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# Flora and Fauna Assessment of proposed Upper Yarra Debris Flow Nets

**Prepared for: Melbourne Water**

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Cover photo: View of Walsh's Creek Arm in the Upper Yarra Reservoir Catchment.



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# 1 Executive summary

Post fire movement of moderate to large sized debris (soil, rock and organic material) in the upper catchments has been identified as a major risk to the water quality and reliability of Melbourne's water supply. After several years of investment in various hydrology and geomorphology technical studies ((Alluvium 2023a), (Alluvium 2020), (Alluvium 2021) and (Jacobs 2022) by Melbourne Water a viable risk management solution with the establishment of debris flow nets has been developed (Alluvium 2023b).

The nets are anchored in the channel flanks using wire rope anchors. The anchors can be installed prior to a bushfire whilst the nets themselves can be fixed to the anchors after a bushfire. Major earthworks are not required, and the nets are easy to adapt to any terrain. The systems are designed to allow the natural flow of water to pass underneath, and through, while retaining soil and rock debris, which significantly reduces downstream sediment flow and erosion. This type debris flow control structure has been proved to be a reliable solution for holding back large debris, and thereby mitigating downstream impacts (Alluvium 2023a).

Ecology Australia conducted an ecological assessment (desktop and field) of each of the proposed 35 debris net sites in the Upper Yarra Catchment. Each site is in the priority upper catchments above or at the point of where a formal channel is starting to form. Most of the sites are located to the east of the Upper Yarra Reservoir with the gullies forming small creek tributaries that flow east to west into the reservoir. The assessment area for the ecological field surveys was based on a 50 m radius of each proposed debris flow net line. Desktop surveys included database searches for threatened species on the Victorian Biodiversity Atlas (VBA) and for Matters of National Environment Significance (MNES) under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

Field surveys involved botanists and zoologists conducting flora surveys, fauna surveys, Vegetation Quality Assessments (VQA), measuring and mapping of large trees and the mapping of other important biodiversity values such as tree-ferns.

The vegetation types that were present at the sites included Damp Forest, Shrubby Foothill Forest, Shrubby Dry Forest and Heathy Dry Forest Ecological Vegetation Classes (EVC). The VQA scores for the majority of the sites were very high ranging from 0.75 and 0.97 out of a maximum of 1. Only two habitat zones had lower scores of 0.49 and 0.53 as they were located next to roads at sites 10 and 32. A total of 386 large trees were identified and mapped within the 50m radius of the 35 debris flow net sites. This equated to an average of 11 large trees per site but with a range of 0-26.

Several threatened flora and fauna species were positively identified during field surveys within debris flow net sites including the following:

- Powelltown correa *Correa reflexa var. lobata* (Site 34)
- Silky golden-tip *Goodia pubescens* (10 sites)
- Lemon boronia *Boronia citrata* (Site 35)
- Gang gang cockatoo *Callocephalon fimbriatum* (Site 8)
- Pilot bird *Pycnoptilus floccosus* (Sites 22 and 23)

Other threatened species that were observed outside of the site boundaries, but within the Upper Yarra Catchment, during field surveys included large-leaf cinnamon wattle *Acacia leprosa var. uninervia,* red-tipped greenhood *Pterostylis clivosa*, Nunniong everlasting *Ozothamnus rogersianus* and lace monitor *Varanus varius*.

After the desktop data review and field surveys were complete, a likelihood of presence assessment was conducted. This resulted in a total of 6 threatened flora species and 19 threatened fauna species (including migratory and marine overfly species) that have a moderate or greater likelihood of presence (LOP) on at least one of the sites. Each one of these species were then assessed for their likelihood of being impacted upon by the proposed debris net installation works. The likelihood of impact assessments during this stage of the project involved a rapid assessment considering the likelihood and severity of debris flow net installation and associated works to each species. The assessment of impacts was based on the following assumptions of the works and associated biodiversity mitigation measures put in place including. Significant work has been done by Melbourne Water to develop high level biodiversity mitigation actions. The major ones include a choice of net design that restricts direct construction impacts to a small and narrow footprint and the proposed use of a helicopter for supplying materials to the majority of sites reducing requirements for the creation of new access tracks. Melbourne Water have identified further mitigations actions that can be put in place to protect threatened plant and animal species, protect large trees and tree-ferns during the detailed design and construction phases. This report provides further detail on the biology and habitat requirements of each of these species along with species specific mitigation measure recommendations.

A planning permit under Clause 52.17 of the Yarra Ranges Council Planning Scheme will be required for the removal, destruction or lopping of native vegetation associated with the development and use of the proposed debris flow nets. The total native vegetation loss (likely a conservative on overestimate of potential permanent and short-term loss) is 1.386 ha including up to 25 large trees being impacted mainly relating to the safe canopy clearance creation for construction material to be delivered via helicopter. This report provides further recommendations relating to micro-siting of lay-down areas and specialist arborist input to protect a greater number of large trees during the detailed design and construction phase of this project.

A protected flora permit will be required under the Flora and Fauna Guarantee Act 1988 (FFG Act) in relation to the removal of some individual plants of listed protected flora at most of the sites.

Eleven of the species (all fauna) with a moderate or higher LOP are MNES under the EPBC Act. This report provides the details of the rapid assessment for each one of these species. It is recommended in this report that given the large number of MNES that have the potential to be significantly impacted from the proposed works if unmitigated that Melbourne Water prepare a referral to the Commonwealth Minister under the EPBC Act. A separate report (White et al 2023c) has been produced which provides the detailed assessment of each MNES against the relevant significant impact criteria.

# 2 Introduction

In February 2023 Ecology Australia was engaged by Melbourne Water to undertake ecological impact assessments at 35 proposed debris net sites within the Upper Yarra Reservoir catchment (Figure 1).

Post fire debris flows has been identified by Melbourne Water as the most significant threat to the continuity of water supply to the Silvan water supply system from the three main reservoirs Upper Yarra, Thomson and O'Shannassy (Alluvium 2023). This system provides >60% of Melbourne's drinking water.

Melbourne Water have had over a decade of investment in post fire erosion research along with partners such as University of Melbourne and the Department of Energy, Environment and Climate Change (DEECA) (Alluvium 2023). Detailed analysis and risk assessments of the post fire erosion impacts to water supply in the Upper Yarra catchment have been completed and documented in several technical reports ((Alluvium 2023a), (Alluvium 2020), (Alluvium 2021) and (Jacobs 2022)).

Debris flow structures in the form of debris nets are proposed to be installed in the upper headwater channels of the Upper Yarra Catchment are proposed to combat the risk which post-bushfire debris flows pose to Melbourne's drinking water supply (Alluvium 2023b).

Debris flow nets are proposed to be installed at up to 35 headwater channels within the study area (Alluvium 2023b). Melbourne Water's Drinking Water Quality Strategy (Melbourne Water 2023a) highlights that bushfire risk is projected to rise due to climate change, increasing the vulnerability of Melbourne's drinking water supplies. Scenario modelling has demonstrated that a high-severity wildfire in the Upper Yarra catchment would result in a 30% chance of 300 or more days of untreatable water within the reservoir (Alluvium 2023b).

Ecological assessments (desktop and field) were conducted for each of the proposed debris net sites and the potential impacts on native vegetation and / or threatened species or communities.

# 3 Study Area

The study area is within the closed Water Supply Catchment area of the Upper Yarra Reservoir and is also within the Yarra Ranges National Park. Field assessments encompassed 35 potential debris net locations within the Upper Yarra Reservoir closed catchment. The Upper Yarra Reservoir catchments provide a significant contribution to Melbourne's drinking water supply. This is both in terms of volume and the quality of the water. The Upper Yarra dam was completed in 1957, taking 10 years to complete construction. In 1995 the area became part of Yarra Ranges National Park. The reservoir has a capacity of 200,000 megalitres (Yarra Ranges Council n.d.), with a catchment area of over 30,000 hectares (Melbourne Water 2023). The study area is located within the Port Phillip and Westernport Catchment Management Area, the Yarra Ranges Shire municipality, and the Highlands – Southern Fall Bioregion.

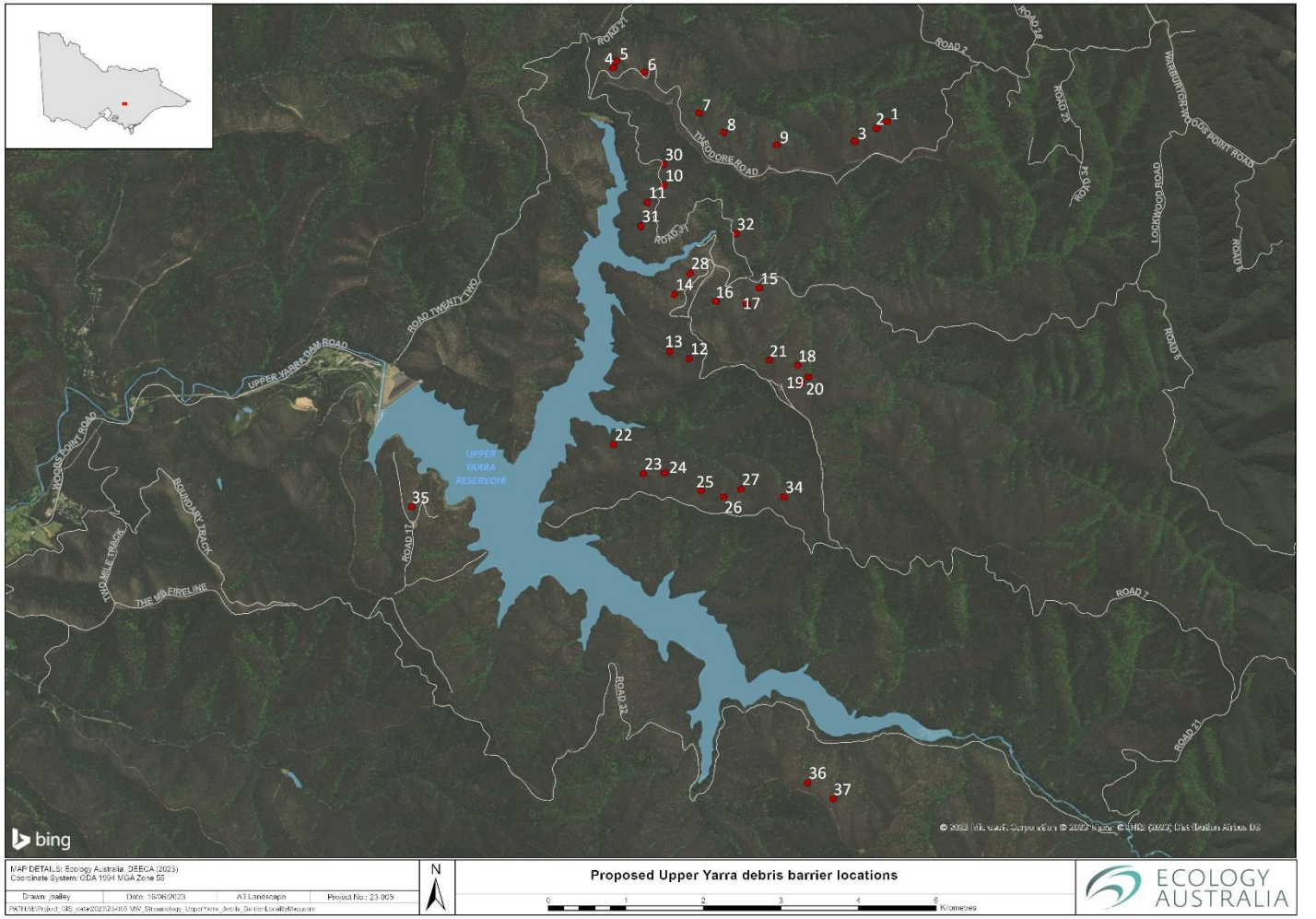


**Figure 1 Location of the proposed debris nets in the closed catchments of the Upper Yarra Reservoir**

  

# 4 Methods

## 4.1 Definitions

### 4.1.1 Native Vegetation

Native vegetation is defined under Clause 73.01 of the planning scheme as 'plants that are indigenous to Victoria, including trees, shrubs, herbs, and grasses'.

Further, the Guidelines classify native vegetation as either a patch or a scattered tree (DELWP 2017).

A patch of native vegetation is defined as:

- An area of vegetation where at least 25% of the total perennial understorey plant cover is native, or
- Any area with three or more native canopy trees where the drip line of each tree touches the drip line of at least one other tree, forming a continuous canopy, or
- Any mapped wetland including the Current Wetlands map, available in the DELWP systems and tools.

A scattered tree is defined as:

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

The purpose of describing native vegetation in discreet measurable units (i.e. patches and scattered trees) is to simplify and standardise the assessment and valuation process for native vegetation in preparation for its removal.

### 4.1.2 Likelihood of presence

Species that are listed as threatened either in the Environment Protection and Biodiversity Conservation Act (EPBC) or Flora and Fauna Guarantee Act (FFG) were assessed for likelihood of presence (LOP) within the project area. Determining LOP is a subjective process that considers the following:

- Documented habitats and ecological requirements for relevant species
- Presence of suitable habitat within the study area, based on a brief site assessment
- Attributes of suitable habitat, including size, shape, and landscape context
- Number, age, and distribution of previous records, considering the likely survey history in terms of intensity and frequency.

A general description of the LOP classifications is provided in Table 1.

  

**Table 1 Description of likelihood of presence classifications.**

| Likelihood | Definition |
|---|---|
| **Not Likely** | Study area is located outside the known geographic range for the taxon or does not contain necessary landscape features and/or habitats documented for that taxon. |
| **Low** | Study area lies within, or on the edge of, the geographic range for the taxon, and supports major habitat elements, but is lacking in one or more critical features, or is located within a landscape that will most likely preclude occupancy or regular use. Historic records may be supported by more recent records within 5 km of the study area. |
| **Moderate** | The location and geographic features of the study area match that which is known for the taxon. Habitat shares numerous floristic, structural or physical similarities with documented habitats, but may be limited with regard to one or more known ecological requirements (e.g. size, landscape context or critical resources). Historic and contemporary records occur within 5 km of the study area and/or the broader region. |
| **High** | Location of the study area lies within the known range and distribution for the taxon. Habitats present within the study area match that documented for the taxon regarding floristics and/or structure and satisfy the known ecological requirements. Multiple historic and recent records within the surrounding landscape indicate occurrence or regular use of the area. |
| **Present** | Taxon recorded within the study area during the current assessment or other recent assessment. |

The likelihood of presence across the broader study area was conducted with desktop analysis of species records. Then during the field survey, each of the 35 individual sites within the study area were assessed for the presence and suitability of habitat for threatened flora and fauna species.

### 4.1.3 Likelihood of significant impact

Once the LOP for threatened species at the site was determined, an assessment of the likelihood and scale of impact of the proposed development was conducted. Those species, or ecological communities, that had been determined as having a moderate or high LOP were then given more detailed consideration of potential impacts from the construction process.

Each species was reviewed for information on its known ecology. Information that is useful in understanding the impacts at an individual or species level includes, but is not limited to:

- Important habitat elements
- Annual or perennial (flora)
- Timing of growth stages (flora)
- Roosting or breeding habitat and timing (fauna)
- Day and night-time activity (fauna)
- Ability to move away from disturbance (fauna).

  

The species or communities that were listed as Matters of National Environmental Significance (MNES) under the EPBC Act are assessed using the Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (DEWHA 2013).

For the purposes of this report only preliminary assessments of the likelihood of significant impact to threatened species was conducted based on site information and broadly known information on each species. A precautionary approach to determination of the likelihood of significant impact was conducted.

**Table 2 Descriptions of the broad categories of used in this report for the Likelihood of Impact (LOI) on threatened species**

| Category of impact | Description of potential impact on species |
|---|---|
| Not likely | No impacts likely |
| Low | Potential impacts/short-term |
| Moderate | Potential impacts for the mid-long term for a small number of individuals |
| High | Very likely to cause significant impacts at either population/species level |

## 4.2 Database review

A database review was conducted to compile information from the following sources:

- Flora and fauna records within 5 km of the study site held in DEECA's Victorian Biodiversity Atlas (VBA) online database (DEECA 2023a)
- Records of ecological communities and flora and fauna species listed under the EPBC Act within a 5 km radius of the study area using the EPBC Protected Matters Search Tool (DCCEEW 2023)
- Ecological Vegetation Class (EVC) mapping/modelling of the area (both extant and pre-1750) from DELWP's NatureKit interactive map (DEECA 2023b)
- DEECA's Native Vegetation Information Management Tool (NVIM) (DEECA 2023c) to determine the assessment pathway of the proposed native vegetation removal and DEECA's EnSym Native Vegetation Regulations Tool (DEECA 2023) to generate the scenario testing Native Vegetation Removal (NVR) report
- Relevant GIS data and aerial photography
- The Yarra Ranges Council Planning Scheme via Victorian Planning Schemes online (DELWP 2022d)
- Relevant legislation, government policies and strategies.

## 4.3 Field Assessment

Half-day assessments were undertaken at each site by a team of 1 botanist and 1 zoologist between 3 April 2023 and 2 May 2023. Surveys quantified potential impacts to flora and fauna within the debris

nets construction area, with an additional 50 m radius buffer surveyed around this area to ascertain threats to ecological values and opportunities to avoid and minimise impacts at the broader site level. During the assessment, an inventory of native and exotic flora and fauna species was recorded. Patches of native vegetation encountered were mapped and assigned an appropriate EVC, with a vegetation quality assessment (VQA) undertaken by a qualified assessor for each distinct Habitat Zone (HZ). The location and number of any threatened flora or fauna individuals or populations encountered were also recorded. The location and Diameter at Breast Height (DBH) of any Large Old Trees (LOTs) were also recorded, with LOT DBH defined by the relevant EVC Benchmark. The location of tree ferns (rough tree-fern *Cyathea australis* and soft tree-fern *Dicksonia antarctica*) were also mapped so that impacts to these slow-growing lifeforms may be avoided where possible. Representative photos were taken with the intent of characterising the types of vegetation and the composition of species present within the study area.

