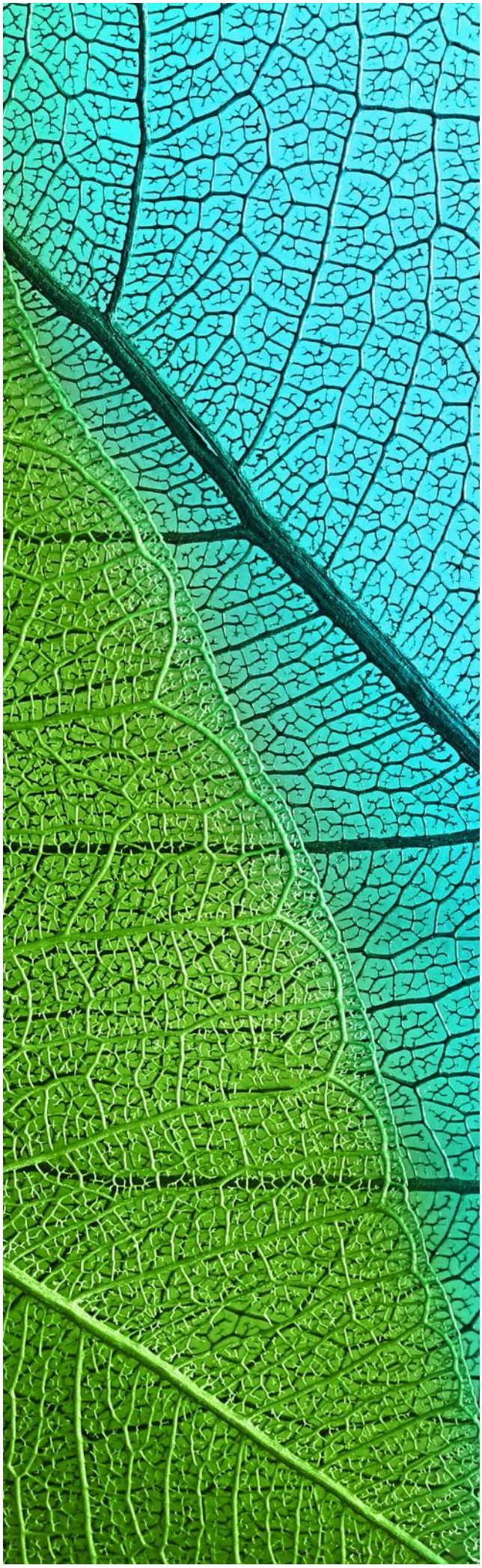

485 Cooper Street Epping — Early Works

Flora and Fauna Assessment

Prepared for
The GPT Group

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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 study area. This report has been prepared to specifically address the early works required.

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 2017), 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.

This report serves as a Native Vegetation Removal Plan and Offset Assessment of any native vegetation to 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.

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

Most 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. Two small patches of woodland occur in the 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. Native vegetation in patches totalled 6.959 hectares.

Large trees in patches were restricted to vegetation along the bank of Merri Creek. Small scattered trees were mapped throughout the site, predominately comprising River Red Gums (Arbor Survey 2022).

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

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

Impacts and implications

The proposed early works will result in the loss of a total extent of 3.983 hectares of native vegetation (including three small scattered trees) as represented in Figure 2. An additional 0.144 ha of native vegetation has already been approved for removal in relation to works for cultural heritage testing and is included in the current application as 'past removal'. The total extent of current and past removal equates to 4.127 hectares as documented in the *Native Vegetation Removal* (NVR) report scenario test (Appendix 7).

A total of 0.062 hectares of impacts to EPBC Act listed ecological communities was previously approved via an EPBC Referral variation (EPBC 2022/09440), to enable the preliminary cultural heritage assessment.

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 River Red Gums proposed for retention to be sited in public open space reserves and/or road reserves. Under this policy, it is likely that a 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 of the study area, including the early works within the ESO3 overlay;
- 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;
- Removal of native vegetation from the study area will trigger a referral to DEECA as it meets the criteria specified in Section 3.2.3, being 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.
    - 1.389 general habitat units and must include the following offset attribute requirements:

        Minimum strategic biodiversity value of 0.447

        Occur within the Port Phillip and Westernport CMA boundary or the Whittlesea City Council municipal district.

        Does not require protection of 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 early works will result in a significant impact on an EPBC Act-listed ecological community present in the study area:
  - Natural Temperate Grassland of the Victorian Volcanic Plain (EPBC: Critically endangered).

  An EPBC Act Referral has been undertaken. DCCEEW have determined it is a controlled action to be assessed via preliminary documentation.
- 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 study area. This report has been prepared to specifically address the early works required.

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 2017), 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.

This report serves as a Native Vegetation Removal Plan and Offset Assessment of any native vegetation to 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.

Specifically, the scope of the investigation included:

- Reviewing existing information on the flora, fauna and native vegetation of the study area and surrounds, including:
  - Victorian Biodiversity Atlas administered by the Department of Energy, Environment and Climate Action (DEECA);
  - The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Protected Matters Search Tool;
  - DEECA's *Native Vegetation Information Management* system (NVIM); and
  - DEECA'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 of the study area (including the early works) 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 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 2017).

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 DEECA.

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

3.2.3. Referral to DEECA

Clause 66.02-2 of the planning scheme determines the role of DEECA in the assessment of native vegetation removal permit applications. If an application is referred, DEECA 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 DEECA 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 DEECA 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 DEECA.

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 2017) 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 DEECA 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.

Limitations

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.

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 of the study area (including the early works). These species included the following:

- Matted Flax-lily (EPBC Act: Endangered; FFG Act: Critically endangered)

- Golden Sun Moth (EPBC Act: Vulnerable; FFG Act: Vulnerable)
- Striped Legless Lizard (EPBC Act: Vulnerable; FFG Act: Endangered)
- 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).

Limitations

Targeted flora surveys can fail to record some species (or individuals of the same species) that are present for various reasons such as short survey duration. However, targeted surveying was carried out during the flowering period of an otherwise inconspicuous species. The survey period was therefore considered optimal for detecting the presence, abundance and location of the targeted species. Visibility was variable across the site as biomass was high across much of the survey area. This can lead to well-concealed plants being overlooked.

Additionally, some of the vegetation mapped as Escarpment Shrubland (EVC 895) within the survey area was too steep to perform parallel transects and usually contained prickly weeds and shrubs that could not be traversed. Where possible, meandering transects through Escarpment Shrubland (EVC 895) were performed.

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.

Limitations

Where practicable, all efforts were made to schedule GSM field surveys in optimal weather conditions with regular intervals between surveys. While surveying was not always undertaken at exact intervals, the time between surveys was considered appropriate to ensure surveys were conducted on optimal weather days.

All surveys for GSM were undertaken in December 2022 and January 2023 (during the typical GSM local flying season) and during appropriate weather conditions. Male moths were recorded flying at nearby reference sites for all of the surveys.

The detection of adult females is considered very difficult due to their poor flying ability and therefore the increased likelihood that they will walk between tussock grasses, rather than fly (DEWHA 2009). Males can only be surveyed with reasonable confidence as searching for females has proven laborious and unreliable (Gibson and New 2007). However, it is assumed that GSM have an equal sex ratio (Gibson 2006), as is the case for many other similar invertebrates.

Striped Legless Lizard

The tile grid method was used for survey Striped Legless lizard (SLL) as this species is known to use roof tiles for thermoregulation (to increase body heat). Tile surveys are recognised as the most effective method of surveying for SLL. These surveys involve the placement of terracotta roof tiles in a grid

formation (a 'tile grid') and monitoring (fortnightly) which fauna species utilise the tiles for shelter over a 12-week period.

The survey followed the standards outlined in the DSE "Biodiversity Precinct Planning Kit". As indicated in this Kit, tile grids were placed on site in winter, no later than late July, to allow tiles to become embedded into the ground prior to survey. The tile grid survey occurred in spring, from early September to early December (being a minimum of three months), as the SLL is unlikely to continue to utilise the tiles after this time.

The survey involved the following tasks:

- Tile grids were laid out in winter (July) within suitable habitat;
- Each grid consists of 50 grooved terracotta or concrete roof tiles in a 20 x 45 m grid configuration (5 x 10 m spacings), with tiles spaced 5 m apart; and
- Artificial shelter sites (tiles) were be checked fortnightly for the presence of SLL by an experienced zoologist, between early September and early December.
- In accordance with the survey guidelines, for sites over 30ha, a ten tile grids were used.

Growling Grass Frog

A habitat assessment was conducted on the 22nd of February 2023 to determine suitable habitat within the development site. Two areas were identified as potential GGF habitat and were subject to targeted surveys (Figure 1). Site 1 was a small, shallow waterbody located in the abandoned quarry vegetated with a mixture of cumbungi and sedges with many large boulders in the vicinity that could provide shelter. Site 2 was a small, isolated waterbody vegetated with cumbungi and reeds; this site is further than 200 meters from the Merri Creek. Both waterbodies were populated with common frog species and tadpoles.

Site 1 is considered moderate quality habitat for GGF due to its location within 200 metres of Merri Creek, it's potential to be inundated regularly, and the availability of sheltering opportunities. While Site 2 is considered low-moderate quality for GGF, due to its small size and distance from Merri Creek.

Surveys for Growling Grass Frog were undertaken in accordance with the survey guidelines outlined in the *Significant impact guidelines for the vulnerable growling grass frog (Litoria raniformis)* (DEWHA 2009). Call playback and visual active search surveys were undertaken by two zoologists, one at each site within the study area over two nights. Surveys were conducted on the following dates:

- 22nd February 2023
- 28th February 2023

The site was surveyed when weather conditions were considered appropriate to detect Growling Grass Frog – i.e., warm evenings with an air temperature of 15˚C or more, and moderate to no wind. Under these conditions, frogs are more likely to be calling and active. During each survey, approximately 45 minutes was spent looking for frogs. The surveys took place between 20:30 and 22:30 (AEDT). At the beginning of each survey, a period of 5 minutes was spent at the water's edge listening. This was immediately followed by 15 minutes of playback and listening, which involved two minutes of playback of GGF advertisement call and three minutes of listening, repeated three times.

Following call playback and listening, the site was systematically searched for frogs with a spotlight and visual inspection for 30 minutes. Call recognition and limited active searching (turning surface debris) was also conducted. All frog species seen and/or heard at each survey site was recorded.

Limitations

The timing of the survey, February 2023 was outside the calling period for the GGF this season. Before each of the surveys began, areas of known GGF populations were visited to ascertain whether or not GGF were calling. On both occasions no GGF were recorded calling. The conditions were considered appropriate for GGF with mild temperatures medium to high humidity and none to very little wind. Despite this the nature of the sites, being so small allowed for a thorough investigation of the area, and the search effort was considered sufficient to detect GGF.

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.

Most 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).

Two small patches of woodland were recorded in the east of the study area.

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 Port Phillip and Westernport catchment management area.

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 (referred to hereafter as 'habitat zones') 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

Habitat Zone	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 & V	Plains Grassy Woodland (EVC 55_61)	Zone L supported a few small River Red Gum trees, and a ground layer heavily dominated by native grasses, particularly Common Tussock-grass and Kangaroo Grass. It exhibited moderate diversity, though low cover, of indigenous forbs. 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.
A, B, C, D, E, F, H, I, P, 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 most of the rest of the patches were moderate due to high weed cover. Zones P supported a ground layer heavily dominated by native grasses, particularly Common Tussock-grass and Kangaroo Grass. It supported a moderate diversity, though low cover, of indigenous forbs. **Patches A, B, D, E, F and P were found to constitute the EPBC listed community *Natural Temperate Grasslands of the Victorian Volcanic Plains* (NTGVVP). All patches are the FFG Act-listed Western Basalt Plains Grassland.**

Habitat Zone	EVC	Description
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	132_61	1.021	32
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

Habitat Zone	EVC no.	Area (ha)	Condition Score (out of 100)
AA	641	1.400	N/A
AB	125	0.106	27
Total		6.959	

5.2.2. Scattered trees

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 3 as the study area is located on private land. Impacts to species listed under the FFG Act on private land may be considered by the Responsible Authority. 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 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, an ephemeral dam 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. It can be assumed a 200m buffer from the creek would provide suitable terrestrial habitat for GGF. The other aquatic habitat types may also serve as seasonal low-quality habitat for Growling Grass Frog, though accessibility to these areas is low due to the steep embankment or distance from the creek.

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).

5.5.1. 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?	No	No	No	No
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	Dry	Dry	Dry
Humidity	47%	43%	39%	54%

5.5.2. Results of targeted surveys for GGF

No GGF were recorded in the study area during the targeted surveys undertaken in February 2023 as part of this investigation. Full details of survey results are provided in Table 5 below.

Table 5: Call playback and visual search survey results

Date	Time	Temp	Humidity	Site no.	Common Name	Count	Survey method used
22/02/2023	20:53	22.6	56	1	Spotted Marsh Frog *Limnodynastes tasmaniensis*		Call playback, spotlighting
					Southern Brown Tree Frog *Litoria ewingii*		
	21:00	22.6	56	2	Spotted Marsh Frog *Limnodynastes tasmaniensis*		Call playback, spotlighting
					Spotted Marsh Frog (tadpoles) *Limnodynastes tasmaniensis*		
28/02/2023	19:15	16	76	Merri Creek	Common Froglet *Crinia signifera*	1	Active searching
	20:30	15.8	80	2	Spotted Marsh Frog *Limnodynastes tasmaniensis*	1	Call playback
					Common Froglet *Crinia signifera*	1	
	20:45				Spotted Marsh Frog (tadpoles) *Limnodynastes tasmaniensis*	13	Spotlighting
					Common Froglet *Crinia signifera*	6	
	21:30	15.4	83	1	Spotted Marsh Frog *Limnodynastes tasmaniensis*	6	Call playback
					Southern Brown Tree Frog *Litoria ewingii*	1	
	21:45				Spotted Marsh Frog *Limnodynastes tasmaniensis*	3	Spotlighting
					Southern Brown Tree Frog	14	

Targeted surveys for GGF were also conducted in the study area in November 2023 (EcoLink 2023). These more recent surveys did not record GGF in the study area. These surveys recorded only Common Eastern Froglet and Striped Marsh Frog.

5.5.3. Results of targeted surveys for SLL

No SLL were recorded in the study area during the targeted surveys undertaken as part of this investigation. Numerous Spotted Marsh Frog, Striped Marsh Frog, unidentified skinks and one Eastern Brown Snake were recorded using the tiles.

5.5.4. 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 based on historical records, habitat found on site during the field assessment and the results of targeted surveys for the relevant species. The results are presented in Table 6.

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.

Table 6: 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 detected during targeted surveys – **unlikely to occur**

Common Name	Scientific name	EPBC-T	EPBC-M	Habitat	Number of records	Date of last record	Likelihood of occurrence
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. Not recorded during targeted surveys - **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**
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). 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**

Common Name	Scientific name	EPBC-T	EPBC-M	Habitat	Number of records	Date of last record	Likelihood of occurrence
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 (including the early works) 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 (including the early works)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 (including the early works) 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 study area (including the early works) 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 study area (including the early works) 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 7). 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 7: 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	Does not occur in the study area.
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 and P.
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 and P were found to meet all of the qualifying criteria for the *Natural Temperate Grassland of the Victorian Volcanic Plain* community.

All patches of Plains Grassland are the FFG Act-listed Western Basalt Plains Grassland.

Figure 1: Study area and native vegetation

Project: 485 Cooper Street, Epping
Client: The GPT Group
Date: 4/12/2023

Study area

EPBC Act listed community

NTGVVP

Native vegetation

- 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)
- Large tree in patch
- Small scattered tree
- Small tree in patch

N

Metres
0 80

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6. Assessment of impacts

6.1. Proposed early works

A commercial/industrial development is proposed for the study area. This report has been prepared to specifically address the early works only.

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 the proposed early works

This impact assessment for the early works assumes the native vegetation located outside of the ESO3 overlay will require removal, with the exception of three River Redgums (see Figure 2). In addition, some impacts to Habitat Zones R, S, T and U, which are located inside the ESO3 overlay, will occur.

6.2.1. Native vegetation

The proposed early works will result in the loss of a total extent of 3.983 hectares of native vegetation as represented in Figure 2. This included four small scattered trees.

An additional 0.144 ha of native vegetation has already been approved for removal on site in relation to works for cultural heritage testing and is included in the current application as 'past removal'.

The total extent of current and past removal equates to 4.127 hectares as documented in the *Native Vegetation Removal* (NVR) report scenario test (Appendix 7).

6.2.2. River Red Gums

A total of 40 River Red Gums were mapped in the study area, including five large trees and 35 small trees (Arbor Survey 2022). Of these, eight small River Red Gums are proposed for removal (Figure 3). Under the Guidelines, only scattered trees and large trees in patches are mapped and trigger offset requirements if removed. Four of the River Red Gums are classified as small scattered trees and have been included in the native vegetation removal above.

The remaining small trees are captured within patches of native vegetation.

6.2.3. Modelled species important habitat

The proposed development including early works 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 including early works.

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 5.5.1 identified that no listed flora species are expected to be impacted by the proposed development including early works.

6.2.6. Threatened ecological communities

The proposed early works will impact on patches of *Natural Temperate Grassland of the Victorian Volcanic Plain* (NTGVVP, EPBC Act-listed) and Western Basalt Plains Grassland (FFG Act-listed) inside the study area.

Note that a total of 0.062 hectares of EPBC Act listed ecological communities was previously approved via an EPBC Referral variation (EPBC 2022/09440) to enable the preliminary cultural heritage assessment (shown on Figure 2).

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.

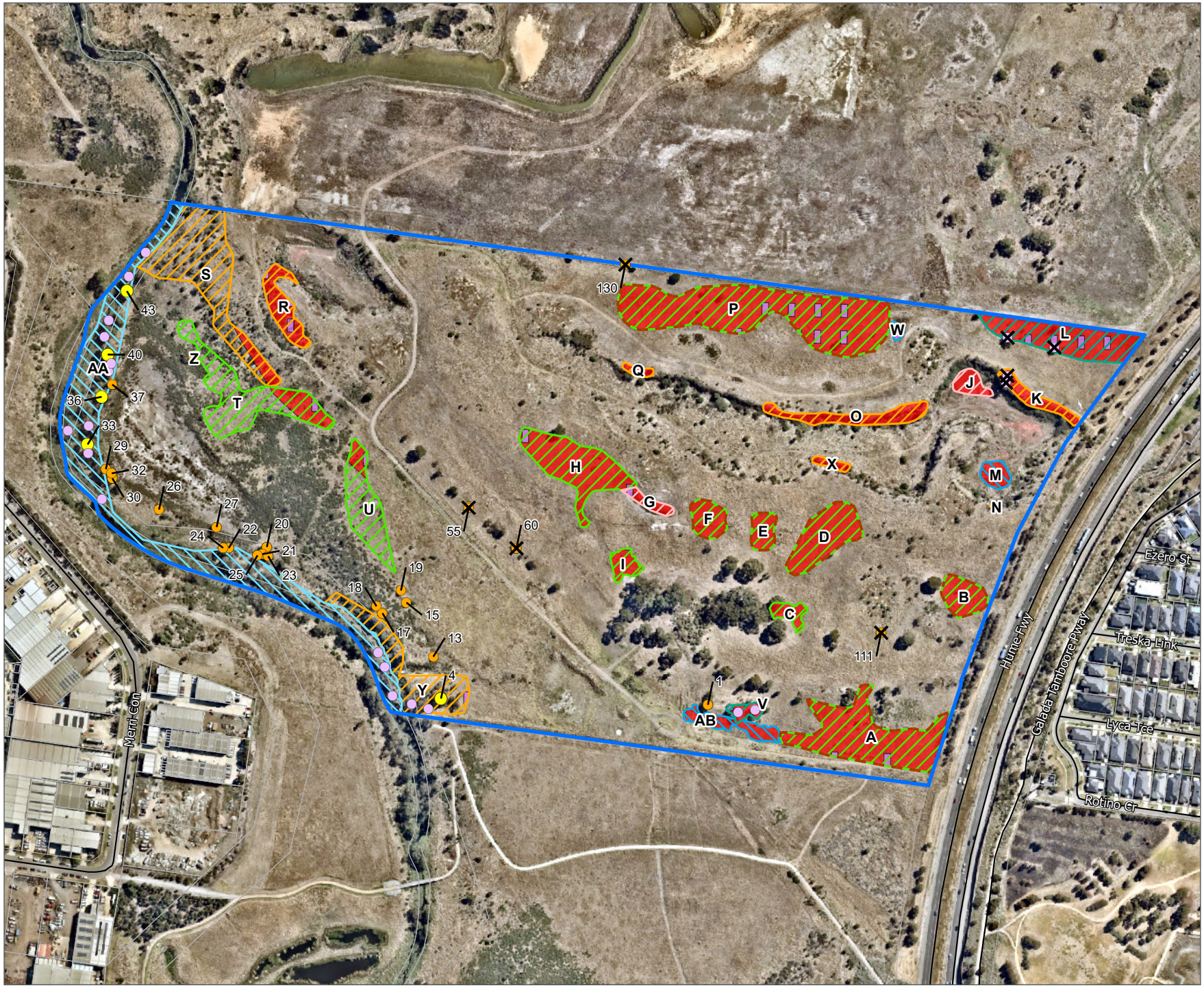

Figure 2: Native vegetation to be removed

Project: 485 Cooper Street, Epping
Client: The GPT Group
Date: 4/12/2023

Study area

EPBC Act listed community

NTGVVP

Native vegetation

- 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)
- Large tree in patch
- Small scattered tree
- Small tree in patch (Arborist mapped)
- Tree to be removed
- Native vegetation proposed to be removed
- Native vegetation approved to be removed

