeds [any infestations are to be reported to DELWP. DELWP is responsible for control of State Prohibited Weeds]; P = Regionally Prohibited Weeds [Land owners must take all reasonable steps to eradicate regionally prohibited weeds on their land]; C = Regionally Controlled Weeds [Land owners have the responsibility to take all reasonable steps to prevent the growth and spread of Regionally controlled weeds on their land]; R = Restricted Weeds [Trade in these weeds and their propagules, either as plants, seeds or contaminants in other materials is prohibited].

* = introduced to Victoria

= Victorian native taxa occurring outside their natural range

Appendix 4: Fauna species recorded in the study area and listed threatened species known to occur in the search region

Origin	Common name	Scientific name	EPBC-T	EPBC-M	FFG-T	Recorded
	Amethyst Hairstreak Butterfly	*Jalmenus icilius*			L	
	Australasian Bittern	*Botaurus poiciloptilus*	EN		L	
	Australasian Shoveler	*Spatula rhynchotis*				
	Australian Little Bittern	*Ixobrychus dubius*			L	
	Australian Magpie	*Cracticus tibicen*				X
	Azure Kingfisher	*Alcedo azurea*				
	Baillon's Crake	*Porzana pusilla*			L	
	Barking Owl	*Ninox connivens*			L	
	Bearded Dragon	*Pogona barbata*				
	Black Falcon	*Falco subniger*			L	
	Black-eared Cuckoo	*Chrysococcyx osculans*				
	Black-faced Cuckoo-shrike	*Coracina novaehollandiae*				X
	Blue-billed Duck	*Oxyura australis*			L	
	Brolga	*Grus rubicunda*			L	
	Brown Falcon	*Falco berigora*				X
	Brown Toadlet	*Pseudophryne bibronii*			L	
	Brown Treecreeper	*Climacteris picumnus*				
	Brush-tailed Phascogale	*Phascogale tapoatafa*			L	
	Bush Stone-curlew	*Burhinus grallarius*			L	
	Caspian Tern	*Hydroprogne caspia*		M (JAMBA)	L	
	Common Bent-wing Bat (eastern ssp.)	*Miniopterus schreibersii oceanensis*			L	
*	Common Blackbird	*Turdus merula*				X
	Common Dunnart	*Sminthopsis murina murina*				
	Common Froglet	*Crinia signifera*				X

Origin	Common name	Scientific name	EPBC-T	EPBC-M	FFG-T	Recorded
	Common Greenshank	*Tringa nebularia*		M (Bonn A2H, ROKAMBA, JAMBA, CAMBA)		
*	Common Starling	*Sturnus vulgaris*				X
	Diamond Dove	*Geopelia cuneata*			L	
	Diamond Firetail	*Stagonopleura guttata*			L	
	Double-banded Plover	*Charadrius bicinctus*		M (Bonn A2H)		
	Eastern Barred Bandicoot	*Perameles gunnii*	VU		L	
	Eastern Grey Kangaroo	*Macropus giganteus*				X
	Eastern Quoll	*Dasyurus viverrinus*	EN		L	
	Eltham Copper Butterfly	*Paralucia pyrodiscus lucida*	EN		L	
	Emu	*Dromaius novaehollandiae*				
*	Eurasian Skylark	*Alauda arvensis*				X
*	European Goldfinch	*Carduelis carduelis*				X
*	European Greenfinch	*Chloris chloris*				X
*	European Rabbit	*Oryctolagus cuniculus*				X
	Fat-tailed Dunnart	*Sminthopsis crassicaudata*				
	Fork-tailed Swift	*Apus pacificus*		M (CAMBA, ROKAMBA, JAMBA)		
	Freckled Duck	*Stictonetta naevosa*			L	
	Glossy Ibis	*Plegadis falcinellus*		M (Bonn A2S)		
	Golden Sun Moth	*Synemon plana*	CR		L	
	Golden-headed Cisticola	*Cisticola exilis*				X
	Grassland Earless Dragon	*Tympanocryptis pinguicolla*	EN		L	
	Great Egret	*Ardea alba*			L	
	Grey Goshawk	*Accipiter novaehollandiae*			L	

Origin	Common name	Scientific name	EPBC-T	EPBC-M	FFG-T	Recorded
	Grey-crowned Babbler	*Pomatostomus temporalis*			L	
	Grey-headed Flying-fox	*Pteropus poliocephalus*	VU		L	
	Growling Grass Frog	*Litoria raniformis*	VU		L	
	Hardhead	*Aythya australis*				
	Hooded Robin	*Melanodryas cucullata*			L	
*	House Sparrow	*Passer domesticus*				X
	King Quail	*Synoicus chinensis*			L	
	Lace Monitor	*Varanus varius*				
	Latham's Snipe	*Gallinago hardwickii*		M (Bonn A2H, ROKAMBA, JAMBA, CAMBA)		
	Lewin's Rail	*Lewinia pectoralis*			L	
	Little Button-quail	*Turnix velox*				
	Little Egret	*Egretta garzetta*			L	
	Little Raven	*Corvus mellori*				X
	Little Whip Snake	*Parasuta flagellum*				X
	Magpie Goose	*Anseranas semipalmata*			L	
	Masked Owl	*Tyto novaehollandiae*			L	
	Mistletoebird	*Dicaeum hirundinaceum*				X
	Musk Duck	*Biziura lobata*				
	Nankeen Night Heron	*Nycticorax caledonicus*				
	New Holland Honeyeater	*Phylidonyris novaehollandiae*				X
	Pacific Gull	*Larus pacificus*				
	Painted Honeyeater	*Grantiella picta*	VU		L	
	Peregrine Falcon	*Falco peregrinus*				X
	Pied Cormorant	*Phalacrocorax varius*				