## 4.4 Limitations

The seasonality of some plant species may prove to be a limitation of the field survey. Some species may have been overlooked because they were inconspicuous when the survey was conducted or have been identified to genus level only due to the absence of fertile material. This is particularly pertinent for geophytic species such as orchids. Several threatened orchid species have previously been recorded within 5 km of the study area including mountain bird-orchid *Chiloglottis jeanesii* and Christmas spider-orchid *Caladenia flavovirens,* neither of which were flowering during the survey period. The absence of aboveground material (present only around anthesis) hinders detection of such species. As such, their presence or absence at sites which supported suitable habitat could not be confirmed. However, these limitations are unlikely to alter the major findings regarding overall quality and significance of the vegetation.

Detailed fauna surveys were not within the scope of this assessment. The presence of many fauna species is difficult to confirm in the absence of targeted survey methods such as camera-trapping or spotlighting. Additionally, the rare or threatened fauna species which form the focus of threatened species legislation cannot always be expected to be detected, particularly outside active seasons or during brief surveys. As such, it is expected that some species which occur within the study area were not able to be recorded by direct or indirect observation (e.g. scats, burrows, feed trees, etc.) during these surveys.

These limitations are unlikely to affect the main outcomes of this report as most were overcome using of databases, review of relevant literature and assessment of habitat suitability for threatened species. However, the accuracy and coverage of the VBA and other sources used in the desktop review is variable and strongly influenced by whether previous ecological surveys have been undertaken in the area. Hence, the absence of species records is not necessarily indicative of that species' absence, particularly where few or no targeted surveys have been undertaken.

## 4.5 Nomenclature and taxonomy

Plant and animal taxonomy and the use of common names follow the online Victorian Biodiversity Atlas (DELWP 2022a).

  

Where an asterisk (*) precedes a plant or animal name, it is used to indicate those which are not indigenous to Victoria. A hash (#) is used to denote a Victorian indigenous plant species that is generally accepted as not indigenous, i.e. outside of its natural range where recorded within the study area.

# 5 Results

## 5.1 Flora

A total of 212 vascular flora taxa were recorded during the field survey. Of these, 207 (98%) are Victorian indigenous species and 5 (2%) are exotic. Appendix 1 shows the full list of plant species observed during the surveys.

### 5.1.1 Ecological Vegetation Classes (EVC)

NatureKit (DELWP 2023b) modelled pre-1750 EVC mapping indicates that the broad study area of the Upper Yarra Catchment likely previously supported a range of EVC's including Cool Temperate Rainforest, Wet Forest, Damp Forest, Riparian Forest, Shrubby Foothill Forest, Heathy Dry Forest, Montane Riparian Thicket and Escarpment Shrubland. The study area contains elevations and topography that also lend itself to having montane or sub alpine EVCs especially in the eastern edges of the catchment area such as Montane Wet Forest, Montane Damp Forest, Montane Sedgeland.

The actual EVCs that were present at the subject sites included Damp Forest, Shrubby Foothill Forest, Heathy Dry Forest and Shrubby Dry Forest. Damp Forest (54%) and Shrubby Foothill (33%) Forest were the two most encountered EVCs at the study sites. Table 3 gives a summary of what EVC occurred at each of the sites. Below is a description of the vegetation found at each of the EVC's encountered.

**Table 3 Summary of the EVCs that were present at each of the study sites.**

| EVC | Site Numbers |
|---|---|
| Damp Forest | 1,2,4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 16, 17, 19,20, 21, 22, 24, 25, 27, 30, 31, 32 |
| Shrubby Foothill Forest | 1,2, 5, 11, 12, 16, 18, 23, 24, 25, 26, 31, 32, 34, 36, 37 |
| Heathy Dry Forest | 10, 14, 15, 28, 35 |
| Shrubby Dry Forest | 3 |

#### Damp Forest (EVC 29) – Least Concern

This vegetation class is characterised in the EVC benchmark (DSE 2004) as having a tall eucalypt layer of greater than 30 m in height with a tall to medium dense shrub layer of broad-leaved species. The understorey has species or herb grasses and ferns that are moisture dependant species. This EVC will include occasional tree ferns (DSE 2004).

In the study area the overstorey species that were most associated with this EVC were mountain grey-gum *Eucalyptus cypellocarpa*, messmate *E. obliqua*, narrow-leaved peppermint *E. radiata* and brown stringybark *E. baxteri*. The understorey species that were most commonly encountered in this EVC were blackwood *Acacia melanoxylon*, hazel pomaderris *Pomaderris aspera*, musk daisy-bush *Olearia argophylla*, prickly currant-bush *Coprosma quadrifida*, common cassinia *Cassinia arculeata*, blanket-leaf *Bedfordia arborescens* and snowy daisy-bush *Olearia lirata* and rough tree-fern *Cyathea australis*.

  

The groundstorey was generally dominated by ferns such as mother shield-fern *Polystichum proliferum*, bracken *Pteridium esculentum* or graminoids such as tasman flax-lily *Dianella tasmanica*, spiny mat-rush *Lomandra longifolia*, sword tussock-grass *Poa ensiformis*, forest wire-grass *Tetrarrhena juncea* and tall sword-sedge *Lepidosperma elatius.* Figure 2 shows an example of what this EVC looks like within the study area.

**Figure 2 Damp Forest at Site 22.**

### Shrubby Foothill Forest (EVC 45) – Least Concern

This vegetation class is characterised in the EVC benchmark (DSE 2004) as having an overstorey made up of medium height (up to 25 m) eucalypts. It is found on moderately fertile soils on ridges or on south or eastern slopes often up slope from Damp or Wet Forest EVC's. The middle strata are usually dominated by medium sized, narrow leaved, shrubs. At the study area this EVC was commonly encountered immediately upslope of Damp Forest and downslope of Heathy Dry Forest.

The species of plants that were common and or characteristic of this EVC in the study area included an overstorey of predominantly narrow-leaved peppermint, silvertop ash *E. sieberi*, messmate and brown stringybark. The medium and small shrubs that were most frequently present included prickly bush-pea *Pultenaea forsythiana,* common cassinia, shiny cassinia *Cassinia longifolia*, narrow-leaf wattle A*cacia mucronata* subsp. *longifolia*, prickly currant-bush, snowy daisy-bush and pink-bells *Tetratheca ciliata*. The groundstorey contained a mixture of graminoids such as spiny mat-rush, tussock grasses *Poa* spp., tasman flax-lily, broom spurge *Amperea xiphoclada* var. *xiphoclada* and forest wire-grass. Other species included bracken, common raspwort *Gonocarpus tetragynus*, slender dodder-laurel *Cassytha glabella*, wonga vine *Pandorea pandorana* subsp. *pandorana*, forest clematis *Clematis aristata* and common

trigger-plant *Stylidium armeria*. Figure 3 shows an example of what this EVC looks like within the study area.

**Figure 3 Shrubby Foothill Forest at Site 23.**

### Heathy Dry Forest (EVC 20) – Least Concern

This vegetation class is characterised in the EVC benchmark (DSE 2004) as having a low and open eucalypt canopy forest with the trees often being of poor form and less than 20m tall. The understorey has low layer of ericoid-leaved shrubs including heaths and peas. It is found on shallow and rock skeletal soils on gentle undulating hills to exposed aspects on ridge tops and steep slopes (DSE 2004). The later was the more common topography of this EVC in the Upper Yarra Catchment at the sites that were assessed.

The species of plants that were common and or characteristic of this EVC in the study area included an overstorey of predominantly broad-leaved peppermint *Eucalyptus dives* and narrow-leaved peppermint. The shrub layer frequently included species such as hairpin banksia *Banksia spinulosa* var. *cunninghamii,* thin-leaf wattle *Acacia aculeatissima*, narrow-leaf wattle, sweet bursaria *Bursaria spinosa* subsp. *spinulosa*, bushy needlewood *Hakea decurrens*, prickly broom-heath *Monotoca scoparia*, gorse bitter-pea *Daviesia ulicifolia* common heath *Epacris impressa* and moth daisy-bush *Olearia erubescens*.

The groundstorey was generally quite sparse with prostrate or small shrubs such as honeypots *Acrotriche prostrata* or robust graminoids such as wattle mat-rush *Lomandra filiformis*, black-anther flax-lily *Dianella revoluta* var. *revoluta* and silvertop wallaby-grass *Rytidosperma pallidum*. Figure 4 shows an example of what this EVC looks like within the study area.

**Figure 4 Heathy Dry Forest at Site 15.**

### Shrubby Dry Forest (EVC 21) – Least Concern

This vegetation class is characterised in the EVC benchmark (DSE 2004) as having an open eucalypt canopy forest that often has a diversity of Eucalypts and is generally lacking a secondary tree canopy layer but had a well-developed medium and small shrub layer. This EVC was only observed at Site 3 (Figure 5). The overstorey consisted of mountain-grey-gum, brown stringybark, messmate stringybark and narrow-leaf peppermint. The common shrub layer species that were present included, narrow-leaf wattle, common cassinia, prickly currant-bush, austral indigo, pricky bush-pea and rough tree-fern. The groundlayer was mostly dominated by ground-ferns such as common ground-fern *Calochlaena dubia* and tufted graminoids such as Tasman flax-lily and spiny-headed mat-rush.

  

**Figure 5 Shrubby Dry Forest at Site 3.**

### 5.1.2 Large Trees and tree ferns

A combined total of 517 medium to large sized (>60 cm DBH) trees were measured across all 35 sites with 386 of these trees being considered Large Trees as per the appropriate EVCs at each site i.e. >60 cm DBH Heathy Dry Forest, >70 cm DBH for Shrubby Foothill and Shrubby Dry Forests and >90 cm DBH for Damp Forest (Table 4). Dead trees were considered as Large Trees if the DBH was greater than or equal to 40 cm.

The average number of large trees per site was approximately 11, ranging between 0–26 per site. There were 5 sites that had 20 or more large trees, and 10 sites that had 5 or less large trees per site (Table 4).

Table 4 shows that the most encountered Large Trees were mountain grey-gum *Eucalyptus cypellocarpa* and dead trees.

Tree-ferns (comprising mainly *Cyathea australis* (Figure 6) and a few *Dicksonia antartica*) were commonly encountered at most debris nets sites that had Damp Forest EVC. Although the two species observed are not listed as threatened species, they are slow growing and there were many examples of the tree ferns being up to 8 m in height. Tree-ferns were observed at 19 of the 35 sites and a total of 338 tree-ferns were mapped. Not all ferns were mapped, however the majority that were close to the debris nets line were recorded. Tree-ferns provide important microclimates and substrates for many species of bryophytes and small epiphytic ferns.

  

**Figure 6 Rough tree-fern *Cyathea australis* at Site 24.**

**Table 4 Number of Large Trees (according the EVC benchmark for relevant EVC) per species for each debris net site location.**

| | Large Tree Species | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Dead | *Eucalyptus baxteri s.s.* | *Eucalyptus cypellocarpa* | *Eucalyptus dives* | *Eucalyptus goniocalyx s.l.* | *Eucalyptus obliqua* | *Eucalyptus radiata subsp. radiata* | *Eucalyptus sieberi* | *Eucalyptus sp.* | Total |
| **Site 1** | 4 | | 9 | 1 | | 3 | | | | **17** |
| **Site 2** | 3 | | 8 | 1 | | 5 | 1 | | | **18** |
| **Site 3** | 3 | 1 | 14 | | | 8 | | | | **26** |
| **Site 4** | 2 | | 1 | | | | | | | **3** |
| **Site 5** | 4 | | | | | 12 | 6 | 1 | | **23** |
| **Site 6** | 5 | | | | | | | | | **5** |
| **Site 7** | 3 | | 17 | | | | | | | **20** |
| **Site 8** | 1 | | 10 | | | | | | | **11** |
| **Site 9** | 1 | | 2 | | | | 1 | | | **4** |
| **Site 10** | | | 2 | | | | | | 1 | **3** |
| **Site 11** | 1 | | 10 | 1 | | 1 | | | | **13** |
| **Site 12** | | | 3 | | | | | | | **3** |
| **Site 13** | 3 | | 6 | | | | | | | **9** |
| **Site 14** | | | | 8 | | | 2 | | | **10** |
| **Site 15** | | | | 3 | | | 6 | | | **9** |
| **Site 16** | 6 | | 7 | 1 | | | | | | **14** |
| **Site 17** | 1 | | 14 | | | | 1 | | | **16** |
| **Site 18** | 6 | | 4 | | | | 5 | | | **15** |
| **Site 19** | 1 | | 4 | | | | | | | **5** |
| **Site 20** | 2 | | 10 | | | | 1 | | | **13** |
| **Site 21** | 3 | 1 | 3 | | | 1 | 1 | | | **9** |
| **Site 22** | 2 | | 3 | | | 3 | | | | **8** |
| **Site 23** | 2 | | 3 | | | 6 | 2 | 1 | | **14** |
| **Site 24** | 9 | | | | | 7 | 7 | | | **23** |
| **Site 25** | 2 | 10 | 3 | | | | 4 | | | **19** |
| **Site 26** | 1 | 1 | | 1 | | | 3 | 5 | | **11** |
| **Site 27** | 3 | | 3 | | | | | | | **6** |
| **Site 28** | | | | | | | | | | **0** |
| **Site 30** | 2 | | 6 | | | | | | | **8** |
| **Site 31** | 4 | 1 | 3 | 1 | | 1 | | | | **10** |
| **Site 32** | 3 | | 8 | | | 1 | | | | **12** |
| **Site 34** | 5 | | 7 | | 1 | | 4 | 3 | | **20** |
| **Site 35** | | | | 3 | | | | | | **3** |
| **Site 36** | | | | | | | | 3 | | **3** |
| **Site 37** | | | | | | | | 3 | | **3** |
| **Total** | **82** | **14** | **160** | **20** | **1** | **48** | **44** | **16** | **1** | **386** |

  

### 5.1.3 Threatened ecological communities

One EPBC Act-listed ecological community is modelled as potentially occurring within 5 km of the study area (DCCEEW 2023). This was the Alpine Sphagnum Bogs and Associated Fens community. This community was deemed not present on site, with criteria (outlined in TSSC 2009) not met for the following reasons:

- Study sites were not located within areas of high enough elevation. The Alpine Sphagnum Bogs and Associated Fens community is known to occur at 1200 m asl within Victoria, whilst most sites were located between approximately 400-600 m asl.
- No *Sphagnum* spp. were recorded during site surveys, nor were characteristic shrubs or restiads *Restionaceae* spp. which are sometimes dominant in place of *Sphagnum* spp.
- Sphagnum bogs and associated fens are generally located within permanently wet areas such as along streams, valley edges and valley floors. Suitable habitat was not present at the study area due to the steep incline of sites leading to rapid drainage of water.

Two FFG Act (1988) listed ecological communities were predicted to potentially occur within the study area during the desktop assessment component. They are:

- Cool Temperate Rainforest
- Cool Temperate Mixed Forest

Neither of these FFG Act-listed ecological communities were deemed present at any of the sites. This was based largely upon the absence of characteristic species of rainforest and mixed forest communities such as southern sassafras *Atherosperma moschatum*, myrtle beech *Nothofagus cunninghamii* and mountain ash *E. regnans*. All sites surveyed were too dry to support these FFG communities, which generally occur in association with Wet Forest (DSE n.d.). Wet Forest was not recorded from any of the study sites, though Damp Forest was abundant.

### 5.1.4 Rare or threatened flora

A desktop survey has found a total of 16 threatened flora species have been recorded (DEECA 2023a) or have habitat modelled (DCEEW 2023b) within 5 km of the study area as shown in Table 5 and Figure 7. This includes:

- 4 species listed as threatened under the EPBC Act and FFG Act
- 12 species listed as threatened only under the FFG Act (1988)

Two additional species that were not in the desktop searches but were observed or were potentially present include red-tipped greenhood *Pterostylis clivosa* and parsley xanthosia *Xanthosia leiophylla*. While red-tipped greenhood was observed in the study area the identification of a Xanthosia sp. that was found at 2 sites was not possible without flowering material. For a precautionary approach these sitings are treated further in this report as of moderate LOP for parsley xanthosia.

A site-specific likelihood of presence (LOP) has been assigned (Table 5) to each of these species based on the criteria outlined in Section 4.1.2. Three threatened flora species were recorded within surveyed sites in 2023 by Ecology Australia. These were lemon boronia *Boronia citrata*, Powelltown correa *Correa reflexa* var. *lobata* and silky golden-tip *Goodia pubescens*. None of these species were considered likely

to currently occur at any of the additional sites surveyed. A further 3 threatened species were incidentally recorded within the broader study area (Upper Yarra Reservoir Catchment) but not within study sites. These were large-leaf cinnamon wattle *Acacia leprosa* var. *uninervia*, Nunniong everlasting *Ozothamnus rogersianus* and red-tipped greenhood *Pterostylis clivosa*. Red-tipped greenhood was considered moderately likely to occur at 4 other sites within the study area (Table 5), whilst large-leaf cinnamon-wattle and Nunniong everlasting were not considered likely to currently occur at any of the surveyed sites. A *Xanthosia* sp. was recorded from sites 12 and 32. This record could not be resolved to species level due to the absence of adequate fertile material. However, it likely represents either the common, cut-leaved xanthosia *Xanthosia dissecta* or the threatened parsley *X. leiophylla*. As such, parsley xanthosia was deemed moderately likely to occur within the study area due to the presence of said individuals and potentially suitable habitat.

Christmas spider-orchid *Caladenia flavovirens* was not recorded from any surveyed sites however the surveys were conducted during the dormant stage of this species life-cycle. There are very small number of records in the Victorian Biodiversity Atlas with only 45 records for this species in total. Only 6 records are from since the year 2000 with none of these records within 30 kilometres of the Upper Yarra Catchment study area. The study area falls within a broad area of modelled habitat as per the DEECA Habitat Distribution Model (HDM) for the Species although the habitat suitability value is less than 20 out of 100. This species had suitable habitat, open forests with a grassy understorey, in at least parts of 7 of the sites. Based on a precautionary approach for the purposes of this report we have assumed that there is a moderate likelihood of occurrence of this species at the 7 sites where suitable habitat exists.