N

Metres
0 80

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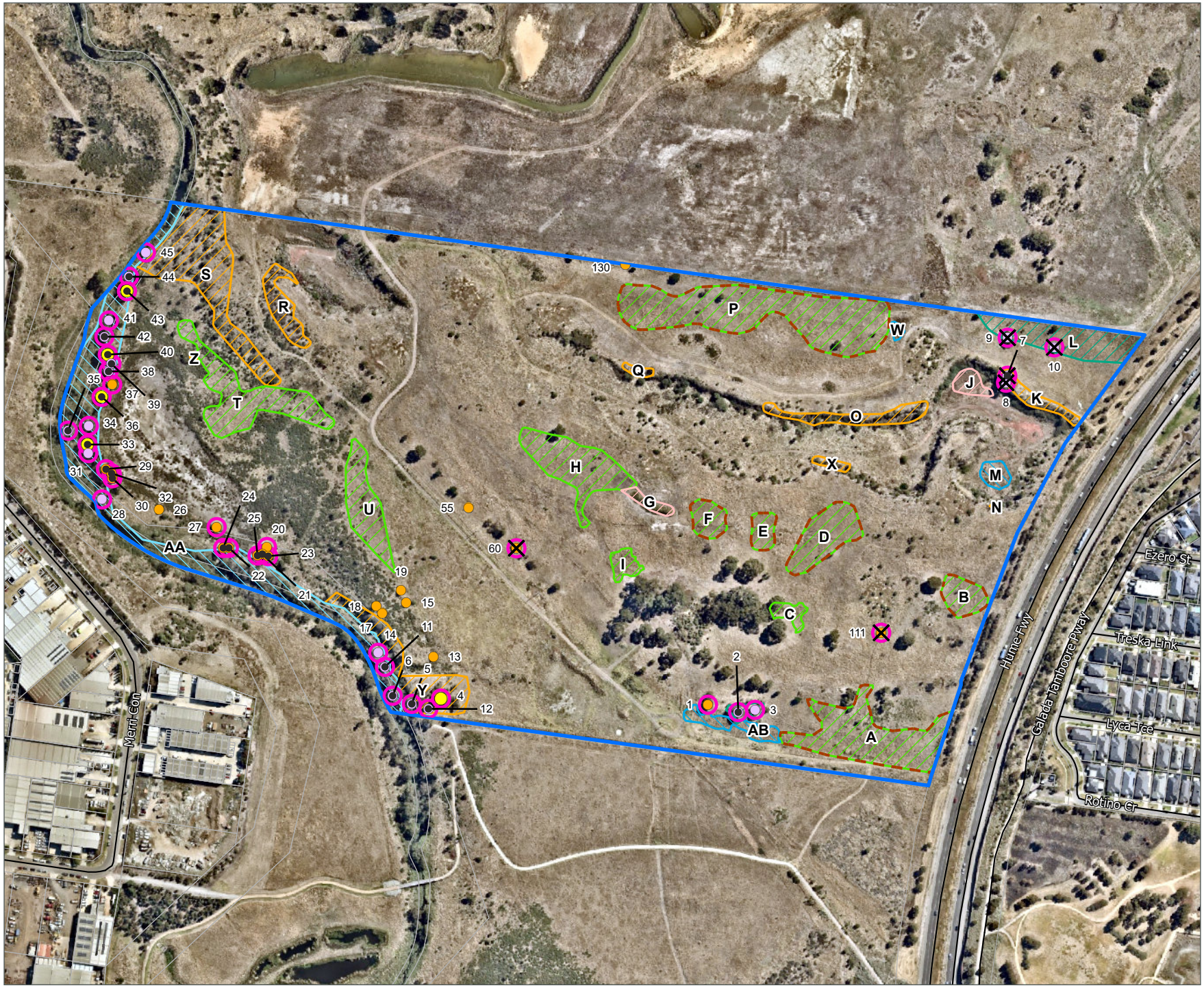

Figure 3: River Red-gum impacts

Project: 485 Cooper Street, Epping
Client: The GPT Group
Date: 4/12/2023

Study area

EPBC Act listed community

NTGVVP

Native vegetation

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

Large tree in patch

Small scattered tree

Small tree in patch(arborist mapped)

River Red-gum proposed to be removed

N

Metres

0 80

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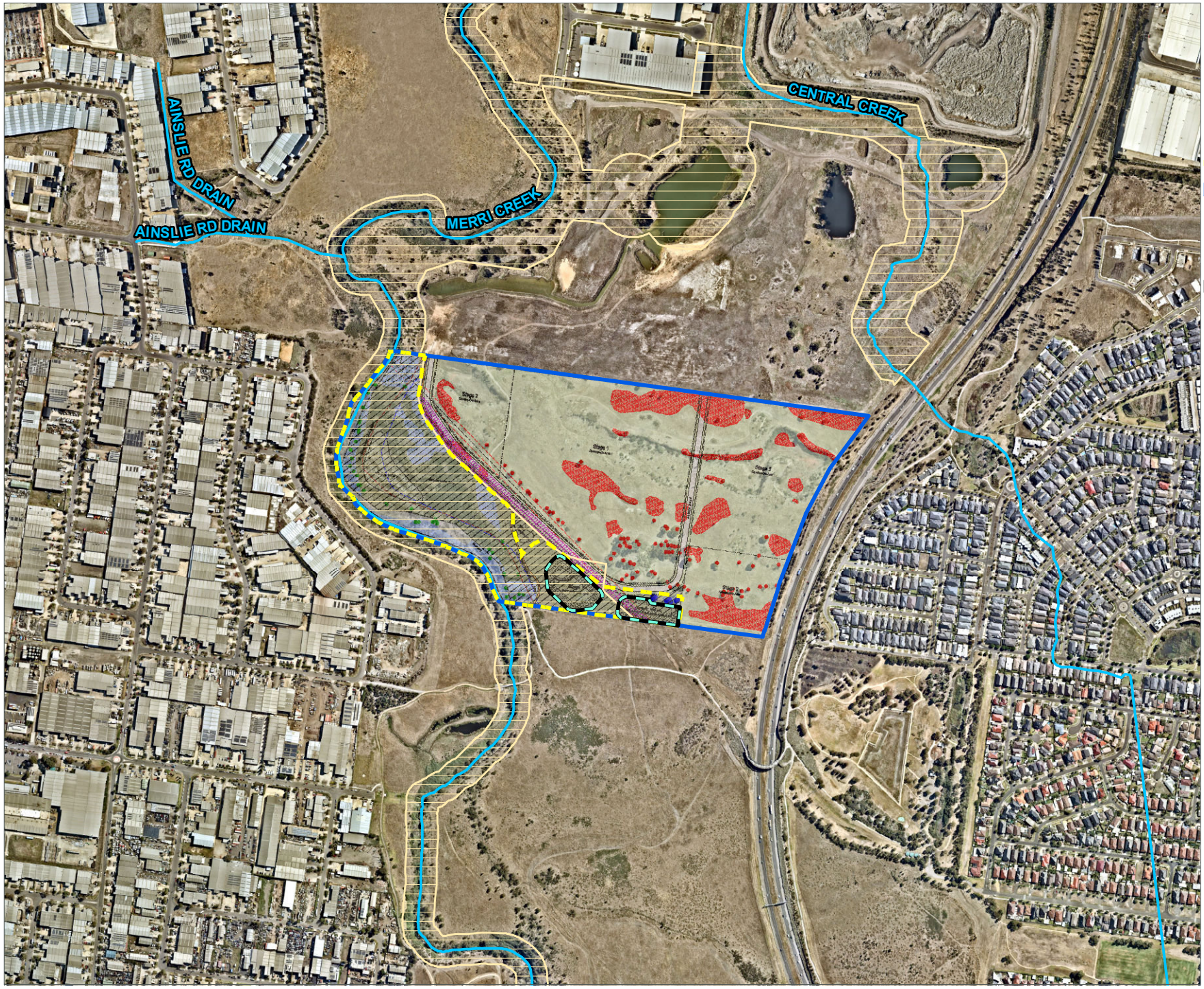

Figure 4: Habitat linkages for GGF

Project: 485 Cooper Street, Epping
Client: The GPT Group
Date: 25/07/2023

- Conservation area
- Property boundary
- Watercourse
- Habitat linkage
- Stormwater treatment boundary

N

Metres
0 160

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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 River Red Gums proposed for retention be 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, 32 will be retained on site including all five large trees and 26 small trees. This equates to an 80% 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. The only strategic level planning done recognised that the key ecological values associated with the study are located close to Merri Creek.
- Site level planning – the proponent indicates that the proposed development of the study area (including the early works) 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.

In addition to the above, a comprehensive avoid and minimise statement has been prepared for the proposed commercial/industrial development in the study area, which is provided in Appendix 9.

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 4.127 ha (3.983 ha current; 0.144 ha past) 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 8: 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 DELWPDEECA 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:

- 1.389 general habitat units and must include the following offset attribute requirements:
  - Minimum strategic biodiversity value (SBV) of 0.447.
  - Occur within the Port Phillip and Westernport CMA boundary or the Whittlesea municipal district.
  - No large trees

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 threatened species and ecological communities that are 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 early works will result in a significant impact on an EPBC Act-listed ecological community present in the study area:

- Natural Temperate Grassland of the Victorian Volcanic Plain (EPBC: Critically endangered).

An EPBC Act Referral has been undertaken. DCCEEW have determined it is a controlled action to be assessed via preliminary documentation.

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 2017)

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 DEECA.

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 DEECA'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	132_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	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	2	0	N/A	0	0	N/A	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	1.36	1.15	1.15	1.15	1.36
	Site Condition subtotal		*23*	*20*	*30*	*16*	*16*	*27*	*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	1	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**	**32**	**20**	**18**	**48**	**32**

* Modified approach to habitat scoring - refer to Table 14 of DEECA'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 DEECA'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
	Lightwood	*Acacia implexa*			
	Hedge Wattle	*Acacia paradoxa*			
	Sheep's Burr	*Acaena spp.*			
	Woodruff	*Asperula spp.*			
	Kneed Spear-grass	*Austrostipa bigeniculata*			
*	Large Quaking-grass	*Briza maxima*			
	Sweet Bursaria	*Bursaria spinosa*			
	Milky Beauty-heads	*Calocephalus lacteus*			
*	Kikuyu	*Cenchrus clandestinus*			
	Slender Bindweed	*Convolvulus angustissimus subsp. omnigracilis*			
*	Hawthorn	*Crataegus monogyna subsp. monogyna*			
*	Artichoke Thistle	*Cynara cardunculus* subsp. *flavescens*			C
*	Couch	*Cynodon dactylon var. dactylon*			
*	Rough Dog's-tail	*Cynosaurus echinatus*			
*	Cocksfoot	*Dactylis glomerata*			
	Black-anther Flax-lily	*Dianella admixta*			
	Kidney-weed	*Dichondra repens*			
	Common Spike-sedge	*Eleocharis acuta*			
	River Red Gum	*Eucalyptus camaldulensis var. camaldulensis*			
*	Sugar Gum	*Eucalyptus cladocalyx*			
	Blue Devil	*Eryngium ovinum*			
*	Montpellier Broom	*Genista monspessulana*			C
	Raspwort	*Gonocarpus spp.*			
*	Spiny Rush	*Juncus acutus* subsp. *acutus*			C
	Rush	*Juncus sp.*			
	Common Blown-grass	*Lachnagrostis filiformis*			
*	Common Peppercress	*Lepidium africanum*			
	Variable Sword-sedge	*Lepidosperma laterale*			
	Wattle Mat-rush	*Lomandra filiformis*			
*	African Box-thorn	*Lycium ferocissimum*			C
	Small Loosestrife	*Lythrum hyssopifolia*			
	Tree Violet	*Melicytus dentatus s.l.*			
*	Lobed Needle-grass	*Nassella charruana*			S
*	Chilean Needle-grass	*Nassella neesiana*			R
*	Serrated Tussock	*Nasella trichotoma*			C
*	Common Prickly-pear	*Opuntia stricta*			C
	Grassland Wood-sorrel	*Oxalis perennans*			
*	Paspalum	*Paspalum dilatatum*			
	Slender Knotweed	*Persicaria decipiens*			
*	Toowoomba Canary-grass	*Phalaris aquatica*			
	Common Reed	*Phragmites australis*			

Origin	Common name	Scientific name	EPBC	FFG-T	CaLP Act
*	Ribwort	*Plantago lanceolata*			
*	Annual Beard-grass	*Polypogon monspeliensis*			
	Common Purslane	*Portulaca oleracea*			
*	Sweet Briar	*Rosa rubiginosa*			C
*	Blackberry	*Rubus fruticosus spp. agg.*			C
*	Curled Dock	*Rumex crispus*			
	Wallaby Grass	*Rytidosperma spp.*			
*	Rat-tail Grass	*Sporobolus africanus*			
	Kangaroo Grass	*Themeda triandra*			
	Bulrush	*Typha spp.*			
*	Gorse	*Ulex europaeus*			C
	Tufted Bluebell	*Wahlenbergia communis*			

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 DEECA. DEECA 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

Origin	Common name	Scientific name	EPBC-T	EPBC-M	FFG-T
	Australian Magpie	*Cracticus tibicen*			
	Black-faced Cuckoo-shrike	*Coracina novaehollandiae*			
	Brown Falcon	*Falco berigora*			
*	Common Blackbird	*Turdus merula*			
	Common Froglet	*Crinia signifera*			
*	Common Starling	*Sturnus vulgaris*			
	Eastern Grey Kangaroo	*Macropus giganteus*			
*	Eurasian Skylark	*Alauda arvensis*			
*	European Goldfinch	*Carduelis carduelis*			
*	European Greenfinch	*Chloris chloris*			
*	European Rabbit	*Oryctolagus cuniculus*			
	Golden-headed Cisticola	*Cisticola exilis*			
*	House Sparrow	*Passer domesticus*			
	Little Raven	*Corvus mellori*			
	Little Whip Snake	*Parasuta flagellum*			
	Mistletoebird	*Dicaeum hirundinaceum*			
	New Holland Honeyeater	*Phylidonyris novaehollandiae*			
	Peregrine Falcon	*Falco peregrinus*			
	Rainbow Lorikeet	*Trichoglossus haematodus*			
*	Red Fox	*Vulpes vulpes*			
	Red Wattlebird	*Anthochaera carunculata*			
	Red-browed Finch	*Neochmia temporalis*			
	Red-rumped Parrot	*Psephotus haematonotus*			
*	Rock Dove	*Columba livia*			
	Silvereye	*Zosterops lateralis*			
	Southern Brown Tree Frog	*Litoria ewingii*			
	Spiny-cheeked Honeyeater	*Acanthagenys rufogularis*			
*	Spotted Dove	*Streptopelia chinensis*			
	Spotted Grass Frog	*Limnodynastes tasmaniensis*			
	Spotted Pardalote	*Pardalotus punctatus*			
	Superb Fairy-wren	*Malurus cyaneus*			
	Swamp Wallaby	*Wallabia bicolor*			
	White-browed Scrubwren	*Sericornis frontalis*			
	White-plumed Honeyeater	*Ptilotula penicillatus*			
	Willie Wagtail	*Rhipidura leucophrys*			
	Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*			

Notes: EPBC-T = threatened species status under EPBC Act (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)

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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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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

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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

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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: **05/12/2023**
Time of issue: **4:32 pm**

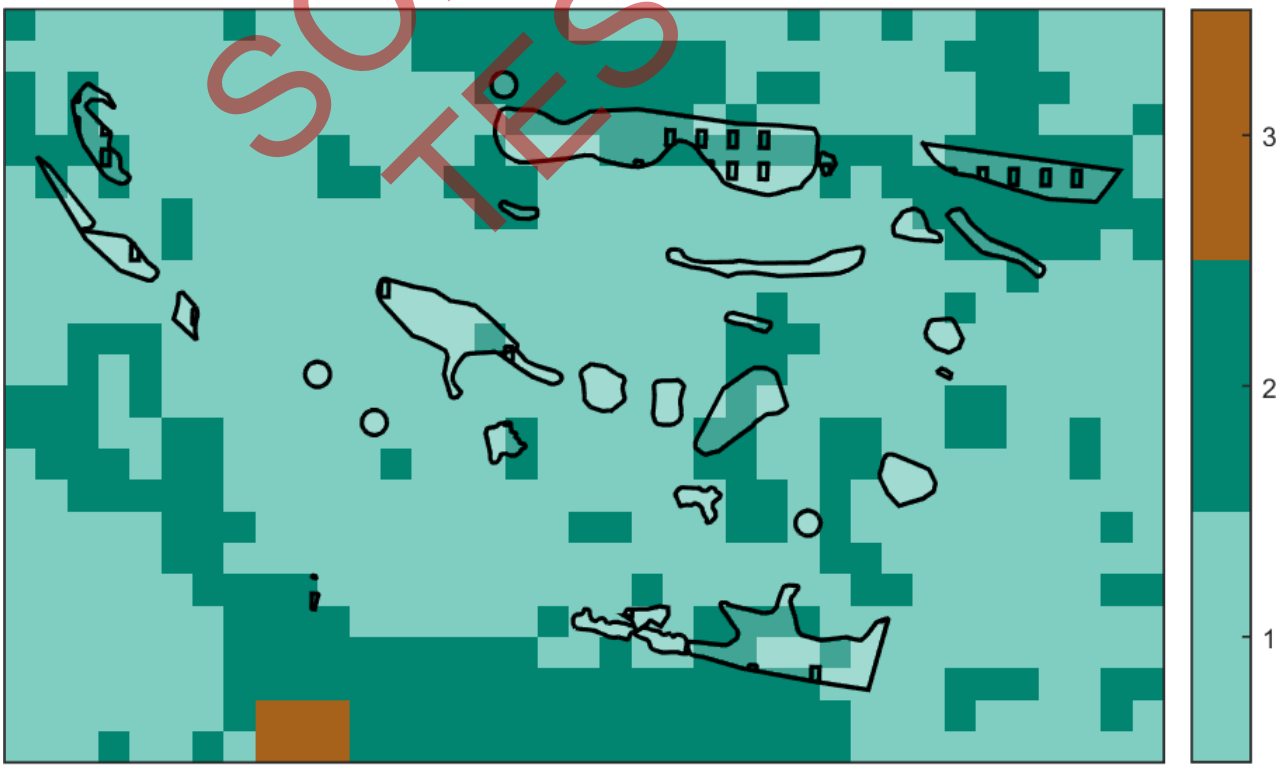
Report ID: Scenario Testing

Project ID	22076_Cooper_St_Removal_230721

Assessment pathway

Assessment pathway	**Detailed Assessment Pathway**
Extent including past and proposed	4.127 ha
Extent of past removal	0.144 ha
Extent of proposed removal	3.983 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]	1.389 general habitat units
Vicinity	Port Phillip and Westernport Catchment Management Authority (CMA) or Whittlesea City Council
Minimum strategic biodiversity value score[2]	0.447
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	0.060	0.060	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-A	Patch	vvp_0132_61	Endangered	0	no	0.390	0.567	0.567	0.631		0.270	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	0.040	0.040	0.400		0.014	General
1-H	Patch	vvp_0132_61	Endangered	0	no	0.270	0.376	0.376	0.405		0.107	General
1-U	Patch	vvp_0132_61	Endangered	0	no	0.230	0.037	0.037	0.410		0.009	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-T	Patch	vvp_0132_61	Endangered	0	no	0.320	0.101	0.101	0.560		0.038	General
1-P	Patch	vvp_0132_61	Endangered	0	no	0.320	0.971	0.971	0.554		0.362	General
1-R	Patch	vvp_0895	Endangered	0	no	0.180	0.131	0.131	0.960		0.035	General
1-W	Patch	vvp_0125	Endangered	0	no	0.340	0.012	0.012	0.430		0.004	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	0.327	0.327	0.564		0.092	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
1-60	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
1-V	Patch	vvp_0055	Endangered	0	no	0.200	0.039	0.039	0.640		0.009	General
1-G1	Patch	vvp_0821	Endangered	0	no	0.330	0.001	0.001	0.400		0.000	General
1-55	Scattered Tree	vvp_0055	Endangered	0	no	0.200	0.031	0.031	0.410		0.007	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	0.0013
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	0.0004
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
Rye Beetle-grass	*Tripogon loliiformis*	503455	Rare	Dispersed	Habitat importance map	0.0002
Swamp Fireweed	*Senecio psilocarpus*	504659	Vulnerable	Dispersed	Habitat importance map	0.0002
Arching Flax-lily	*Dianella sp. aff. longifolia (Benambra)*	505560	Vulnerable	Dispersed	Habitat importance map	0.0002
Pale Swamp Everlasting	*Coronidium gunnianum*	504655	Vulnerable	Dispersed	Habitat importance map	0.0002
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
Small Milkwort	*Comesperma polygaloides*	500798	Vulnerable	Dispersed	Habitat importance map	0.0001
Clover Glycine	*Glycine latrobeana*	501456	Vulnerable	Dispersed	Habitat importance map	0.0001
Golden Sun Moth	*Synemon plana*	15021	Critically endangered	Dispersed	Habitat importance map	0.0001
Floodplain Fireweed	*Senecio campylocarpus*	507136	Rare	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

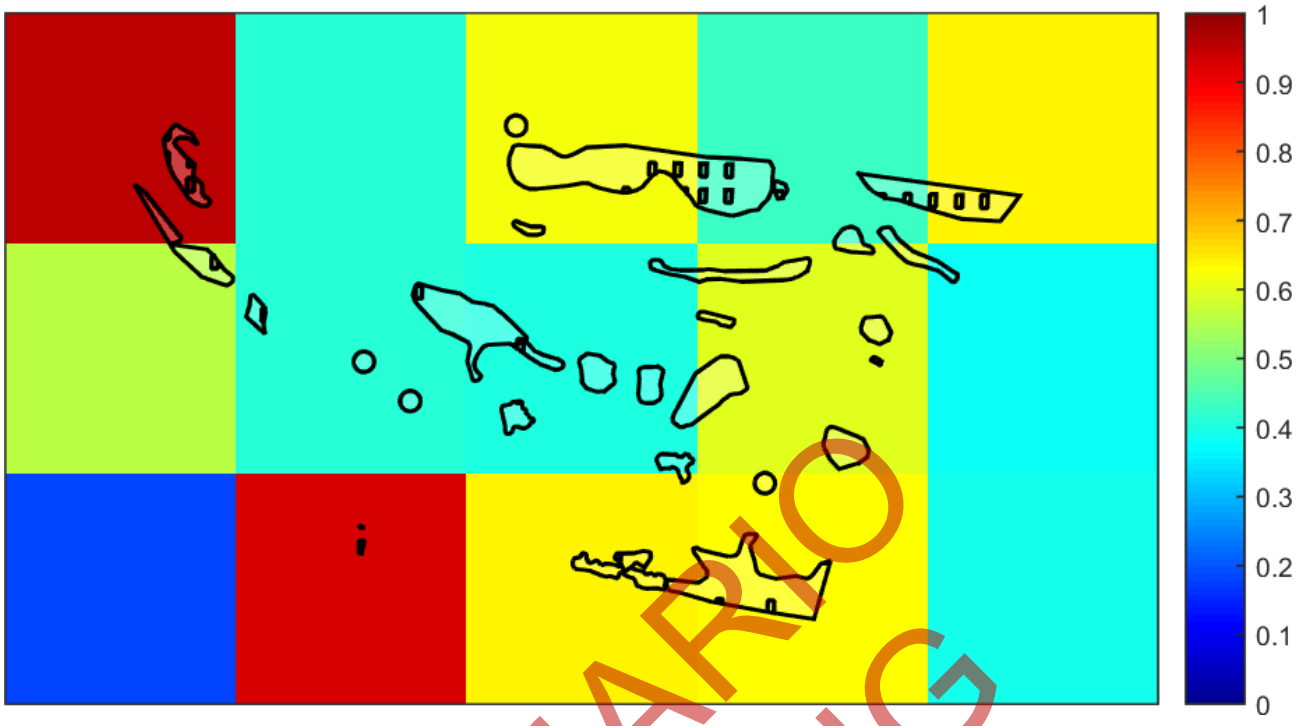
- Highly localised habitat means there is 2000 hectares or less mapped habitat for the species
- Dispersed habitat means there is more than 2000 hectares of mapped habitat for the species

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: 05/12/2023 06:03 **Report ID: 22087**

What was searched for?