Origin	Common name	Scientific name	EPBC-T	EPBC-M	FFG-T	Recorded
	Plains-wanderer	*Pedionomus torquatus*	CR		L	
	Plumed Egret	*Ardea plumifera*			L	
	Powerful Owl	*Ninox strenua*			L	
	Rainbow Lorikeet	*Trichoglossus haematodus*				X
*	Red Fox	*Vulpes vulpes*				X
	Red Wattlebird	*Anthochaera carunculata*				X
	Red-browed Finch	*Neochmia temporalis*				X
	Red-chested Button-quail	*Turnix pyrrhothorax*			L	
	Red-rumped Parrot	*Psephotus haematonotus*				X
	Regent Honeyeater	*Anthochaera phrygia*	CR		L	
*	Rock Dove	*Columba livia*				X
	Royal Spoonbill	*Platalea regia*				
	Rufous Fantail	*Rhipidura rufifrons*		M (Bonn A2H)		
	Satin Flycatcher	*Myiagra cyanoleuca*		M (Bonn A2H)		
	Sharp-tailed Sandpiper	*Calidris acuminata*		M (Bonn A2H, ROKAMBA, JAMBA, CAMBA)		
	Short-tailed Shearwater	*Puffinus tenuirostris*		M (JAMBA, CAMBA)		
	Silvereye	*Zosterops lateralis*				X
	Southern Brown Tree Frog	*Litoria ewingii*				X
	Southern Toadlet	*Pseudophryne semimarmorata*				
	Speckled Warbler	*Pyrrholaemus sagittatus*			L	
	Spiny-cheeked Honeyeater	*Acanthagenys rufogularis*				X
	Spot-tailed Quoll	*Dasyurus maculatus maculatus*	EN		L	
*	Spotted Dove	*Streptopelia chinensis*				X
	Spotted Grass Frog	*Limnodynastes tasmaniensis*				X

Origin	Common name	Scientific name	EPBC-T	EPBC-M	FFG-T	Recorded
	Spotted Harrier	*Circus assimilis*				
	Spotted Pardalote	*Pardalotus punctatus*				X
	Striped Legless Lizard	*Delma impar*	VU		L	
	Superb Fairy-wren	*Malurus cyaneus*				X
	Superb Parrot	*Polytelis swainsonii*	VU		L	
	Swamp Wallaby	*Wallabia bicolor*				X
	Swift Parrot	*Lathamus discolor*	CR		L	
	Turquoise Parrot	*Neophema pulchella*			L	
	Tussock Skink	*Pseudemoia pagenstecheri*				
	Whiskered Tern	*Chlidonias hybridus*				
	White-bellied Sea-Eagle	*Haliaeetus leucogaster*			L	
	White-browed Scrubwren	*Sericornis frontalis*				X
	White-plumed Honeyeater	*Ptilotula penicillatus*				X
	White-throated Needletail	*Hirundapus caudacutus*	VU	M (CAMBA, ROKAMBA, JAMBA)		
	White-winged Black Tern	*Chlidonias leucopterus*		M (ROKAMBA)		
	Willie Wagtail	*Rhipidura leucophrys*				X
	Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*				X

Notes: EPBC-T = threatened species status under EPBC Act (EX = presumed extinct in the wild; CE = critically endangered; EN = endangered; VU = vulnerable); **EPBC-M**: migratory status under the EPBC Act (M = listed migratory taxa; Bonn Convention (A2H) - Convention on the Conservation of Migratory Species of Wild Animals – listed as a member of a family; Bonn Convention (A2S) - Convention on the Conservation of Migratory Species of Wild Animals - species listed explicitly; CAMBA - China- Australia Migratory Birds Agreement; JAMBA - Japan-Australia Migratory Birds Agreement; ROKAMBA - Republic of Korea Australia Migratory Birds Agreement); **FFG:** L = listed as threatened under the FFG Act.

* = introduced to Victoria # = Victorian native taxa occurring outside their natural range

Appendix 5: Photographs of native vegetation proposed for removal

All photographs were taken on 8th August 2022

Photo 1: Habitat Zone A

Photo 2: Habitat Zone B

Photo 3: Habitat Zone C

Photo 4: Habitat Zone D

Photo 5: Habitat Zone E

Photo 6: Habitat Zone F

Photo 7: Habitat Zone G

Photo 8: Habitat Zone H

Photo 9: Habitat Zone I

Photo 10: Habitat Zone J

Photo 11: Habitat Zone K

Photo 12: Habitat Zone L

Photo 13: Habitat Zone M

Photo 14: Habitat Zones N & X (typical of both zones)

Photo 15: Habitat Zones O & Q (typical of both zones)

Photo 16: Habitat Zone P

Photo 17: Habitat Zone R

Photo 18: Habitat Zone S

Photo 19: Habitat Zones T & U (typical of both zones)

Photo 20: Habitat Zone V

Photo 21: Habitat Zone AB

Appendix 6: EVC Benchmarks

EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 55_61: Plains Grassy Woodland

Description:
An open, eucalypt woodland to 15 m tall. Occupies poorly drained, fertile soils on flat or gently undulating plains at low elevations. The understorey consists of a few sparse shrubs over a species-rich grassy and herbaceous ground layer. This variant occupies areas receiving approximately 500 – 700 mm annual rainfall.

Large trees:

Species	DBH(cm)	#/ha
Eucalyptus spp.	80 cm	8 / ha

Tree Canopy Cover:

%cover	Character Species	Common Name
10%	*Eucalyptus camaldulensis*	River Red Gum

Understorey:

Life form	#Spp	%Cover	LF code
Immature Canopy Tree		5%	IT
Understorey Tree or Large Shrub	1	5%	T
Medium Shrub	3	10%	MS
Small Shrub	2	1%	SS
Prostrate Shrub	1	1%	PS
Large Herb	3	5%	LH
Medium Herb	8	15%	MH
Small or Prostrate Herb	3	5%	SH
Large Tufted Graminoid	2	5%	LTG
Medium to Small Tufted Graminoid	12	45%	MTG
Medium to Tiny Non-tufted Graminoid	2	5%	MNG
Bryophytes/Lichens	na	10%	BL
Soil Crust	na	10%	S/C

LF Code	Species typical of at least part of EVC range	Common Name
MS	*Acacia pycnantha*	Golden Wattle
MS	*Acacia paradoxa*	Hedge Wattle
SS	*Pimelea humilis*	Common Rice-flower
PS	*Astroloma humifusum*	Cranberry Heath
PS	*Bossiaea prostrata*	Creeping Bossiaea
MH	*Oxalis perennans*	Grassland Wood-sorrel
MH	*Gonocarpus tetragynus*	Common Raspwort
MH	*Acaena echinata*	Sheep's Burr
SH	*Dichondra repens*	Kidney-weed
SH	*Hydrocotyle laxiflora*	Stinking Pennywort
LTG	*Austrostipa mollis*	Supple Spear-grass
LTG	*Austrostipa bigeniculata*	Kneed Spear-grass
MTG	*Themeda triandra*	Kangaroo Grass
MTG	*Elymus scaber* var. *scaber*	Common Wheat-grass
MTG	*Austrodanthonia setacea*	Bristly Wallaby-grass
MTG	*Austrodanthonia racemosa* var. *racemosa*	Stiped Wallaby-grass
MNG	*Microlaena stipoides* var. *stipoides*	Weeping Grass

Recruitment:
Continuous

Organic Litter:
10 % cover

Logs:
10 m/0.1 ha.