  

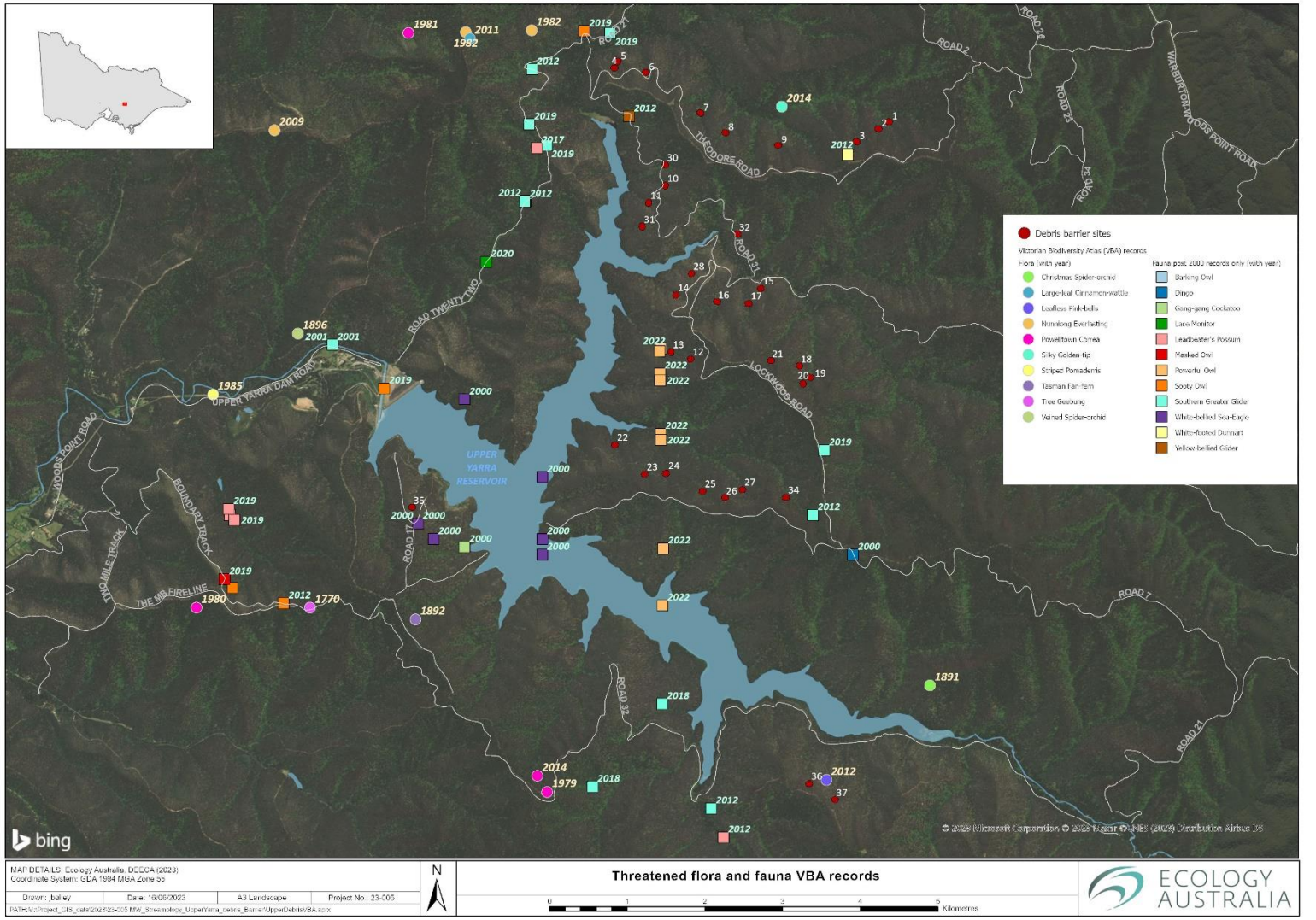


**Figure 7 Threatened flora and fauna VBA records within the broader Upper Yarra Catchment area.**

  

**Table 5 Likelihood of Presence (LOP) of threatened flora species (FFG or EPBC Act) across the 35 proposed debris net sites in the Upper Yarra Catchment.**

| Scientific Name | Common Name | EPBC | FFG Category of Threat | FFG Extinction Risk | Source | Number of Records | Last Recorded | LOP |
|---|---|---|---|---|---|---|---|---|
| *Acacia leprosa var. uninervia* | large-leaf cinnamon-wattle | | en | Victoria | VBA | 13 | 25/10/2018 | Not likely. Not observed and it is perennial and conspicuous, and the survey effort was appropriate. |
| *Caladenia flavovirens* | Christmas spider-orchid | | cr | Victoria | VBA | 1 | 01/01/1891 | Moderate Sites 14, 15, 18, 28,35, 36 and 37 |
| *Caladenia reticulata s.s.* | veined spider-orchid | | en | Victoria | VBA | 1 | 01/09/1896 | Not likely. This species in the strict sense is now possibly only confined to South Australia. It is now most circumscribed as several other species in Victoria (VicFlora 2023) |
| *Correa reflexa var. lobata* | Powelltown correa | | en | Australia | VBA | 4 | 30/10/2014 | Present Site 34 only |
| *Goodia pubescens* | silky golden-tip | | en | Victoria | VBA | 6 | 21/12/2016 | Present sites 1-3,10, 17-21 and 34 only. |
| *Lastreopsis hispida* | bristly shield-fern | | en | Victoria | VBA | 1 | 28/10/2014 | Not likely |
| *Ozothamnus rogersianus* | Nunniong everlasting | | en | Australia | VBA | 5 | 12/03/2009 | Present near Site 13. Not likely for all other sites |
| *Persoonia arborea* | tree geebung | | en | Australia | VBA | 19 | 14/02/2019 | Not likely. Not observed and it is perennial and conspicuous, and the survey effort was appropriate. |
| *Pomaderris pilifera subsp. pilifera* | striped pomaderris | | en | Victoria | VBA | 2 | 7/08/1985 | Not likely. Not observed and it is perennial and conspicuous, and the survey effort was appropriate. |
| *Prasophyllum morganii* | mignonette leek-orchid | VU | Extinct | Victoria | PMST | | | Listed as extinct in Victoria |

  

| Scientific Name | Common Name | EPBC | FFG Category of Threat | FFG Extinction Risk | Source | Number of Records | Last Recorded | LOP |
|---|---|---|---|---|---|---|---|---|
| *Pterostylis chlorogramma* | green-striped greenhood | VU | en | Victoria | PMST | | | Not likely. The DEECA Habitat distribution model shows the nearest modelled suitable habitat as over 15 km to the south-west of the study area. |
| *Pterostylis clivosa* | red-tip greenhood | | en | Australia | observed 2023 | | | Observed on roadside of Theodore Rd near Site 4. Moderate LOP at Sites 10, 15, 28 and 35 based on suitable habitat. |
| *Pultenaea juniperina s.s.* | prickly beauty | | vu | Victoria | VBA | 1 | 8/11/2012 | Not likely. Not observed and it is perennial and conspicuous, and the survey effort was appropriate. |
| *Sticherus tener s.s.* | Tasman fan-fern | | en | Victoria | VBA | 1 | 01/08/1892 | Not likely. Not observed and it is perennial and conspicuous, and the survey effort was appropriate. |
| *Tetratheca subaphylla* | leafless pink-bells | | vu | Victoria | VBA | 3 | 24/07/2012 | Not likely. Not observed and it is perennial and conspicuous, and the survey effort was appropriate. |
| *Thesium australe* | austral toad-flax | VU | en | Victoria | PMST | | | No records within proximity to the study area and no suitable damp woodland or herbfields were present |
| *Xanthosia leiophylla* | parsley xanthosia | | en | Victoria | Observed Xanthosia sp. and VBA (10 km) | 2 | 1982 | *Xanthosia sp*. found at Sites 12 and 32. Moderate LOP for *X.leiophylla* |
| *Xerochrysum palustre* | swamp everlasting | VU | cr | Victoria | PMST | | | Not likely. No records nearby and no suitable lowland swamps on black - cracking clays exist at any of the sites. |

  

### 5.1.5 Threatened flora species descriptions

#### Powelltown correa *Correa reflexa* var. *lobata* (Endangered FFG Act)

This species was observed at one site (Site 34) where it was locally abundant with over 151 plants recorded (Figure 8 and Figure 16)

This subspecies is likely to be elevated to a specific rank based on, yet unpublished data by Geoff Carr. This is based upon a suite of characters unique to the subspecies (DELWP 2021a). This shrub can grow up to 2 m in height and is long-lived, regenerating post-fire from soil stored seed. Although it can continuously recruit, a pulse of recruitment occurs after a fire. This species is bird pollinated and seeds are ejected from fruits within 5 m of the adult plant. Ants will disperse and bury the seed as they harvest lipids from fleshy structures on the seed (elaisomes).

This species is naturally restricted to a relatively small area of Victoria mostly in the catchment of the Yarra River east from the Dandenong Ranges (DELWP 2021a). Populations of the species are also fragmented. A detailed population estimate does not exist as no population viability analysis has been conducted for the species.

**Figure 8 Powelltown correa *Correa reflexa* var. *lobata* at Site 34.**

  

### Silky golden-tip *Goodia pubescens* (Endangered FFG Act)

This species was observed at 10 of the 35 sites (Sites 1-3,10, 17-21 and 34), with a total number of 344 plants recorded. The 2 largest populations were at Site 20 and 21 with approximately 150 plants found in each. At many of the sites only scattered juvenile plants were observed. This species occurs sporadically in sheltered sites in river valleys or lower slopes on alluvial or colluvial soils. The species is recorded in 4 distinct regions of Victoria in the Grampians, the Far Southwest, Eastern Otways and Central Highlands (VicFlora 2023). The Threatened Species Assessment (DELWP 2021b) describes that very little is known about the local and regional population size and it is estimated to be severely fragmented.

This shrub species is about 2 metres tall. It is distinguished from the more common, golden-tip *Goodia lotifolia* by its young branchlets and leaflets having appressed or spreading hairs (Figure 9 and Figure 10.) This species recruits from seed after fire events and is also likely to recruit after other soil disturbance events (DELWP 2021b). At several sites within the study area it was noted to be recruiting within disturbed soil where trees had fallen and their root balls had been ripped out. It has also been recorded as root suckering which may extend the adult lifespan after fire events that destroy the crown of the plant.

**Figure 9 Silky golden-tip *Goodia pubescens* at Site 20.**

  

**Figure 10 Characteristic leaf and stem pubescence of Silky-golden tip, Site 2.**

### Lemon boronia *Boronia citrata* (Endangered FFG Act)

Only one plant of this species (Figure 11 and Figure 12) was observed at one site, Site 35, growing within Heathy Dry Forest exhibiting a dense shrub layer underneath a canopy of broad-leaf peppermint *E. dives* and narrow-leaf peppermint *E. radiata* subsp. *radiata.* This small shrub can grow up to 1.5 m high and has pungently lemon scented leaves. The seed is hard and long-lived and can survive in the soil seed bank for many years. Plants are estimated to live between 5-15 years.

This species is endemic to Victoria where it is known only from 3 areas: the upper catchment of the Macalister River north and east of Licola and upper catchment of the Yarra River. This record potentially extends the known distribution of the species within the Upper Yarra catchment, as only one record exists within the Australasian Virtual Herbarium for this population (with none held on the VBA) which is located approximately 3.3 km southeast of the study site. As such, this is a potentially significant record and this individual (and any others which may be incidentally encountered during works) should be protected as a priority due to the restricted distribution of the species. The Habitat Distribution Model for this species (NatureKit 2023) models the nearest potential distribution for the species as approximately 51 km to the east of the location of this new record (likely due to the absence of records within the area on the VBA). The *Threatened Species Assessment Boronia citrata Lemon Boronia* (DELWP 2021c) describes that there is there is an estimated population of 300- 900 individuals of this species based on field observations in 2018 by Neville Walsh. The area of occupancy is described as only being about 4 $km^2$ in two locations.

  

**Figure 11 Lemon boronia recorded from Site 35.**

**Figure 12 Leaf close-up of lemon boronia recorded from Site 35.**

  

### Large-leaf Cinnamon Wattle *Acacia leprosa* var. *uninervia* (Endangered FFG Act)

This species was not observed at any of the study sites but was observed occurring along the side of various roads throughout the catchment area. One location of this species with 4 individuals was recorded as an incidental record along Theodore Road, upslope from Site 1. As the sites were not close to any of these populations, detailed mapping and assessments of population size were not conducted as part of this project.

This sub-species generally occurs as an understorey shrub up to 5 m tall within wet and dry eucalypt forests. The Threatened Species Assessment (DELWP 2021d) documents that it occurs from Gisborne through to the north-east ranges including Powelltown and Buxton. Populations also occur at Mt Buffalo and around Nyora in the south-east of Melbourne.

Population estimates for the species are currently lacking (DELWP 2021d). The subspecies was recorded recruiting *en mass* after the 2009 bushfires. Tens of thousands of individuals were observed in the Kinglake (Tolsma *et al*. 2012) and Healesville areas (Marty White pers obs.) This species is susceptible if fires occur more frequently than the seed set age of the plants.

**Figure 13 Characteristic leaf venation of large-leaf cinnamon-wattle *Acacia leprosa* var. *uninervia.* Theodore Road, Upper Yarra Reservoir Catchment.**

### Red-tipped greenhood *Pterostylis clivosa* (Endangered, FFG Act)

One red-tipped greenhood individual was incidentally recorded along the roadside embankment of Theodore Road near Site 4. This species is found in open forests and woodlands of drier slopes and ridges with most of the known populations occurring east of Melbourne (VicFlora 2023). Red-tipped greenhood was therefore also deemed moderately likely to occur at Sites 10, 15, 28 and 35 due to the presence of potentially suitable habitat (with these sites supporting Heathy Dry Forest vegetation).

  

No records of red-tipped greenhood exist within 5 km of the study area on the VBA. The closest available record is approximately 10 km east from the southern study sites (VicFlora 2023). This population occurs at the outer extent of the current known range for the species (excluding sparse northerly pre-1987 records held on AVH which have not been re-recorded in more recent times) and may therefore represent a somewhat significant find. Frequent records for the species occur in the outer eastern suburbs of Melbourne, northwest of Traralgon and northwest of Bairnsdale (NatureKit 2023). The Habitat Distribution Modelling (NatureKit 2023) currently only encompasses the populations surrounding Melbourne and Bairnsdale, potentially due to the recency of many of the records occurring within the central population area northwest of Traralgon.

**Figure 14 The endangered, red-tipped greenhood *Pterostylis clivosa* found on the roadside embankment of Theodore Road, near Site 4.**

### Nunniong everlasting *Ozothamnus rogersianus* (Endangered FFG Act)

Two individual Nunniong everlasting plants were incidentally recorded in the vicinity of Site 13. Nunniong everlasting is an erect shrub which grows to 2.5 m high. It exhibits viscid, densely cottony branchlets with new yellowish growth (VicFlora 2023). Nunniong everlasting is endemic to Victoria and is known from 4 geographically distinct areas: moist foothill forests of the western Otway Range and East Warburton Area, and subalpine woodlands and shrublands of Mount Wellington and the Nunniong Plateau (VicFlora 2023). The study area is mapped as important habitat for the species on NatureKit's Habitat Importance Model (HIM). Six records of the species within 5 km of the study area are held on the VBA, with the most recent dating from 2009.

### Parsley xanthosia *Xanthosia leiophylla* (Endangered FFG Act)

As discussed earlier, parsley xanthosia was deemed moderately likely to occur at sites 12 and 32 due to the presence of a *Xanthosia* sp. (Figure 15) which could represent parsley xanthosia but could not definitively be resolved to species level due to the absence of adequate fertile material. Parsley xanthosia is known from sandy heathlands and heathy woodlands across the south of Victoria, with most post-2000 records confined to the southwest. One record within 5 km of the study area was present on the VBA, dating from 1982. While it is more likely that the records from Site 12 and 32 relate to the common cut-leaved xanthosia based upon the lack of recent records of parsley xanthosia in eastern Victoria, it has been included here as a precaution.

**Figure 15 *Xanthosia* sp. recorded from Site 32.**

### Christmas spider-orchid *Caldenia flavovirens* (Critically Endangered FFG Act)

Christmas spider-orchid was not recorded from any of the survey sites but was deemed moderately likely to occur at 4 sites (Table 5). The presence of Christmas spider-orchid could not be confirmed at these sites due to surveys taking place outside of the flowering window of the species (Dec-Jan). Christmas spider-orchid is known from a range of habitat types, including low altitude mountain forests with a grassy understorey (VicFlora 2023). Surveyed sites supporting Heathy Dry Forest or Shrubby Foothill Forest with a grassy understorey were considered moderately likely to contain the species.

Christmas spider-orchid is known from areas east of Melbourne, near-coastal areas across the state and scattered mountainous areas in eastern Victoria. Only one record within 5 km of the study area was present on the VBA (dating from 1891). However, this may be reflective of a relatively low survey and

reporting effort within the Upper Yarra Catchment Reservoir area. Nonetheless, the study area is located within the Habitat Distribution Modelling for the species on NatureKit (NatureKit 2023).