General offset

General habitat units	Strategic biodiversity value	Large trees	Vicinity (Catchment Management Authority or Municipal district)	
1.389	0.447	0	CMA	Melbourne Water
			or LGA	Whittlesea City

Details of available native vegetation credits on 05 December 2023 06:03

These sites meet your requirements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
BBA-0277	2.553	444	Melbourne Water	Mornington Peninsula Shire	No	Yes	No	Abezco, Ethos, VegLink
BBA-0670	16.596	107	Melbourne Water	Cardinia Shire	No	Yes	No	Abezco, VegLink
BBA-0677	9.712	1451	Melbourne Water	Whittlesea City	No	Yes	No	Abezco, VegLink
BBA-0678	44.536	2608	Melbourne Water	Nillumbik Shire	No	Yes	No	VegLink
BBA-2790	2.911	116	Melbourne Water	Baw Baw Shire	Yes	Yes	No	Contact NVOR
BBA-2870	2.544	431	Melbourne Water	Yarra Ranges Shire	Yes	Yes	No	VegLink
BBA-2871	16.335	1668	Melbourne Water	Yarra Ranges Shire	Yes	Yes	No	VegLink
BBA-3017_02	1.984	0	Melbourne Water	Greater Geelong City	No	Yes	No	VegLink
TFN-C1763_3	11.231	0	Melbourne Water	Mornington Peninsula Shire	Yes	Yes	No	Ecocentric
VC_CFL-3682_01	1.834	0	Melbourne Water	Nillumbik Shire	Yes	Yes	No	Abezco
VC_CFL-3710_01	7.606	322	Melbourne Water	Yarra Ranges Shire	Yes	Yes	No	VegLink
VC_CFL-3764_01	5.620	8	Melbourne Water	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	Melbourne Water	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 DEECA Customer Service Centre 136 186 or the Native Vegetation Credit Register at nativevegetation.offsetregister@delwp.vic.gov.au

Appendix 9: Avoid and minimise statement

Avoid and Minimise Statement

485 Cooper Street, Epping, Victoria

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Executive Summary

The avoid and minimise statement outlined in this document relates to a proposed industrial development at 485 Cooper Street, Epping. The site is approximately 352,000M2 in size and is zoned Industrial 1 (INZ1). The lot adjoins the Merri Creek to the West, Barry Road Grasslands to the South, Hume Hwy to the East and an approved industrial development to the North. Previous uses of the site include quarrying, a golf course and uncontrolled access such as motocross and dumping.

The study area has been subject to regional strategic planning through the application of an Environmental Significance Overlay to the Western portion of the property. The development plan overlay for the site, as detailed in Schedule 33 of the Whittlesea City Council's planning scheme, outlines the requirements for site level planning. Road access into the site is predetermined by the approved development plan for 481 Cooper Street.

The GPT Group engaged Nature Advisory Pty Ltd, to conduct a detailed flora and fauna assessment of the site in August 2022. The assessment found that the majority of the study area was treeless open grassland, dominated by introduced pasture grasses and broad-leaf weeds. Interspersed throughout the study area are various sized patches of plains grassland, grassy woodland, grassy wetland, riparian woodland, escarpment shrubland, tall marsh vegetation and EPBC listed Native Temperate Plains Grassland of the Victorian Volcanic Plain.

A number of schemes for the proposed development have been created in response to the regional strategic level planning, the development plan overlay, site assessments and extensive consultation with local authorities. The proposed scheme, and supporting conservation management plan, result in a net gain in native vegetation through the preservation and rehabilitation of the Environmental Significance Overlay. Following the multiple amendments made to the plans no feasible opportunities exist to further avoid and minimise impacts on native vegetation without undermining the key objectives of the proposal.

Background

The avoid and minimise statement contained here within, relates to the proposed development at 485 Cooper Street, Epping. The site, located in the city of Whittlesea, is generally rectangular in shape with the Eastern boundary aligning with the Hume Freeway, the Western boundary aligning with Merri Creek and the Southern Boundary aligning with the Barry Road Grasslands. The land is approximately 352,000M2 in size and is zoned Industrial 1 (INZ1). Previous uses of the site include quarrying, a golf course and uncontrolled access involving motocross and dumping. Arial images showing the historical uses of the site are provided at Appendix X.

The GPT Group engaged Nature Advisory Pty Ltd, to conduct a detailed flora and fauna assessment of the site in August 2022. The assessment found that the majority of the study area was treeless open grassland, dominated by introduced pasture grasses and broad-leaf weeds. Interspersed throughout the study area are various sized patches of plains grassland, grassy woodland, grassy wetland, riparian woodland, escarpment shrubland, tall marsh vegetation, EPBC listed Native Temperate Plains Grassland and Grassy Eucalypt Woodland of the Victorian Volcanic Plain.

Following the flora and fauna assessment Nature Advisory were engaged to conduct targeted surveys for Matted Flax-lily, Golden Sun Moth and Growling Grass Frog, none of the targeted species were identified.

Strategic Level Planning

The study area has been subject to a regional strategic planning through the application of an Environmental Significance Overlay (ESO) to the Western portion of the property.

The purpose of the Environmental Significance overlay is:

- To identify areas where the development of land may be affected by environmental constraints.

- To ensure that development is compatible with identified environmental values.

The ESO also provides crucial connectivity for the wider Galada Tambor and Merri Creek Corridor which is currently in the planning process of becoming a Regional Parkland (Maram Baba Parklands). As much of the surround land has been subject to urban and industrial development these parklands act as an important habitat corridor, and provide a unique opportunity for visitors to connect to the natural environment. The Merri Creek corridor is also an important indigenous cultural feature which is known to support indigenous cultural heritage values.

The presence of the Environmental Significance Overlay and the factors outlined above, indicates that priority should be given to the Western portion of the property when planning for biodiversity values across the site.

Site Level Planning

Schedule 33 to the Development Plan overlay, applicable to the site, requires a plan to be developed in general accordance with the concept plan shown at Clause 4.0 of the schedule – the concept plan is provided at appendix I for reference.

This requirement was the starting point for the initial site level planning undertaken for the development, however there were a number of limitations to the concept plan that needed to be considered. These limitations are outlined below:

- The plan doesn't take into consideration the requirement to manage stormwater runoff from the site. The advice from Melbourne Water and engineering consultants Costin Roe is that a storm water asset needs to constructed at the South West of the site. This is due to the topography of the land which slopes North East to South West, and the requirement to discharge into Merri Creek.
- The development plan for 481 Cooper Street was processed separately to the proposed development. The approved plan for 481 Cooper Street deviates substantially from the concept plan and predetermines the road access points into the site. A copy of the plan is provided at appendix II.
- The concept plan doesn't take into consideration the topography of the site, in particular the 15 meter difference levels at the North West of the site. A copy of the site survey is provided at appendix III.

- The concept plan does not take into consideration native vegetation and habitat on the site. A copy of the site vegetation mapping is provided at appendix IV.

Scheme A

The first revision of the development plan provided at appendix V (Scheme A) focuses on the retention of patches of native vegetation of the highest value, in particular patches A and L, and the creation of a continuous public reserve along the Barry Road Grasslands. The plan also allows for the retention of in excess of 80% of river redgums located on the site.

It should be noted that this scheme doesn't look to retain patch P as the patch is impacted by the location of the estate road which is predetermined by the approved development plan for 481 Cooper Street. Smaller patches of vegetation dispersed throughout the property were also unable to be retained. This is due to the sloping topography of the site and the requirement for large level building pads, and hardstand areas, for loading and unloading of B Double trucks. A draft copy of the cut and fill plan is provided at appendix VI to demonstrate the extend of bulk earth works required to develop modern industrial facilities.

The assessment of the advantages and limitations of Scheme A are provided below:

Advantages:

- The plan is in general accordance with the concept plan provided in Schedule 33 to the Development Plan Overlay
- The plan allows for the retention of native vegetation patches L and A
- Retention of over 80% of river redgums on site
- Creation of a continuous public reserve at the interface of the Barry Road Grasslands

Limitations:

- Significant encroachment on the ESO
- Significant encroachment on areas of cultural heritage sensitivity
- Complete displacement of Plains Grassland (patch T and U)
- Partial displacement of Escarpment Woodland (patch S)
- Displacement of EPBC listed Growling Grass Frog fringe habitat (significantly encroaching on advised 100m buffer)
- Net loss of 1.2 hectares of vegetation across the site

Scheme B

After consideration of the limitations of Scheme A, in particular the net loss of native vegetation and the displacement of Growling Grass Frog fringe habitat, an alternative scheme was developed (Scheme B) with a focus on prioritising preservation of the ESO. A copy of Scheme B is provided at Appendix VII. The change in approach was coupled with the development of a conservation management plan with a focused on improving the quality of existing vegetation within the ESO, as well as well as regeneration of native grasslands through weed management and revegetation programmes. Advice provided from the Merri Creek Management Committee during the development of the conservation management plan indicates a good level of success has been achieved in the regeneration of native grasslands along the creek corridor.

The assessment of the advantages and limitations of Scheme B are provided below:

Advantages:

- Revegetation and conservation of the large majority of the ESO.
- Avoidance of development in the large majority of areas of cultural heritage sensitivity
- Retention of the majority of Plains Grassland (patch T and U)
- Retention of the majority of escarpment woodland (patch S)
- Conservation of EPBC listed Growling Grass Frog fringe habitat through protection of a 100m buffer along the creek.
- Opportunity to create an additional 5.12 hectares of native vegetation within the ESO
- Net gain of 1.21 hectares of vegetation across the site.
- The retention and revegetation of 8.12 hectares of native vegetation within the ESO

Limitations:

- Removal of native vegetation to the East of the site including patches A and L.
- Removal of an additional 5 river redgums when compared to Scheme A.
- Removal of continuous public reserve at the interface of the Barry Road Grasslands.
- Reduction of total land available for development when compared to Scheme A.

The assessment undertaken above, in particular the net gain of 1.21 hectares of native vegetation, conservation of EPBC listed Growling Grass Frog fringe habitat,

and the retention and revegetation of 8.12 hectares of native vegetation within the ESO, strongly supported the decision to move away from Scheme A as the preferred strategy for the development of the site.

Scheme C

Consultation, based on Scheme B, was undertaken with various stakeholders included Melbourne Water, Merri Creek Management Committee, Parks Victoria and the City of Whittlesea over a period of 7 Months from September 2022 to March 2023. The consultation process included the provision of relevant assessments and site information, in person meetings and site walks during spring months. A number of attempts were made to engage with The Department of Energy Environment and Climate Action (DEECA) during this time, little to no input was provided.

Scheme C was developed in response to feedback provided during the consultation period, namely a desire to see the bio retention system relocated out of the ESO, requests to consider the retention of additional River Red Gums, and requests to honour the intent of the concept plan with a road interface along the grasslands to the south, in particular for fire management. A copy of scheme C is provided at appendix VIII.

Scheme C goes beyond the avoidance outlined in Scheme B by removing the bio retention system from the ESO as much as feasibly possible, while also achieving the retention of an addition 3 river redgums on the site. It also provides for a public reserve across approximately 75% of the interface with the grasslands as well as dedicated fire access to the grasslands.

Scheme C demonstrates a commitment to achieving the best environmental outcomes for the site while also balancing the requirements of important stakeholders. These outcomes have been reached through a further reduction to the development footprint to what was proposed in Scheme B. This was achieved through the complete removal of warehouse 5 from the scheme.

Scheme D

Scheme C was then used for consultation with Parks Victoria and The Department of Energy Environment and Climate Action (DEECA).

Parks Victoria, responsible for management of the grassland reserve to the south of the development on behalf of the Victorian Government, raised concerns about the potential impact of shading on grasslands to the south. Shadow diagrams

were created for the hours between 10am-3pm on 22 June. This exercise showed that Scheme C did create shading as can be seen in the figure below.

Scheme D, provided at appendix IX, was created in response to the shading concerns. The changes involved lowering of pad levels, relocating car parking to the southern boundary and the introduction of a landscaping buffer. These changes resulted in a loss of 1,000 M2 from warehouse 4.

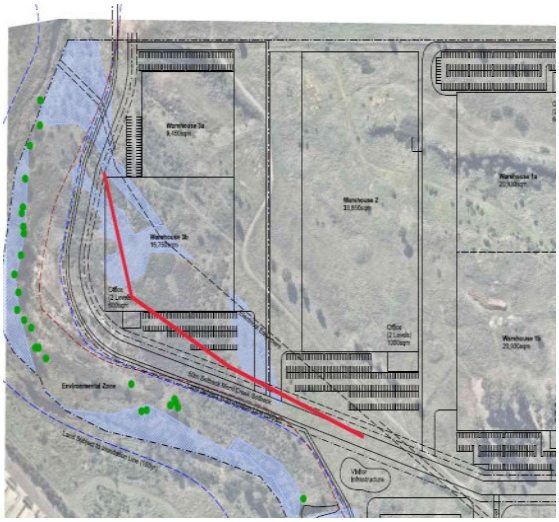
DEECA also raised the suitability of the stormwater retention asset as habitat for growling grass frog. In response to this feedback dedicated growling grass frog habitat has been incorporated into Scheme D. The proposed habitat is located in close proximity to the creek in an area that was highly disturbed during the construction of the golf course. An image of the original ground disturbance in 1991 contrasted with the current condition is shown below.

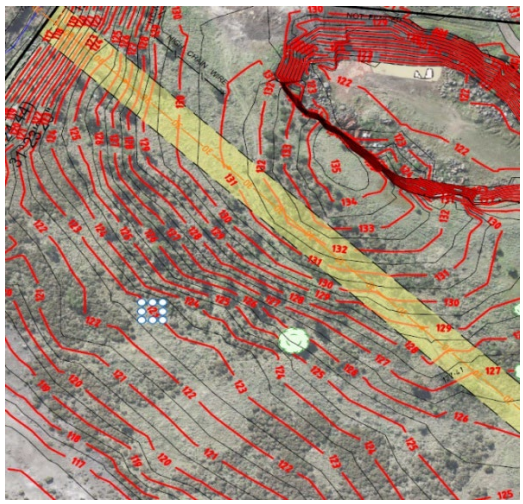
Ground Disturbance 1991

Current Condition 2022

Locating new habitat in this area provides the opportunity to create new habitat for the local Growling Grass Frog Community, in an area that would usually be constrained by cultural heritage sensitivities.

DEECA's review also requested consideration of a revised Scheme A that retained Patch A while reducing the impact on growling grass frog habitat within the ESO. A review concluded that, due to the steep gradient of the land in this area of the site, the change in road alignment would result in excessively high retaining walls (up to 12 meters) along the majority of the interface with the conservation area. After considering all the information provide DEECA provided endorsement of the proposed strategy for the site in November 2023.



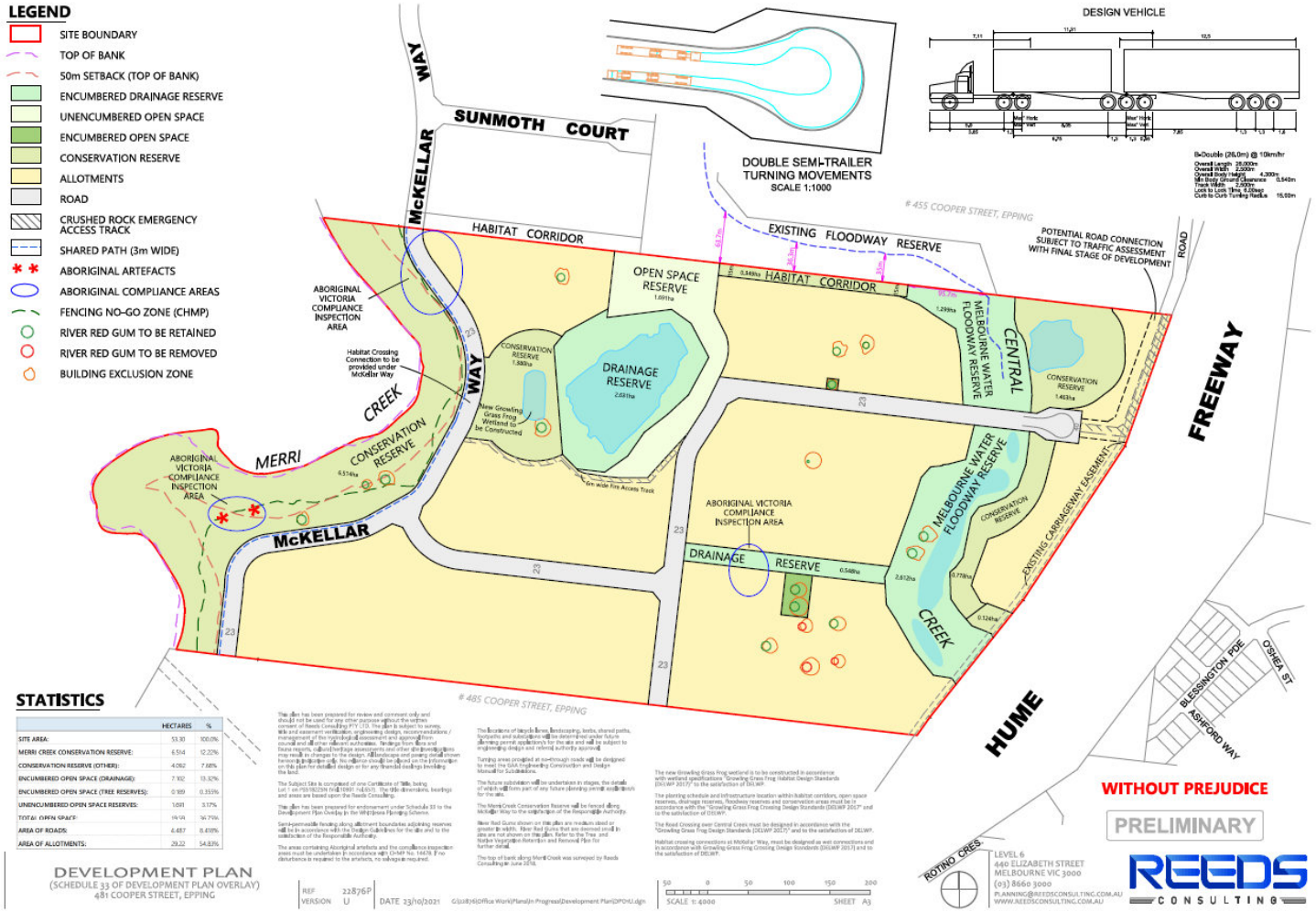


Conclusion

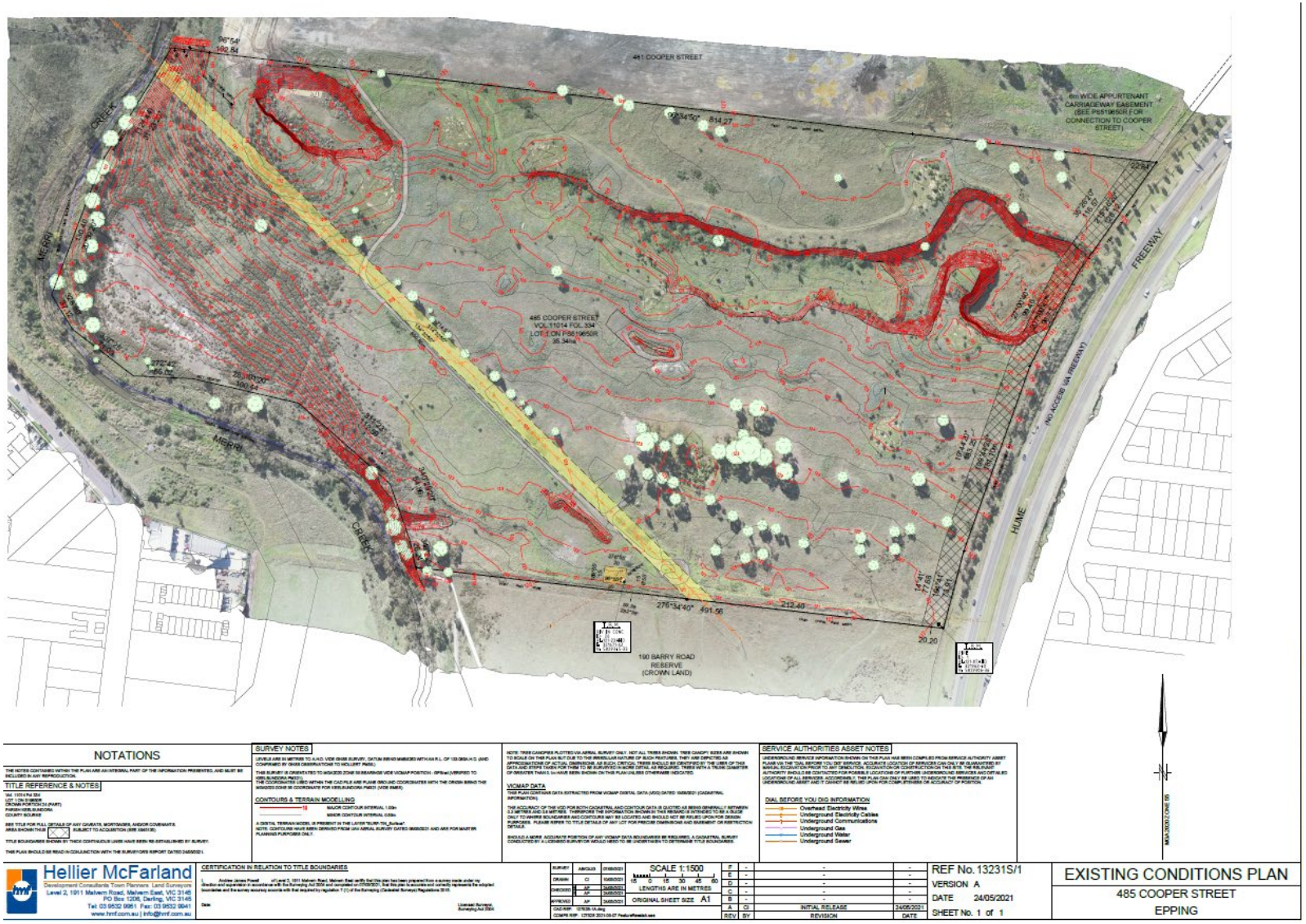
A number of schemes for the proposed development have been created in response to the regional strategic level planning, the development plan overlay, site assessments and extensive consultation with local authorities. The proposed scheme, Scheme D, and supporting conservation management plan, result in a net gain in native vegetation on site through prioritising the preservation and rehabilitation of the Environmental Significance Overlay, over isolated patches of vegetation to the east of the site. Following the multiple amendments made to the plans no feasible opportunities exist to further avoid and minimise impacts on native vegetation without undermining the key objectives of the proposal.