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
MS	*Lycium ferocissimum*	African Box-thorn	high	high
LH	*Cirsium vulgare*	Spear Thistle	high	high
LH	*Sonchus oleraceus*	Common Sow-thistle	high	low
LH	*Plantago lanceolata*	Ribwort	high	low
MH	*Hypochoeris radicata*	Cat's Ear	high	low
LNG	*Holcus lanatus*	Yorkshire Fog	high	high
MTG	*Vulpia bromoides*	Squirrel-tail Fescue	high	low
MTG	*Romulea rosea*	Onion Grass	high	low
MTG	*Briza minor*	Lesser Quaking-grass	high	low
MTG	*Briza maxima*	Large Quaking-grass	high	low

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EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 125: Plains Grassy Wetland

Description:
This EVC is usually treeless, but in some instances can include sparse River Red Gum *Eucalyptus camaldulensis* or Swamp Gum *Eucalyptus ovata*. A sparse shrub component may also be present. The characteristic ground cover is dominated by grasses and small sedges and herbs. The vegetation is typically species-rich on the outer verges but is usually species-poor in the wetter central areas.

Life Forms:

Life form	#Spp	%Cover	LF code
Large Herb	5	5%	LH
Medium Herb	6	10%	MH
Small or Prostrate Herb	3	10%	SH
Large Tufted Graminoid	3	15%	LTG
Large Non-tufted Graminoid	1	5%	LNG
Medium to Small Tufted Graminoid	8	30%	MTG
Medium to Tiny Non-tufted Graminoid	2	10%	MNG
Bryophytes/Lichens	na	10%	BL

LF Code	Species typical of at least part of EVC range	Common Name
LH	*Epilobium billardierianum*	Variable Willow-herb
LH	*Villarsia reniformis*	Running Marsh-flower
LH	*Epilobium billardierianum ssp. cinereum*	Grey Willow-herb
MH	*Potamogeton tricarinatus s.l.*	Floating Pondweed
MH	*Lilaeopsis polyantha*	Australian Lilaeopsis
MH	*Utricularia dichotoma s.l.*	Fairies' Aprons
SH	*Eryngium vesiculosum*	Prickfoot
SH	*Neopaxia australasica*	White Purslane
SH	*Lobelia pratioides*	Poison Lobelia
LTG	*Juncus flavidus*	Gold Rush
LTG	*Deyeuxia quadriseta*	Reed Bent-grass
LTG	*Amphibromus nervosus*	Common Swamp Wallaby-grass
LTG	*Poa labillardierei*	Common Tussock-grass
MTG	*Triglochin procerum s.l.*	Water Ribbons
MTG	*Glyceria australis*	Australian Sweet-grass
MTG	*Juncus holoschoenus*	Joint-leaf Rush
MTG	*Austrodanthonia duttoniana*	Brown-back Wallaby-grass
MNG	*Eleocharis acuta*	Common Spike-sedge
MNG	*Eleocharis pusilla*	Small Spike-sedge

Recruitment:
Episodic/Flood. Desirable period between disturbances is 5 years.

Organic Litter:
20% cover

Logs:
5 m/0.1 ha.(where trees are overhanging the wetland)

Victoria The Place To Be

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
LH	*Cirsium vulgare*	Spear Thistle	high	high
MH	*Leontodon taraxacoides ssp. taraxacoides*	Hairy Hawkbit	high	low
MH	*Hypochoeris radicata*	Cat's Ear	high	low
LTG	*Phalaris aquatica*	Toowoomba Canary-grass	high	high
LNG	*Holcus lanatus*	Yorkshire Fog	high	high
MTG	*Briza minor*	Lesser Quaking-grass	high	low
MTG	*Romulea rosea*	Onion Grass	high	low
TTG	*Cyperus tenellus*	Tiny Flat-sedge	high	low

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Department of Sustainability and Environment

EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 132_61: *Heavier-soils* Plains Grassland

Description:
Treeless vegetation mostly less than 1 m tall dominated by largely graminoid and herb life forms. Occupies fertile cracking basalt soils prone to seasonal waterlogging in areas receiving at least 500 mm annual rainfall.

Life Forms:

Life form	#Spp	%Cover	LF code
Large Herb	2	5%	LH
Medium Herb	12	20%	MH
Small or Prostrate Herb	4	5%	SH
Large Tufted Graminoid	1	5%	LTG
Medium to Small Tufted Graminoid	13	40%	MTG
Medium to Tiny Non-tufted Graminoid	4	5%	MNG
Bryophytes/Lichens and Soil Crust*	na	20%	BL

* Note: treat as one life form in this EVC

LF Code	Species typical of at least part of EVC range	Common Name
SS	*Pimelea humilis*	Common Rice-flower
LH	*Rumex dumosus*	Wiry Dock
MH	*Calocephalus citreus*	Lemon Beauty-heads
MH	*Acaena echinata*	Sheep's Burr
MH	*Leptorhynchos squamatus*	Scaly Buttons
MH	*Eryngium ovinum*	Blue Devil
SH	*Solenogyne dominii*	Smooth Solenogyne
SH	*Lobelia pratioides*	Poison Lobelia
LTG	*Austrostipa bigeniculata*	Kneed Spear-grass
LTG	*Dichelachne crinita*	Long-hair Plume-grass
MTG	*Themeda triandra*	Kangaroo Grass
MTG	*Austrodanthonia caespitosa*	Common Wallaby-grass
MTG	*Elymus scaber* var. *scaber*	Common Wheat-grass
MTG	*Schoenus apogon*	Common Bog-sedge
MNG	*Microlaena stipoides* var. *stipoides*	Weeping Grass
MNG	*Thelymitra pauciflora* s.l.	Slender Sun-orchid
MNG	*Microtis unifolia*	Common Onion-orchid
SC	*Convolvulus erubescens*	Pink Bindweed

Recruitment:
Episodic/Fire or Grazing. Desirable period between disturbances is 5 years.