  

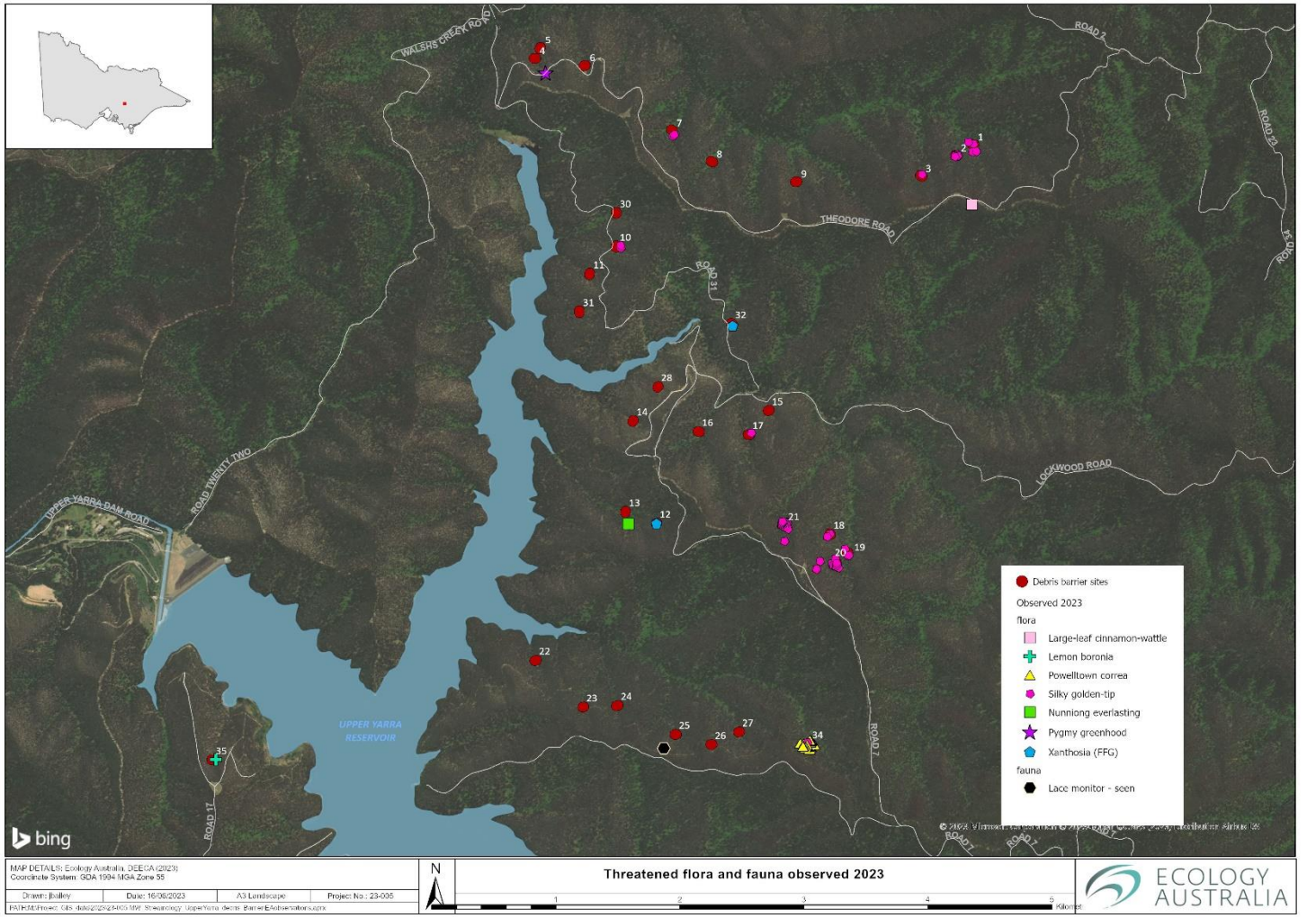


**Figure 16 Threatened flora and fauna observed during the field surveys in 2023.**

  

## 5.2 Fauna assessment

A total of 36 fauna taxa were recorded during the field survey (Table 6). Only the one exotic fauna species was observed during the survey, sambar deer *Rusa unicolor.* Sambar deer were regularly observed walking along the management tracks and scats and rub trees were also regularly observed.

Three threatened species were observed or heard during the field surveys and included gang-gang cockatoo *Callocephalon fimbriatum*, pilot bird *Pycnoptilus floccosus* and lace monitor *Varanus varius.*

**Table 6 Fauna that were recorded from while surveying the study area (*=introduced, EN=Endangered- EPBC Act, VU=Vulnerable- EPBC Act, en= Endangered FFG Act.).**

| Status | Scientific Name | Common Name | Observation | Lifeform |
|---|---|---|---|---|
| * | *Cervus unicolor* | Sambar deer | Seen | Mammals |
| | *Rattus fuscipes* | Bush rat | Scat | Mammals |
| | *Trichosurus cunninghami* | Mountain brush-tailed possum | Scat | Mammals |
| | *Vombatus ursinus* | Bare-nosed wombat | Burrows and scat | Mammals |
| | *Wallabia bicolor* | Black-tailed wallaby | Seen | Mammals |
| | *Cacomantis flabelliformis* | Fan-tailed cuckoo | Heard | Non-passerine birds |
| EN | *Callocephalon fimbriatum* | Gang-gang cockatoo | Seen | Non-passerine birds |
| | *Calyptorhynchus funereus* | Yellow-tailed black-cockatoo | Heard | Non-passerine birds |
| | *Dacelo novaeguineae* | Laughing kookaburra | Seen | Non-passerine birds |
| | *Leucosarcia melanoleuca* | Wonga pigeon | Seen | Non-passerine birds |
| | *Platycercus elegans* | Crimson rosella | Seen | Non-passerine birds |
| | *Acanthiza lineata* | Striated thornbill | Seen | Passerine birds |
| | *Acanthiza pusilla* | Brown thornbill | Seen | Passerine birds |
| | *Acanthorhynchus tenuirostris* | Eastern spinebill | Seen | Passerine birds |
| | *Colluricincla harmonica* | Grey shrike-thrush | Seen | Passerine birds |
| | *Cormobates leucophaea* | White-throated treecreeper | Seen | Passerine birds |
| | *Corvus coronoides* | Australian raven | Seen | Passerine birds |
| | *Cracticus torquatus* | Grey butcherbird | Seen | Passerine birds |
| | *Eopsaltria australis* | Eastern yellow robin | Seen | Passerine birds |
| | *Malurus cyaneus* | Superb fairy-wren | Seen | Passerine birds |
| | *Melithreptus lunatus* | White-naped honeyeater | Seen | Passerine birds |
| | *Menura novaehollandiae* | Superb lyrebird | Heard | Passerine birds |
| | *Pachycephala pectoralis* | Golden whistler | Seen | Passerine birds |
| | *Pardalotus punctatus* | Spotted pardalote | Seen | Passerine birds |

  

| Status | Scientific Name | Common Name | Observation | Lifeform |
|---|---|---|---|---|
| | *Ptilotula penicillata* | White-plumed honeyeater | Seen | Passerine birds |
| VU | *Pycnoptilus floccosus* | Pilotbird | Heard | Passerine birds |
| | *Rhipidura albiscapa* | Grey fantail | Seen | Passerine birds |
| | *Sericornis frontalis* | White-browed scrubwren | seen | Passerine birds |
| | *Strepera graculina* | Pied currawong | seen | Passerine birds |
| | *Strepera versicolor* | Grey currawong | seen | Passerine birds |
| | *Zosterops lateralis* | Silvereye | seen | Passerine birds |
| | *Austrelaps ramsayi* | Highland copperhead | seen | Reptiles |
| | *Lampropholis guichenoti* | Garden skink | seen | Reptiles |
| en | *Varanus varius* | Lace monitor | seen | Reptiles |
| | *Niveoscincus coventryi* | Coventry Skink | seen | Reptiles |
| | *Eulamprus tympanum tympanum* | Southern Water Skink | seen | Reptiles |

### 5.2.1 Threatened Fauna

During the desktop review a total of 51 threatened fauna (including migratory or marine overfly listed) species have been recorded (DEECA 2023a) or have habitat modelled (DEECA 2023b) within 5 km of the study area (Figure 7 2).

This desktop review list included:

- 28 species listed as threatened under both the EPBC Act (1999) and FFG Act (1988)
- 14 species listed as threatened under the FFG Act (1988) only.

Aside to the fauna species listed above, 9 additional species only listed as migratory or marine overfly species under the EPBC Act (1999) had modelled habitat within 5 km of the study area (DCCEEW 2023). Of those, only 3 species have any likelihood of utilising the assessed sites: satin flycatcher *Myiagra cyanoleuca* and rufous fantail *Rhipidura rufifrons.* These 2 species have moderate or high potential to occur within the study area, and as such are considered in this report.

A likelihood of presence (LOP) has been assigned to each of 51 listed threatened fauna species which have previously been recorded, or have potential to occur, within 5 km of the study area, based on the criteria outlined in Section 4.1.2. Presence in this context relates to occupancy – be that constant or transient, for nesting, foraging or movement. Of these 51 listed fauna species, 19 species are considered to have a moderate or high LOP at sites within the study area (Table 7) with low or not likely LOP at other sites; only the lace monitor is considered highly likely to occur at all 35 sites. Ten species are considered to have a moderate LOP across all sites, with 3 species being considered a low likelihood at most sites, and 4 species (largely aquatic, or strongly associated with wetlands) are considered not likely to occur at any of the 35 sites (Table 7).

Three threatened fauna species were observed or heard during the field surveys, including gang-gang cockatoo *Callocephalon fimbriatum*, pilotbird *Pycnoptilus floccosus* and lace monitor *Varanus varius.*

Of the 5 species with high LOP at given sites, despite some not being directly confirmed as present during surveys, they were assigned a high LOP at these sites due to the presence of suitable habitat types for foraging and/or shelter in general in addition to other elements which would support breeding or denning activity within the site. Of the 19 species with moderate or high LOP across most of the sites, 11 are species that are highly mobile species including birds, gliding arboreal mammals, dingo and lace monitor. As such, there is an increased likelihood that they may be able to be detected at new sites where they have not previously been recorded, due to their ability to travel long distances and cross unsuitable areas between areas of preferred habitat. There also appears to have been relatively little survey effort within this area, resulting in relatively few recent VBA records within 5 km of the site for many species.

All species with either a moderate or high LOP at given sites were assigned a low or moderate likelihood of significant impact because of the footprint of proposed works. This is reflective of the lifeform type, as birds, gliding arboreal mammals and highly mobile terrestrial fauna that can easily disperse throughout the landscape to occupy other areas of suitable habitat in adjacent areas if their current habitat becomes unsuitable (when compared with less mobile fauna types such as small mammals for example, which may struggle to cross inhospitable matrix between discrete areas of suitable habitat).

The rapid Likelihood of Impact (LOI) assessments results shown in Table 7 considered the suitability of habitat observed onsite, the likelihood of their being significant populations at each of the sites and the susceptibility of each species impacts associated with the proposed works.  A more detailed analysis of likelihood of significant impacts for each of the 11 MNES fauna listed under the EPBC Act is provided in a separate report by White et al 2023c.

  

**Table 7 Summary of the assessment of Likelihood of Presence and Likelihood of Impacts to threatened fauna species (FFG and or EPBC Act) with a moderate or higher likelihood of presence at any site. Likelihood category definitions are shown in Table 2. Assessment for all species is shown in Appendix 2.**

| | | | | Likelihood of Presence | | | | | Likelihood of Impact (for Moderate / High / Present species only) if no mitigations measures were in place | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Threatened Status** | **Source** | **Present** | **High** | **Moderate** | **Low** | **Not Likely** | **Category** | **Sites** |
| *Callocephalon fimbriatum* | gang-gang cockatoo | EN en | VBA | **Site 8** | Sites 1, 2, 3, 5, 7 | Sites 4, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 31, 32, 34, 35, 36, 37 | n/a | n/a | **Moderate** | Sites 2, 3, 5, 7, 8, 18, 20, 21, 22, 23, 24, 30, 31, 34 |
| | | | | | | | | | **Low** | Sites 1, 4, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 25, 26, 27, 28, 32, 35, 36, 37 |
| *Canis lupus dingo* | dingo | vu | VBA | n/a | n/a | **All sites** | n/a | n/a | **Low** | **All sites** |
| *Dasyurus maculatus maculatus* | spot-tailed quoll | EN en | PMST | n/a | n/a | **All sites** | n/a | n/a | **Low** | **All sites** |
| *Hirundapus caudacutus* | white-throated needletail | VU vu | VBA | n/a | n/a | **All sites** | n/a | n/a | **Not likely** | **All sites** |
| *Liopholis montana* | mountain skink | EN en | PMST | n/a | n/a | Sites 3, 10, 14, 15, 28, 35 | Sites 1, 2, 4, 5, 6, 7, 8, 9, 11, 12, 13, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30, 31, 32, 34, 36, 37 | n/a | **Moderate** | Sites 3, 15, 28, 35 |
| | | | | | | | | | **Low** | Sites 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30, 31, 32, 34, 36, 37 |
| *Mastacomys fuscus mordicus* | broad-toothed rat | VU vu | VBA and PMST | n/a | Site 6, 20 | Sites 4, 12, 13, 14, 15, 16, 17, 18, 19, 21, 25, 26, 27, 28, 30, 31, 35, 36, 37 | Sites 1, 2, 3, 5, 7, 8, 9, 10, 11, 22, 23, 24, 32, 34, 35 | n/a | **Moderate** | Sites 6, 12, 13, 14, 15, 17, 18, 19, 20, 21, 25, 26, 27, 28, 30, 37 |
| | | | | | | | | | **Low** | Site 4, 16, 31, 35, 36 |

  

| | | | | Likelihood of Presence | | | | | Likelihood of Impact (for Moderate / High / Present species only) if no mitigations measures were in place | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Threatened Status** | **Source** | **Present** | **High** | **Moderate** | **Low** | **Not Likely** | **Category** | **Sites** |
| *Miniopterus orianae oceanensis* | eastern bent-winged bat | cr | VBA | n/a | n/a | **All sites,** | n/a | n/a | **Low** | **All sites** |
| *Myiagra cyanoleuca* | satin flycatcher | Mi Ma | PMST | n/a | n/a | **All sites** | n/a | | **Low** | **All sites** |
| *Ninox connivens* | barking owl | cr | VBA | n/a | n/a | Sites 1, 2, 3, 5, 6, 9, 10, 11, 12, 14, 15, 16, 17, 18, 22, 23, 25, 26, 27, 28, 30, 31, 32 | Sites 4, 7, 8, 13, 19, 20, 21, 24, 34, 35, 36, 37 | n/a | **Low** | Sites 1, 2, 3, 5, 6, 9, 10, 11, 12, 14, 15, 16, 17, 18, 22, 23, 25, 26, 27, 28, 30, 31, 32 |
| *Ninox strenua* | powerful owl | vu | VBA | n/a | n/a | **All sites** | n/a | n/a | **Low** | **All sites** |
| *Petauroides volans* | southern greater glider | EN en | VBA and PMST | n/a | Sites 1, 2 | Sites 3, 5, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30, 31, 34 | Sites 4, 6, 7, 8, 9, 10, 11, 12, 14, 28, 32, 35, 36, 37 | n/a | **Moderate** | Sites 1, 2, 3, 5, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 31, 34 |
| | | | | | | | | | **Low** | Sites 25, 27, 30 |
| *Petaurus australis australis* | yellow-bellied glider | VU vu | VBA and PMST | n/a | Sites 1, 2 | Sites 3, 5, 7, 8, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 30, 31, 34 | Sites 4, 6, 9, 10, 11, 12, 13, 14, 19, 28, 32, 35, 36, 37 | n/a | **Moderate** | Sites 1, 2, 3, 5, 8, 15, 16, 17, 18, 20, 21, 22, 23, 24, 26, 31, 34 |
| | | | | | | | | | **Low** | Sites 7, 25, 27, 30 |
| *Pseudomys fumeus* | smoky mouse | EN en | VBA and PMST | n/a | Sites 14, 28, 37 | Sites 8, 10, 12, 25, 30, 35, 36 | Sites 1, 2, 3, 4, 5, 6, 7, 9, 11, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 31, 32, 34 | n/a | **Moderate** | Sites 8, 10, 12, 14, 25, 28, 30, 35, 36, 37 |

  

| | | | | Likelihood of Presence | | | | | Likelihood of Impact (for Moderate / High / Present species only) if no mitigations measures were in place | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Threatened Status** | **Source** | **Present** | **High** | **Moderate** | **Low** | **Not Likely** | **Category** | **Sites** |
| *Pycnoptilus floccosus* | pilotbird | VU vu | VBA and PMST | **Sites 22 & 23** | Sites 7, 8, 9, 24, 30, 34, 35 | Sites 1, 2, 3, 4, 6, 10, 11, 13, 15, 19, 20, 25, 26, 27, 28, 31, 32, 36, 37 | Sites 5, 12, 14, 16, 17, 18, 21 | n/a | **Moderate** | Sites 4, 6, 7, 8, 9, 10, 11, 13, 15, 19, 20, 22, 23, 24, 25, 26, 27, 28, 30, 31, 32, 34, 35, 36, 37 |
| | | | | | | | | | **Low** | Sites 1, 2, 3 |
| *Rhinolophus megaphyllus megaphyllus* | eastern horseshoe bat | en | VBA | n/a | n/a | **All sites** | n/a | n/a | **Low** | **All sites** |
| *Rhipidura rufifrons* | rufous fantail | Mi Ma | VBA and PMST | n/a | Sites 1, 4, 6, 7, 8, 9, 11, 13, 17, 19, 20, 21, 22, 27, 30, 31, 32 | Sites 2, 5, 10, 16, 24, 25 | Sites 3, 12, 14, 15, 18, 23, 26, 28, 34, 35, 36, 37 | n/a | **Low** | **All sites** |
| *Sminthopsis leucopus* | white-footed dunnart | vu | VBA | n/a | n/a | Sites 6, 10, 12, 35, 36, 37 | Sites 1, 2, 3, 4, 5, 7, 8, 9, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 31, 32, 34 | n/a | **Moderate** | Sites 10, 12, 35, 36, 37 |
| | | | | | | | | | **Low** | Site 6 |
| *Tyto tenebricosa* | sooty owl | en | VBA | n/a | n/a | **All sites** | n/a | n/a | **Low** | **All sites** |
| *Varanus varius* | lace monitor | en | VBA | n/a | **All sites** | n/a | n/a | n/a | **Low** | **All sites** |

  

### 5.2.2 Threatened fauna species descriptions

#### Broad-toothed rat *Mastacomys fuscus mordicus* (Endangered EPBC & FFG Acts)

The broad-toothed rat is a ground-dwelling mammal listed as vulnerable under both the EPBC Act and FFG Act, and has a moderate likelihood of occurring across the broader Upper Yarra Reservoir catchment. However, the species is generally under-surveyed throughout its distribution range, with scarce recent surveys being undertaken. The broad-toothed rat often occurs in close association with streams and steep banks, however, it is also recorded within vegetation that is dense and complex, usually with grasses (particular tussock grasses *Poa* spp.) and sedges present, adjacent to drainage lines, particularly in areas alongside boulders or large logs. They can also be found in forests with a grassy understorey (DoE 2016a). They create runnels under dense cover of grasses, sedges and shrubs (Strahan 1983). This habitat was observed at several debris net survey sites, with runnels and scats potentially attributable to the species also detected at some of these sites. However, no directly identifiable sign or sightings of the species were made during any of the site surveys. A high cover of grasses, which are the predominant component of the rodent's diet, as well as the presence of boulders and shrubs including *Prostanthera* and *Phebalium* species, are important components of suitable habitat (DoE 2016a). Presence of native tussock grasses was generally in small, discrete patches, and only locally abundant at a couple of sites. Overall, works may impact individuals at some of the sites, but impact of works on the species is likely to be moderate or low. This is due to the relatively small footprint of the works and continuous dense ground cover generally present at sites where potential habitat occurred within the works footprint, which would allow movement of broad-toothed rat.