Appendix I – Site Concept Plan

Appendix II – 481 Cooper Street Development Plan

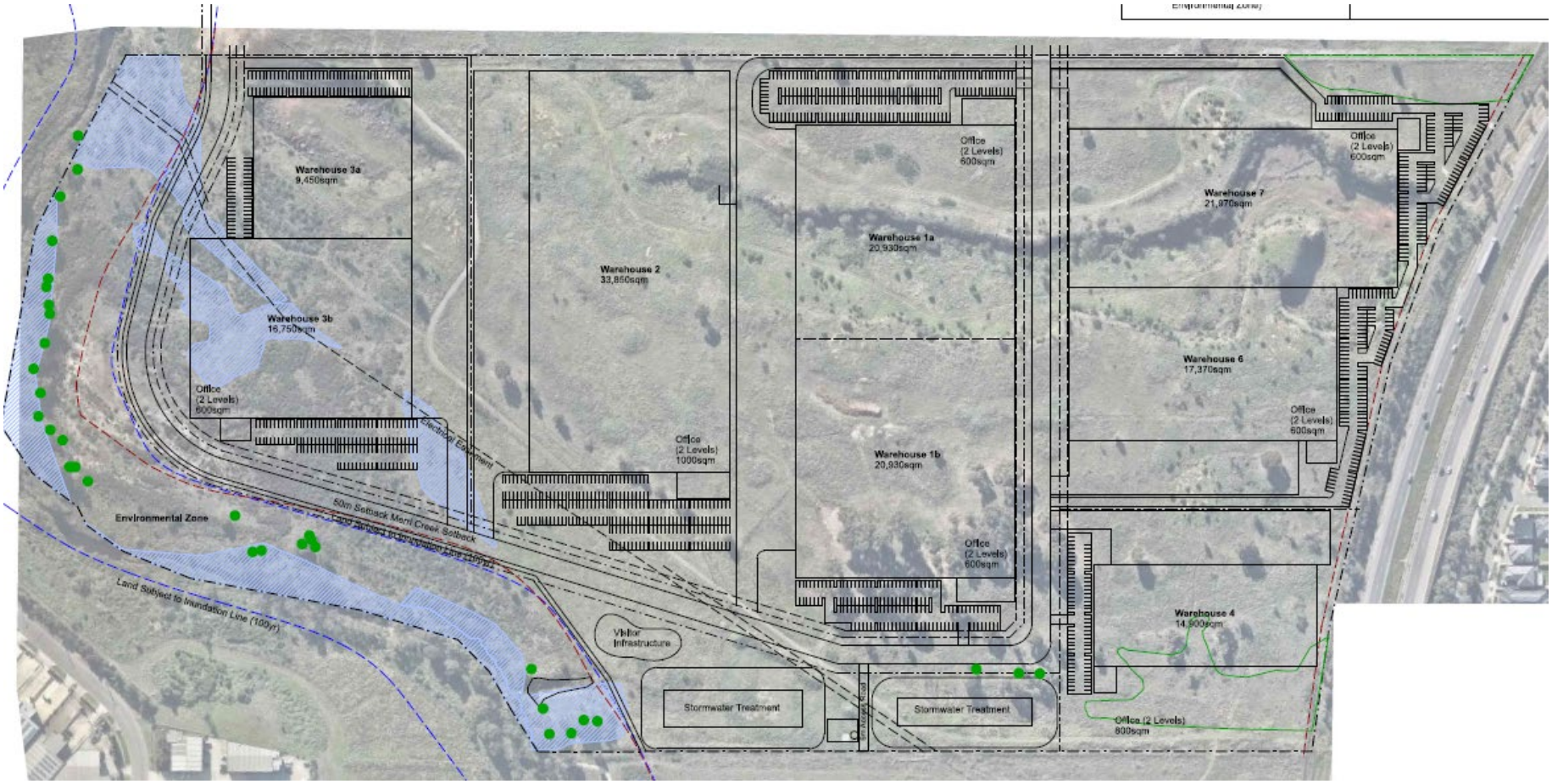


Appendix III – Site Survey

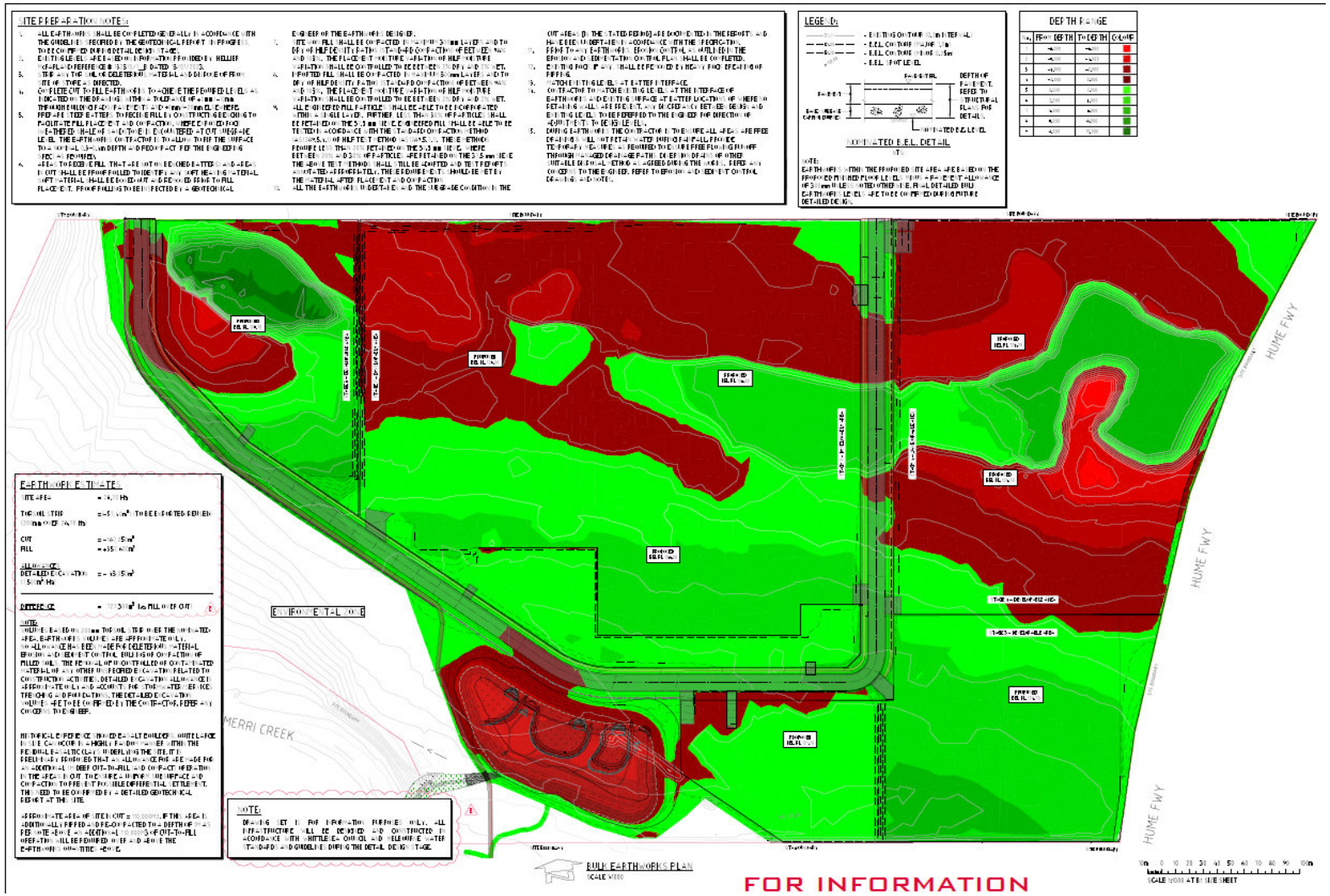


Appendix IV – F&F Overlay

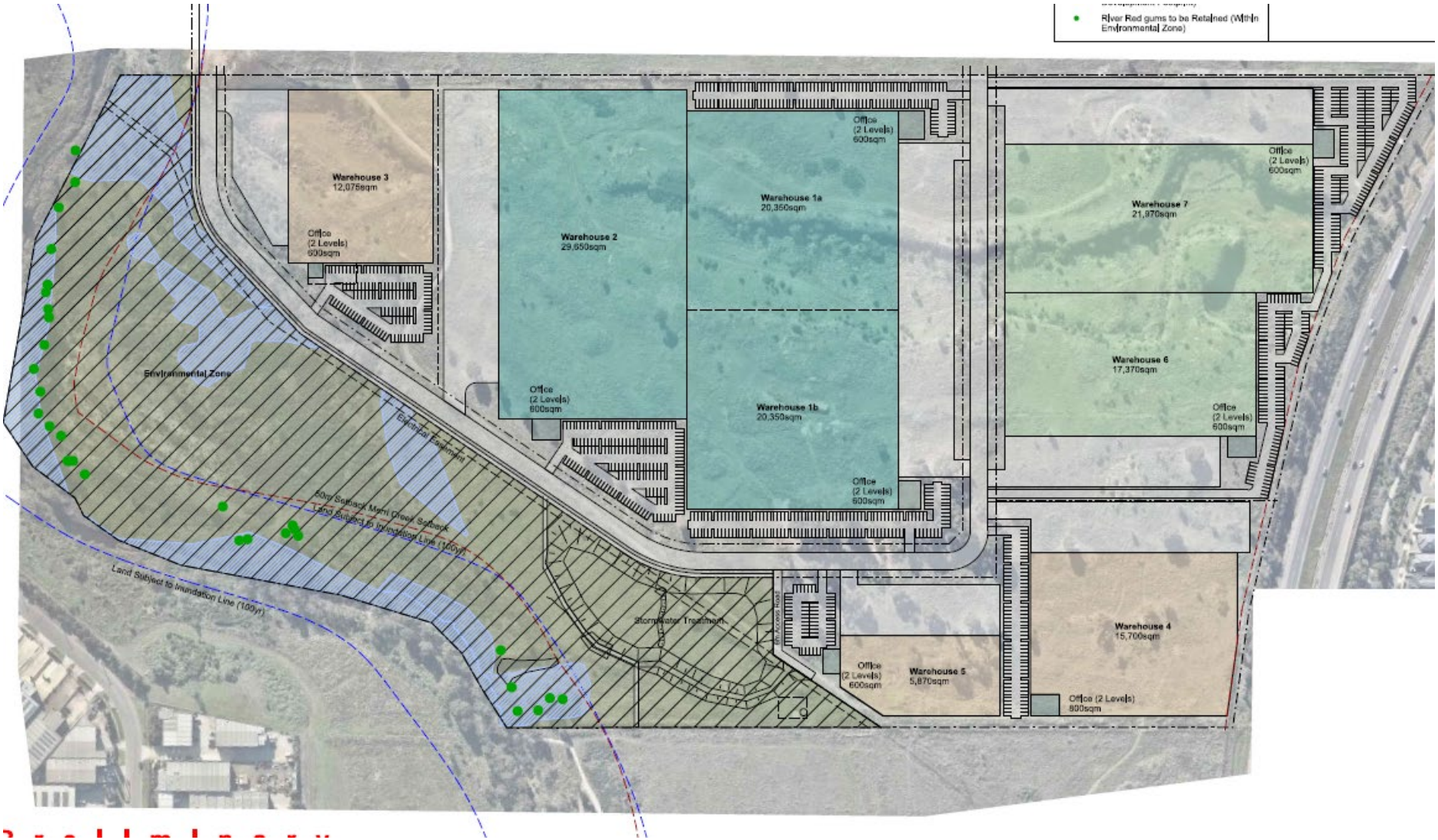
Appendix V – Scheme A



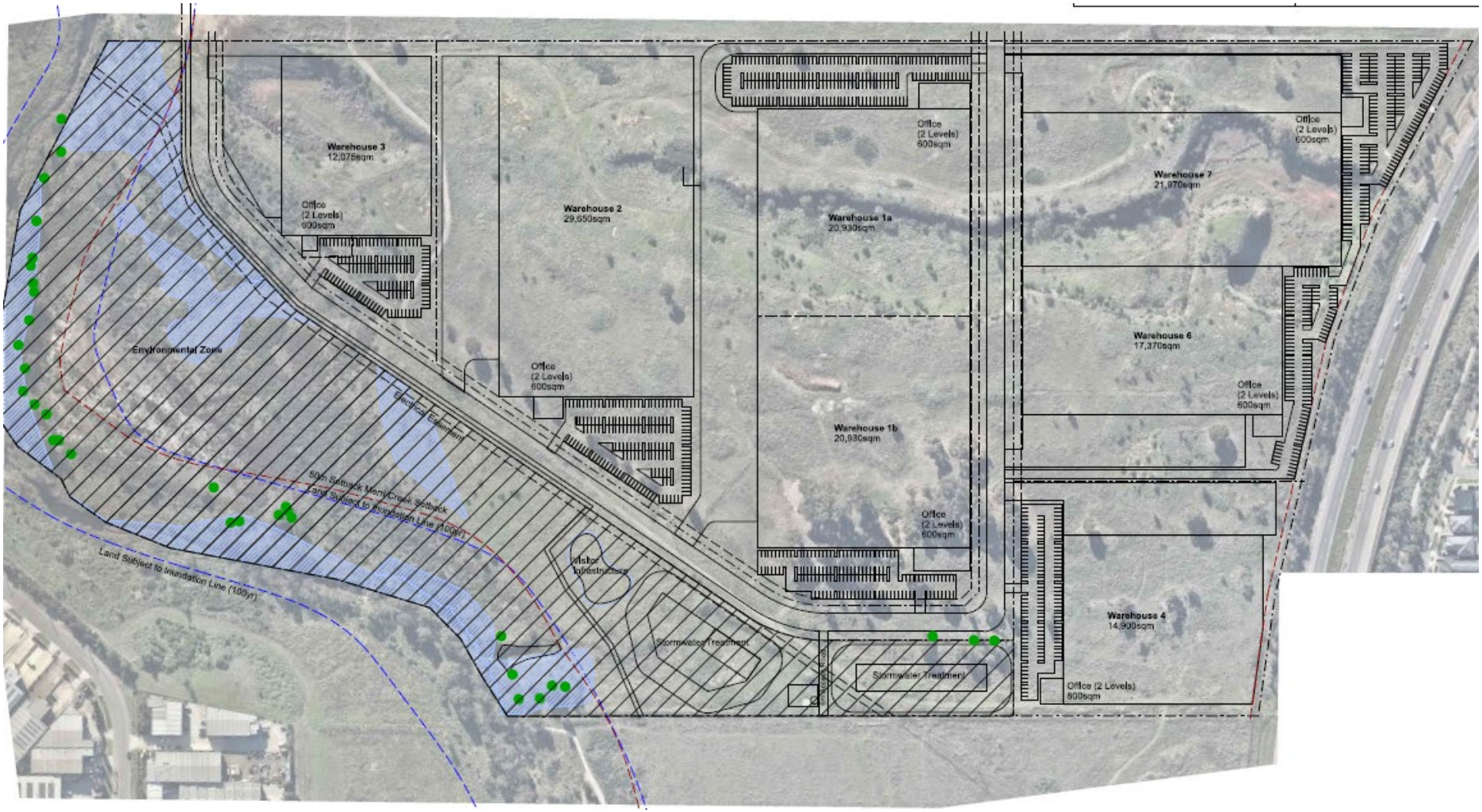
Appendix VI – Bulk Earthworks Plan



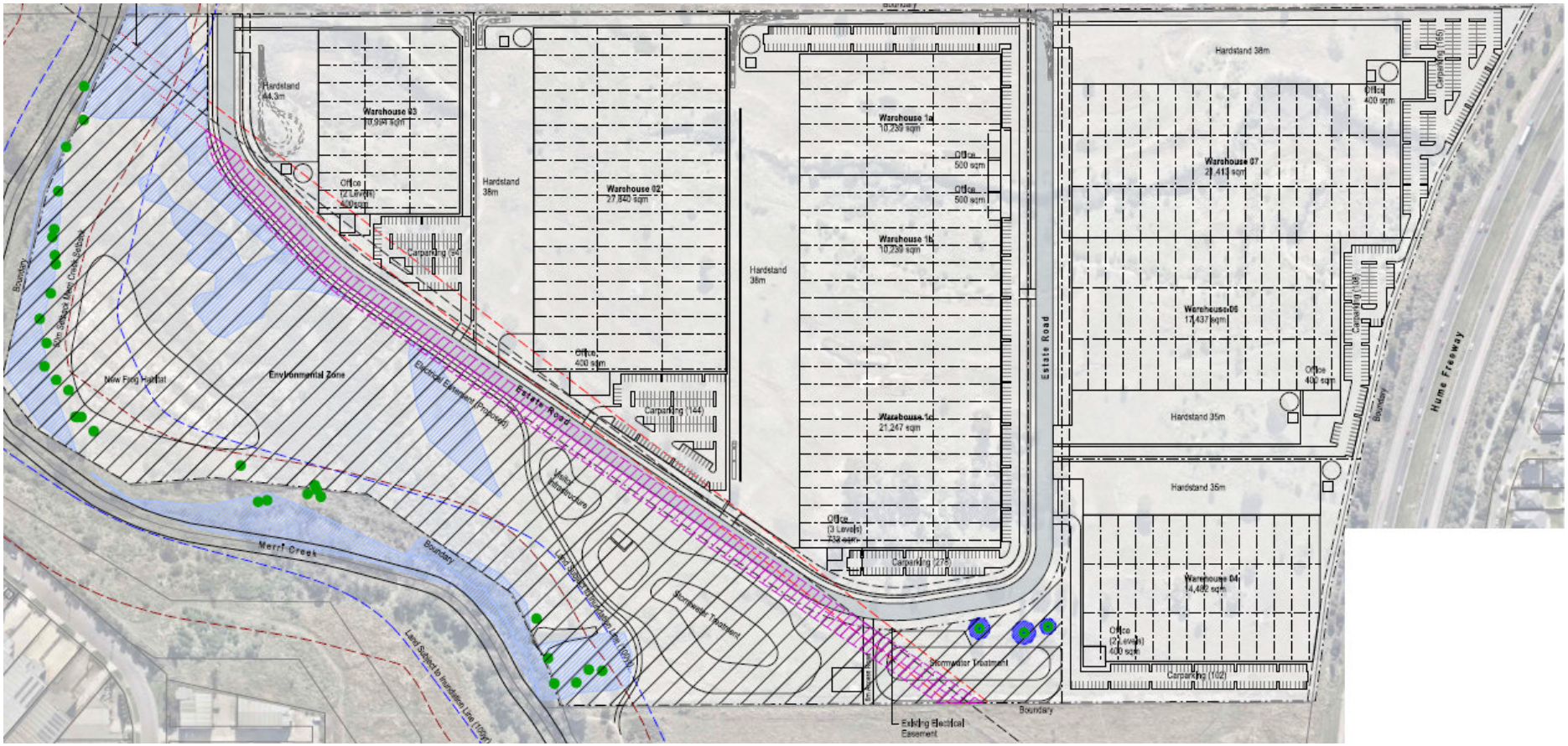
Appendix VII – Scheme B



Appendix VIII – Scheme C



Appendix IX Scheme D



Appendix X – Historical Site Conditions

Aerial Imagery 1974

485 Cooper Street, Epping, VIC 3076

Aerial Imagery 1981

485 Cooper Street, Epping, VIC 3076

Aerial Imagery 1991

485 Cooper Street, Epping, VIC 3076

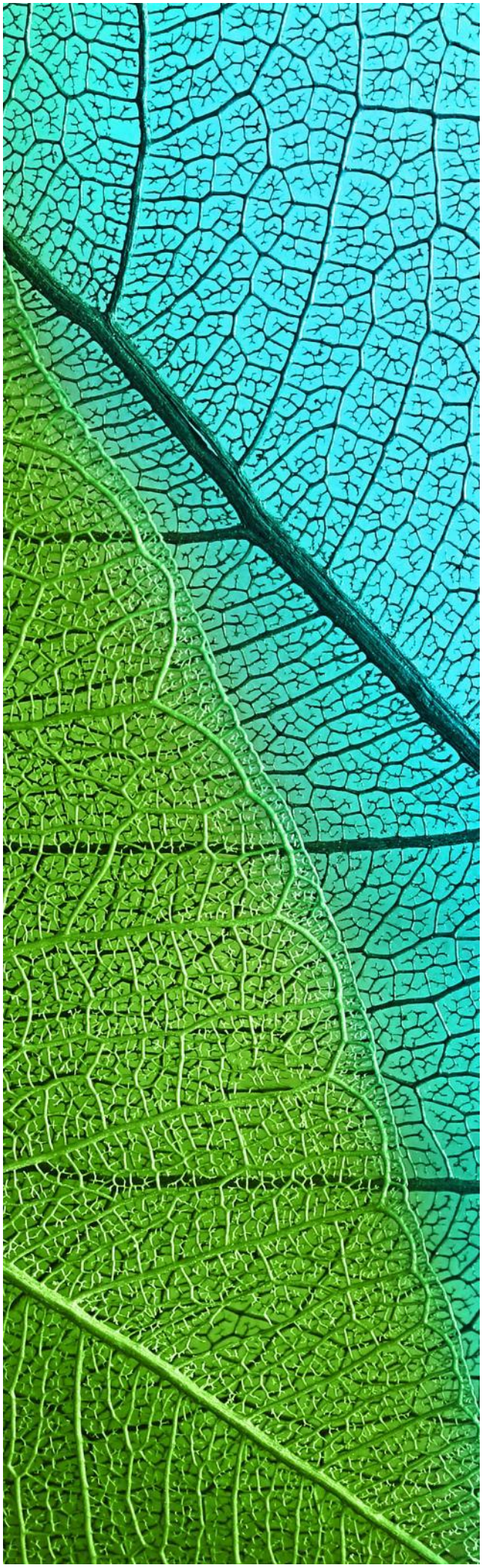
Aerial Imagery 2001

485 Cooper Street, Epping, VIC 3076

Aerial Imagery 2009

485 Cooper Street, Epping, VIC 3076

Appendix XI – Conservation Management Plan



485 Cooper Street, Epping

Conservation Management Plan

Prepared for
The GPT Group

June 2023
Report No. 22076.5 (1.2)

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1. Introduction

The GPT Group engaged Nature Advisory Pty Ltd to produce a Conservation Management Plan (CMP) for a section of a 35-hectare area of private land at 485 Cooper Street, Epping. The area investigated, referred to herein as the 'conservation area or study area', is an approximate 10.3-hectare area in the western section of the property comprising Merri Creek and the riparian vegetation within the property, rocky escarpments adjoining the creek, as well as woodland and grassy woodland adjacent the creek (Figure 1). This Conservation Management Plan (CMP) has been prepared to satisfy the permit condition for the Development Plan Overlay (DPO33), as well as, address decision guidelines of the Environmental Significance Overlay (ESO3) and the River Red-gum Protection Policy (Clause 22.10) that apply to the study area.

Nature Advisory Pty Ltd undertook a detailed native vegetation assessment of the study area in August of 2022, during which the extent and condition of native vegetation was identified, and the expected impacts resulting from the proposed development were calculated. A subsequent assessment was conducted in February 2023 to identify ecological values and threats within the conservation area to inform this management plan.

The primary objectives of this CMP are to protect the following matters of environmental significance identified in the area:

- The Merri Creek corridor and Growling Grass Frog (GGF) habitat;
- Remnant River Red-gum trees; and
- Remnant grassland and woodland with the potential to support listed maters such as the Matted Flax-lily.

The conservation area will be managed by the land holder until ownership and management is handed over to the responsible authority.

This plan aims to prescribe management requirements of threats including weeds, pests, biomass, erosion, habitat decline, fencing, lack of natural regeneration and fauna management. Furthermore, it aims to inform management of the area over a 10-year period and includes the following:

- A statement of methods used and sources of information consulted for the investigation, including any limitations, where applicable;
- Results of the review of existing information documenting biodiversity, ecological values and management requirements of the site and study area;
- A list of weed/flora species and habitat values identified during the site survey and identification of key threats to ecological values in the study area;
- Maps of the study area showing the ecological values to be conserved, threats and relevant management measures;
- Construction environmental mitigation measures to ensure protection of the environmental values within the conservation area during construction works for the adjacent development; and
- Table of appropriate management actions required.

This Conservation Management Plan (CMP) is designed as a comprehensive framework, setting specific conservation goals for each management zone along with weed control and revegetation targets. It outlines the recommended management techniques to meet these targets. The Plan is created to be dynamic and adaptable, allowing for both planned and impromptu modifications as needed, especially in response to insights gathered by bushland contractors in the field. This flexibility ensures the CMP remains relevant and effective in the face of changing environmental conditions and evolving

conservation needs. The implementation of this CMP must commence immediately upon its approval by the Responsible Authority (City of Whittlesea).

This plan was developed in consultation with Merri Creek Management Committee and prepared by a team from Nature Advisory comprising Merinda Day-Smith (Botanist & Project Manager), Emma Wagner (GIS Analyst) and Cara Cappelletti (Ecologist & Project Manager).

2. Environmental values and threats

2.1. Site assessment method

A site assessment of the property was undertaken by Nature Advisory on 21st February 2023. This assessment aimed to document current environmental values and management issues within the study area, to inform the preparation of this report. During this assessment, the study area was surveyed on foot.

All weed species encountered in the study area were recorded and sites found to support high-threat weeds were mapped using ArcGIS Field Maps (accurate to approximately five metres).

Detailed information about native vegetation and listed flora and fauna values on site was detailed in a separate report, along with expected impacts and implications of the proposed development (Nature Advisory 2022).