Organic Litter:
10% cover

EVC 132_61: *Heavier-soils* Plains Grassland - Victorian Volcanic Plain bioregion

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
LH	*Plantago lanceolata*	Ribwort	high	low
LH	*Cirsium vulgare*	Spear Thistle	high	high
LH	*Sonchus oleraceus*	Common Sow-thistle	high	low
MH	*Hypochoeris radicata*	Cat's Ear	high	low
MH	*Leontodon taraxacoides* ssp. *taraxacoides*	Hairy Hawkbit	high	low
MH	*Trifolium subterraneum*	Subterranean Clover	high	low
MH	*Plantago coronopus*	Buck's-horn Plantain	high	low
MH	*Trifolium striatum*	Knotted Clover	high	low
MH	*Trifolium dubium*	Suckling Clover	high	low
LTG	*Phalaris aquatica*	Toowoomba Canary-grass	high	high
LNG	*Holcus lanatus*	Yorkshire Fog	high	high
MTG	*Romulea rosea*	Onion Grass	high	low
MTG	*Vulpia bromoides*	Squirrel-tail Fescue	high	low
MTG	*Briza minor*	Lesser Quaking-grass	high	low
MTG	*Bromus hordeaceus* ssp. *hordeaceus*	Soft Brome	high	low
MTG	*Briza maxima*	Large Quaking-grass	high	low
MTG	*Lolium rigidum*	Wimmera Rye-grass	high	low
MTG	*Lolium perenne*	Perennial Rye-grass	high	low
MTG	*Nassella neesiana*	Chilean Needle-grass	high	high
MNG	*Cynosurus echinatus*	Rough Dog's-tail	high	low
MNG	*Juncus capitatus*	Capitate Rush	high	low

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EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 641: Riparian Woodland

Description:
Occurs beside permanent streams, typically on narrow alluvial deposits. Woodland to 15 m tall generally dominated by *Eucalyptus camaldulensis* over a tussock grass-dominated understorey. Tall shrubs may be present and amphibious herbs may occur in occasional ponds and beside creeks. While flooding may be common, sites are rarely inundated for lengthy periods.

Large trees:

Species	DBH(cm)	# / ha
Eucalyptus spp.	80 cm	15 / ha

Tree Canopy Cover:

%cover	Character Species	Common Name
20%	*Eucalyptus camaldulensis*	River Red-gum

Understorey:

Life form	#Spp	%Cover	LF code
Immature Canopy Tree		5%	IT
Understorey Tree or Large Shrub	2	10%	T
Medium Shrub	2	10%	MS
Small Shrub	1	5%	SS
Large Herb	4	15%	LH
Medium Herb	5	10%	MH
Small or Prostrate Herb	1	5%	SH
Large Tufted Graminoid	3	10%	LTG
Large Non-tufted Graminoid	1	5%	LNG
Medium to Small Tufted Graminoid	4	20%	MTG
Medium to Tiny Non-tufted Graminoid	2	5%	MNG
Scrambler or Climber	1	5%	SC
Bryophytes/Lichens	na	10%	BL

LF Code	Species typical of at least part of EVC range	Common Name
T	*Acacia melanoxylon*	Blackwood
MS	*Bursaria spinosa* ssp. *spinosa*	Sweet Bursaria
MS	*Viminaria juncea*	Golden Spray
SS	*Rubus parvifolius*	Small-leaf Bramble
LH	*Wahlenbergia gracilis* s.s.	Sprawling Bluebell
LH	*Senecio quadridentatus*	Cottony Fireweed
LH	*Myriophyllum crispatum*	Upright Water-milfoil
MH	*Rumex brownii*	Slender Dock
MH	*Oxalis perennans*	Grassland Wood-sorrel
MH	*Mentha australis*	River Mint
MH	*Acaena novae-zelandiae*	Bidgee-widgee
SH	*Dichondra repens*	Kidneyweed
LTG	*Poa labillardierei*	Common Tussock-grass
LTG	*Carex appressa*	Tall Sedge
LNG	*Phragmites australis*	Common Reed
MTG	*Lachnagrostis filiformis* var. *filiformis*	Common Blown-grass
MTG	*Triglochin procerum* s.l.	Water-ribbons
MNG	*Eleocharis acuta*	Common Spike-sedge
SC	*Calystegia sepium*	Large Bindweed

Recruitment:
Continuous

Organic Litter:
30% cover

Logs:
20m / 0.1 ha

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
MS	*Rosa rubiginosa*	Sweet Briar	high	high
LH	*Sonchus oleraceus*	Common Sow-thistle	high	low
LH	*Cirsium vulgare*	Spear Thistle	high	high
LH	*Plantago lanceolata*	Ribwort	high	low
LH	*Helminthotheca echioides*	Ox-tongue	high	low
LH	*Rumex crispus*	Curled Dock	high	low
LH	*Aster subulatus*	Aster-weed	high	low
LH	*Rorippa palustris*	Marsh Yellow-cress	high	high
MH	*Leontodon taraxacoides* ssp. *taraxacoides*	Hairy Hawkbit	high	low
MH	*Hypochoeris radicata*	Cat's Ear	high	low
LTG	*Phalaris aquatica*	Toowoomba Canary-grass	high	high
LNG	*Holcus lanatus*	Yorkshire Fog	high	high
MTG	*Bromus hordeaceus* ssp. *hordeaceus*	Soft Brome	high	low
MTG	*Anthoxanthum odoratum*	Sweet Vernal-grass	high	high
MNG	*Paspalum distichum*	Water Couch	high	high
SC	*Galium aparine*	Cleavers	high	low

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EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 821: Tall Marsh

Description:
Closed to open grassland/sedgeland to 3 m tall, dominated by Common Reed and Cumbungi. Small aquatic and semi-aquatic species occur amongst the reeds. Occurs on Quaternary sedimentary geology of mainly estuarine sands, soils are peaty, silty clays, and average annual rainfall is approximately 600 mm. It requires shallow water (to 1 m deep) and low current-scour, and can only tolerate very low levels of salinity.