#### Other ground-dwelling mammals – Smoky mouse *Pseudomys fumeus* (Endangered EPBC & FFG Acts), and white-footed dunnart *Sminthopsis leucopus* (Vulnerable FFG Act)

Both the smoky mouse, listed as endangered under the EPBC and FFG Acts, and white-footed dunnart, listed as vulnerable under the FFG Act, are small ground-dwelling mammals which rely on habitat with a heathy and grassy groundcover associated with ridgelines or mid-slopes. Of the two species, the smoky mouse is more likely to utilise wetter habitat, compared to the white-footed dunnart, which is commonly found in more open, ridgelines and midslopes with a lower coverage of groundstorey. The smoky mouse forages on the seeds of legumes, epacrid berries in summer, and underground fungi in winter; they occasionally also prey on invertebrates. The white-footed dunnart is carnivorous, largely preying on invertebrates, and occasionally skinks (Strahan 1995). Minimal suitable habitat for either species was observed within the assessed sites, with these patches generally located on the upper slopes of the assessment area, away from gully lines where most vegetation impacts will occur. The white-footed dunnart is more mobile, generally moving about 80–105 m (Strahan 1995), and would be more likely to be effectively able traverse, or go around, any disturbance to groundstorey vegetation, and as such, likelihood of significant impact is considered low or moderate. For the smoky mouse, with a smaller home range and heavier reliance on suitable habitat and foraging resources, the likelihood of significant impact is considered to be moderate, where suitable habitat is present within, or near works areas.

### Arboreal mammals – southern greater glider *Petauroides volans* (Endangered EPBC & FFG Acts), yellow-bellied glider *Petaurus australis australis* (Vulnerable EPBC & FFG Acts), and Leadbeater's possum *Gymnobelideus leadbeateri* (Critically endangered – EPBC & FFG Acts)

Two large glider species, the southern greater glider, listed as endangered under the EPBC and FFG Acts, yellow-bellied glider, listed as vulnerable under the EPBC and FFG Acts, and the smaller Leadbeater's possum, a non-gliding species (addressed further below), listed as critically endangered under the EPBC and FFG Acts, are all nocturnal arboreal mammals, which utilise hollows as denning and breeding sites. All species generally prefer forests containing older trees with an abundance of suitably-sized hollows and good canopy connectivity (Woinarski et al. 2012). Greater gliders are folivorous and mostly browse on eucalypt leaves within a 1–4 ha home range (DoE 2016b), while yellow-bellied gliders are more active foragers, feeding on insects, flowers and tree sap in 50–65 ha home ranges (DAWE 2022a). Some hollow bearing trees potentially suitable for both large glider species were detected within or near many of the proposed works sites, however, such trees were usually relatively isolated from each other, with many younger, less suitable trees in between. While across the Upper Yarra Reservoir catchment area there is a high likelihood of both these large arboreal gliders occurring, most of the proposed debris net sites contained only suboptimal forest habitat preferred by southern greater gliders and habitat was generally drier than that preferred by yellow-bellied gliders. Furthermore, given that works will take place during daylight hours when gliders are not active, and only few hollow-bearing, or other older trees (if any) will need to be removed to accommodate the works, the impact on either species is likely to be moderate or low.

The Leadbeater's possum occupies montane ash forests (mountain ash *Eucalyptus regnans*, alpine *ash E. delegatensis* and shining gum *E. nitens* and areas of cool temperate rainforest and riparian thickets); sub-alpine woodland (snow gum *E. pauciflora*); and lowland floodplain forest (Harley 2004; Lindenmayer et. al.1989). As a non-gliding arboreal mammal, the species requires suitable hollow-bearing trees (alive or dead) for denning and mid-storey vegetation with adequate connectivity (Smith and Lindenmayer 1988; Lindenmayer *et al*. 1989; Lindenmayer *et al*. 1990). In sub-alpine and montane ash forest, maintenance of a wattle stratum and dense stands of mountain tea *tree Leptospermum grandiflorum* and myrtle beech *Nothofagus cunninghamii* are integral to the species' habitat connectivity, respectively. The home range area of 1–3 ha consists of multiple den sites that are actively defended against adjacent colonies (Smith 1980; Lindenmayer and Meggs 1996; Harley 2005). The diet consists of arthropods, psyllid exudates, nectar and sap with the gum from *Acacia* spp. and exudate from the trunks of mountain swamp gum, *Melaleuca* spp. and *Leptospermum* spp., an important energy source (Smith 1980; 1984; Harley 2005). While the species is likely to occur within the broader area in the Upper Yarra catchment; none of the assessed sites were considered as containing habitat likely to significantly support the species, due to the largely dry, open structure, and lack of midstorey shrub layers with dense *Acacia* spp. in conjunction with large old, hollow-bearing trees. Likelihood of significant impacts on this species is not likely, as the species is considered as having a low likelihood of occurring at all the assessed sites.

### Pilotbird *Pycnoptilus floccosus* (Vulnerable – EPBC & FFG Acts)

The pilotbird, listed as vulnerable under the EPBC and FFG Acts, is small, ground-dwelling bird that inhabits dense forests with heavy undergrowth. Pilotbird usually inhabit wet sclerophyll forest and moist gullies dominated by mountain ash *Eucalyptus regnans*, alpine ash *E. delegatensis*, mountain grey-gum

  

*E. cypellocarpa* or messmate *E. obliqua*, over a dense understorey of sword-sedge *Lepidosperma* species, wire-grass *Tetrarrhena* spp., bracken *Pteridium esculentum* and low shrubs such as hop goodenia *Goodenia ovata*. A tall shrub layer is also usually present in preferred habitats including tree ferns, hazel 41omaderris *Pomaderris aspera*, blackwood *Acacia melanoxylon* and musk daisy-bush *Olearia argophylla* (Higgins and Peter 2002). Pilotbird occasionally inhabit dry, open sclerophyll forest on ridges and slopes dominated by silvertop ash *Eucalyptus sieberi* over a dense low shrub cover. The species nest on or near the ground and feed on the ground for insects and occasionally seeds and fruit. They inhabit relatively strict (breeding) territories of a little over 1 ha in size. Pilotbirds are also associated with superb lyrebird and often forage in the same habitat (DAWE 2022b).

Suitable pilotbird habitat, often including lyrebird scratchings, was observed at many of the proposed debris net sites, and pilotbird calls were heard at some of the sites. Given the contiguous nature of suitable habitat at most sites and the pilotbird home range size, removal of some mid- and understorey vegetation around the works sites is expected to only have a low impact on the species across the broader area and not significantly impact an ecologically significant proportion of the pilotbird population.

#### Gang-gang cockatoo *Callocephalon fimbriatum* (Endangered – EPBC & FFG Acts)

The gang-gang cockatoo, listed as endangered under the EPBC and FFG Acts, is a small forest cockatoo that inhabits a range of forested habitat throughout south-eastern Australia (Menkhorst *et al*. 2022). The species largely feeds on seeds from eucalypts, acacias and introduced trees and shrubs and is dependent on suitable hollows for breeding (BirdLife Australia 2023). Suitable habitat is present at many of the sites for at least occasional foraging, and where suitable hollows are present, potentially supports breeding for the species. The species was seen at one site and heard within proximity of others. The species follows flowering and seeding across the broader landscape and is likely to utilise preferred vegetation within sites as these are in flower or seed. Although collective vegetation removal across all sites will reduce habitat extent, the species is highly mobile and would be able to forage effectively within the broader area, and as such works would not significantly disrupt breeding, or isolate individuals. With hollows observed, there is some potential that removal of such trees may impact the breeding locally; however, the overall likelihood of significant impact for the species is considered low or moderate.

#### Large forest owls –powerful owl *Ninox strenua* (Vulnerable - FFG Act), sooty owl *Tyto tenebricosa* (Endangered - FFG Act), and barking owl *Ninox connivens* (Critically endangered – FFG Act)

The two forest owls, powerful owl (listed as vulnerable under FFG Act) and sooty owl (listed as endangered under FFG Act) are both considered to have a high likelihood of presence across the broader study area, and the more open forest/woodland specialist, barking owl (listed as critically endangered under FFG Act) is considered to have a moderate likelihood of occurring throughout the broader study area. Suitable foraging and roosting habitat are present within the broader study area and many of the assessed sites, for these large forest and woodland owls. However, only a few sites would be considered higher quality, with the presence of potentially suitable hollows for breeding, and particularly for the sooty owl, the presence of more densely vegetated gullies in wet forest habitat. All 3 species require suitable dense understorey vegetation for roosting. However, no whitewash or pellets were observed during field assessment which suggests they are not regularly occupying the sites,

although occasional daytime roosting cannot be ruled out. Collated vegetation removal across all sites will likely reduce foraging habitat extent, but all 3 species are able to traverse large areas to forage effectively within the broader area. Likelihood of significant impact is considered low for all the large forest owls.

### Lace monitor *Varanus varius* (Endangered- FFG Act)

The lace monitor is a large lizard that can reach 2 m in total length and weigh up to 14 kilograms. They inhabit both open and closed forests and forage over long distances, up to 3 km a day. They are mainly active in the warmer months (September to May) and are inactive in cooler weather, sheltering and foraging in tree hollows or under fallen trees or large rocks (DELWP 2021e). Lace monitors are adept climbers and remain within the same area for most of their adult lives, sometimes occupying the same tree for multiple years. Lace monitors depend on termite nests either on the ground or in the trees, where they lay their eggs. There is a moderate likelihood of lace monitor presence throughout the Upper Yarra Reservoir catchment and by extent at each of the proposed debris net sites. There is a lot of contiguous habitat throughout the area for individuals to occupy. Site works will reduce habitat extent, but the species is very mobile and therefore likely to be able to traverse areas cleared of vegetation and forage effectively within the broader area. Removal of termite nests may have a higher impact on the species, given their importance as breeding sites. Only a few termite nests were observed during the site surveys, but if found within works areas, it is advised to avoid removal where possible. For lace monitors, at a species level, the likelihood of significant impact from vegetation removal is considered low.

### Mountain skink *Liopholis montana* (Endangered – EPBC & FFG Acts)

The species is grey-brown on the head, body, limbs, and tail with most individuals being plain-backed with a reddish-brown dorsum (Donellan et al. 2002). The patterned morph has a series of dorsolateral blotches or vermiculation's that occasionally that may form a continuous outline of spots of the underlying brown colouring (Donellan et al. 2002). Adults have a snout–to-vent length of approximately 74 mm, with a maximum adult snout–to-vent length of 92 mm and 111 mm respectively (Donellan et al. (2002). The species is distinguished from *Liopholis whitii* by the absence of dark-edged pale ocellate markings, particularly above the base of the forelimb and can be distinguished from *Liopholis guthega* by the absence of broad paravertebral stripes (Robertson and Coventry 2019). The species is now known from a range of high elevation areas (including the southern and northern fall, Victorian alps, east Gippsland uplands and Monaro tablelands bioregions, NSW and ACT) above 900 m. The western range limit being the upper Yarra Valley in Victoria (Donnellan et al., 2002; Clemann et al., 2018; Robertson and Coventry, 2019), as indicated by a record several kilometres south-east of the Upper Yarra catchment. A separate population is located at lower elevations to the west of Melbourne in the western uplands in the Wombat State Forest (Farquhar et al. 2021). The species is largely associated with rocky habitats, such as boulder outcrops or rock screes, typically in subalpine woodland or open dry forest communities (Robertson and Coventry 2019). Their typical habitat includes dry, north-facing hillside with partially open canopy of *Eucalyptus dives* in scrubby foothill forest (Farquhar et al. 2021). As such, the species may occur in areas of habitat consisting partly, or wholly, of Heathy Dry Forest and / or Scrubby Dry Forest EVCs.

  

### Dingo *Canis lupus dingo* (Vulnerable- FFG Act)

The dingo is a top order predator that has adapted to different habitats throughout Australia. It was probably found throughout most habitats in Victoria prior to European Settlement (DEPI 2013). Studies of their diet from Gippsland showed that they primarily consumed medium-sized mammals, such as wallaby, possums and rabbits (Newsome et al. 1983 and Triggs et al. 1984). However, they are opportunistic feeders and have been observed feeding on birds, reptiles, arthropods and vegetation. This species is highly mobile, home-range studies in eastern Victoria found territories of 12,430 ha for males and 4,150 ha for females (Robley et al. 2010). The proposed works is considered to have a low likelihood of significant impact on this highly mobile and adaptable species.

### Eastern horseshoe bat *Rhinolophus megaphyllus megaphyllus* (Endangered – FFG Act)

The eastern horseshoe bat, listed as endangered under the FFG Act, is a medium-sized, insectivorous bat, hunting for moths and beetles at night in forested areas. They use disused mineshafts and natural caves as places to nurse their young and roost during the day (DELWP 2021f). As eastern horseshoe bats fly around forested areas while foraging, there is a moderate likelihood some may pass through debris net work sites. However, they would experience very little impact from some vegetation removal, as they require open spaces to hunt for their prey. Additionally, no mine shafts or caves were detected at any of the 35 sites during surveys. Overall, it is therefore very unlikely that the proposed works will significantly affect the presence or behaviour of this species.

### White-throated needletail *Hirundapus caudacutus* (Vulnerable - EPBC & FFG Acts, EPBC migratory treaty Bonn A2H)

The white-throated needletail, listed as vulnerable under both the EPBC Act and FFG Act, is a migrant species that breeds in Asia, which visits south-eastern Australia for the austral summer, arriving in late spring, and returning to Asia in March–April. They forage on flying insects such as termites, ants, beetles and flies while also drinking in flight. This species occasionally flies low to the ground, but often flies high >1.8 km when foraging. White-throated needletails have been recorded roosting in trees in forests and woodlands and may use parts of the proposed debris net site for roosting. Site-wide there is a moderate likelihood of this species being present, as the area falls within the species' known distribution range (Menkhorst *et al*. 2022). However, most individuals would only occur high above the canopy, well outside the works impact zone. The barrier works will reduce habitat extent for roosting opportunities where trees need to be removed, however, based on the life history and the fact that the white-throated needletail spends much of its time high above forest canopy, this is unlikely to have any significant impact on this species. Furthermore, the area is not known to be of critical importance to an 'ecologically significant proportion of the population' (DoE 2013), further reducing the likelihood of impact of the proposed works to not likely.

### White-bellied sea-eagle *Haliaeetus leucogaster* (Endangered - FFG Act)

The white-bellied sea-eagle, listed as endangered under the FFG Act, is a large raptor, mostly associated with larger water bodies such as reservoirs, rivers and coastal areas. They are largely sedentary once a territory is established, but immature birds can disperse over great distances (DELWP 2021g). These large birds usually breed, roost and perch in large trees near open water, and would not typically utilise trees in any of the debris net work sites. Individuals may fly high over the canopy and likely would be

disturbed by helicopter activity. However, given the territory size, the Upper Yarra Reservoir is likely to only harbour two individuals at best, which will have the ability to easily move away from temporary works activities without being displaced or experiencing reduced foraging and roosting opportunities. Given the species' typical preferred habitat and low-density occurrence in combination with the location of proposed debris net sites, the likelihood of significant impact of planned works on the white-bellied sea-eagle is considered not likely.

### King quail *Synoicus chinensis* (Endangered – FFG Act)

The king quail, listed as endangered under the FFG Act, is a small, terrestrial bird, foraging, nesting and roosting on the ground among dense vegetation. They mainly feed on grass seeds and green blades, but may also forage for insects (DELWP 2021h). They prefer very dense ground cover of grasses, shrubs, ferns, or herbs and mostly occur in damp to swampy sites. While the understorey cover at some of the proposed debris net sites appeared to be dense enough, none of the sites were particularly damp and no notable wet or swampy areas were observed within or directly adjacent to any of the sites, which in turn has resulted in the species being not likely to occur at any of the sites. Therefore, even though proposed works include removal of some dense understorey vegetation, it is not likely this will significantly impact king quail.

### Aquatic fauna – growling grass frog *Litoria raniformis* (Vulnerable –EPBC and FFG Act) and platypus *Ornithorhynchus anatinus* (Vulnerable – FFG Acts)

Both the growling grass frog, listed as vulnerable under the EPBC and FFG Acts, and platypus listed as vulnerable under the FFG Act are strongly aquatic in habit, with a heavy reliance on suitable aquatic habitat. However, both species are known to traverse terrestrial habitat in search of other waterbodies to occupy, particularly during juvenile dispersal or breeding season. No suitable aquatic habitat was present at any of the assessed sites. All sites were situated high up steep, largely dry slopes and a long distance from permanent waterbodies, and gullies were not connected to waterbodies further upslope. As a result, it is not likely that either species would occur, and thus likelihood of direct significant impact in relation to the works is considered not likely.

### Migratory birds – satin flycatcher *Myiagra cyanoleuca* and rufous fantail *Rhipidura rufifrons* (both EPBC migratory treaty Bonn A2H)

Both the satin flycatcher and rufous fantail are migratory species that breed in Australia, and migrate northwards for the winter, including far northern Queensland, islands in the Torres Strait islands, and trans-fly region as far north as New Guinea (Menkhorst et al. 2019). The satin flycatcher is seldomly observed, especially in the far south of its range (BirdLife Australia 2023a). This species is commonly found in taller forests and woodlands, favouring wetter habitats like heavily vegetated gullies, but not rainforests (BirdLife Australia 2023a; Pizzey & Knight 2012). Satin flycatchers generally breed between October–February throughout south-eastern Australia and Tasmania. The rufous fantail occupies a wider range of habitat, and will occur in more open, urban areas while on passage, as well as wet rainforest (BirdLife Australia 2023b; Menkhorst et al. 2019). Both species are unlikely to make significant use of the mostly open, dry gullies where the proposed works will be situated, and are both highly mobile, as such they would be able to easily disperse into adjacent habitat, so potential impacts are considered to be low.