Photos of the site are provided in Section 2.3 and 4.2. All photos provided in this plan were taken on 21st February 2023 with the aim of demonstrating the status of the environment in the study area at that time.

2.2. Site description

The property constituted approximately 35 hectares of private land located at land located at 485 Cooper Street, Epping, approximately 16.5 km north of Melbourne CBD and is approximately 500 m south of Quarry Access Road, 2.5km north of the Western Ring Road and is bordered by Merri Creek to the west and the Hume Freeway to the east. The conservation area is 10.3 hectares of the westernmost portion of the property, following the length of Merri Creek and adjacent vegetation.

The study area supports heavy basaltic soils on an undulating landscape sloping downward to Merri Creek which forms the western boundary of the property. The property was formerly part of a golf course, although little evidence of this former use remains. It is understood that the site has not been managed ever since, apart from wildfire mitigation slashing in areas. The surrounding area has since been developed into an industrial area to the west and north and housing to the east.

The conservation area is directly north of the Galada Tambor and Merri Creek Parklands which include the Barry Road Grasslands Reserve. This site provides crucial connectivity for the for the wider Galada Tambor and Merri Creek Corridor which is currently in the planning process of becoming a Regional Parkland (maram baba Parklands). As much of the surround land has been subject to urban and industrial development these parklands provide diverse habitats for protected flora and fauna, as well as provide a unique opportunity for visitors to connect to the natural environment. The Merri Creek corridor is an important indigenous cultural feature, and the conservation area is likely to support Indigenous Cultural Heritage Values.

Vegetation type varies across the conservation area. Riparian woodland vegetation was situated along the creek line comprising a moderate cover of River Red-gum, most immature. The riparian vegetation largely comprised indigenous Common Reed, other native aquatics like Common Ribbon-grass and the noxious weed Spiny Rush. Indigenous and introduced shrubs were scattered along the banks (e.g., River Bottle-brush, Woolly Tea-tree and Gorse) and ground cover was largely invasive grasses Toowoomba Canary-grass, Chilean Needle Grass and potentially Lobed Needle Grass, although some indigenous Tussock Grass was scattered throughout.

Steep rocky escarpments line the southern and northern portions of the creek supported escarpment shrubland comprising a mixture of invasive and indigenous shrubs. Native shrubs included Tree Violet, Sweet Bursaria, Lightwood and Hedge Wattle. Invasive shrubs included African Box-thorn, Common Prickly Pear, Hawthorn, Montpellier Broom, Sweet Briar and Gorse. The ground layer is dominated by

Toowoomba Canary-grass, Chilean Needle Grass and potentially Lobed Needle Grass with some small patch of native Kangaroo Grass. River Red-gum also grew atop the escarpment plateau.

The majority of the conservation area comprises undulating treeless grassland dominated by a dense cover of invasive shrub Gorse. Patches are co-dominated by Toowoomba Canary-grass and Chilean Needle-grass, as well as some herbaceous weeds or in some areas, native Kangaroo Grass and Spear Grass

Native Vegetation within the conservation area is represented by Riparian Woodland (EVC 641) along the Creekline corridor, Escarpment shrubland (EVC 895) situated on and atop the steep Creekline escarpments, and Plains Grassland (EVC 132_61) on the flatter plains and lower lying grassy areas.

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). The conservation area is currently partially zoned Industrial 1 Zone (IN1Z) and Urban Floodway Zone (UFZ) in the Whittlesea Planning Scheme. The following overlays are covering the conservation area:

Land Subject to Inundation Overlay (LSIO) – This overlay is considered irrelevant to the current investigation.

Environmental Significance Overlay (ESO3) – This overlay relates to the Merri Creek and Environs Strategy. The main objective of this overlay is to protect and enhance natural values and heritage of the Merri Creek corridor.

Design Plan Overlay (DPO33) – This overlay relates to the Cooper Street South-West Employment Area plan. Under this overlay, a Conservation Management Plan is required, identifying existing and future habitat links and communities of species identified in the Flora and Fauna Assessment Report (NA 2022). The relevant permit requirements are addressed in this report.

2.3. Environmental values

2.3.1. Merri Creek Corridor

The Merri Creek and its immediate surrounds are host to some of the most threatened ecosystems in Australia. The creek is vital in the preservation of threatened flora and fauna and the maintenance of vegetation communities in the surrounding area. The Merri Creek Corridor is under existing and increasing pressure from development and its associated issues. These include alterations to hydrological regimes, destruction of habitat, imposition of barriers to movement of fauna, reduction in water quality, increases in pest plant and animal threats and more. A key objective of the Conservation Management Plan (CMP) is the strategic management and restoration of native and non-native vegetation within the conservation area. The intent is to reflect the area's historic vegetation, enhancing ecological continuity, and ensuring the preservation of biodiversity. This will involve a combination of invasive species control, strategic revegetation, and ongoing monitoring to achieve a balance that more closely resembles the original ecosystem structure and function.

Golden Sun Moth

Golden Sun Moth (GSM) is listed as vulnerable under the EPBC Act and FFG Act. Conservation advice for the GSM has been prepared by the commonwealth (DAWE 2021). An action plan has been prepared for this species in Victoria (No. 106) (DSE 2004). Golden Sun Moths occur in temperate grasslands, once wide-spread over south-eastern Australia. The GSM is now restricted to fragmented populations across Victoria, NSW and ACT (DEWHA 2009). GSM populations have been restricted due to a number of environmental pressures and stressors but the main threats to the species survival and viability are habitat loss, degradation and fragmentation.

Potential habitat for the GSM exists within the conservation area in the open grassland areas. However, available grassland habitat is degraded and now dominated by weed species Chilean Needle Grass, Kikuyu and Grose. This CMP will aim to enhance GSM habitat by increasing native grass cover, particularly, Wallaby Grass, an important food source for the species and reducing weed cover to maintain an open tussock structure.

Growling Grass Frog

Riparian woodland along Merri Creek supported potential terrestrial and aquatic habitat for the Growling Grass Frog (*Litoria raniformis*), a species listed as vulnerable under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) and the *Flora and Fauna Guarantee Act 1988* (FFG Act). Main threats to the species are habitat removal or disturbance, degradation, fragmentation and pollution, infection from Chytrid Fungus, and predation from introduced fauna. Targeted surveys were undertaken on site and did not detect the species. Notwithstanding this, there may be opportunity for the species to move into the site in the future. This CMP will incorporate management strategies from the *Guidelines for managing Growling Grass Frog in Urbanising Landscapes* (DSE 2010) to preserve and enhance habitat for GGF and other native fauna species, as well as enable the maintain the continuity of the Merri Creek corridor.

River Red Gum Protection Policy

This policy recognises the visual and environmental importance of River Red-gum trees as a part of the open plains grassland within the Whittlesea municipality and that they are under threat from surrounding encroachment of urban development. This policy aims to protect important River Red-gum impacted by development and requires the retention of important trees where possible.

The conservation area supports many young and a few large River Red-gum trees along the creek corridor Riparian Woodland and at the top of the escarpments within Escarpment Shrubland. This CMP will protect and retain all the River Red-gum trees within the habitat area as well enhancing habitat through weed management and mitigating threats.

Native vegetation

The conservation area supports the following native vegetation (Figure 1):

- 1.4 hectares of Riparian Woodland (EVC 641);
- 1.03 hectares of Escarpment Shrubland (EVC 895); and
- 0.726 hectares of *Heavier Soils* Plains Grassland (EVC 132_61).

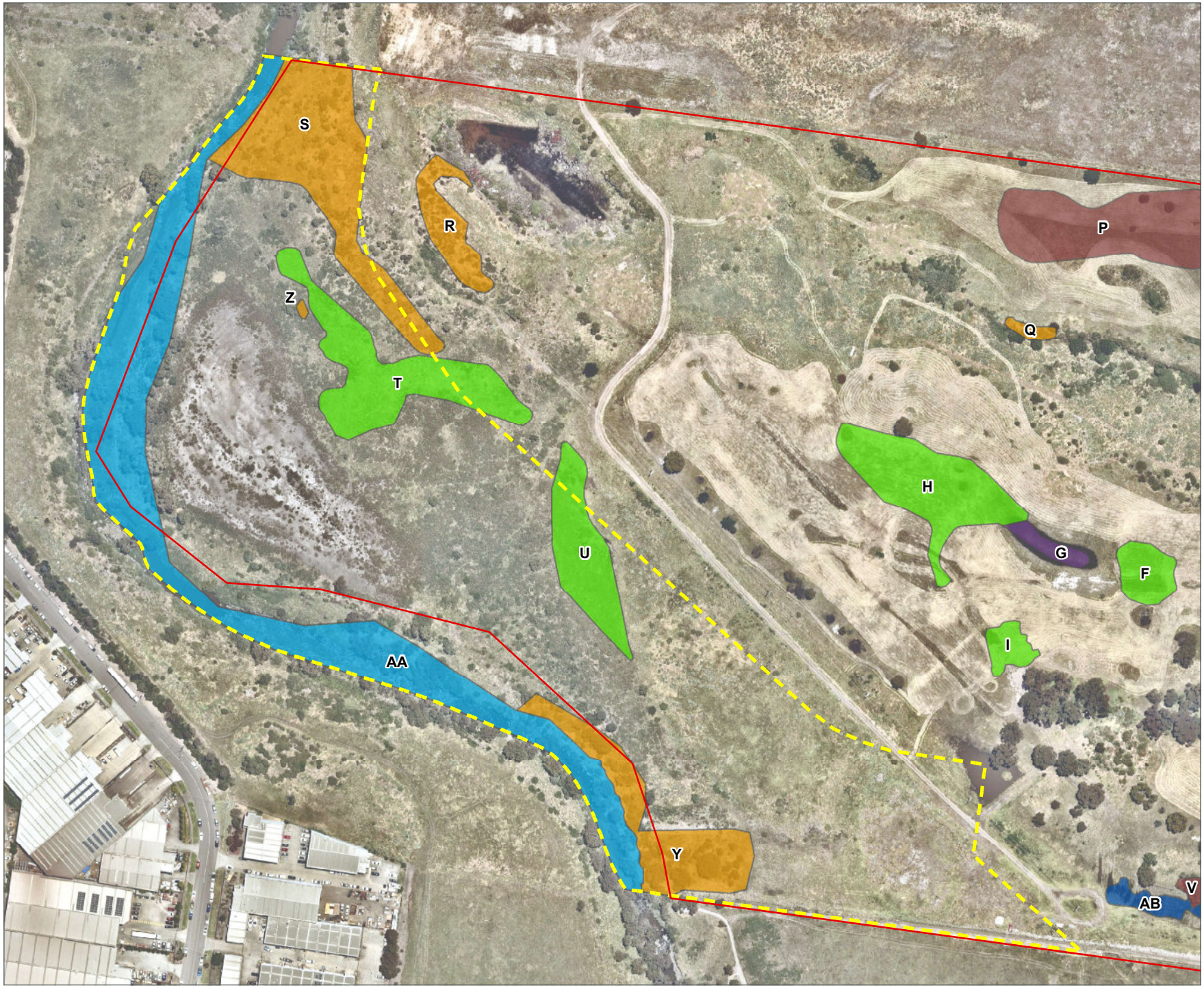

Figure 1: Conservation area and native vegetation

Project: 485 Cooper Street, Epping
Client: The GPT Group
Date: 23/03/2023

Property boundary
Conservation area

Native vegetation

- 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)

N

Metres
0 50

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2.4. Management issues and threats

The following sections describe current threats to environmental values in the conservation area and how these can adversely affect environmental values within the conservation area. The management strategy designed to respond to these threats is outlined in Section 4 and 5.

2.4.1. Weeds

High-threat weeds pose a significant risk to native vegetation within the conservation areas. Many of these species are currently out-competing indigenous species across the conservation area and will continue to do so if left untreated. Location and extent of high-threat weed species are shown in Figure 2.

A high-threat weed is determined as any of the following:

- All woody weeds;
- Declared noxious weeds under the CaLP *Act 1994*;
- Species listed as a serious or priority weed by Whittlesea Council (2022);
- Any other weed deemed to be high-threat due to the potential risk the species poses to the surrounding landscape; or
- Weeds not otherwise accounted for above that are on the *Advisory List of Environmental Weeds* (DELWP 2018) and occurred above a negligible cover.

Weed cover was extensive across the conservation area mainly comprising high threat woody weeds Gorse, Hawthorn, Sweet Briar, Montpellier Broom and Prickly Pear. High threat grassy weeds were also prevalent across the conservation area largely comprising Toowoomba Canary Grass and Chilean Needle-grass.

An infestation site comprises the following:

- The location of a woody weed; or
- A defined area or the location of an herbaceous high-threat weed.

Land managers are required to meet the obligations under the CaLP Act regarding preventing the growth and spread of regionally controlled weeds.

Fifty-seven weed species were recorded during the field study (Appendix 2), of which 17 were woody or high-threat herbaceous weeds and 14 species listed under the CaLP Act.

High-threat weed infestation sites were recorded across the entire the study area, all of which contained at least one CaLP-listed weed.

A priority weed of concern is Lobed Needle Grass listed as Prohibited under the CaLP Act. Prohibited weeds are controlled under the management of the DEECA and must be reported immediately if detected. This species was not detected during the most recent survey although it has observed within the conservation area previously by the Merri Creek Management Committee (MCMC). Further surveying will be conducted to confirm the presence and extent within the conservation area. If this species is confirmed on site, it will be reported to DEECA and weed control efforts will be increased to eliminate this species on site.

With the exception of Lobed Needle Grass, weeds of highest concern within the study area are Gorse, Toowoomba Canary-grass and Chilean Needle-grass. These species are currently densely covering the majority of the study area, out-competing indigenous species and will continue to do so if left untreated. This threat also applies to the remnant scattered trees, under which there is currently a lack of natural regeneration, inhibited by the high biomass of high threat weeds.

Other weed species that pose the highest risk within the property include Sweet Briar, African Boxthorn, and Spear Thistle.

Weed control methods are discussed in Section 4.6.2.

2.4.2. Biomass

The bank of Merri Creek is largely comprised of a thick cover of Toowoomba Canary-grass and Chilean Needle Grass. Scattered occurrences of native species occur throughout this section of the study area. At the current levels of cover, the invasive grasses are out competing native species and not providing inter tussock space, which is crucial to the functionality and biodiversity values of grassland vegetation. In addition to this, high grass biomass on the bank of Merri Creek forms inappropriate habitat for GGF as it decreases mobility of the species. A reduction in biomass will allow for the recruitment or spread of natives and increase the quality of GGF habitat. Measures for the controll of grassy biomass are outlined in Sections 4.6 and 5.3.

Photo 1. High biomass of Toowoomba Canary-grass on Merri Creek.

2.4.3. Pest animals

Evidence of both rabbits and foxes were observed within the conservation area via scat. Rabbits pose a risk to the native vegetation throughout the conservation area through overgrazing and digging around roots. Furthermore, rabbits can cause soil erosion, establishment of opportunistic weeds and high numbers of foxes. Foxes are a threat to native wildlife in general, including preying on frogs, lizards and native mammals.

Eastern Grey Kangaroos have been recorded in high numbers within and around the property suggesting the area is a highly utilised corridor for this species. While care needs to be given to facilitate free movement across the corridor, herbivory from kangaroos can be a significant threat to revegetation efforts. A detailed plan for the management of kangaroos across the entire site is address in a separate Eastern Grey Kangaroo Management Plan.

Pest animal control methods are discussed in Section 4.5.

2.4.4. Rubbish

A moderate amount of rubbish was observed within the conservation area. Rubbish can reduce the amount of space available for regeneration of native vegetation within the study area. Furthermore, it can act as harbour for pest animals such as rabbits.

Rubbish found in the conservation area consisted of list household waste, materials from construction, dumped fill, polystyrene and plastic, etc, mostly occurring from the recent flooding. Examples of some of the rubbish observed within the conservation area are shown in photos below. Locations of rubbish are shown in Figure 2. Removal of rubbish is discussed in Section 4.2.1.

Photo 2. Examples of rubbish in conservation area

2.4.5. Unauthorised/inappropriate access

Unauthorised access to the conservation area poses risks to the conservation values, both during the construction phase of future development (i.e. by construction work personnel, equipment and activities) and during the post-occupancy phase. Unauthorised or inappropriate access may lead or has led to destruction or degradation of health of environmental values through:

- Habitat destruction and soil compaction;
- Weed invasion;
- Introduction of pests and diseases; and
- Dumping of rubbish.

The property is currently fenced off from public access, however the conservation area will require fencing for protection throughout the construction phase and a permanent delineation of the conservation area through the use of bollards to limit access in the future to pedestrian foot traffic only.

Inappropriate and broken barb wire fencing was recorded within the conservation area along the bank of Merri Creek. This fencing will have to be removed to ensure native fauna is not harmed. Sections 4.4 and 3.2 discusses fencing requirements.

Photo 3. Inappropriate barb wire fence inside conservation area

Figure 2: Existing threats

Project: 485 Cooper Street, Epping
Client: The GPT Group
Date: 27/03/2023

- Property boundary
- Conservation area

Weed infestations

- Artichoke Thistle, Chilean Needle-grass, Galenia
- English Ivy
- Gorse
- Hawthorn
- Kikuyu
- Phalaris
- Phalaris and Chilean Needle-grass
- Toowoomba Canary-grass, Gorse, Sweetbriar
- Blackberry
- Common Prickly-pear

Other threats

- Rubbish

N

Metres
0 50

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3. Construction environmental management measures

The following mitigation measures will be put in place to ensure no adverse impacts occur to the environmental values in conservation area from the adjacent construction works. A full report addressing environmental threats relating to construction including, sediment and dust control, water quality control and contamination for the entire site is addressed in a separate Construction Environmental Management Plan (CEMP).

These mitigation measures refer specifically to the construction area and are to be undertaken alongside management actions relating to the conservation area outlined in Section 4.

Detailed construction environmental management actions are provided in Appendix 1. Compliance indicators are provided to enable monitoring of the success or failure of these actions. Management actions are to be reviewed and adapted if the associated compliance indicators are not being achieved.

All construction contractors must be inducted into the content of this chapter prior to accessing the site for the first time.

3.1. Erosion control

3.1.1. Stockpiles

If soil is stockpiled, the capture and trapping of sediment runoff should be managed to prevent any runoff with use of adequate sediment barriers.

3.1.2. Construction sites

Diversion swales /cut off drains should be installed above the construction site to minimise runoff through the construction site. Cut-off drains should not flow directly into reserve but be distributed by outfall drains, which dissipate energy and minimise erosion; the use of a silt trap may also be necessary.

3.1.3. Sediment fencing

Sediment fencing must be installed on the downward slope of the site between the bioretention basin construction footprint and the conservation area. The following measures must be undertaken to ensure that indirect impacts to native vegetation and waterway are avoided:

- All earthworks must be undertaken in a manner that will minimise soil erosion and adhere to Construction Techniques for Sediment Pollution Control (EPA 1991).
- No stormwater, runoff or wash-water can leave the site during the construction phase without being retained and treated to the Best Practice Environmental Management Guidelines for Urban Stormwater, 1999 (BEPM). These requirements are outlined in the CEMP. EPA construction guidelines are provided below in Figures 3 and 4 (EPA 2004).

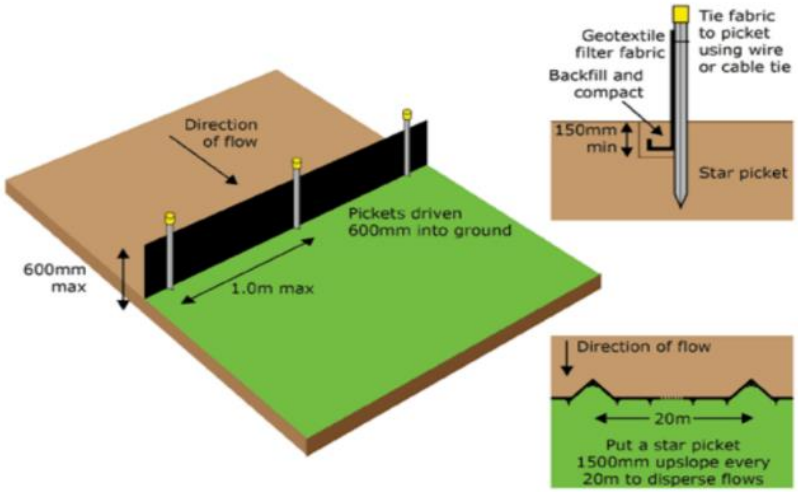

Figure 3: EPA guidelines for sediment fencing construction

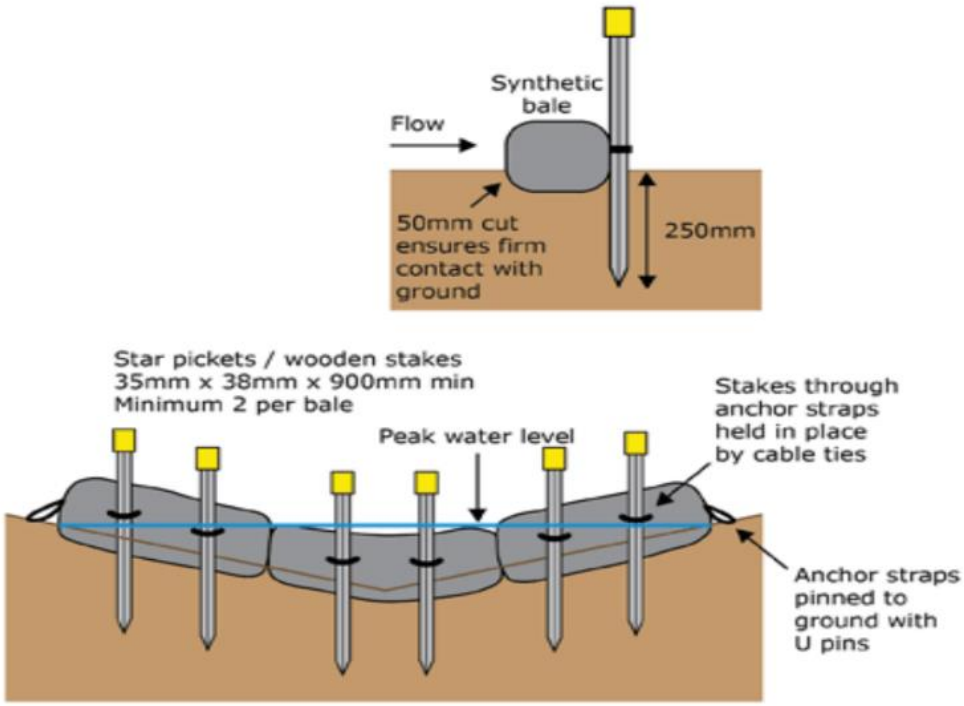

Figure 4: EPA guidelines for synthetic bale sediment control construction

3.2. Frog exclusion fencing

Temporary frog exclusion fencing may be required to deter frogs from entering construction impact zones. It is requirement that the fencing is upgraded to frog proof fencing where the area of works encroaches within 20 metres of permanent waterbodies. All construction is occurring more than 20 meters from any permanent waterbodies and does not require frog exclusion fencing. Frog fencing requirements for areas outside of the conservation area will be addressed in the CEMP.

3.3. Clean-down location

Establishment of a clean-down area must be incorporated prior to the commencement of works. This area must be selected based on the following criteria:

- In close proximity to site access/egress;
- At least 30 metres away from waterways, drainage lines or wetlands;
- Avoid areas of native vegetation and Tree Protection Zones; and

- Be bunded to prevent sediment run-off.