Life Forms:

Life form	#Spp	%Cover	LF code
Large Herb	3	10%	LH
Medium Herb	2	5%	MH
Small or Prostrate Herb	6	10%	SH
Large Tufted Graminoid	1	5%	LTG
Large Non-tufted Graminoid	2	40%	LNG
Medium to Tiny Non-tufted Graminoid	1	1%	MNG
Total understorey projective foliage cover		**70%**	

LF Code	Species typical of at least part of EVC range	Common Name
LH	*Myriophyllum verrucosum*	Red Water-milfoil
LH	*Myriophyllum salsugineum*	Lake Water-milfoil
LH	*Villarsia reniformis*	Running Marsh-flower
MH	*Rumex bidens*	Mud Dock
MH	*Lilaeopsis polyantha*	Australian Lilaeopsis
MH	*Lepilaena bilocularis*	Small-fruit Water-mat
SH	*Lemna disperma*	Common Duckweed
SH	*Azolla filiculoides*	Pacific Azolla
SH	*Wolffia australiana*	Tiny Duckweed
SH	*Mimulus repens*	Creeping Monkey-flower
LTG	*Triglochin procerum s.l.*	Water Ribbons
LTG	*Juncus ingens*	Giant Rush
LNG	*Schoenoplectus tabernaemontani*	River Club-sedge
LNG	*Phragmites australis*	Common Reed
LNG	*Typha domingensis*	Cumbungi
LNG	*Typha orientalis*	Broad-leaf Cumbungi
MNG	*Lepilaena cylindrocarpa*	Long-fruit Water-mat
MNG	*Eleocharis acuta*	Common Spike-sedge

Recruitment:
Episodic/Flood: desirable period of disturbance is every five years

Organic Litter:
10% cover

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
MH	*Cotula coronopifolia*	Water Buttons	high	high
MNG	*Paspalum distichum*	Water Couch	high	high

EVC 821: Tall Marsh - Victorian Volcanic Plain bioregion

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EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 895: Escarpment Shrubland

Description:

Occurs on rocky escarpments in steep valleys or gorges, associated with limestone or basalt. Sites have moderate to high fertility, are well-drained but subject to regular summer drought due to shallow soils. Eucalypt woodland to 15 m tall or non-eucalypt shrubland to 8 m tall, with occasional eucalypts; lichen-covered rock outcrops are common.

[+] eucalypt woodland only components (ignore when assessing shrubland areas and standardise site condition score as required)

Large trees[+]:

Species	DBH(cm)	# / ha
Eucalyptus spp.	70 cm	15 / ha

Tree Canopy Cover:

% cover	Character Species	Common Name
15%	*Acacia implexa*	Lightwood
	Allocasuarina verticillata	Drooping Sheoak
	Acacia mearnsii	Black Wattle
	Bursaria spinosa	Sweet Bursaria
	Eucalyptus viminalis ssp. viminalis	Manna Gum

Understorey:

Life form	# Spp	% Cover	LF code
Immature Canopy Tree[+]		5%	IT
Understorey Tree or Large Shrub[+]	3	10%	T
Medium Shrub	3	10%	MS
Small Shrub	2	5%	SS
Large Herb	3	5%	LH
Medium Herb	4	10%	MH
Small or Prostrate Herb	5	5%	SH
Large Tufted Graminoid	1	5%	LTG
Large Non-tufted Graminoid	1	5%	LNG
Medium to Small Tufted Graminoid	9	25%	MTG
Medium to Tiny Non-tufted Graminoid	3	5%	MNG
Ground Fern	1	5%	GF
Scrambler or Climber	1	5%	SC
Bryophytes/Lichens	na	10%	BL
Soil Crust	na	10%	S/C

LF Code		Species typical of at least part of EVC range	Common Name
MS	r	*Rhagodia parabolica*	Fragrant Saltbush
MS		*Hymenanthera dentata* s.l.	Tree Violet
SS		*Enchylaena tomentosa* var. *tomentosa*	Ruby Saltbush
LH		*Wahlenbergia communis* s.l.	Tufted Bluebell
MH		*Oxalis perennans*	Grassland Wood-sorrel
MH		*Maireana enchylaenoides*	Wingless Bluebush
MH		*Einadia nutans* ssp. *nutans*	Nodding Saltbush
SH		*Chamaesyce drummondii*	Flat Spurge
SH		*Dichondra repens*	Kidney-weed
LTG		*Austrostipa bigeniculata*	Kneed Spear-grass
MTG		*Austrodanthonia racemosa* var. *racemosa*	Stiped Wallaby-grass
MTG		*Austrodanthonia setacea*	Bristly Wallaby-grass
MNG		*Panicum effusum*	Hairy Panic
GF		*Cheilanthes distans*	Bristly Cloak-fern
SC		*Clematis microphylla*	Small-leaved Clematis
SC		*Convolvulus erubescens* spp. agg.	Pink Bindweed

Victoria The Place To Be

EVC 895: Escarpment Shrubland - Victorian Volcanic Plain bioregion

Recruitment:
Continuous

Organic Litter:
20 % cover

Logs:
15 m/0.1 ha+.
5 m/0.1 ha. (note: large log class does not apply)