# 6 Policy and Legislative Implications

## 6.1 Federal Environment Protection and Biodiversity Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) pertains to matters of national environmental significance (MNES), including world heritage properties, national heritage properties, listed threatened flora and fauna species and ecological communities, listed migratory fauna species, Ramsar Wetlands and Commonwealth marine areas. It applies to public and private land, and referral to the Federal Department of Agriculture, Fisheries and Forestry is necessary when a proposed action is considered likely to significantly impact on any matters of national environmental significance under the Act.

No species, or ecological communities listed under the EPBC Act were recorded during the site assessment. The native vegetation proposed for removal is not within a wetland designated under the Ramsar Convention and is not upstream of any Ramsar-listed wetlands.

There are no EPBC Act threatened flora species that have a moderate or high likelihood of presence at any of the 35 sites.

There are 9 EPBC Act threatened fauna species that were identified during the desktop surveys as having a moderate or high likelihood of presence within the study area; gang-gang cockatoo, spot-tailed quoll, white-throated needletail, broad-toothed rat, southern greater glider, yellow-bellied glider, smoky mouse and pilotbird. The Leadbeater's Possum was deemed as not likely to be present at any of the sites after the site visits, due to insufficient suitable habitat.

A brief assessment, in this report, of likelihood of significant impact was conducted for each of these species at each site considering the presence and quality of habitat and the identification of likely impacts that the construction and use the proposed debris nets may have for each species. The results of this assessment are shown in the Section 4.2.1 Threatened Fauna section of this report including Table 7.

A total of 11 fauna species listed as Matters of National Environmental Significance under the EPBC Act have been identified as having a moderate or higher likelihood of presence in one or more of the 35 proposed debris barrier sites. These species are gang-gang cockatoo, spot-tailed quoll, mountain skink, southern greater glider, smoky mouse, white-throated needletail, broad-toothed rat, yellow-bellied glider, pilotbird, stain flycatcher and rufous fantail.

Unmitigated, there is a chance that there could be a significant impact to MNES under the EPBC Act. However, Melbourne Water have committed to a number of mitigation actions that would significantly reduce the likelihood of any impacts being significant. The discussions on each of the threatened species in Section 4.2.1 provides more detail as to the likelihood of impact details. A separate report has also been produced to address in more detail the significant impact assessment of the project (White et al 2023c). Large scale mitigation actions proposed to date include:

- Significantly limiting the construction footprint through the use of helicopters to lower small temporary work platforms to each site
- Siting the debris net anchor points where large trees, tree fern and threatened species can be avoided

  

However, we recommend that a referral under the EPBC Act is made for the project and includes a report that details the findings of a significant impact assessment for each MNES that has the potential to be impacted upon with the proposed debris nets project. A report titled Biodiversity Assessment of impacts to Matters of National Significance form the proposed Upper Yarra Debris Nets installation (White et al 2023c) provides this detail and should be read in conjunction with this report.

## 6.2 Victorian Flora and Fauna Guarantee Act 1988

The *Flora and Fauna Guarantee Act 1988* (FFG Act) lists flora and fauna species and ecological communities that are recognised as threatened in Victoria. It also identifies threatening processes and flora that require protection. Protected flora includes those species listed as threatened under the Act, and plant taxa that belong to listed communities and plant taxa that are not threatened, but require protection for other reasons (e.g. over-collection).

No threatened communities listed under the FFG Act were present or deemed likely to be present at any of the 35 sites.

Six FFG Act-listed threatened flora species, all with an endangered status, were observed during the field survey at or near the proposed debris net sites. These were:

- Powelltown correa: Site 34
- Silky golden-tip: Sites 1, 2, 3, 10, 17, 18, 19, 20, 21 and 34
- Lemon boronia: Site 35
- Nunniong everlasting: incidental near site 13
- Large-leaf cinnamon wattle: incidental throughout study area including along Theodore Road, upslope from Site 1
- Red-tipped greenhood: on roadside embankment of Theodore Road near access to Site 4

There were an additional 2 species listed under the FFG Act that were not confirmed at any of the sites but were considered of moderate likelihood to occur within the study area due to the presence of potentially suitable habitat. These species included Christmas spider-orchid (critically endangered) and parsley xanthosia (endangered). Non-flowering *Xanthosia* sp. individuals were detected at 2 sites, contributing to the moderate likelihood assessment for parsley xanthosia.

There are 14 threatened fauna species listed under the FFG Act that have been assessed in this report as having a moderate or high likelihood of presence on at least one of the 35 proposed debris net sites (Table 7). This includes the seven EPBC species listed above in Section 5.1 (which are also listed as threatened under the FFG Act) and the following species: dingo, powerful owl, sooty owl, barking owl, white-footed dunnart, eastern horseshoe bat, and lace monitor.

The likelihood of impact assessment for the threatened fauna that are also listed under the EPBC Act has been covered in the previous section. Of the 7 species that are only FFG listed fauna species, only the white-footed dunnart has at least one site where there is a Moderate likelihood of impacts to habitat of the species that may cause a localised impact to a small number of individuals of the species if works were unmitigated.

### 6.2.1 Protected Flora Controls

Additional to the threatened flora species there are 59 species that are considered protected flora under the FFG Act and would require a protected flora permit if removal of any of these species was proposed. Based on the species present at each of the sites and their proximity to the proposed debris net locations there will be some unavoidable impacts on the protected flora. With mitigation measures prior to and during construction, this impact should be mostly limited to the non-threatened protected species which are generally common or abundant across Victoria or the local region.

Mitigation measures that we would recommend include:

- Prior to construction that the sites that contain threatened flora species (as shown in Figure x) have no-go areas identified (with temporary non -invasive means i.e wooden stakes and flagging tape) by a suitably experience botanist
- That works are located away from tree-ferns to protect them from any damage
- That all mitigation measures are identified in a Construction Environment Management Plan for the project

Melbourne Water will require a protected flora permit under the FFG Act prior to the impact on protected flora species.

## 6.3 Victorian Environment Effects Act 1978 (EE Act)

The EE Act regulates proposed actions that are capable of having a significant effect on the Victorian environment. The Ministerial Guidelines for assessment on environmental effects under the Environment Effects Act 1978 (DSE 2006) sets out criteria that should be used to guide the decision making on whether a referral is required under the EE Act.

Relevant criteria, as outlined in DSE (2006), for potential effects that might be of regional or state significance and therefore require a referral under the EE Act are:

- potential clearing of 10 ha 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 or
  - is, or is likely to be, of very high conservation significance (as defined in accordance with Appendix 3 of 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.
- 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.

The extent of native vegetation clearance proposed for the 35 debris net sites is likely to total less than 1.4 ha. Based on the initial assumptions of impacts involving:

- complete loss of native vegetation within 2m either side of the debris net line
- partial tree canopy removal of 10m radius from the temporary works platform to allow for access for helicopter delivered equipment and materials during construction of anchor points
- temporary loss of native vegetation where a small work platform (4- 9 $m^2$) will be sited, via helicopter, close to the debris net line and remain onsite during the construction phase of the anchor point installation
- Some temporary loss of vegetation via trampling from workers going between the work platform and the debris net line

The works associated with the debris net installation and use for the 35 sites is unlikely to trigger a referral, and therefore approvals under the EE Act based on the area of native vegetation or habitat impacted.

The debris net site locations do not contain FFG Act-listed ecological communities, listed critical habitats, or wetlands that support migratory bird species.

As discussed in the FFG Act section above there are several FFG Act threatened flora and fauna species that were observed or have a moderate or high likelihood of occurrence at or near at least one of the 35 sites in the study area. However, Ecology Australia believes that the existing proposal will not trigger the need for a referral based on long-term loss of a significant proportion of a threatened species habitat/population.

Ecology Australia has only considered the biodiversity related criteria in this report. Melbourne Water should ensure that there are no other criteria under the Act, i.e. Cultural Heritage, major land stability issues, and major social and economic effects, that requires further consideration.

## 6.4 Victorian National Parks Act 1975 (National Parks Act)

As the proposed construction and maintenance of debris barriers by Melbourne Water is in the Yarra Ranges National Park there is a requirement for a Public Authority Consent to be gained under Section 27 of the Victorian National Parks Act 1975 (National Parks Act).

Melbourne Water will need to follow the Section 27 Instructional Sheet and provide the relevant project information consistent with the template of the consent documentation.

Melbourne Water would likely require this report along with the geotechnical and cultural heritage reports as supporting documentation to the consent documentation.

## 6.5 Victorian Wildlife Act 1975 (Wildlife Act)

The Wildlife Act protects native fauna species and regulates the conduct of any persons engaged in activities concerning or relating to wildlife. The Act establishes procedures to promote the protection

and conservation of wildlife, to prevent wildlife taxa from becoming extinct, and the sustainable use of and access to wildlife. It also provides the basis for most wildlife permit/licensing requirements within the state. Under the Act, a person must not hunt, take, or destroy endangered, notable or protected wildlife; this includes all native vertebrate animals, all kinds of deer, non-indigenous quail, pheasants, and partridges, and all terrestrial invertebrate fauna listed under the Flora and Fauna Guarantee Act 1988.

The Wildlife Regulations 2013 provide further detail relating to the act, including that a person is not to damage, disturb, or destroy any wildlife habitat, although this does not apply if the person is authorised to do so under any other Act.

## 6.6 Victorian Catchment and Land Protection Act 1994 (CALP Act)

The state CaLP Act (1994) provides a legislative framework for the management of land, including the control of declared noxious weeds and pest animals. Each Catchment Management Authority (CMA) region within Victoria has a designated list of declared noxious weeds (control of which is enforceable).

Two declared regionally controlled noxious weed species were recorded within the study area: *common blackberry *Rubus anglocandicans* and spear thistle *Cirsium vulgare.*

- **Regionally Controlled:** Landowners and managers have the responsibility to take all reasonable steps to prevent the growth and spread of species classified as Regionally Controlled within the Port Phillip and Westernport Catchment area.

Measures to control and reduce the extent of listed species should be undertaken during the construction and operation phase of the project and be incorporated into a Construction Environmental Management Plan (CEMP) or similar document prepared for the project. A CEMP should also include measures to protect land and water resources in accordance with the Act.

## 6.7 Victorian *Planning and Environment Act 1987*

The state Planning and Environment Act (1987) (PE Act) establishes a framework for planning the use, development and protection of land, including native vegetation retention controls. The PE Act allows for the development of planning schemes in Victoria. In particular, Clause 52.17 (Native Vegetation) of the planning scheme identifies circumstances where a planning permit is required for native vegetation removal within the Yarra Ranges Shire Council municipality.

The removal of native vegetation at the site may require a permit under Clause 52.17 of the planning scheme unless a relevant exemption exists under Clause 52.17-7.

The relevant provisions in relation to zones, overlays and in particular Clause 52.17 are discussed further below.

The application requirements of Clause 52.17 are addressed in Section 6. Because the application follows the detailed assessment pathway it will also need to be referred to DEECA.

  

### 6.7.1 Zones and Overlays

#### Clause 36.03 PCRZ Public Conservation and Resource Zone

All of the study area falls within the PCRZ zone and there are no schedules listed for this zone in the Yarra Ranges Planning Scheme. This zone relates to public land where the main purpose of the zone (as shown in the Yarra Ranges Planning Scheme) is:

- *To protect and conserve the natural environment and natural processes for their historic, scientific, landscape, habitat or cultural values*
- *To provide facilities which assist in public education and interpretation of the natural environment with minimal degradation of the natural environment or natural processes*
- *To provide appropriate resource based uses*

In this zone a building or works requires a planning permit unless the following applies:

- *A building or works shown in an Incorporated plan which applies to the land.*
- *A building or works specified in Clause 62.02-1 or 62.02-2 carried out by or on behalf of a public authority or municipal council, if the public authority or municipal council is carrying out functions, powers or duties conferred by or under the Local Government Act 1989, the Reference Areas Act 1978, the National Parks Act 1975, the Fisheries Act 1995, the Wildlife Act 1975, the Forests Act 1958, the Water Industry Act 1994, the Water Act 1989, the Marine Safety Act 2010, the Port Management Act 1995 or the Crown Land (Reserves) Act 1978.*
- *A building or works carried out by or on behalf of a public land manager, Parks Victoria or the Great Ocean Road Coast and Parks Authority, under the Local Government Act 1989, the Reference Areas Act 1978, the National Parks Act 1975, the Fisheries Act 1995, the Wildlife Act 1975, the Forests Act 1958, the Water Industry Act 1994, the Water Act 1989, the Marine Safety Act 2010, the Port Management Act 1995, the Crown Land (Reserves) Act 1978, or the Road Management Act 2004.*

Ecology Australia is unsure whether the building and works associated with the debris net installation has a specific requirement for a planning permit under this Clause. Melbourne Water should seek planning advice from Yarra Ranges Council or a Town Planning Consultant as to whether the proposed works would be considered exempt under this Clause in relation to carrying out functions, powers or duties relating to the Water Act 1989 or National Parks Act 1975.

In Clause 62.02-1and Clause 62.02-2 there are circumstances where Buildings and Works may not require a permit. One potentially relevant circumstance for this project is described in the Planning Scheme as

- *Any works necessary to prevent soil erosion, or to ensure soil conservation or reclamation.*

Provided that the proposed works met the definitions in relation to Melbourne Water's power, function or duties under the relevant listed Acts i.e Water Industry Act or Water Act and that the works are consistent with the Clause 62.02, then a permit may not be required.

However, what is clear is that an exemption under this Clause does not remove the obligation for a planning permit that is most likely required under Clause 52.17 for impacts to native vegetation.

### Clause 42.01. ESO1- Highest Biodiversity Habitat areas and biolink corridors

The Yarra Ranges Planning Scheme describes the environmental objectives to be achieved as:

- *To protect and manage the larger patches of remnant highest biodiversity bushland from fragmentation and incremental loss so that they continue to provide high quality biolink corridors and sustainable habitat for indigenous flora and fauna.*

The following decision guidelines that apply to an application for a permit under Clause 42.01, listed in the planning scheme, are:

- *Whether the proposal will contribute to the achievement of the environmental objectives of this schedule to the overlay.*
- *Whether the proposal will require the removal of indigenous vegetation from a site where the majority of understorey ground cover comprises indigenous plants.*
- *Where removal of vegetation is unavoidable, whether vegetation loss is minimised and appropriate actions taken to offset the loss.*
- *Whether the proposed development or vegetation removal minimises adverse environmental effects including impacts on rare or threatened species, during and after the construction phase*
- *Whether the proposal has any adverse effect on faunal movement within habitat corridors and within and between highest biodiversity habitat areas.*

## 6.7.2 Clause 52.17 Native Vegetation

The proposed works involved in the construction of the debris barriers are going to remove, destroy or lop native vegetation and would require a permit under Clause 52.17 of the Yarra Ranges Planning Scheme unless exemptions apply under Clause 52.17-7.

One potential exemption that may be relevant for this project is the Crown Land exemption that specifies:

*Native vegetation that is to be removed, destroyed or lopped to the minimum extent necessary to manage Crown land:*

- *by or on behalf of the Secretary to the Department of Environment, Land, Water and Planning (as constituted under Part 2 of the Conservation, Forests and Lands Act 1987), the Great Ocean Road Coast and Parks Authority or Parks Victoria, and in accordance with the Procedure for the removal, destruction or lopping of native vegetation on Crown land; or*
- *with written permission from the Secretary to the Department of Environment, Land, Water and Planning (as constituted under Part 2 of the Conservation, Forests and Lands Act 1987).*

The document *Exemptions from requiring a planning permit to remove, remove destroy or lop native vegetation- guidance* (DELWP 2017) describes how the exemptions for the Crown Land in Clause 52.17 should be interpreted. This exemption comprises two separate parts, each with a specific purpose. The first part applies to native vegetation removal on Crown land that is undertaken by, or on behalf of DELWP (DEECA) or Parks Victoria. To rely on this exemption to remove native vegetation, the removal must be in accordance with the Procedure for the removal, destruction or lopping of native vegetation

on Crown land available on DEECA's website. Organisations or individuals other than DELWP (DEECA) or Parks Victoria cannot rely on this part of the exemption to remove native vegetation on Crown land. So unless other-wise advised by DEECA, this part of the exemption would not apply for Melbourne Water for this project even though the works are on Crown Land. The second part applies to parties who have sought and obtained written permission from the Secretary to DELWP (DEECA) to remove native vegetation.

The second part of the exemption may be the mechanism where: written permission from the Secretary to the Department is obtained. This may be an appropriate avenue to discuss with DEECA given the strategic state-wide importance of the project to protect Melbourne's drinking water supply.

If it is deemed by DEECA or Melbourne Water that this written permission is not going to be sought for this project, then a Planning permit under Clause 52.17 would be required.

This report has provided information in a format that is consistent with the information requirements of Clause 52.17.

### 6.7.3 Clause 51.03 Upper Yarra and Dandenong Ranges Regional Strategy Plan

This planning clause is unique to the Yarra Ranges Planning Scheme. Its purpose is to ensure that the Upper Yarra and Dandenong Ranges Regional Strategy Plan is consistent with the Yarra Ranges Planning Scheme.

Of importance is that even if there are relevant exemptions for planning permits in other Clauses of the Yarra Ranges Planning Scheme i.e 52.17-7, a planning permit my still be required under Clause 51.03 because of the following sub-clause:

- *"Clause 51.03-2 Interpretation. If there is an inconsistency between any provision in this clause or a schedule to this clause and any other clause or provision of the Yarra Ranges Planning Scheme, the requirements of this clause or a schedule to this clause prevail.".*

Relevant permit requirements and exemptions in this Clause for the debris net project are:

*"A permit is required to:*

- *Remove, destroy or lop any vegetation. This does not apply if the schedule to this clause specifically states that a permit is not required.*
- *Any permit issued must meet the requirements of the schedule to this clause.*

*The provisions of this schedule do not apply to:*

- *Vegetation required to be removed, destroyed or lopped to provide for public works or the connection of utility installation, provided those works have the agreement of Council and there will be no removal, destruction or lopping of remnant vegetation beyond that provided for in any relevant Code of Practice for Tree Clearing."*

Therefore, even if an exemption for Crown Land works is accessed, the native vegetation removal for the project would require written agreement from Yarra Ranges Council under Clause 51.03.