As such, the clean-down area will be located at the entry/exit of the site on northern boundary, outside of the conservation area, as the vegetation is devoid of native species and represents the current point of entry to the property.

A layer of gravel is to be used to minimise mud and improve drainage.

Signage indicating the clean-down area must be clearly visible and include suitable instructions to works staff, particularly those leaving the site.

Waste collected from clean-down bays must be managed on site by burying the waste below the topsoil. Care must be taken to prevent discharge off site to waterways and drainage.

3.4. Clean-down procedures

All site personnel must be inducted into this section of the plan and given instructions of the location of and how to use the clean-down area.

A logbook must be kept on site and all personnel who use this facility must sign in, declaring the machinery/vehicle to be free from weed propagules (Appendix 5).

The clean-down area must provide facilities for adequate washdown of machinery and vehicle exteriors. These facilities should include a high-pressure water hose and manual implements such as brooms and brushes, which can also be used to clean contaminated footwear.

All vehicles, machinery and plant entering or exiting the construction site must be examined and cleaned of mud, vegetation and seeds before entering the site and upon leaving. Particular attention must be made to critical areas of contamination commonly associated with earthmoving and other construction vehicles, as illustrated in Appendix 3.

3.5. Biosecurity

Construction personnel must reduce the potential for the spread of Chytrid Fungus (a lethal pathogen of frogs), weed seeds and other pathogens by implementing biosecurity controls:

- Installing rumble grids and brush/washdown stations to remove soil/plant material from vehicles, equipment and/or footwear that are not free of soil/plant material as they enter and exit the site.
- Sourcing fill material (if required) from a reputable company.
- Cleaning rumble grids and washdown/brush areas of mud and debris as required.
- Designating susceptible water waterways as ‘no go’ zones with work prohibited unless approved by the SER. If works are approved by the SER, then:
    - Machinery and plant must be free of mud and debris.
    - Personnel must disinfect hands, boots/shoes and any other clothing that has contacted water, mud or damp soil with Phytoclean or similar fungicide
    - The use of Phytoclean should be at least 10 metres from waterbodies, and no risk of draining to waterbodies to minimise the risk of chemical contamination.
- Including a requirement for new plant and machinery to be free of (weed seed and pathogen free) prior to arrival on site in the plant pre-acceptance checklist. Vehicles and soil contamination zones must be sprayed with Phytoclean upon arrival to site. Works on site must not commence until this checklist is complete.
- Maintaining a register that includes details such as date, personnel and equipment approved to enter the ‘no-go’ zone.

- Contain waste from rumble grids and washdown stations to prevent contaminants entering waterways.
- Seek Melbourne Water approval to discharge water into any tributary.

If Lobed Needle Grass is recorded on site these measures will be adjusted where required in consultation with DEECA to ensure the biohazard is contained.

For the purposes of this report, it is assumed pathogens like Chytrid fungus are present on site within relevant dams, waterways and tributaries.

3.6. Weed control and monitoring

The aim of weed control in the construction area is to prevent the spread of high-threat weeds from within the study area into the conservation area. A separate Weed Management Plan has been prepared to address weed control within the developable area and outside the conservation area (Nature Advisory 2023). A wash-down facility must be situated on site and any fill material that enters the site must be monitored. Location and details are outlined in the Construction Environmental Management Plan (CEMP).

4. Conservation Area Management Plan

The following sections describe the management strategy to be undertaken for the 10-year period that will commence upon approval of the CMP. A summary of management actions is provided in Table 4.

A baseline survey was undertaken by a botanist from Nature Advisory as part of the preparation of this report. This survey determined the status of the environmental values and management issues within the conservation area. Weed cover estimates were also recorded and are provided in Table 2.

Weed control and revegetation works are key management action and are outlined in detail in Section 4.6.2 and Section 6 respectively.

4.1. Security and management responsibility

The CMP is secured to the title and the property will be managed in the lead up to, during and post construction, and for the duration of this plan by the landholder or titleholder.

4.2. Management zone overview

The conservation area has been divided into five zones (Figure 3) as detailed in the following sections. Each zone will be prescribed different management actions and revegetation works. These zones and objectives are summarised below.

Management Zone 1

MZ1 pertains to the Riparian Zone of the Merri Creek. This zone is identified as supporting moderate quality remnant native vegetation that aligns with the Riparian Woodland (EVC641). Assessment has shown that canopy vegetation for this zone is relatively well represented in diversity and cover but the understorey is dominated by dense exotic grass, namely Toowoomba Canary-grass and the shrub layer largely comprised woody weeds. This zone is important as an integral part of the Merri Creek corridor, supporting the movement of the Growling Grass Frog and other aquatic fauna. The management objectives for this zone are to improve the habitat values for the Growling Grass Frog and other fauna in consultation with the *Growling Grass Frog Habitat Design Standards* (DELWP 2017) by sensitively reducing the cover or biomass of the exotic grasses, replacing with appropriate native grasses; managing woody weeds; introducing other habitat elements that are beneficial to fauna of the Merri Creek and managing pest animals which may prey on sensitive fauna. As this zone is also subject to flooding, periodic litter removal and monitoring for new and emerging weeds will require ongoing action. This plan will outline recommendations for management of this zone however, MZ1 lies largely outside the property boundary, therefore ongoing management decisions will ultimately be determined in consultation with Melbourne Water.

Photo 4. Riparian zone of Management Zone 1.

Management Zone 2

MZ2 is represented by moderate quality Escarpment Shrubland (EVC 895) in the northern and southern sections of the Conservation Area and the lower lying grassland adjacent to the Creekline corridor dominated by grassy weeds and small patches native grasses. Escarpment areas are represented by a diverse native shrublayer comprising Lightwood, Tree Violet, Sweet Bursaria and Drooping Sheoak. The understorey is largely dominated by woody weeds Gorse, Prickly Pear, Montpellier Broom and African Boxthorn, and grassy weeds Toowoomba Canary-grass, Chilean Needle Grass and potentially Lobed Needle Grass. The grassland area is dominated by Toowoomba Canary Grass, Chilean Needle Grass and Gorse. Scattered occurrences of native grasses (Kangaroo Grass, Spear Grass and Wallaby Grass) and native herbs (Tufted Bluebell, Native Flax and Ruby Saltbush) indicates a native seed bank could persist in the soil. The goal for this management area is to enhance existing native vegetation through the elimination of the high-threat woody weeds and reduction of grassy weeds and biomass cover. Management of this zone will largely involve replacement of woody weeds using medium and large native shrubs as habitat for local mammal, reptile and bird species.

Photo 5. Exotic grassland (MZ3) with Escarpment Shrubland (MZ2) in background.

Photo 6. Marginal native grassland in Management zone 2.

Management Zone 3

MZ3 is a large area that historically supported native grassland. It is now overrun by thick swathes of Gorse and patches of introduced weedy grasses. There is evidence of native grasses persisting in the seedbank through the scattered occurrences of Kangaroo Grass and Spear Grass underneath the Gorse infestations. The objectives of this management zone will focus on the restoration of the existing native grassland and surrounding areas. There is opportunity to enhance this zone through selective weed control, particularly Gorse, and potentially fire management (where appropriate), followed by revegetation in order to re-establish the EPBC Act listed community, NTGVVP. Although this is not a legislative requirement to restore this area to NTGVVP quality and will not be used to achieve a net

gain, rehabilitation of this area will aim to compensate for removal of this community within the developable area.

Photo 7. Gorse densely populating most of Management Zone 3.

Management Zone 4

MZ4 relates to the proposed frog wetland area. This area was historically intensively scraped and is depauperate of flora, native and non-native. Revegetation of this zone will aim to provide potential habitat for Growling Grass Frog and includes ponds and foraging areas, as well as potentially creating a habitat linkage for GGF between the wetland and the creek. This zone will be designed in accordance to the GGF habitat design standards and lopped trees and boulders from civil works will be recycled to create habitat where possible. The detailed design for this zone is beyond the scope of the current investigation and will be addressed in a separate Wetland Design Plan.

Photo 8. Scrapped grassland where potential GGF wetland is proposed.

Management Zone 5

This management zone is the proposed site of a stormwater retention basin. The proposed area currently lacks native vegetation. The design of the retention basins will be outlined in the stormwater retention design plan.

Photo 9. Area of proposed stormwater retention basin.

4.2.1. Adaptive management

This CMP is designed to be highly dynamic. It provides informed recommendations tailored to the current condition of the site. If site conditions are to change or a management practice has proven to be unsuccessful or inappropriate, methods can be subject to change through consultation with important stakeholders such as, but not limited to the Merri Creek Management Committee, Wurundjeri Woi-wurrung Indigenous Group and Melbourne Water.

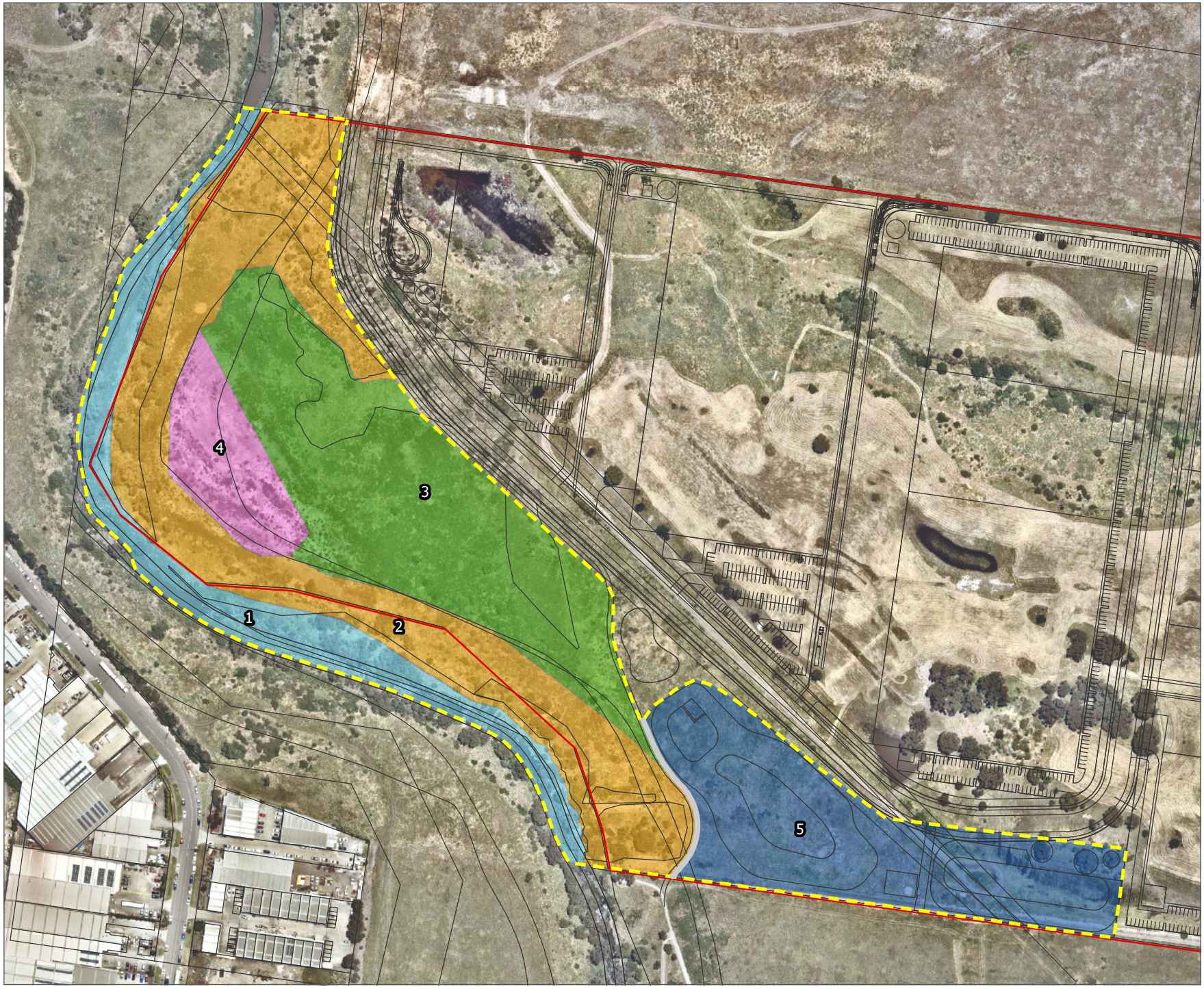

Figure 5: Management zones

Project: 485 Cooper Street, Epping
Client: The GPT Group
Date: 17/07/2023

- Property boundary
- Conservation area
- Shared path

Management zones

- Zone 1
- Zone 2
- Zone 3
- Zone 4 - Frog habitat wetland
- Zone 5 - Stormwater basin

N

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4.3. Remove rubbish

All rubbish in the vicinity of the conservation area must be promptly removed before any management measures are performed. Rubbish, comprising mainly plastic litter and some metal waste, was observed along the banks of Merri Creek and on the escarpment occurring mainly from high floodwaters moving debris down the creek. Removal must be undertaken in such a way that the native vegetation in the conservation area is not adversely impacted. Rubbish must be disposed of at an approved landfill site and adequate fencing must be installed to prevent continual dumping of rubbish. Merri Creek should be monitored after heavy rain to maintain low rubbish levels.

4.4. Fencing

Prior to the installation of the perimeter fencing, all internal fencing is to be removed. The existing fencing may impede on management actions such as weed control and revegetation efforts.

Stockpiling, equipment lay-down and personnel rest areas will be located outside of the conservation area to prevent any impact on the conservation area.

4.4.1. Temporary exclusion fencing

The conservation area should be entirely fenced during proposed works to exclude inappropriate/unauthorised access. Fencing must be placed a minimum of 2 metres **outside** of the conservation area and will have 'Conservation Area – NO GO ZONE' signs affixed at 30-metre intervals and at a height of 1.5 metres. Temporary exclusion fencing must also be applied around the wetland construction area with at least a two-metre buffer from native vegetation. Fencing around the wetland must also include sediment fencing, see Section 3.1

Fencing specifications are to be adapted and reviewed by a qualified person. Recommended construction fencing details are presented below, as per *DELWP requirements for Construction Environmental Management Plans under the Melbourne Strategic Assessment* (DELWP 2020):

- Posts are vertical steel pipes to a height of 1.8 metres at 3 metre intervals, and can either be driven 0.7 metres into the ground or resting in concrete bollards.
- Chain link or welded mesh fencing affixed to posts.

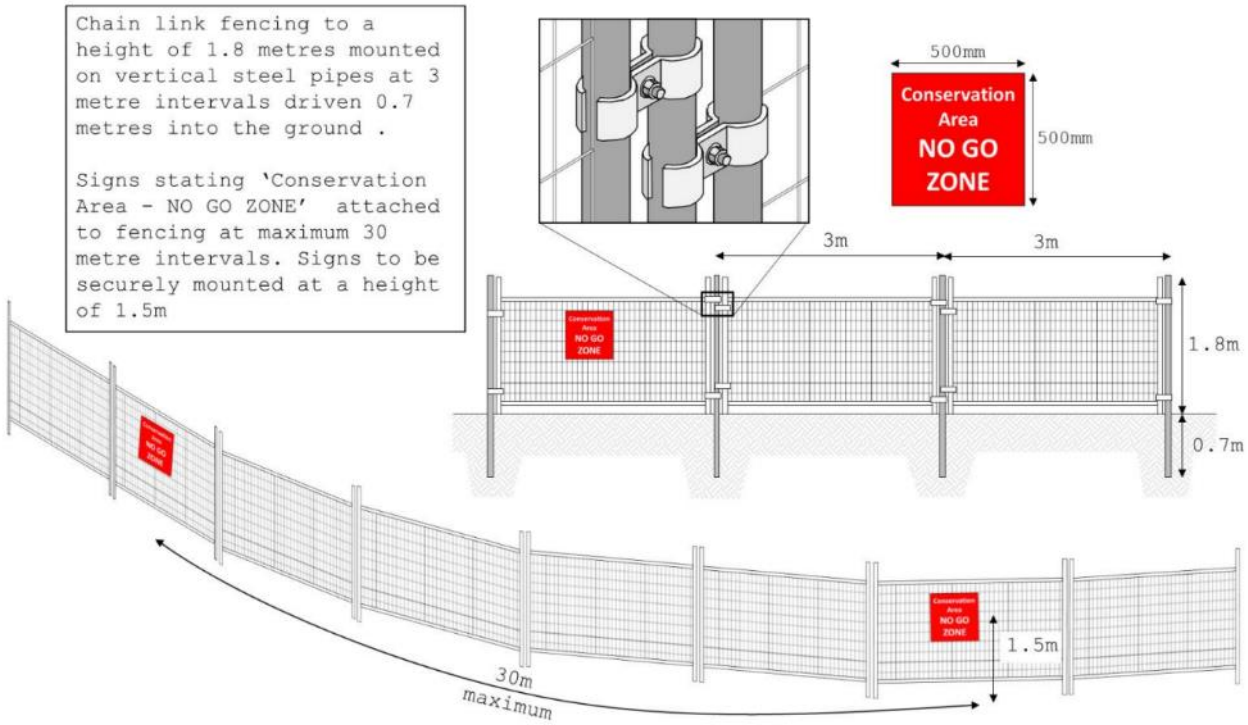

Figure 6: Temporary perimeter fencing

Once construction work has been completed, temporary construction fencing must be removed. The permanent perimeter fencing (described below) must stay in place to exclude threats, such as vehicular and pedestrian access, domestic pets and pest animals.

4.4.2. Permanent perimeter fencing

The landowner has an obligation under this current plan to install, upgrade and maintain fencing to exclude threats for the duration of the plan. Fencing helps manage threats to native vegetation from construction personnel as well as limiting access to the area. The conservation area will be accessible to the public to encourage connection and appreciation of the Merri Creek corridor. Permanent fencing surrounding the Conservation Reserve should be based on the use of bollards/ post and rail to restrict vehicle access, while facilitating the movement of native fauna and people.

The conservation area boundary fence must only encourage public access at designated entry/exit points that are linked to existing pathway or future installation of an environmentally sensitive boardwalk.

Fence bollards must be installed and upgraded (if required) within three months of this plan being approved by the responsible authority, and prior to the commencement of construction.

In addition to the fencing, installation of interpretative signage is recommended to detail:

- ecological and indigenous values;
- benefits of basalt boulders and woody debris for native fauna (to discourage firewood collection); and
- requirements to keep dogs on leashes.

4.4.3. Fencing removal

Where redundant fencing exists on site, it is likely to pose a threat to native animals, especially if it is barbed. Wire from redundant fencing must be removed and disposed of at an appropriate facility.

4.4.4. Adaptive management

Considerations of revegetation survival and targets should be taken when deciding fencing specifications and installation methodologies. Fencing requirements are up to the discretion of a qualified contractor.

In the future, if new threats arise, such as inappropriate access from humans, pest animals or native herbivores, fencing may have to be upgraded to such a standard which protects the environmental values of the site.

4.5. Pest animal control

Evidence of rabbits and foxes were observed from scat in the conservation area. All pest animals are to be monitored and controlled as required within the reserve for the life of the plan. Regular monitoring will be required throughout the year to inform the control methods used.

4.5.1. Rabbit control

The control of rabbits is particularly important as they could encourage permanent populations of other introduced species including cats and foxes, in addition to promoting erosion and loss of native flora.

Combining several control methods listed in Table 1 is more effective in controlling rabbit populations than limiting control to one method. Specific site conditions may mean that some of the below methods are not appropriate.

Rabbit control, where required, should prioritise harbour removal (i.e. invasive shrubs) and warren destruction. Where numbers are high, baiting should be considered prior to warren ripping only as a last resort. Any baiting would require careful stock or fauna management to ensure they were not poisoned as well. Shooting should not be considered as a method due to the proximity to urban development and industrial estate.

Temporary rabbit proof fencing can be considered for revegetation areas when other pest management strategies are observed to be ineffective.

Table 1: Summary of possible rabbit control methods

Method	Time	Cost	Advantages	Risks
1080 Baiting with carrot pieces	Late summer	Most cost-effective method	Large areas covered quickly. Foxes killed by eating poisoned rabbit. Most native animals at low risk from ingesting carrot bait.	Dry weather required. No effective antidote. Hazardous to livestock. Not suitable if stock grazing.
Pindone baiting	Late summer	Moderate cost	Less hazardous to domestic animals.	Hazardous to livestock. Not suitable in view of current land use (i.e., grazing land) Risk to some native animals.
Harbor removal	Any time	Labor-intensive	Good follow-up method to combine with other treatments.	Few where native vegetation not present
Warren fumigation and ripping	After autumn rains when soil softens	Labor intensive	Removes shelter – effective when undertaken in combination with harbor removal.	Limited

Method	Time	Cost	Advantages	Risks
Rabbit-proof fencing	Before planting/ seeding.	Very labor-intensive. High initial cost	Long-term effect, stops reinvasion.	Need regular checking. May also stop native fauna dispersal and would require significant changes in stock management on the farms.
Shooting	All year round. Optimum late summer.	Low to Moderate cost.	Appropriate for low numbers.	Very labor-intensive and unlikely to exclude rabbits permanently

Source: adapted from Farrelly & Merks 2001.

4.5.2. Fox control

Regular monitoring (at least quarterly) must be undertaken to control the pest animals as needed. If dens or warrens are located, they must be destroyed through fumigation and hand collapse. The control of woody weeds with also reduce habitat for foxes.

4.6. Native grassland management

Once established, native grassy vegetation may require occasional biomass reduction (management) and habitat enhancement to maintain the health and diversity of local flora and fauna. This may be achieved through slashing or burning when/if native grasslands have re-established in the latter half of the management plan.

If burning is determined to be a suitable option, it is strongly advised ecological/cultural burning to manage biomass in native grassland areas across all zones, is informed by local RAP and experienced bushland/burn management contractors,.

4.6.1. Ecological burning for grasslands

Biomass levels in grasslands may need reduction to facilitate natural regeneration processes. The frequency of the burning regime implemented on site should be guided by biomass levels (approximately burn frequency of 3-5 years). It is very unlikely the grassland within the Conservation Reserve has been burned within this time frame. Ideally, at least one burn should be undertaken during the life of this plan within the Grassland (Management Zone 3). All burns should be cool and undertaken in smaller patches in a mosaic fashion to allow for retention of habitat for reptiles over time. Burns to be used in unison with management of Gorse regeneration within this area.

As part of meeting safety requirements, a burn plan will need to be prepared. This will need to incorporate fire planning in consultation with CFA or DELWP. The burns should be planned to occur in autumn up to early spring each year outside of the normal annual Fire Danger Period (1st December to 30th April). No burns should occur outside of this period to prevent inadvertent impacts to potential Golden Sun Moth populations.

The purpose of these ecological burns is to increase flora diversity by creating space for herbaceous species to germinate and reduce the exotic grass and woody weed regeneration cover in the higher quality grassland areas. Flora monitoring (pre and post burn) to be incorporated as part of the costs of these burns, as well as follow up weed control (particularly Gorse control. Flora monitoring will guide timing and extent of follow-up weed control post burn, which is essential following a burn to ensure weeds do not set seed.

In preparation for each burn, a boundary needs to be created. This boundary needs careful consideration as it cannot be created by ploughing the rocks and grass to create a mineral earth border. No soil removal or excavation can be carried out. Each burn boundary can be wet down (with water) or slashed with brush

cutters, while utilising optimal weather conditions. The optimal conditions are low wind days with wind direction blowing away from the industrial areas and the Hume Highway. The following is pertinent to the implementation of ecological burns:

- slip on vehicles (vehicles with fire-fighting equipment) may be more appropriate
- consider completing burns in very low wind conditions

Burns may be started with drip torches and extinguished using slip on vehicles afterwards. No fires should be left smouldering or burning without supervision due to the proximity of industrial estates and the Hume Highway. A cool burn would be started with a drip torch and burn at low intensity for a short time and extinguished.