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
T	*Schinus molle*	Pepper Tree	high	high
MS	*Lycium ferocissimum*	African Box-thorn	high	high
MS	*Genista monspessulana*	Montpellier Broom	high	high
SS	*Marrubium vulgare*	Horehound	high	high
LH	*Sonchus oleraceus*	Common Sow-thistle	high	low
LH	*Helminthotheca echioides*	Ox-tongue	high	high
LH	*Lactuca serriola*	Prickly Lettuce	high	low
LH	*Sisymbrium officinale*	Hedge Mustard	high	high
LH	*Sonchus asper* s.l.	Rough Sow-thistle	high	low
LH	*Verbascum thapsus* ssp. *thapsus*	Great Mullein	high	high
LH	*Echium plantagineum*	Paterson's Curse	high	high
LH	*Centaurium tenuiflorum*	Slender Centaury	high	low
LH	*Foeniculum vulgare*	Fennel	high	high
MH	*Hypochoeris radicata*	Cat's Ear	high	low
MH	*Trifolium arvense* var. *arvense*	Hare's-foot Clover	high	low
MH	*Trifolium subterraneum*	Subterranean Clover	high	low
MH	*Trifolium campestre* var. *campestre*	Hop Clover	high	low
MH	*Trifolium angustifolium* var. *angustifolium*	Narrow-leaf Clover	high	low
MH	*Lotus suaveolens*	Hairy Bird's-foot Trefoil	high	low
MH	*Cerastium glomeratum* s.l.	Common Mouse-ear Chickweed	high	low
SH	*Medicago polymorpha*	Burr Medic	high	low
SH	*Trifolium glomeratum*	Cluster Clover	high	low
SH	*Modiola caroliniana*	Red-flower Mallow	high	low
SH	*Aptenia cordifolia*	Heart-leaf Ice-plant	high	high
LTG	*Phalaris aquatica*	Toowoomba Canary-grass	high	high
LNG	*Holcus lanatus*	Yorkshire Fog	high	high
LNG	*Avena fatua*	Wild Oat	high	low
MTG	*Nassella trichotoma*	Serrated Tussock	high	high
MTG	*Ehrharta longiflora*	Annual Veldt-grass	high	low
MTG	*Briza maxima*	Large Quaking-grass	high	low
MTG	*Bromus hordeaceus* ssp. *hordeaceus*	Soft Brome	high	low
MTG	*Sporobolus africanus*	Rat-tail Grass	high	high
MTG	*Vulpia bromoides*	Squirrel-tail Fescue	high	low
MTG	*Romulea rosea*	Onion Grass	high	low
MTG	*Pentaschistis airoides* ssp. *airoides*	False Hair-grass	high	low
MTG	*Lolium perenne*	Perennial Rye-grass	high	high
MTG	*Dactylis glomerata*	Cocksfoot	high	high
MTG	*Vulpia myuros*	Rat's-tail Fescue	high	low
MTG	*Bromus rubens*	Red Brome	high	low
MTG	*Avena barbata*	Bearded Oat	high	low
MTG	*Aira caryophyllea*	Silvery Hair-grass	high	low
SC	*Vicia sativa* ssp. *sativa*	Common Vetch	high	low

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Appendix 7: Native Vegetation Removal (NVR) report

Scenario test – native vegetation removal

This report provides offset requirements for internal testing of different proposals to remove native vegetation. **This report DOES NOT support an application to remove, destroy or lop native vegetation under Clause 52.16 or 52.17 of planning schemes in Victoria.** A report must be obtained from the Department of Environment, Land, Water and Planning (DELWP).

Date of issue: **27/01/2023**
Time of issue: **10:36 am**

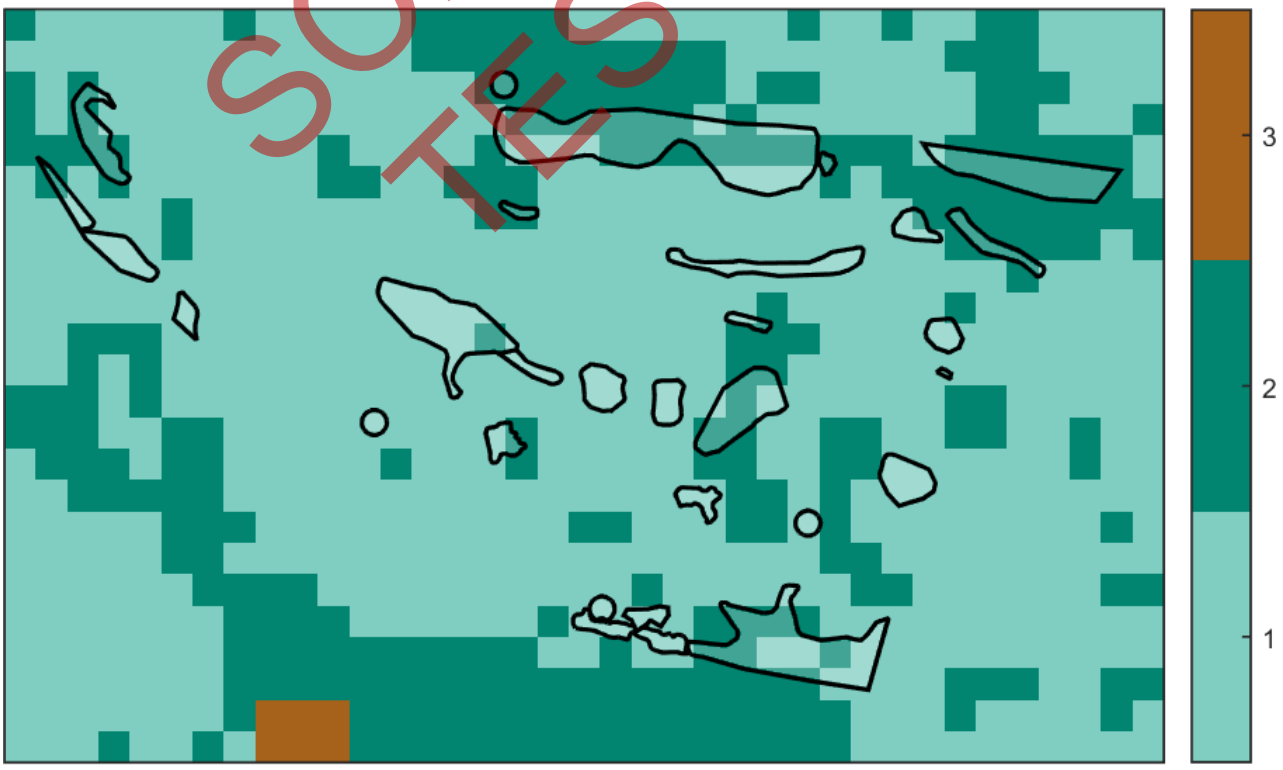
Report ID: Scenario Testing

Project ID	22076_Cooper_St_Removal_230124

Assessment pathway

Assessment pathway	**Detailed Assessment Pathway**
Extent including past and proposed	4.121 ha
Extent of past removal	0.000 ha
Extent of proposed removal	4.121 ha
No. Large trees proposed to be removed	0
Location category of proposed removal	Location 2 The native vegetation is in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map). Removal of less than 0.5 hectares of native vegetation in this location will not have a significant impact on any habitat for a rare or threatened species.

1. Location map



Scenario test – native vegetation removal

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]	1.352 general habitat units
Vicinity	Port Phillip and Westernport Catchment Management Authority (CMA) or Whittlesea City Council
Minimum strategic biodiversity value score[2]	0.449
Large trees	0 large trees

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

Appendix 1 includes information about the native vegetation to be removed

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

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

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

Scenario test – native vegetation removal

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.

This report DOES NOT support an application to remove, destroy or lop native vegetation under Clause 52.16 or 52.17 of planning schemes in Victoria.