# 7 Assessment of native vegetation under Clause 52.17 and the Native Vegetation Guidelines

The Guidelines for the Removal, Destruction or Lopping of Native Vegetation (DELWP 2017)—hereafter referred to as 'the Guidelines'—is a key policy concerning the removal of native vegetation in Victoria. It applies to all Victorian planning schemes and serves to guide how impacts on biodiversity should be considered when assessing an application for a planning permit to remove, lop or destroy native vegetation under Clauses 52.16 and 52.17.

The proposed installation and use of multiple debris barriers in the Upper Yarra Catchment will require the removal or incidental loss of native vegetation. A quantification of the potential losses and offsets associated with the proposed development is provided below. Assumptions of potential loss have erred on the side of a reasonable over estimation in order as a precautionary principle during the design stage of this project.

## 7.1 Proposed works

There are a total of 35 potential debris net sites that have been identified during a strategic assessment of the protection of Melbourne's drinking water supply from major post wildfire erosion. There has been a significant amount of geotechnical and surface hydrology investigations that have informed the proposed design of the debris barriers and the siting of them. The specific details of these investigations and the description of the construction and use of debris flow nets can be found in the Alluvium Technical Report (Alluvium 2023b). A summary of the likely disturbance footprint required includes:

- The route that provides access to the location from the road. This route will be traversed by foot. Where possible traversing in will not require vegetation clearance as existing fauna trails provide suitable access. Understory vegetation may need to be partially pruned to facilitate safe access.
- The debris flow net itself and the area surrounding it (~2m either side), where ground cover and understory vegetation needs to be cleared for access.
- The location of anchor points where holes will be drilled. There are typically 12-18 anchor point per nets.
- The drill cuttings for each anchor points. This is the volume of material produced from holes that are 8m deep and 10mm in diameter (~0.12 m3 per drill hole).
- The laydown area which is where the equipment would be dropped. By crane if accessible by road or by helicopter where needed. The area is set to 2 x 2 m.
- The area that would potentially be inundated by debris in the case of a debris flow occurring and filling up the volume behind the debris flow net.
- Canopy separation (tree pruning or removal) works where required to facilitate safe lowering of materials to each site by Helicopter

  

For the purposes of establishing the potential loss of native vegetation from the construction of the 35 debris barriers, the following assumptions have been made on the partial and complete vegetation loss.

At the line of the debris net anchor point construction (including a 2 m buffer) the construction techniques and equipment can ensure that there is no impact on trees and tree-ferns in most if not all sites. Within the 2m buffer there is likely to be vegetation trampled and possibly pruning of shrubs to allow the safe working area to drill and establish the anchor point footings. For the scenario test we have considered that unless there was also going to be potential canopy removal that this loss would be considered as partial removal.

The other key element to the construction is the lowering of a works platform as close as practically possible to the debris net anchor point line. For the purposes of achieving an area free of canopy for the helicopter to operate safely, we have for the purposes of the native vegetation loss scenario assumed a loss of a 10 m radius or canopy around the location of the works platform (Figure 17). It is Ecology Australia's understanding that there is scope to potentially modify the location of the debris net platform location that may be able to make use of existing canopy clearance and potentially avoid impacts further to import biodiversity values such as Large Trees, tree-ferns and threatened flora and fauna habitat. Recommendations for further potential opportunities to avoid and minimise impacts large trees are also shown in Table 9 for Melbourne Water's consideration.

The impacts of the deposition of debris and soil behind the debris net also has to be considered in terms of the area and depth of this soil and associated impacts to native vegetation. As the Debris nets are only going to be deployed after a major wildfire the main assumption is that the high to very high fire severities will have meant that most native understorey will have been consumed in the fire. In this stage of early post fire succession there will be a lot of natural erosion and deposition processes involving debris and soil movement. It is for these reasons that we have taken the approach that the establishment of the debris nets will have a neutral effect overall to native vegetation recovery within the area surrounding each of the debris net locations. The assumption of neutral effect is based on the debris nets being left in situ and no future removal of native vegetation is involved on the debris flow field. The estimated size and shape of each debris field, post establishment of the nets, is shown in more detail in the Ecology Australia's site summaries report (White et al 2023b) with spatial information provided by Alluvium.

  

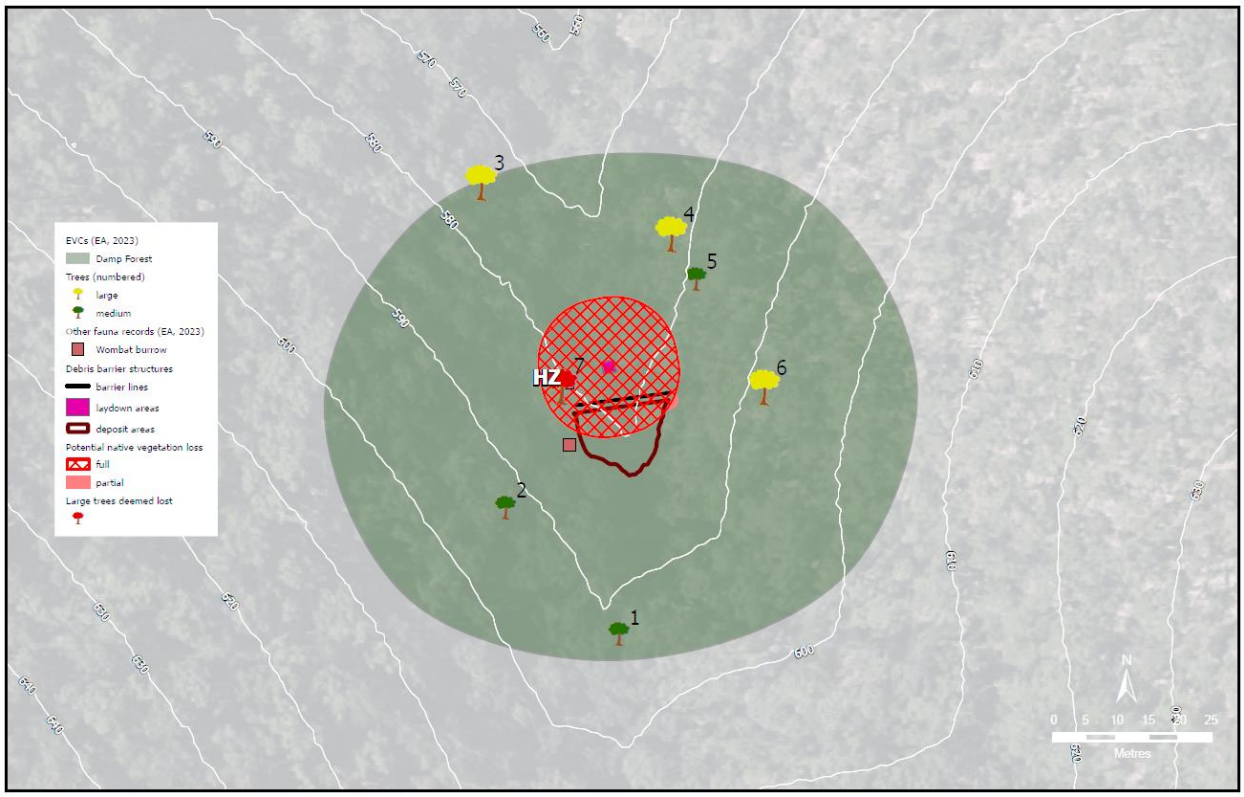


**Figure 17 Example map showing the spatial outcome of native vegetation loss calculations as per Clause 52.17 of Yarra Ranges Planning Scheme. The example shown is for Site 8.**

As this report addresses 35 separate sites it has been decided to present the site-specific information regarding biodiversity values and impacts in a separate document (White et al 2023b) that is to be read in conjunction with this report.

## 7.2 Assessment pathway

According to the details provided to Ecology Australia by the Melbourne Water, 1.386 ha of native vegetation may be removed or impacted within the study area due to the proposed works. The proposed clearing meets the requirements of a Detailed Assessment Pathway due to native vegetation removal exceeding 0.5 ha. The key determinants are as follows (DELWP 2017):

| | |
|---|---|
| **Location category:** | Location 1 |
| **Type of vegetation:** | Patch |
| **Extent of native vegetation:** | Proposed clearing of 1.386 ha native vegetation comprising 4 EVCs: Heathy Dry Forest (EVC 20), Shrubby Dry Forest (EVC 21), Damp Forest (EVC 29) and Shrubby Foothill Forest (EVC 45) |
| **Number of large trees removed** | 25 |

  

### Habitat Zones

Each of the debris net sites were separated into habitat zones based predominantly on EVC boundary, or in instances where there was a clear vegetation quality score change of greater than 15 points according to the VQA methodology and the '*Guidelines*'. All the VQA scores demonstrate that the vegetation quality is exceptionally high with most scores (46 of 48 habitat zones) ranging between 0.75 and 0.96 out of a possible 1.0 score (Table 8). Two habitat zones, one at Sites 10 and 32, have been modified and scored 0.53 and 0.49 respectively, as they appear to have been regularly mowed and used as vehicle turning around areas associated with the management and access along tracks.

**Table 8 Habitat scores for each habitat zone within the 50 m radius of each debris net site. Full details of scores are shown in Appendix 3.**

| Debris net Site No. | Habitat Zone | Ecological Vegetation Class (EVC) | Habitat Scores |
|---|---|---|---|
| 1 | HZ1 | Damp Forest | 0.93 |
| | HZ2 | Shrubby Foothill Forest | 0.84 |
| 2 | HZ1 | Damp Forest | 0.88 |
| | HZ2 | Shrubby Foothill Forest | 0.88 |
| 3 | HZ1 | Shrubby Dry Forest | 0.86 |
| 4 | HZ1 | Damp Forest | 0.89 |
| 5 | HZ1 | Shrubby Foothill Forest | 0.91 |
| | HZ2 | Damp Forest | 0.89 |
| 6 | HZ1 | Damp Forest | 0.89 |
| 7 | HZ1 | Damp Forest | 0.93 |
| 8 | HZ1 | Damp Forest | 0.9 |
| 9 | HZ1 | Damp Forest | 0.88 |
| 10 | HZ1a | Damp Forest | 0.53 |
| | HZ1b | Damp Forest | 0.81 |
| | HZ2 | Heathy Dry Forest | 0.89 |
| 11 | HZ1 | Damp Forest | 0.91 |
| | HZ2 | Shrubby Foothill Forest | 0.91 |
| 12 | HZ1 | Shrubby Foothill Forest | 0.87 |
| 13 | HZ1 | Damp Forest | 0.87 |
| 14 | HZ1 | Heathy Dry Forest | 0.87 |
| | HZ2 | Damp Forest | 0.9 |
| 15 | HZ1 | Heathy Dry Forest | 0.96 |
| 16 | HZ1 | Shrubby Foothill Forest | 0.91 |
| | HZ2 | Damp Forest | 0.86 |

  

| Debris net Site No. | Habitat Zone | Ecological Vegetation Class (EVC) | Habitat Scores |
|---|---|---|---|
| 17 | HZ1 | Damp Forest | 0.91 |
| 18 | HZ1 | Shrubby Foothill Forest | 0.93 |
| 19 | HZ1 | Damp Forest | 0.87 |
| 20 | HZ1 | Damp Forest | 0.96 |
| 21 | HZ1 | Damp Forest | 0.94 |
| 22 | HZ1 | Damp Forest | 0.87 |
| 23 | HZ1 | Shrubby Foothill Forest | 0.93 |
| 24 | HZ1 | Damp Forest | 0.81 |
| | HZ2 | Shrubby Foothill Forest | 0.93 |
| 25 | HZ1 | Damp Forest | 0.91 |
| | HZ2 | Shrubby Foothill Forest | 0.95 |
| 26 | HZ1 | Shrubby Foothill Forest | 0.91 |
| 27 | HZ1 | Damp Forest | 0.91 |
| 28 | HZ1 | Heathy Dry Forest | 0.75 |
| 30 | HZ1 | Damp Forest | 0.89 |
| 31 | HZ1 | Damp Forest | 0.86 |
| | HZ2 | Shrubby Foothill Forest | 0.93 |
| | | | |
| 32 | HZ1 | Shrubby Foothill Forest | 0.88 |
| | HZ2a | Damp Forest | 0.88 |
| | HZ2b | Damp Forest | 0.49 |
| 34 | HZ1 | Shrubby Foothill Forest | 0.93 |
| 35 | HZ1 | Heathy Dry Forest | 0.84 |
| 36 | HZ1 | Shrubby Foothill Forest | 0.82 |
| 37 | HZ1 | Shrubby Foothill Forest | 0.8 |

### Large Trees

Across the 35 sites there were 386 trees that were measured and mapped that met the relevant EVC benchmark for being considered a Large Tree. Of the 386 trees only 25 large trees could be considered at risk of being lost from the current construction footprint from canopy clearance works that may be required to lower and retrieve the work platform and associated equipment via helicopter. If the laydown locations can be modified from the proposed layout, guided by suggestions in Table 9, then this number could be reduced to possibly only 6 Large Trees.

  

**Table 9 Summary of Large Trees that are potentially at risk of being lost in association with the making of a safe helicopter winching area for the work platform laydown area at each of the 35 debris net sites. Based on an assumed 10 m radius clearance of canopy.**

| Site No. | Tree No. | Scientific Name | Common Name | DBH (cm) | Lost | Further Avoid and Minimise Recommendations |
|---|---|---|---|---|---|---|
| 2 | 6 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 92 | y | Possibly retain by moving laydown area south a few metres |
| 2 | 7 | *Eucalyptus dives* | Broad-leaf Peppermint | 71 | y | |
| 2 | 19 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 72 | y | |
| 3 | 18 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 76 | y | Possibly retain by moving laydown area by moving it south a few metres |
| 3 | 20 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 76 | y | |
| 4 | 5 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 95 | y | Possibly retain by moving laydown area south a few metres |
| 5 | 14 | *Eucalyptus obliqua* | Messmate Stringybark | 122 | y | Possibly retain by moving laydown area south- west a few metres |
| 8 | 7 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 138 | y | Possibly retain by moving laydown area south- west a few metres |
| 8 | 11 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 122 | y | |
| 9 | 7 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 92 | y | Possibly retain by moving laydown east a few metres. |
| 12 | 3 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 75 | y | Possibly retain by moving laydown east a few metres. |
| 14 | 11 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 104 | y | Possibly retain by moving laydown area south- west a few metres |
| 17 | 7 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 151 | y | Possibly retain by moving laydown area north a few metres |
| 20 | 18 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 170 | y | Possibly retain by moving laydown area south- west a few metres |
| 21 | 7 | Dead | | 180 | y | Possibly retain by moving laydown area south- west a few metres |
| 21 | 10 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 100 | y | |
| 22 | 19 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 115 | y | Possibly retain by moving laydown area south a few metres |
| 22 | 21 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 102 | y | |
| 23 | 5 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 87 | y | Possibly retain by moving laydown area south a few metres |
| 24 | 22 | Dead | | 101 | y | Possibly retain by moving laydown area north a few metres |
| 27 | 11 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 112 | y | Possibly retain by moving laydown area south a few metres |

  

| Site No. | Tree No. | Scientific Name | Common Name | DBH (cm) | Lost | Further Avoid and Minimise Recommendations |
|---|---|---|---|---|---|---|
| 31 | 11 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 116 | y | Possibly retain by moving laydown east a few metres. |
| 34 | 7 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 96 | y | Possibly retain by moving laydown area south a 10-15 metres |
| 34 | 8 | Dead | | 84 | y | |
| 34 | 9 | Dead | | 99 | y | |

## 7.3 Native Vegetation Impact Assessment

### 7.3.1 Avoid

Early planning investigations by Melbourne Water had identified 55 potential debris net locations based on early feasibility and desktop surveys. After the early feasibility assessments by Alluvium ((Alluvium 2021, 2020) the number of potential debris net sites were reduced to 35.

In early planning investigations options to create temporary and or permanent construction or maintenance tracks to the sites were considered. In the feasibility studies conducted by Melbourne Water and during discussions with contractors with experience in making and installing the debris barriers it was decided that a more expensive deployment of the construction equipment should occur by Helicopter. The decision to not create additional safe machinery access tracks (additional temporary or permanent) other than the existing roads has led to a significant reduction on the potential loss of native vegetation. The steep slopes would have required long contouring tracks, hundreds of metres long, and significant cut and fill impacts in order to reach each site from the existing roads.

The siting of the debris net sites was refined by Alluvium after their detailed field mapping in March-April 2023 (Alluvium 2023b). There were specific minimum criteria of a technical nature regarding the locating of debris barriers above or at the start of a formal channel in the gully and that the site had an appropriate cross-sectional shape to support a debris barrier.

In choosing the locations of the debris net line and the potential laydown area for equipment Alluvium also looked to place the locations in existing more open canopy areas and away from large trees.

The identification of threatened flora species and potential threatened fauna species habitat in this report will enable for additional micro-siting of the construction footprint and guide mitigation measures to avoid loss.

As part of this report there are recommendations that can assist Melbourne Water in further modification of the potential impact location and avoid the potential impacts on more Large Trees and threatened species (Table 9).

### 7.3.2 Minimise

The footprint of the construction of the debris net footings has been restricted to the smallest possible feasible area of 2 m either side of the debris net line.

The size of the temporary worksite has been designed to be the minimum size possible to contain all required equipment for the hand construction of the barrier anchor points. This not only minimises the temporary footprint of the work site, but it also reduces the minimum canopy clearance that is required to deploy and pick up the worksite platform.

The identification of threatened flora species and potential threatened fauna species habitat will enable additional micro-siting of the construction footprint and guide mitigation measures to avoid loss. See recommendations in Section 8.

### 7.3.3 Offsets

A scenario test, using the ENSYM computer software, has been created based on the current proposed footprint of works and the potential native vegetation impact areas.

The summary of the native vegetation offsets required under Clause 52.17 of Yarra Ranges Planning Scheme for this project are:

| Offset Requirements- Clause 52.17. | |
|---|---|
| General Offset amount | **1.468 General Habitat Units** |
| Vicinity | Port Phillip and Westernport Catchment Management Authority (CMA) or Yarra Ranges Shire Council |
| Minimum strategic biodiversity value score | 0.491 |
| Large trees | To be confirmed. |

Melbourne Water have several possible opportunities to provide this offset via the Native Vegetation Credit Register with the purchase of third-party credits and/or the use of first party registered credits from Melbourne Water owned land.