Ecological burning requires bushland management contractors to have appropriate insurance to prepare for and implement such burns. They also need to have experience in undertaking burns and are able to prepare a burn plan that aims to ensure any burns are undertaken at the appropriate time of year, under correct weather conditions and in a mosaic fashion.

4.6.2. Management of grassland fauna habitat

Consideration of protected grassland fauna should be incorporated into weed management (i.e. GSM, Striped Legless Lizard and Tussock Skink habitat), particularly within zone 2 & 3. Considerations should include:

- Place logs within existing areas of native vegetation and in revegetation areas. Smaller logs and timber such as old fenceposts may be placed in piles, while larger, hollow-forming logs may be placed individually. These logs and any timber used must be untreated.
- Place stones within existing areas of native vegetation and in revegetation areas. These stones should be matched to the geology of the study area, and range in size from 10cm to over 1 metre in diameter.
- Place logs within the GGF habitat revegetation area to provide shelter and overwintering opportunities (DEHWA 2009).
- Place fringing rock piles within the water adjacent to the aquatic/GGF habitat revegetation area using a range of rock sizes between 10cm and one metre in diameter. These rock piles must be at least one metre deep (DELWP 2017).
- Non-native vegetation must be maintained at a low height through mowing. Low, grassy vegetation does not need to be native to be suitable Growling Grass Frog habitat (DELWP 2017).
- If undertaking biomass management through ecological burning where appropriate, ensure only small areas are burnt at any one time in a mosaic fashion to allow reptiles to retreat to unburnt areas.

Photo 10. Stone stockpile useful for habitat enhancement. Location in Figure 2.

5. Weed Management Plan

A total of 20 priority weeds to be controlled were identified during the field assessment. These weeds were assessed as being a priority for management based on the following criteria:

- All woody weeds;
- Declared noxious weeds under the CaLP *Act 1994*;
- Species listed as a serious or priority weed by Whittlesea Council (2023);
- Any other weed deemed to be high-threat due to the potential risk the species poses to the surrounding landscape; or
- Weeds not otherwise accounted for above that are on DELWP's *Advisory List of Environmental Weeds* and occurred above a negligible cover.

Management targets for priority weeds to be controlled are discussed in the following sections. Recommended methods for their control, optimal timing for control and current infestation status are detailed in Table 2. The locations of major weed infestations on the site are presented in Figure 2. Weed control will be undertaken at least quarterly each year for the duration of the CMP.

All weed control is to be carried out by a suitably qualified revegetation and/or weed control contractor, with experience in working in ecologically sensitive areas approved by Whittlesea council. A reporting form (Appendix 7) describing the control methods used to manage these species must be completed by the weed control contractor, with the results submitted to council upon request. Any spot-spraying would be undertaken on days with minimal wind to prevent off-target damage by spray-drift.

5.1. High-threat woody weeds

A diverse number of woody weeds occur within the conservation area (see Table 2) however, most are confined to a small number of individuals or low to moderate cover levels. Therefore, the management target is to gradually reduce cover yearly until all infestations are eliminated i.e. **no mature plants present** while emergent seedlings are controlled in a timely manner across all management zones**.**

This target is with the exception of Gorse, which is currently at extremely high cover levels (accounting for 60% of weed cover), particularly in Zone 2 where elimination may not be achievable. The management target for Gorse is **reducing cover of mature plants to <5%.** Recommended methods for gorse control are outlined in Section 5.6.

Management strategies and cover targets for woody species are outlined in Table 2.

All woody weeds are to be removed from the conservation area and disposed of appropriately. The 'cut-and-paint' method is the most effective means of controlling any woody weeds on the site. This entails a clean cut to the main stem/s of the plant followed by immediate application of a non-selective herbicide to the entire surface of the cut stem/s. The dead left over branches should be removed and immediately disposed of at a municipal landfill. Seedlings must be sprayed with an appropriate herbicide during their active growth period.

5.2. High-threat herbaceous weeds

Two high-threat non-woody (herbaceous) weeds recorded within the conservation area (Artichoke Thistle and Fennel) currently exist at moderate cover levels and are to be 'eliminated' (reduced to **less than 1% cover with no concentrated populations present**). These weeds are mostly concentrated management zone 4 and a focus should be on eliminating infestations prior to the construction of the wetland. Herbaceous weeds to be controlled area outlined in Table 2.

These species can be treated with an appropriate broadleaf-selective herbicide.

5.3. High-threat grassy weeds

The application of the following strategies should be evaluated through onsite observations and annual assessments to ensure the effectiveness of the measures and adapt as necessary.

See Table 2 for management targets of specific weed species.

Management Zone 1

MZ1 is predominantly situated within a riparian or floodway area, requiring specific precautions when implementing herbicide applications. Within a 5m radius of the waterway, herbicides like Roundup Biactive or similar biactive formulations of glyphosate could be applied during dry weather conditions to manage invasive species such as Toowoomba Canary-grass and Spiny Rush. This intervention should be guided by a clear objective of enhancing habitat conditions for the Growling Grass Frog (GGF).

However, to protect the GGF's active season, any spray application of biactive glyphosate within its habitat should be scheduled outside this period. Woody weeds may be treated with non-spray applications of the herbicide, such as the "cut and paint" method with neat Roundup Biactive, in dry conditions. This method might also be acceptable during the GGF active season for summer-growing weeds like Blackberry, provided the benefits outweigh the effort required to keep the area weed-free amidst regular inundation.

After weed control replacement of invasive species with native riparian species should be considered. Suggested species for this area are listed in table 3. As MZ1 lies largely outside the property boundary, ongoing management decisions will ultimately be determined in consultation with Melbourne Water.

Further detail on weed management for GGF are outlined in Section 5.2.

Management zone 2

For MZ2, the primary objective is to maintain and enhance existing native vegetation. High-threat invasive grasses within the conservation area will primarily be managed via slashing and biomass reduction. This approach aims to provide an optimal habitat for the Growling Grass Frog (GGF) and other native fauna while fostering the regrowth of native grasses, herbs, and tree species.

In instances where more aggressive control measures are deemed necessary, such as when Toowoomba Canary-grass inhibits the regeneration of native species, a combination of slashing and herbicide application should be considered. These actions are intended to proactively decrease the dominance of such threats, allowing regeneration of native vegetation. Regular monitoring and adaptation of strategies will be integral to the successful conservation of this zone.

Management Zone 3

While the primary objective for MZ3 is the eradication of Gorse, a holistic approach that includes the regeneration of native grasses instead of invasive ones is also crucial. Field surveys indicated the presence of some native grass species beneath the Gorse, suggesting the existence of a native seed bank in the soil.

However, invasive grasses are known opportunists, taking advantage of disturbed areas to establish and potentially outcompete native species. If this is observed, localised spraying and slashing may be warranted to counteract the invasive grasses.

This focused intervention aids in maintaining inter-tussock space, critical for native grasses and herbs, and supports a balanced and biodiverse ecosystem. Regular monitoring and adaptations to the approach will ensure the successful restoration and preservation of this area.

Management Zone 4 & 5

As these areas will be completely revegetated the primary goal for this area is to prevent spread of grassy weeds before and during construction. Grassy weeds should be slashed prior to setting seed and maintained at low levels.

5.4. All other weeds

All other weeds will be controlled such that their combined cover does not exceed current levels.

5.5. Weed management of GGF habitat

Additional considerations have been given for weed management within Management Zone 1 along the Merri Creek corridor for providing habitat for GGF. The management strategy for this area is based on advice given by DEECA, derived from the *Growling Grass Frog Habitat Design Standards* (DELWP 2017).

It is recommended that spot-spraying for Serrated Tussock and herbaceous weeds avoid the GGF active period (September to March). Herbicides specifically intended for use near waterways must be used and must be applied in late summer, when Growling Grass Frogs have reached adult form. While spot-spraying, care must be taken to ensure herbicides do not enter the creek.

Weeds of concern include those that grow quickly, and have the ability to 'smother' out the preferred open grassy structure for GGF, i.e. those than need regular, frequent biomass control. These include Toowoomba Canary-grass (predominantly), but also *Nassella* species, Cocksfoot, Water Couch, Kikuyu and Artichoke Thistle and Spiny Rush.

Woody weeds are also highly problematic, i.e. Gorse, Hawthorn, Sweet Briar and Blackberry as they have the potential to completely cover the ground in dense thickets making it incompatible for GGF. However, theses woody weeds can provide habitat for other fauna. Therefore, they should be removed in a staged process, and replaced with suitable indigenous species.

Care needs to be undertaken during weed control and revegetation works to ensure soil disturbance, and the risk of erosion, is minimised. Replacing woody weeds with indigenous species will reduce the risk of erosion and the movement of sediment-laded runoff into Merri Creek.

Mow/brush cut non-native vegetation

Management Zone 1 excluding areas of vegetation on rock escarpments and native woody vegetation, must be mown or brush cut following the initial round of weed control (once the treated weeds are dead), and as required, in order to achieve and maintain suitable vegetation structure for GGF. All terrestrial GGF habitat must be kept short. Biomass may remain in-situ.

The following targets relating to mowing/brush cutting non-native vegetation are prescribed:

- All non-native vegetation should be mown/brush cut to 10cm; and
- Native vegetation should be monitored every 3 months to determine when mowing/brush cutting is next required;

Mowing and brush cutting should occur:

- Outside of GGF active times (October to March), except where required to address fire risk management;
- When *Nassella* species are not in seed to not spread noxious weeds; and
- Outside of wet or boggy areas to avoid ground disturbance.

Mowing and brush cutting equipment should be cleaned before and after entering the site and in-between management of native/non-native vegetation to avoid weed spread/re-introduction, especially for minimising spread of *Nasella* species.

5.6. Management of Gorse

Given the abundance and density of Gorse on site, the ideal management strategy is sequentially using a combination of methods (VGT 2021).

The following methods are often used by a qualified bushland contractor to control gorse:

- Soil scraping
- Physical removal of plants by hand or machinery
- Chemical control
- Cutting then painting with herbicide
- Burning
- Biological control

Given the unique conditions of the site, such as the infestation density and size, cultural sensitivity considerations, and the potential existence of a native seed bank, certain suggested methods may not be suitable. The recommended approach to manage the pervasive Gorse involves a gradual thinning process, primarily utilizing the cut and paste method, with the biomass either removed from the site or incinerated.

Considering the extent of the infestation, Gorse control and native grass restoration are anticipated to be a multi-year process. Consequently, continuous follow-up treatments are vital in the months and years following the removal of mature Gorse stands. Gorse stumps are likely to resprout for several years post-removal, and high numbers of Gorse seeds may germinate in the first few years, decreasing gradually over the subsequent decades.

For Gorse germinants and resprouting Gorse under 50cm in height, spot spraying with a suitable selective herbicide, such as triclopyr, should be considered as a follow-up treatment. For regrowth exceeding 50cm, the cut and paint method with neat glyphosate is suggested. The usage of glyphosate or metsulfuron-based herbicides for spot spraying is discouraged due to the potential off-target damage to regenerating lilies and herbs. As the Gorse biomass is significantly reduced, the implementation of burning treatments may be considered, if appropriate.

Gorse management will be subject to an annual review and modification process to optimize control strategies and ensure success of the management objectives. This adaptive management will allow for the adjustment of methods based on observed outcomes, enhancing the overall effectiveness and efficiency of the conservation efforts.

5.7. Lobed Needle Grass

Lobed Needle Grass (LNG), classified as a 'State Prohibited Weed' under the CaLP Act, poses a significant threat to native flora and fauna due to its highly invasive nature. According to the CaLP Act, it's the Secretary's duty to take reasonable steps to exterminate State prohibited weeds across The State. However, despite this legal obligation, DEECA has ceased efforts towards the weed's eradication.

Whittlesea Council firmly advises that if LNG is detected, management should aim to eliminate the species from any infested site. Although the most recent field surveys did not record any presence of LNG, past sightings have been reported by bushland contractors.

To ensure accurate detection and reporting, it's recommended that surveys are conducted during the weed's flowering season, which begins in September. These surveys will help document the locations and extent of any LNG infestations. If LNG is identified, it will be immediately reported to both Whittlesea Council and DEECA.

The strategy to eradicate this invasive species will require collaboration with the Council and may involve continued slashing and the application of appropriate herbicides.

5.8. Disposal of weed material

Any fertile weed material, especially that of any CaLP Act-listed weeds **must** be burned or otherwise legally disposed of using appropriate permits for disposal and transportation.

If weeds are to be stockpiled and burned, all fertile or woody weed material must remain on site and be piled in the designated stockpile area, and a permit to do so must be obtained under the relevant legislation. Prior to any burning off, appropriate warning will be given to local residents through a letterbox drop and fire authorities will be notified. Firebreaks will be slashed around the perimeter of the designated stockpile area in the lead up to burns.

Burns will be undertaken on days with only light wind, with sufficient numbers of suitably experienced bushland contractor personnel on hand within firebreaks with portable water supplies to halt the fire if required. Bushland contractors would remain at the site of the burn until an appointed team leader confirms that all fire has been extinguished.

Table 2: Weed control management actions for high threat weeds within the conservation area.

Weed type	Common name	Scientific name	Recommended control method	Timing	Current infestation status	Estimated % cover as at 21/01/2023	Management outcome to be achieved and maintained per species
Woody	Hawthorn	*Crataegus monogyna*	Manual removal of individuals via lopping and spraying or hand pulling.	Spring (drill and fill); any time of year (hand-pulling)	Scattered across rocky escarpment areas and few trees in riparian zone of Merri Creek.	2%	<1%. A reduction target of 20% each year until the elimination of all mature plants. Control of emergent seedlings as required thereafter.
	Desert Ash	*Fraxinus anugstifolia*			Scattered mature individuals on eastern boundary of conservation area	1%	
	Galenia	*Galenia pubescens var. pubescens*	Thoroughly wet the plant with a foliar spray using an appropriate herbicide.	Autumn and Spring	Concentrated to escarpments and open woodland areas. Also densely covering area proposed for wetland.	5%	
	Montpellier Broom	*Genista monspessulana*	Manual removal of individuals via lopping and spraying or hand pulling.	Winter and spring	Concentrated to escarpments and disturbed areas.	2%	
	Atlantic Ivy	*Hedera hibernica*		All year-round.	One infestation on quarry escarpment.	2%	
	African Box-thorn	*Lycium ferocissimum*		Autumn and spring	Sparsely scattered throughout conservation area, mainly on steep escarpments.	5%	
	Radiata Pine	*Pinus radiata*	Manual lopping and removal of mature and emergent individuals.	All year-round	Few individuals on eastern boundary of Conservation Area.	1%	
	Sweet Briar	*Rosa rubiginosa*	Thoroughly wet the plant with a foliar spray using an appropriate herbicide.	Autumn and Spring	Large individuals on Creek banks and scattered throughout escarpments.	3%	
	Blackberry	*Rubus fruticosus spp. agg.*		Spring (drill and fill); any time of year (hand-pulling)	Scattered large brambles in wetter gullies, escarpment areas and riparian Creekline.	1%	
	Prickly Pear	*Opuntia stricta*		Spring to early-summer	Sparsely scattered throughout conservation area.	3%	
	Gorse	*Ulex europaeus*	Multi-disciplinary approach needed e.g. mulching and spraying emergent seedlings.	Autumn	Across majority of conservation area in dense stands.	60%	<5%. Reduction goal of at least 20% each year until cover target is achieved and not concentrated infestations remain. Control and eliminate emergent plants as required thereafter.
High-threat herbaceous weeds	Artichoke Thistle	*Cynara cardunculus subsp. flavescens*	Spot-spray using a broadleaf-selective herbicide or cut and paste with appropriate herbicide.	Early-Mid Spring must be before flower stem thickens.	Scattered across grassland and woodland sections of the conservation area. Dense infestations in disturbed areas on eastern boundary.	15%	<1%. A reduction target of 20% each year until the elimination of all mature plants. Control of emergent seedlings as required thereafter.
	Fennel	*Foeniculum vulgare*		Any time for cut and paste. Early spring for slashing.			
High-threat grassy weeds	Lobed Needle-grass	*Nassella charruana*	Spot spray with an appropriate herbicide. Due to the isolated occurrences of this weed, elimination is recommended.	Minimum biannually in Spring and Autumn, or as required.	Infestation locations and extent need to be determined through targeted surveys.	N/A	<1%. Elimination of all mature plants.
	Chilean Needle-grass	*Nassella neesiana*	Slash prior to flowering to prevent seed development.	Minimum biannually in Spring and Autumn, or as required.	Infestation across entire conservation area. Dense stands on creek banks and higher elevation grassland.	50%	Remain at current levels i.e. prevent further spread.
	Toowoomba Canary-grass	*Phalaris aquatica*		Minimum biannually in Spring and Autumn, or as required.			

Weed type	Common name	Scientific name	Recommended control method	Timing	Current infestation status	Estimated % cover as at 21/01/2023	Management outcome to be achieved and maintained per species
	Couch	*Cynodon dactylon var. dactylon*		Spring	Infestations concentrated to north east corner of study area. 15%	15%	
	Kikuyu	*Cenchrus clandestinus*		Spring to early-summer			
	Paspalum	*Paspalum dilatatum*	Spot spray with an appropriate herbicide. Due to the isolated occurrences of this weed, elimination is recommended.	Spring to early summer.			
	Serrated Tussock	*Nassella trichotoma*		All year-round during periods of active growth	Scattered across grassland at low densities.	10%	Remain at current levels i.e. prevent further spread and maintain suitable habitat for GGF.
	Spiny Rush	*Juncus acutus*	Burn/slash to ground level during summer after an extended period of no rainfall, when the water level is low and plants are not submerged. Follow up with spot spraying of sprouting clumps and seedlings. Ensure no herbicide enters the waterway.	Late summer after extended period of no rainfall	Scattered throughout waterway.	2%	

6. Revegetation

6.1. Revegetation zones and objectives

The revegetation strategy for the conservation area is presented below in the subsections below. This includes a detailed approach for Management Zones 1, 2 and 3. Zone 1 subject to revegetation efforts in consultation with Melbourne Water. Zone 4 will be considered during the wetland landscape design process.

6.2. Revegetation timing

Weed control and must commence as soon as possible to ensure that planting can occur without delay. However, revegetation should not be initiated until sufficient weed control has taken place, this may take several seasons. Adaptive management will determine optimised timing for revegetation efforts to begin.

Revegetation works must be initiated in autumn to early spring after and ideally preceding a forecast of a significant rain event to encourage successful establishment of new plants.

6.3. Planting Preparation

Planting should be conducted within one month of the last weed control efforts to reduce competition from weeds and in turn increase the likelihood of plant establishment and survival. Ideally weed control should occur in the spring and autumn before planting occurs.

6.4. Planting Guide

Species recommended for revegetation of management zones were largely determined using local indigenous species observed on site and in nearby intact remnant vegetation. Other resources consulted include the Victorian Volcanic Plain bioregion benchmarks Escarpment Shrubland (EVC 895) and Plains Grassland (EVC 132_61), species listed in *Start With the Grasslands* (VNPA 2013)and plants listed in the *Growling Grass Frog Habitat Design Standards* (DELWP 2017). All species chosen are widely distributed and robust options. Final planting schedule will be refined and adapted in consultation with bushland contractors.

A planting guide has been designed to rapidly revegetate and stabilise the ground, and a variety of plants have been chosen to enhance the biodiversity values of the area. The following sections describe revegetation within each zone. Recommended revegetation species and estimated tube-stock and seed quantities for each zone are listed in Table 3.

The planting schedule summarised in Table 3 is intended as a guide only and local indigenous plant nurseries should be consulted regarding suitable indigenous species for the area and to substitute like-for-like species if others are not available. Given that a large quantity of plants is required, we recommend that a local indigenous nursery be consulted as soon as possible to enable the preparation of tube-stock for planting by spring.

Tube-stock is to be used for all shrubs, as this will increase the likelihood of survival and thereby ensuring a more effective restoration effort. For all other grassy species, only direct seeding will be undertaken. This is best carried out in late winter - early spring or autumn, immediately after a rainfall event and during a period of little to no wind. If it is not feasible to seed following a rainfall event, the area must be soaked prior to and post seeding.

For each revegetation zone, plantings should comprise a combination of the suitable species (indicated by the ✓). Using a mix of species will create a diverse habitat structure and have a lower risk of failure

than using a few select species. Planting sites and density will ultimately be determined by a bushland contractor based on the estimates stated in Table 3.

6.4.1. Zone 2 – Escarpment shrubland and grassland

Planting of native shrubs should be considered where woody weeds have been removed, higher rises and escarpments. This will offset habitat lost and provide habitat variability for invertebrates and bird species. This will also improve the visual amenity of the reserve.

Revegetation within this area should be limited to supplementary plantings of scattered shrubs and trees appropriate to the landscape and provide similar habitat function as the weeds being replaced. The following species suggestions fulfill these requirements:

- Lightwood (*Acacia implexa*)
- Drooping Sheoak (*Allocasuarina verticillatala*)
- Black Wattle (*Acacia mearnsii*)
- Sweet Bursaria (*Bursaria spinosa*)
- Tree Violet (*Melicytus dentatus*)
- Hedge Wattle (*Acacia paradoxa*)

As GGF require low grassy vegetation, replacement planting should occur on the higher rises and escarpments. Land managers should plant understorey life forms in dense patches to create a mosaic effect and to provide some competitive advantage against weeds, while ensuring that disturbance to any native ground cover areas is minimised, although projective cover of planted shrub/tree vegetation should not exceed 10%.

6.4.2. Zone 3 – Establishment of NTGVPP

The native vegetation within this zone is present in the form of *Heavier soils* Plains Grassland (EVC 132_61), therefore revegetation design should be in line with a species composition reflective of this EVC type and account for local variances. The management objective for this zone is to restore the grassland to NTGVVP standards. This will be achieved by meeting following condition thresholds:

- The total perennial tussock cover represented by native grasses Kangaroo grass (*Themeda*), Wallaby grass (*Rytidosperma*), Spear Grass (*Austrostipa*) or Tussock Grass (*Poa*) is at least 50%; and
- The cover of non-grassy weeds is less than 30% of total vegetation cover at any time of year.

All plantings and reseeding must be of Indigenous local provenance with seed sourced from *Heavier soils* Plains Grassland soil type and receiving at least 500mm annual rainfall. For grassy species direct seeding will be undertaken. This is best carried out in late winter–early spring or autumn.

The following target is to be achieved in regard to vegetation restoration within Zone 3:

- Establish 70% native vegetation cover, derived from a mix of grasses.

The target of 70% exceeds the required 50% cover to qualify for NTGVVP is to account for potential mortality. Seeding efforts (plant health and mortality) must be monitored to determine the necessity and timing of management actions and adapted accordingly. Supplementary planting in order to achieve the cover target for each lifeform may include tube-stock planting or over sowing with seed. The quantity of seed is intended to comprise multiple species as indicated in Table 3 below and should not be considered as a rate for each specific species. A combination of the below species and their representative seeding

quantities should be used dependent on seed availability and the recommendation of the contractor. Using a mix of species will create a diverse habitat structure and have a lower risk of failure than using a few select species.