If you wish to remove the mapped native vegetation you must submit the related shapefiles to the Department of Environment, Land, Water and Planning (DELWP) for processing, by email to ensymnvrtool.support@delwp.vic.gov.au. DELWP will provide a *Native vegetation removal report* that is required to meet the permit application requirements in accordance with *Guidelines for the removal, destruction or lopping of native vegetation* (Guidelines).

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-C	Patch	vvp_0132_61	Endangered	0	no	0.220	0.053	0.053	0.429		0.012	General
1-I	Patch	vvp_0132_61	Endangered	0	no	0.190	0.061	0.061	0.400		0.012	General
1-S	Patch	vvp_0895	Endangered	0	no	0.480	0.056	0.056	0.960		0.040	General
1-V	Patch	vvp_0055	Endangered	0	no	0.200	0.041	0.041	0.640		0.010	General
1-A	Patch	vvp_0132_61	Endangered	0	no	0.390	0.577	0.577	0.631		0.275	General
1-B	Patch	vvp_0132_61	Endangered	0	no	0.270	0.123	0.123	0.600		0.040	General
1-D	Patch	vvp_0132_61	Endangered	0	no	0.310	0.261	0.261	0.544		0.094	General
1-E	Patch	vvp_0132_61	Endangered	0	no	0.310	0.074	0.074	0.400		0.024	General
1-F	Patch	vvp_0132_61	Endangered	0	no	0.310	0.099	0.099	0.400		0.032	General
1-G	Patch	vvp_0821	Endangered	0	no	0.330	0.046	0.046	0.400		0.016	General
1-H	Patch	vvp_0132_61	Endangered	0	no	0.270	0.386	0.386	0.405		0.110	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
1-U	Patch	vvp_0132_61	Endangered	0	no	0.230	0.041	0.041	0.410		0.010	General
1-T	Patch	vvp_0132_61	Endangered	0	no	0.320	0.108	0.108	0.560		0.040	General
1-P	Patch	vvp_0055	Endangered	0	no	0.250	1.021	1.021	0.551		0.297	General
1-R	Patch	vvp_0895	Endangered	0	no	0.180	0.146	0.146	0.960		0.039	General
1-W	Patch	vvp_0125	Endangered	0	no	0.340	0.016	0.016	0.430		0.006	General
1-J	Patch	vvp_0821	Endangered	0	no	0.410	0.061	0.061	0.508		0.028	General
1-M	Patch	vvp_0125	Endangered	0	no	0.340	0.058	0.058	0.600		0.024	General
1-K	Patch	vvp_0895	Endangered	0	no	0.270	0.091	0.091	0.493		0.028	General
1-X	Patch	vvp_0895	Endangered	0	no	0.200	0.027	0.027	0.600		0.006	General
1-N	Patch	vvp_0895	Endangered	0	no	0.200	0.005	0.005	0.600		0.001	General
1-L	Patch	vvp_0055	Endangered	0	no	0.240	0.357	0.357	0.566		0.101	General
1-Q	Patch	vvp_0895	Endangered	0	no	0.200	0.022	0.022	0.620		0.005	General
1-O	Patch	vvp_0895	Endangered	0	no	0.200	0.162	0.162	0.558		0.038	General
1-AB	Patch	vvp_0125	Endangered	0	no	0.270	0.106	0.106	0.640		0.035	General
1-1	Scattered Tree	vvp_0055	Endangered	0	no	0.200	0.031	0.030	0.640		0.007	General
1-60	Scattered Tree	vvp_0055	Endangered	0	no	0.200	0.031	0.031	0.410		0.007	General
1-111	Scattered Tree	vvp_0055	Endangered	0	no	0.200	0.031	0.031	0.630		0.008	General
1-130	Scattered Tree	vvp_0055	Endangered	0	no	0.200	0.031	0.031	0.620		0.008	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
Curly Sedge	*Carex tasmanica*	500650	Vulnerable	Dispersed	Habitat importance map	0.0012
Yellow Watercrown Grass	*Paspalidium flavidum*	507820	Endangered	Dispersed	Habitat importance map	0.0004
Large-flower Crane's-bill	*Geranium sp. 1*	505342	Endangered	Dispersed	Habitat importance map	0.0004
Large-headed Fireweed	*Senecio macrocarpus*	503116	Endangered	Dispersed	Habitat importance map	0.0004
Plump Swamp Wallaby-grass	*Amphibromus pithogastrus*	503624	Endangered	Dispersed	Habitat importance map	0.0003
Brackish Plains Buttercup	*Ranunculus diminutus*	504314	Rare	Dispersed	Habitat importance map	0.0003
Plains Yam-daisy	*Microseris scapigera s.s.*	504657	Vulnerable	Dispersed	Habitat importance map	0.0002
Tough Scurf-pea	*Cullen tenax*	502776	Endangered	Dispersed	Habitat importance map	0.0002
Matted Flax-lily	*Dianella amoena*	505084	Endangered	Dispersed	Habitat importance map	0.0002
Pale-flower Crane's-bill	*Geranium sp. 3*	505344	Rare	Dispersed	Habitat importance map	0.0002
Western Golden-tip	*Goodia medicaginea*	501518	Rare	Dispersed	Habitat importance map	0.0002
Small Scurf-pea	*Cullen parvum*	502773	Endangered	Dispersed	Habitat importance map	0.0002
Purple Blown-grass	*Lachnagrostis punicea subsp. punicea*	504206	Rare	Dispersed	Habitat importance map	0.0002
Swamp Fireweed	*Senecio psilocarpus*	504659	Vulnerable	Dispersed	Habitat importance map	0.0002
Rye Beetle-grass	*Tripogon loliiformis*	503455	Rare	Dispersed	Habitat importance map	0.0002
Arching Flax-lily	*Dianella sp. aff. longifolia (Benambra)*	505560	Vulnerable	Dispersed	Habitat importance map	0.0001
Pale Swamp Everlasting	*Coronidium gunnianum*	504655	Vulnerable	Dispersed	Habitat importance map	0.0001
Rosemary Grevillea	*Grevillea rosmarinifolia subsp. rosmarinifolia*	504066	Rare	Dispersed	Habitat importance map	0.0001
Growling Grass Frog	*Litoria raniformis*	13207	Endangered	Dispersed	Habitat importance map	0.0001