Table 3: Suggested planting schedule for Revegetation Zones

Common name	Scientific name	Zone 1	Zone 2	Zone 3
Shrubs and herbs (tube-stock) approx. 1/square meter in revegetation areas				
Lightwood	*Allocasuarina verticillatala*		✓	
Drooping Sheoak	*Acacia mearnsii*		✓	
Black Wattle	*Bursaria spinosa*		✓	
Sweet Bursaria	*Melicytus dentatus*		✓	
Hedge Wattle	*Acacia paradoxa*		✓	
Rock Correa	*Correa glabra*		✓	
Ruby Saltbush	*Enchylaena tormentosa*		✓	✓
Plains Everlasting	*Chrysocephalum* sp 1		✓	✓
Lemon Beauty-heads	*Calocephalus citreus*		✓	✓
Black-anther Flax-lily	*Dianella revoluta var. revoluta*		✓	✓
Common Sedge	*Carex tereticornis*	✓		
Common Tussock-grass	*Poa labillardierei*	✓		
Running Marsh-flower	*Villarisa reniformis*	✓		
Pondweed*	*Potamogeton spp.*	✓		
Water Ribbons*	*Triglochin procerum*	✓		
Grasses (seeds) 30kg/ha				
Kangaroo Grass	*Themeda triandra*			✓
Wallaby-grasses	*Rytidosperma spp.*			✓
Weeping Grass	*Microlaena stipoides var. stipoides*			✓
Common Wheat-grass	*Anthosachne scabra*			✓
Kneed Spear-grass	*Austrostipa bigenticulata*			✓

6.4.3. Zone 4 & 5 – Stormwater infrastructure and future wetland

A bioretarding basin is proposed for southeast of the conservation area and wetland is proposed within the scraped area of MZ4 (Figure 3). Management and mitigation measures will be considered during the landscape design process. Although GGF was not recorded during targeted surveys the intention is to revegetate the wetland in order to provide habitat for GGF and other native fauna. Considerations will be given to the Growling Grass Frog Habitat Design Standards (DELWP 2017) and may include the habitat enhancement measures outlined in Section 4.6.2.

In addition, water treatment measures should be considered if there is a risk of the wetland collecting water coming directly from a possible polluting source, such as those carrying sediments, heavy metals, pollutants, and disease directly into the aquatic ecosystem. Water can be treated prior entering the system in the following ways:

- Install a sediment trap and constructed wetland according to Melbourne Water guidelines to treat water from the pollutant prior to entering the wetland; and
- Allow the wetland to dry and flood naturally, helping heavy metals filtrate and lock into the soil.

These improvements will provide habitat features for fauna, primarily through the provision of shelter, but will also likely have other benefits relating to improved sources of food and water.

6.5. Plant Protection

Temporary rabbit proof and Kangaroo fencing and browsing control should be considered for revegetation areas only when other pest management are observed to be ineffective. All newly planted trees will be protected with a stake and tree guards.

6.6. Maintenance and adaptive management

Seeding and planting schedules should be aligned with the Melbourne revegetation season (e.g. April-September). It is recommended the Greening Australia (2003) 'Guide to timing of revegetation activities' (see figure 7) is used to guide timing of practice.

Occasional watering, dependent on rainfall and climate, may be required to aid plant establishment, growth and survival (particularly in summer). Watering must occur at the time of seeding and two weeks after seeding (if no follow up rains have occurred in this time after seeding).

Weed control must be conducted post planting to facilitate the natural growth and recruitment of understory vegetation.

It is recommended that a monitoring assessment be conducted at two months and at six months post-planting to assess the progress/success of rehabilitation and determine the need for supplementary planting, weed control or watering. This monitoring can be conducted by land manager or bushland contractor. That way any ad-hoc changes in management or planting can be easily implemented. Supplementary planting in order to achieve the cover target for each lifeform may include additional tube-stock planting.

Further monitoring should be conducted every 12 months on the anniversary of CMP implementation. This assessment must be conducted by a qualified ecologist (independent of the weed control contractor) and the results of monitoring must be reported to Whittlesea Council within a month of the monitoring see (Section 7).

Guide to timing of revegetation activities

Activity	Spring	Summer	Autumn	Winter	Spring	Summer	Autumn	Winter	Spring
1. Planning*									
2. Preparing the ground									
Soil preparation									
Weed control*									
3. Pest animal management									
Pest control									
Fencing									
4. Seeds and seedlings									
Seed collection, cleaning and ordering*									
Plant orders and propagation*									
5. Revegetation									
Natural regeneration									
Direct seeding and planting									
6. Maintenance									
7. Monitoring									

Refers to the timing of activities for both semi-arid and medium to high rainfall environments

Refers to medium to high rainfall (500mm plus p.a.) areas only

Refers to semi-arid (250-500mm rainfall p.a.) areas only

*These activities should commence in advance of the seasons shown. Ideally:
- begin planning two or more years ahead of seeding or planting;
- start weed control at least twelve months prior to seeding or planting or earlier depending on the site;
- order seed two years before seeding or planting;
- order plants at least twelve months prior to planting.

Figure 7: Guide to timing of revegetation activities

7. Monitoring and reporting

This CMP requires the site manager to monitor and maintain the sites by an engaged contractor at least quarterly. The agreement also requires annual monitoring by a suitably qualified third party to measure management objectives against the baseline data detailed within this plan.

A report will be submitted to the responsible authority annually for each year of this management plan until the land is handed over. Reports are to be submitted by the anniversary date of the execution of the agreement, using the Annual Report template provided by the Department.

The Annual Report addresses progress against the commitments set out in this plan. Annual Reports must provide enough detail in the form of written comments and supporting evidence that an assessor can easily determine the completion of, or progress towards meeting the commitments. A minimum of one piece of evidence is to be provided per management commitment, such as a work log, photographs of works, before/after photos, receipts/invoices for equipment, materials, labour or professional fees.

The responsible authority will coordinate this monitoring, which will include:

- Extent and quality of retained native vegetation;
- Weed cover estimates to be recorded for each weed species that occurs in the conservation;
- An overall weed cover estimate for the conservation area;
- Monitoring of pest animals to determine the need for pest animal control;
- Monitoring of revegetation progress;
- Monitoring of fencing; and
- Monitoring of rubbish levels

Findings recorded during this periodic monitoring will be documented in a report, which will include:

- A summary of works completed since the last monitoring event;
- Assessment of the integrity of the property fencing for plant protection;
- Extent and quality of native vegetation and percentage cover of declared noxious weeds and high-threat weeds within the conservation area;
- Assessment of the status of weed control works;
- Identification of any new and emerging weeds, including extent of infestation;
- Assessment of the status of revegetation works;
- Assessment of the effects of pest animal activity;
- Discussion and evidence of the progress of the management actions listed in Section 8 and whether or not targets have been achieved; and
- Recommendations for future management of the site.

The responsible landowner will provide the periodic reporting to Whittlesea Council within three months of the anniversary of the commencement this plan.

7.1. Ongoing management

The conservation area will be managed for conservation beyond the nominal 10-year period of this plan until handover of the land to the responsible authority.

7.2. Adaptive management

By monitoring the outcomes of actions, management may be adapted to ensure the stated commitments in the plan are upheld. For example, new techniques for controlling high threat weeds may become available or further information on the ecology and status of vegetation communities may necessitate adjustment to management actions.

8. Management actions and timing

The following table provide the management actions to be undertaken and proposed timelines.

Table 4: Management actions and timing

Management Action	Timing	Target to be achieved	Responsible person	CMP reference	Completed (Yes/No)	Month completed
Year 1						
Establish conservation area	Upon approval of this plan	Defines the start of the prescribed management period under this Plan	Landowner	N/A		
Demarcate conservation area – establish markers to identify boundary of the conservation area to assist with its management and monitoring	Prior to commencement of civil construction	Boundary of conservation area clearly demarcated onsite	Landowner in consultation with land surveyor	Figure 1		
Erect temporary construction fencing around the boundary of the conservation area and silt fencing around wetland construction area.	Prior to commencement of civil construction	Temporary construction fencing to be erected prior to commencement of civil construction.	Landowner	Section 3 & 4.4		
Erect permanent bollard/post and rail fencing around the boundary of the conservation area	Upon implementation of this Plan	Permanent fencing to be established prior to management actions being undertaken.	Landowner-nominated contractor	Section 4.4.2		
Removal of rubbish	Upon implementation of this Plan	All rubbish to be removed from the conservation area. Regular monitoring after heavy rain to maintain low rubbish levels along the creek.	Landowner-nominated contractor	Section 4.3 and Figure 2		
Removal of inappropriate fencing	Upon implementation of this Plan	Complete removal of barbed wire fencing running along the Merri Creek escarpment.	Landowner nominated contractor	Section 4.4.3		
Biomass control in areas of non-native vegetation all management zones. Maintaining grass levels at less than 10cm for management zone 1.	Minimum biannually during spring and autumn	Ensure grasses are slashed prior to flowering and seed formation	Landowner nominated contractor	Section 4.6 and 5.3		
Weed control	As required as per optimal time for each species in each zone	See Section 5.1 for weed control targets for each species, each weed type and total weed cover.	Landowner-nominated contractor	Section 5 and Table 3		
Pest animal control Implement rabbit and fox control as required	Autumn (or at commencement)	Pest animals are monitored regularly and controlled when required	Landowner-nominated contractor	Section 4.5		
Revegetation of Zone 2 Supplementary planting of shrubs after woody weed removal	Autumn or early spring and preceding a forecast of a large rain event	Only conducted if weeds are at suitable levels. Achieve at least an 80% survival rate of planted species.	Landowner nominated contractor	Section 6.4.1		
Revegetation of Zone 3 Seeding with native grasses after woody weed removal	late winter–early spring or autumn, as soon as possible after weed management, preceding rain event.	Only conducted if weeds are at suitable levels. Achieve at least 70% cover of mature native grasses and the reduction of non-grassy weed to below 30%	Landowner nominated contractor	Section 6.4.2		

Management Action	Timing	Target to be achieved	Responsible person	CMP reference	Completed (Yes/No)	Month completed
Monitoring of revegetation efforts and supplementary planting if required	3 months and 6 months after every planning effort	Meeting the revegetation goals for each zone	Landowner nominated contractor	Section 6.6		
Site quality audit	No later than three months after anniversary of implementation of this Plan	Results will inform management approaches and techniques.	Qualified ecologist engaged by the landowner	Section 7		
Monitoring to determine fencing integrity and timeliness of management actions	Permanent conservation area boundary fencing inspected annually; each management action monitored annually	Boundary fencing effective and management actions undertaken on time	Landowner	Section 4 and 7		
Report to be prepared documenting management actions undertaken and monitoring results	No later than three months after anniversary of implementation of this Plan	Report delivered to Whittlesea council no later than three months after anniversary of commencement	Landowner	Section 7		
Year 2 onwards						
Biomass reduction	Minimum biannually during spring and autumn	Grassy biomass layer reduced Inter-tussock spaces maintained to optimise ecological function	Landowner nominated contractor	Section 4.7 and 5.2.		
Pest animal monitoring and control if required	Monitored annually in autumn control implemented as required	Pest animals controlled	Landowner nominated ecologist for monitoring an contractor for control	Section 4.5.		
Weed monitoring	Annually in September to November	Results will inform management approaches and techniques. All new and emerging weeds should be controlled where possible (i.e. not in areas where GGF habitat would be impacted).	Landowner nominated ecologist	Section 5.1 and Table 1.		
Implement weed control if required. Herbicide and mechanical removal.	March to May or September to November as required as per optimal time for each species	As per targets outlined in Section 3.4	Landowner nominated contractor	Section 5.1 and Table 1.		
Monitoring of revegetation efforts of Zone 2 to determine if supplementary seeding or planting required	Once annually	Achieve at least 80% survival rate of planted species.	Landowner nominated ecologist	Section 6.4.2		
Follow up revegetation of Zone 3 Seeding of areas where weed control was recently conducted	late winter–early spring or autumn, as soon as possible after weed management, preceding rain event. Continuing supplementary seeding when appropriate until target is achieved.	Achieve at least 70% cover of mature native grasses and the reduction of non-grassy weed to below 30%	Landowner nominated contractor	Section 6.4.2		
Site quality audit (includes pest control, weed control, revegetation progress, fencing condition and rubbish levels)	Annually late spring to early summer	Results will inform management approaches and techniques	Landowner nominated ecologist	Section 4		

Management Action	Timing	Target to be achieved	Responsible person	CMP reference	Completed (Yes/No)	Month completed
Report to be prepared documenting management actions undertaken and monitoring results.	No later than three months after anniversary of commencement. Annually after the first report.	Report delivered to Melton Council no later than three months after anniversary of commencement	Landowner nominated ecologist	Section 7		

9. References

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White, M, Cheal, D, Carr, GW, Adair, R, Blood, K & Meagher, D 2018, Advisory list of environmental weeds in Victoria, Arthur Rylah Institute for Environmental Research Technical Report Series No. 287, Department of Environment, Land, Water and Planning, Heidelberg.

Appendix 1: Construction environmental management actions

Management actions	Responsibility	Monitoring frequency
Fence the conservation reserve with temporary fencing constructed to the fencing requirements detailed in section 4.4.1. Affix '**VEGETATION PROTECTION ZONE – No Access Permitted**' signage at 30 metre intervals. One farm gate entry to each zone provided to allow entry for management. NO GO ZONES strictly enforced to exclude pedestrian or vehicle access, material storage or equipment laydown. Ensure that fencing and signage is maintained and effective for the duration of this Plan.	Responsible landowner/ Construction Contractor	Ongoing
Control all weed outbreaks in disturbed areas within 20 metres of the reserve to prevent spread into the conservation reserve.	Responsible landowner/ Construction Contractor	Monthly
All vehicle washdown, equipment lay down and personnel rest areas are to be clearly defined (fenced and/or signed) and located to prevent any detrimental impact on the reserve.	Construction Contractor	Daily
Manage surface runoff from stormwater or construction works (e.g. hosing down or clean-up) so that no excess runoff is directed towards the reserve.	Construction Contractor	Weekly and after any rain
Stockpile soil/fill outside at least 20 metres from the reserve. Bund all soil/fill stockpiles.	Construction Contractor	Daily during earthworks

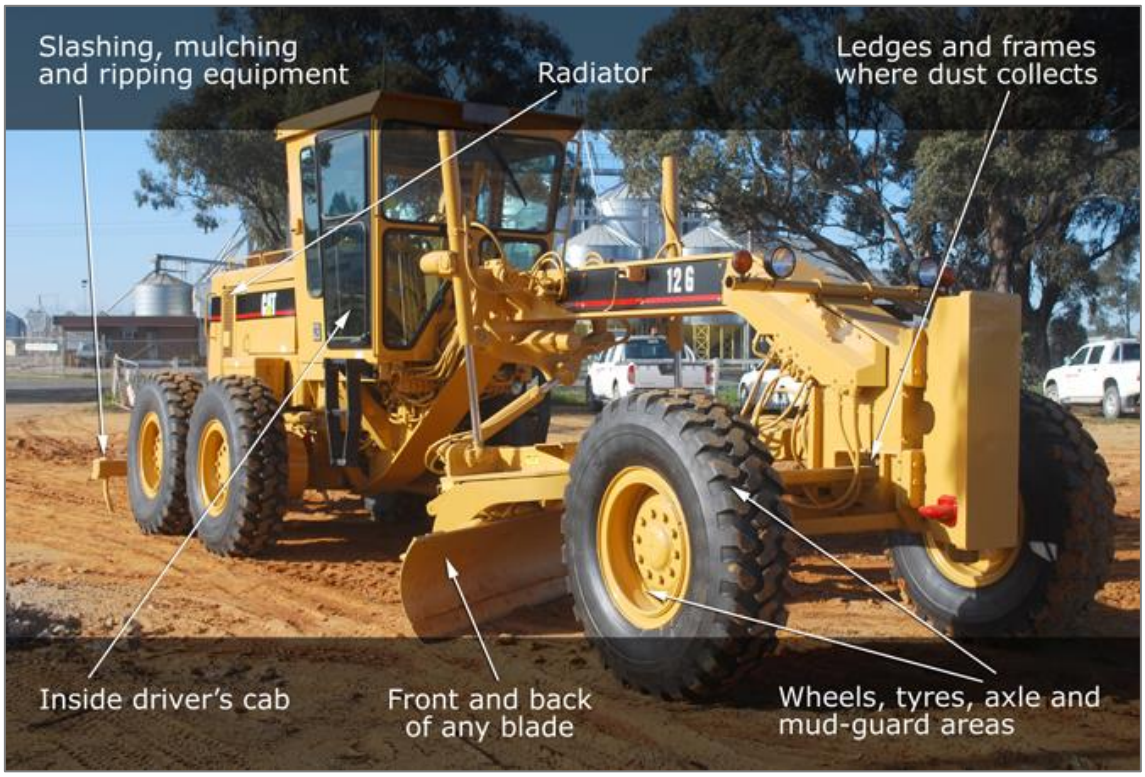
Appendix 2: Weed Species recorded in study area

Common name	Scientific name	DELWP	CaLP Act	WONS
Sheep Sorrel	*Acetosella vulgaris*	Y		
Agapanthus	*Agapanthus praecox*	Y		
Galenia	*Aizoon pubescens*	Y		
Belladonna Lily	*Amaryllis belladonna*	Y		
Wild Oat	*Avena fatua*	Y		
Twiggy Turnip	*Brassica fruticulosa*	Y		
Large Quaking Grass	*Briza maxima*	Y		
Kikuyu	*Cenchrus clandestinus*	Y		
Common Centaury	*Centaurium erythraea*	Y		
Spear Thistle	*Cirsium vulgare*	Y	C	
Hawthorn	*Crataegus monogyna*	Y	C	
Artichoke Thistle	*Cynara cardunculus subsp. flavescens*	Y	C	
Couch	*Cynodon dactylon*	Y		
Rough Dog's-tail	*Cynosurus echinatus*	Y		
Drain Flat-sedge	*Cyperus eragrostis*	Y		
Cocksfoot	*Dactylis glomerata*	Y		
Paterson's Curse	*Echium plantagineum*	Y	C	
Panic Veldt-grass	*Ehrharta erecta*	Y		
Fleabane	*Erigeron spp.*	Y		
Fennel	*Foeniculum vulgare*	Y	R	
Desert Ash	*Fraxinus angustifolia*	Y		
Cleavers	*Galium aparine*	Y		
Montpellier Broom	*Genista monspessulana*	Y	C	WONS
Atlantic Ivy	*Hedera hibernica*	Y		
Ox-tongue	*Helminthotheca echioides*	Y		
Yorkshire Fog	*Holcus lanatus*	Y		
Barley-grass	*Hordeum leporinum*	Y		
Flatweed	*Hypochaeris radicata*	Y		
Spiny Rush	*Juncus acutus subsp. acutus*	Y	C	
Prickly Lettuce	*Lactuca serriola*	Y		
Common Peppercress	*Lepidium africanum*	Y		
Rye Grass	*Lolium spp.*	Y		
African Boxthorn	*Lycium ferocissimum*	Y	C	WONS
Small-flower Mallow	*Malva parviflora*	Y		
Cane Needle-grass	*Nassella hyalina*	Y		
Chilean Needle-grass	*Nassella neesiana*	Y	R	WONS

Common name	Scientific name	DELWP	CaLP Act	WONS
Serrated Tussock	*Nassella trichotoma*	Y	C	WONS
Watercress	*Nasturtium officinale*	Y		
Common Prickly Pear	*Opuntia stricta*	Y	C	WONS
Paspalum	*Paspalum dilatatum*	Y		
Water Couch	*Paspalum distichum*	Y		
Toowoomba Canary-grass	*Phalaris aquatica*	Y		
Radiata pine	*Pinus radiata*	Y		
Ribwort	*Plantago lanceolata*	Y		
Annual Meadow-grass	*Poa annua s.l.*	Y		
Prostrate Knotweed	*Polygonum aviculare s.l.*	Y		
Onion Grass	*Romulea rosea*	Y		
Sweet Briar	*Rosa rubiginosa*	Y	C	
Blackberry	*Rubus fruticosus spp. agg.*	Y	C	WONS
Curled Dock	*Rumex crispus*	Y		
Black Nightshade	*Solanum nigrum s.l.*	Y		
Sonchus asper	*Sonchus asper*	Y		
Common Sow-thistle	*Sonchus oleraceus*	Y		
Gorse	*Ulex europaeus*	Y	C	WONS
Common Vetch	*Vicia sativa*	Y		
Fescue	*Vulpia spp.*	Y		

Notes: EPBC = threatened species status under the EPBC Act; **FFG-T** = threatened species status under the FFG Act; **FFG-P**: listed as protected 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].

Appendix 3: Critical contamination areas in earthmoving vehicles



Source: DJPR (2017).

Appendix 4: Logbook for weed survey and weed control

Date										
Initials										
Monitoring checklist										
Site entrance										
Clean-down bay and discharge areas										
Materials transported to the site										
Stockpiles										
Areas of soil disturbance										
Disposal of sediment at clean-down bay as required										
Monitor remainder of site not included above										

Appendix 5: Logbook for recording clean-down facility

All personnel who utilise the clean-down area must populate the logbook below. Ensure no material remains on or within the vehicle before entering the site.

Date	Time	Name/company	Machine type	Rego/ identification	Last location of machine	Destination within site	Adequately cleaned	Declaration (Signature)

Appendix 6: Logbook for recording importation of materials

Record all importation of organic material that has the potential to contain weed seeds, plant parts and/or pathogens: gravel, soil, bark, etc.

Date	Time	Name/company	Supplier	Composition	Source location (if known)	Destination of material within site	Declaration that material is propagule-free (Signature)

Appendix 7: Reporting form for weed control

Weed type	Common name	Scientific name	Control method used	Date implemented	No. of infestations treated (%)	Management outcome to be achieved and maintained	Name of company/contractor undertaking works	Name of herbicide and rate applied
Woody	Hawthorn	*Crataegus monogyna*				<1%.		
	Desert Ash	*Fraxinus anugstifolia*				A reduction target of 20% each year until the elimination of all mature plants. Control of emergent seedlings as required thereafter.		
	Galenia	*Galenia pubescens var. pubescens*						
	Montpellier Broom	*Genista monspessulana*						
	Atlantic Ivy	*Hedera hibernica*						
	African Box-thorn	*Lycium ferocissimum*						
	Radiata Pine	*Pinus radiata*						
	Sweet Briar	*Rosa rubiginosa*						
	Blackberry	*Rubus fruticosus spp. agg.*						
	Prickly Pear	*Opuntia stricta*						
	Gorse	*Ulex europaeus*				<5%.- Reduction goal of at least 20% each year until cover target is achieved and not concentrated infestations remain. Control and eliminate emergent plants as required thereafter.		
High-threat herbaceous weeds	Artichoke Thistle	*Cynara cardunculus subsp. flavescens*				<1%.		
	Fennel	*Foeniculum vulgare*				A reduction target of 20% each year until the elimination of all mature plants. Control of emergent seedlings as required thereafter.		
High-threat grassy weeds	Chilean Needle-grass	*Nassella neesiana*				Remain at current levels i.e. prevent further spread.		
	Toowoomba Canary-grass	*Phalaris aquatica*						

Weed type	Common name	Scientific name	Control method used	Date implemented	No. of infestations treated (%)	Management outcome to be achieved and maintained	Name of company/contractor undertaking works	Name of herbicide and rate applied
	Couch	*Cynodon dactylon var. dactylon*						
	Kikuyu	*Cenchrus clandestinus*						
	Paspalum	*Paspalum dilatatum*						
	Serrated Tussock	*Nassella trichotoma*				Remain at current levels i.e. prevent further spread and maintain suitable habitat for GGF.		
	Spiny Rush	*Juncus acutus*						