Swamp Everlasting	*Xerochrysum palustre*	503763	Vulnerable	Dispersed	Habitat importance map	0.0001
Clover Glycine	*Glycine latrobeana*	501456	Vulnerable	Dispersed	Habitat importance map	0.0001
Small Milkwort	*Comesperma polygaloides*	500798	Vulnerable	Dispersed	Habitat importance map	0.0001
Floodplain Fireweed	*Senecio campylocarpus*	507136	Rare	Dispersed	Habitat importance map	0.0001
Golden Sun Moth	*Synemon plana*	15021	Critically endangered	Dispersed	Habitat importance map	0.0001
Bearded Dragon	*Pogona barbata*	12177	Vulnerable	Dispersed	Habitat importance map	0.0000
Black Falcon	*Falco subniger*	10238	Vulnerable	Dispersed	Habitat importance map	0.0000
Yarra Gum	*Eucalyptus yarraensis*	501326	Rare	Dispersed	Habitat importance map	0.0000

Habitat group

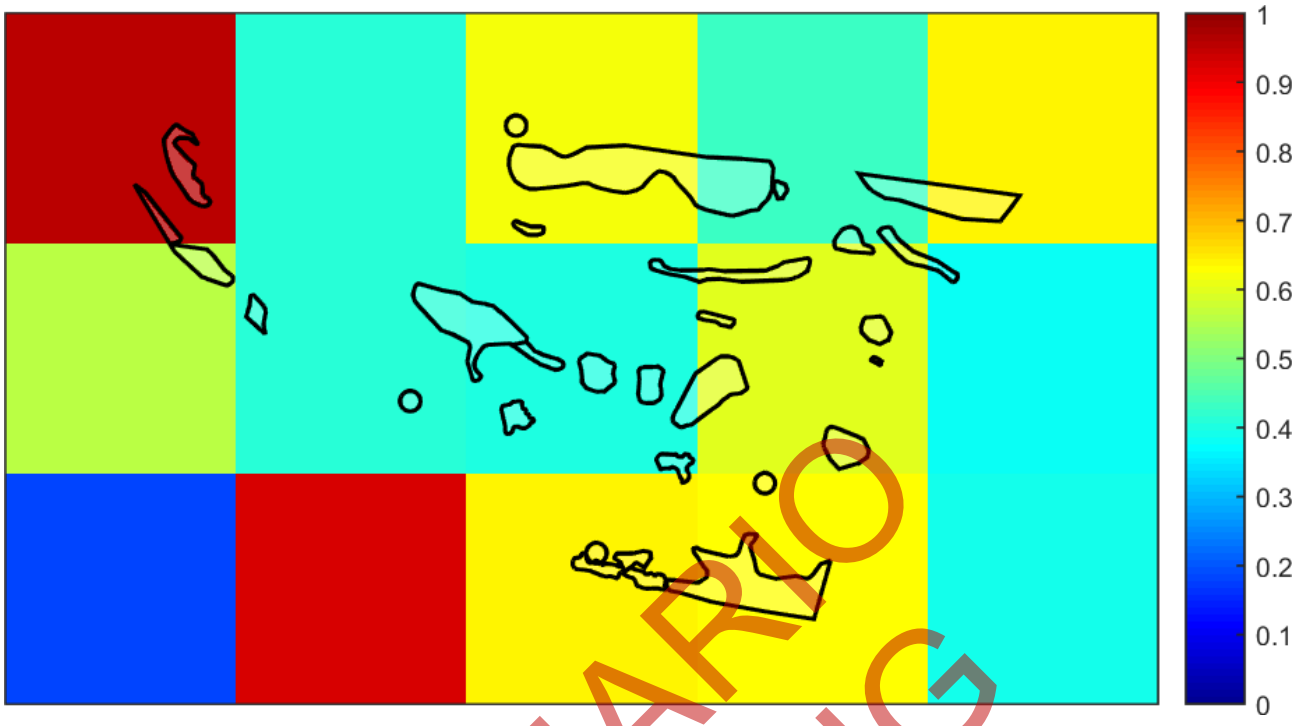
- Highly localised habitat means there is 2000 hectares or less mapped habitat for the species
- Dispersed habitat means there is more than 2000 hectares of mapped habitat for the species

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



SCENARIO TESTING

Appendix 8: Evidence that native vegetation offset requirement is available

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: 31/01/2023 01:13 **Report ID: 17525**

What was searched for?

General offset

General habitat units	Strategic biodiversity value	Large trees	Vicinity (Catchment Management Authority or Municipal district)	
1.352	0.449	0	CMA	Port Phillip and Westernport
			or LGA	Whittlesea City

Details of available native vegetation credits on 31 January 2023 01:13

These sites meet your requirements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
BBA-0277	6.426	454	Port Phillip and Westernport	Mornington Peninsula Shire	No	Yes	No	Abezco, Ethos, VegLink
BBA-0670	18.072	148	Port Phillip and Westernport	Cardinia Shire	No	Yes	No	Abezco, VegLink
BBA-0677	16.368	1491	Port Phillip and Westernport	Whittlesea City	No	Yes	No	Abezco, VegLink
BBA-0678	45.193	2622	Port Phillip and Westernport	Nillumbik Shire	No	Yes	No	VegLink
BBA-2790	2.911	116	Port Phillip and Westernport	Baw Baw Shire	Yes	Yes	No	Contact NVOR
BBA-2870	2.544	431	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	No	VegLink
BBA-2871	16.335	1668	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	No	VegLink
TFN-C1763_3	11.231	0	Port Phillip and Westernport	Mornington Peninsula Shire	Yes	Yes	No	Ecocentric
VC_CFL-3682_01	1.834	0	Port Phillip And Westernport	Nillumbik Shire	Yes	Yes	No	Abezco
VC_CFL-3710_01	7.606	322	Port Phillip And Westernport	Yarra Ranges Shire	Yes	Yes	No	VegLink
VC_CFL-3744_01	2.428	377	Port Phillip And Westernport	Macedon Ranges Shire	Yes	Yes	No	VegLink
VC_CFL-3764_01	8.011	51	Port Phillip And Westernport	Yarra Ranges 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)
VC_CFL-3746_01	4.962	563	Port Phillip And Westernport	Macedon Ranges Shire	Yes	Yes	No	VegLink

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 DELWP Customer Service Centre 136 186 or the Native Vegetation Credit Register at nativevegetation.offsetregister@delwp.vic.gov.au