A *Report of Available native vegetation credits* has been generated to detail the availability of the required offset credits that meet the minimum offset requirements. Based on the preliminary results of the scenario test, the report demonstrates that there are 9 sites with a total of over 100 General Habitat Units (GHU) that are currently available on the native vegetation credit register.

Melbourne Water will further refine the offset management strategy once all investigations have been finalised.

  

# 8 Recommendations

The following recommendations are provided to minimise vegetation loss and protect the biodiversity values of the study area:

- Marking out of significant flora species or fauna habitat features within a 10 m radius of potential work areas by a suitably qualified ecologist prior to works commencing
- Where possible avoid direct damage or removal of tree-ferns (rough tree-fern and soft tree-fern) due to the slow-growing nature of these species
- Ensure any excavation or fill is kept to less than 10% of Tree Protection Zones for Large Trees
- Micro-site anchor points away from large trees and their roots, tree-ferns and threatened flora species
- Avoid the pruning or removal of large trees in the process of creating site access for helicopter delivery of materials
- Develop a Construction Environmental Management Plan (CEMP) or similar document for the project to minimise unnecessary and unintentional environmental impacts
- Obtain and implement an Arborist's recommendations to minimise the likelihood of Large Tree decline due to pruning or other construction activities
- Where impacts to native vegetation cannot be avoided, vegetation should be lopped or slashed to the minimum extent necessary, as opposed to complete removal
- Mark out the design footprint prior to the commencement of constructions works to avoid unintentional trampling or destruction of native vegetation outside of the construction footprint.
- Minimise the spread of weeds species and pathogens during construction by:
    - Ensuring all machinery, equipment and staff footwear or clothing that enters the site is free of soil and weed seeds
    - Controlling all CaLP Act listed noxious weeds prior to commencing works to minimise their spread during construction, including *spear thistle and *common blackberry, which were recorded from the study area.

Recommendations relating to further legislative approvals and associated documentation required include:

- Submission of a Planning permit to Yarra Ranges Council for the removal of native vegetation associated with the proposed use and works associated with the debris nets
- Finalise an offset strategy during the planning permit assessment phase based on the agreed magnitude of impacts
- Preparation of an EPBC Act referral with an associated Biodiversity Significant Impact Assessment that includes the MNES that have been identified as potentially impacted by the proposed works

  

- Preparation of a Section 27 consent application under the National Parks Act incorporating the findings of this report and any other relevant reports that may be required
- Preparation of a Protected Flora Controls Permit under the FFG Act.

  

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DELWP (2021g) Threatened Species Assessment *Haliaeetus leucogaster* White-bellied Sea-Eagle. (Department of Environment, Land, Water and Planning: Melbourne)

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# 10 Glossary

| | |
|---|---|
| Biodiversity | The variety of all life-forms, plants, animals, fungi, protists (including algae) and bacteria, their encoded genes, and the ecosystems of which they form a part |
| Bioregion | Defined geographical regions of Australia with similar climatic and geophysical characteristics, and which generally contain a suite of distinct ecosystems and species |
| CaLP Act | Victorian *Catchment and Land Protection Act 1994* |
| Conservation status | Categorisation of the threat risk to biological assets (plant and animal species, EVCs or plant communities) at a defined scale (e.g. national, state), as determined by specific criteria |
| Ecological Vegetation Class (EVC) | A vegetation classification described through a combination of its floristic composition, life form and ecological characteristics, and its association with particular environmental attributes. EVCs may include one or more floristic communities that occur across a biogeographic range, and have similar habitat and ecological processes operating |
| Endemic | Naturally found only in a defined geographic area (e.g. Murray cod are endemic to the Murray Darling basin) |
| EPBC Act | Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* |
| Exotic | Plants, animals, fungi and other organisms that have been introduced (deliberately or accidentally) to Australia or a given area after European settlement |
| Exotic vegetation | Vegetation comprised wholly or substantially of exotic species |
| FFG Act | Victorian *Flora and Fauna Guarantee Act 1988* |
| Floristic | Of or pertaining to plant species, i.e. flora |
| GIS | Geographic Information System. A digital platform for creating, analysing and viewing maps and other spatially referenced data |
| Habitat Hectares | A measure of the quality and extent of native vegetation, incorporating attributes including presence of large trees, tree canopy health, understorey structure and diversity, weed cover and landscape context |
| High threat weeds | Introduced species (including non-indigenous 'natives') which, as invading species have highly deleterious impacts on indigenous vegetation and faunal habitats |
| Indigenous | Plant and animal species native to the geographic area of interest |
| Indigenous vegetation | Vegetation native to the geographic area of interest |
| Introduced | Deliberately or accidentally brought to Australia or part of Australia, usually by human agency |

  

| | |
|---|---|
| Life form | An abbreviated description of the habit, growth form and longevity of a plant species (e.g. tree, shrub, vine, annual, submerged aquatic) |
| Native species | Species occurring naturally in Australia as part of the pre-European flora or fauna |
| Vegetation community | Term for interacting plant populations forming vegetation. A vegetation community in formal classifications may have characteristic plant species, composition and structure |
| WONS | Weeds of National Significance |

  

## Appendix 1 Flora and fungi species recorded during site assessments

* - Exotic species
# - Species native to Victoria though not indigenous within study area
P - Protected flora species under the FFG Act
EPBC Act: CR - Critically endangered, EN - Endangered, VU - Vulnerable, Mi - Migratory, Ma - Marine
CaLP - *Catchment and Land Protection Act 1994*
C - Species listed as Regionally Controlled under the CaLP Act
R - Species listed as Restricted under the CaLP Act
WONS - Weeds of National Significance

| Status | Scientific Name | Common Name |
|---|---|---|
| P | *Acacia gunnii* | Ploughshare wattle |
| en P | *Acacia leprosa var. uninervia* | Large-leaf cinnamon-wattle |
| | *Acacia melanoxylon* | Blackwood |
| P | *Acacia mucronata subsp. longifolia* | Narrow-leaf wattle |
| | *Acaena novae-zelandiae* | Bidgee-widgee |
| | *Achrophyllum dentatum* | Toothed mitre-moss |
| P | *Acrotriche prostrata* | Trailing ground-berry |
| P | *Acrotriche serrulata* | Honey-pots |
| # P | *Adiantum aethiopicum* | Common maidenhair |
| | *Ajuga australis* | Austral bugle |
| | *Amperea xiphoclada var. xiphoclada* | Broom spurge |
| | *Asperula pusilla* | Alpine woodruff |
| | *Asperula scoparia subsp. scoparia* | Prickly woodruff |
| | *Asperula spp.* | Woodruff |
| P | *Asplenium flabellifolium* | Necklace fern |
| P | *Asplenium spp.* | Spleenwort |
| | *Australina pusilla subsp. muelleri* | Shade nettle |
| | *Banksia spinulosa var. cunninghamii* | Hairpin banksia |
| | *Bauera rubioides* | Wiry bauera |
| P | *Bedfordia arborescens* | Blanket leaf |
| | *Billardiera mutabilis* | Common apple-berry |
| | *Billardiera spp.* | Apple berry |
| P | *Blechnum cartilagineum* | Gristle fern |
| P | *Blechnum nudum* | Fishbone water-fern |
| P | *Blechnum wattsii* | Hard water-fern |
| P | *Blechnum spp.* | Water fern |
| | *Boletus barragensis* | Bolete fungi |
| en P | *Boronia citrata* | Lemon boronia |
| | *Bossiaea prostrata* | Creeping bossiaea |
| | *Burchardia umbellata* | Milkmaids |
| | *Bursaria spinosa subsp. spinosa* | Sweet bursaria |
| P | *Calochlaena dubia* | Common ground-fern |
| | *Carex appressa* | Tall sedge |

  

| Status | Scientific Name | Common Name |
|---|---|---|
| P | *Cassinia aculeata* subsp. *aculeata* | Common cassinia |
| P | *Cassinia longifolia* | Shiny cassinia |
| P | *Cassinia trinerva* | Three-nerved cassinia |
| | *Cassytha glabella* | Slender dodder-laurel |
| | *Cassytha glabella* f. *glabella* | Slender dodder-laurel |
| | *Cassytha pubescens* s.s. | Downy dodder-laurel |
| | *Catagonium nitens* subsp. *nitens* | Feather-tail moss |
| * | *Centaurium erythraea* | Common centaury |
| P | *Chrysocephalum semipapposum* | Clustered everlasting |
| * | *Cirsium vulgare* | Spear thistle |
| | *Clematis aristata* | Mountain clematis |
| | *Comesperma ericinum* | Heath milkwort |
| | *Comesperma volubile* | Love creeper |
| | *Coprosma quadrifida* | Prickly currant-bush |
| en P | *Correa reflexa* var. *lobata* | Powelltown correa |
| P | *Corunastylis morrisii* | Bearded midge-orchid |
| P | *Cyathea australis* | Rough tree-fern |
| | *Cyperaceae* spp. | Sedge |
| | *Daviesia ulicifolia* | Gorse bitter-pea |
| | *Daviesia ulicifolia* subsp. *ruscifolia* | Gorse bitter-pea |
| | *Desmodium gunnii* | Southern tick-trefoil |
| | *Deyeuxia frigida* | Forest bent-grass |
| | *Deyeuxia* spp. | Bent grass |
| | *Dianella revoluta* s.l. | Black-anther flax-lily |
| | *Dianella* spp. | Flax lily |
| | *Dianella tasmanica* | Tasman flax-lily |
| | *Dichondra repens* | Kidney-weed |
| P | *Dicksonia antarctica* | Soft tree-fern |
| | *Dillwynia phylicoides* | Small-leaf parrot-pea |
| | *Drymophila cyanocarpa* | Turquoise berry |
| | *Echinopogon ovatus* | Common hedgehog-grass |
| P | *Epacris impressa* var. *impressa* | Common heath |
| | *Epilobium billardiereanum* | Variable willow-herb |
| | *Eucalyptus baxteri* s.s. | Brown stringybark |
| | *Eucalyptus cypellocarpa* | Mountain grey-gum |
| | *Eucalyptus dives* | Broad-leaf peppermint |
| | *Eucalyptus macrorhyncha* | Red stringybark |
| | *Eucalyptus obliqua* | Messmate stringybark |
| | *Eucalyptus radiata* s.l. | Narrow-leaf peppermint |
| | *Eucalyptus radiata subsp. radiata* | Narrow-leaf peppermint |
| | *Eucalyptus sieberi* | Silvertop ash |
| P | *Euchiton involucratus* s.s. | Star cudweed |
| P | *Euchiton japonicus* s.s. | Creeping cudweed |
| P | *Euchiton* spp. | Cudweed |
| | *Euryomyrtus ramosissima* | Rosy baeckea |

| Status | Scientific Name | Common Name |
|---|---|---|
| | *Exocarpos cupressiformis* | Cherry ballart |
| | *Exocarpos strictus* | Pale-fruit ballart |
| | *Galium leiocarpum* | Maori bedstraw |
| | *Galium* spp. | Bedstraw |
| | *Geranium potentilloides* | Soft crane's-bill |
| | *Geranium* sp. *2* | Variable crane's-bill |
| | *Geranium* spp. | Crane's bill |
| | *Glycine clandestina* | Twining glycine |
| | *Gonocarpus humilis* | Shade raspwort |
| | *Gonocarpus tetragynus* | Common raspwort |
| | *Goodenia ovata* | Hop goodenia |
| en P | *Goodia pubescens* | Silky golden-tip |
| | *Hakea decurrens* subsp. *physocarpa* | Bushy needlewood |
| | *Hedycarya angustifolia* | Austral mulberry |
| P | *Helichrysum leucopsideum* | Satin everlasting |
| | *Hibbertia* spp. | Guinea flower |
| P | *Histiopteris incisa* | Bat's wing fern |
| | *Hovea heterophylla* | Common hovea |
| | *Hydrocotyle hirta* | Hairy pennywort |
| | *Hydrocotyle* spp. | Pennywort |
| P | *Hymenophyllum cupressiforme* | Common filmy-fern |
| | *Hypericum gramineum* | Small st john's wort |
| * | *Hypochaeris glabra* | Smooth cat's-ear |
| * | *Hypochaeris radicata* | Flatweed |
| P | *Hypolepis muelleri* | Harsh ground-fern |
| | *Indigofera australis* subsp. *australis* | Austral indigo |
| | *Isolepis* spp. | Club sedge |
| | *Juncus pauciflorus* | Loose-flower rush |
| | *Kunzea ericoides* s.l. | Burgan |
| | *Kunzea* spp. | Kunzea |
| P | *Lagenophora* spp. | Bottle daisy |
| P | *Lagenophora stipitata* s.s. | Blue bottle-daisy |
| P | *Lastreopsis* spp. | Shield fern |
| | *Lepidosperma elatius* | Tall sword-sedge |
| | *Lepidosperma laterale* | Variable sword-sedge |
| P | *Leptorhynchos squamatus* | Scaly buttons |
| | *Leptospermum continentale* | Prickly tea-tree |
| | *Lindsaea linearis* | Screw fern |
| | *Linum marginale* | Native flax |
| | *Lomandra filiformis* | Wattle mat-rush |
| | *Lomandra longifolia* | Spiny-headed mat-rush |
| | *Lomandra longifolia* subsp. *longifolia* | Spiny-headed mat-rush |
| | *Lomatia fraseri* | Tree lomatia |
| | *Lomatia ilicifolia* | Holly lomatia |
| | *Luzula meridionalis* | Common woodrush |

  

| Status | Scientific Name | Common Name |
|---|---|---|
| | *Mentha australis* | River mint |
| | *Mentha laxiflora* | Forest mint |
| | *Microlaena stipoides* var. *stipoides* | Weeping grass |
| P | *Monotoca scoparia* | Prickly broom-heath |
| | *Mycena interrupta* | Pixie's parasol |
| | *Notelaea ligustrina* | Privet mock-olive |
| P | *Notogrammitis billardierei* | Common finger-fern |
| P | *Olearia argophylla* | Musk daisy-bush |
| P | *Olearia erubescens* | Moth daisy-bush |
| P | *Olearia lirata* | Snowy daisy-bush |
| P | *Olearia phlogopappa* | Dusty daisy-bush |
| P | *Olearia phlogopappa* subsp. *continentalis* | Dusty daisy-bush |
| | *Opercularia varia* | Variable stinkweed |
| * | *Oxalis corniculata* s.s. | Creeping wood-sorrel |
| | *Oxalis exilis* | Shade wood-sorrel |
| | *Oxalis* spp. | Wood sorrel |
| P | *Ozothamnus ferrugineus* | Tree everlasting |
| en P | *Ozothamnus rogersianus* | Nunniong everlasting |
| | *Pandorea pandorana* subsp. *pandorana* | Wonga vine |
| | *Parsonsia brownii* | Twining silkpod |
| | *Pelargonium inodorum* | Kopata |
| P | *Pellaea falcata* s.s. | Sickle fern |
| | *Persoonia confertiflora* | Cluster-flower geebung |
| | *Pimelea axiflora* subsp. *axiflora* | Bootlace bush |
| | *Pimelea linifolia* | Slender rice-flower |
| | *Plantago debilis* | Shade plantain |
| | *Poa ensiformis* | Sword tussock-grass |
| | *Poa morrisii* | Soft tussock-grass |
| | *Poa sieberiana* | Grey tussock-grass |
| | *Poa* spp. | Tussock grass |
| | *Poa tenera* | Slender tussock-grass |
| | *Polyscias sambucifolia* | Elderberry panax |
| | *Polyscias sambucifolia* subsp. *1* | Broad-leaf panax |
| P | *Polystichum proliferum* | Mother shield-fern |
| | *Pomaderris aspera* | Hazel pomaderris |
| | *Pomaderris prunifolia* var. *prunifolia* | Prunus pomaderris |
| | *Pomaderris racemosa* | Cluster pomaderris |
| | *Pomaderris velutina* | Velvet pomaderris |
| | *Poranthera microphylla* s.s. | Small poranthera |
| P | *Prostanthera lasianthos* var. *lasianthos* | Victorian christmas-bush |
| | *Pteridium esculentum* subsp. *esculentum* | Austral bracken |
| en P | *Pterostylis clivosa* | Red-tip greenhood |
| P | *Pterostylis* spp. | Greenhood |
| # | *Pultenaea forsythiana* | Prickly bush-pea |
| | *Ranunculus lappaceus* | Australian buttercup |

  

| Status | Scientific Name | Common Name |
|---|---|---|
| | *Ranunculus plebeius* s.s. | Forest buttercup |
| | *Ranunculus* spp. | Buttercup |
| | *Rhytidosporum procumbens* | White marianth |
| * WONS | *Rubus anglocandicans* | Common blackberry |
| | *Rubus parvifolius* | Small-leaf bramble |
| | *Rytidosperma pallidum* | Silvertop wallaby-grass |
| | *Schoenus* spp. | Bog sedge |
| P | *Senecio linearifolius* | Fireweed groundsel |
| P | *Senecio linearifolius* var. *denticulatus* | Fireweed groundsel (eastern variant) |
| P | *Senecio* spp. | Groundsel |
| P | *Senecio tenuiflorus* s.l. | Slender fireweed |
| P | *Senecio velleioides* | Forest groundsel |
| P | *Sigesbeckia orientalis* subsp. *orientalis* | Indian weed |
| | *Spyridium parvifolium* | Dusty miller |
| | *Stackhousia monogyna* s.s. | Creamy candles |
| | *Stellaria flaccida* | Forest starwort |
| | *Stellaria pungens* | Prickly starwort |
| P | *Stylidium armeria* | Common triggerplant |
| P | *Stylidium armeria* subsp. *armeria* | Common triggerplant |
| P | *Stylidium graminifolium* s.s. | Grass triggerplant |
| | *Tetrarrhena juncea* | Forest wire-grass |
| | *Tetratheca ciliata* | Pink-bells |
| | *Themeda triandra* | Kangaroo grass |
| | *Trametes versicolor* | Turkey-tail |
| | *Tremella fuciformis* | |
| | *Urtica incisa* | Scrub nettle |
| | *Veronica calycina* | Hairy speedwell |
| | *Veronica notabilis* | Forest speedwell |
| | *Veronica plebeia* | Trailing speedwell |
| | *Viola hederacea* sensu *Entwisle (1996)* | Ivy-leaf violet |
| | *Wahlenbergia gracilis* | Sprawling bluebell |
| | *Wahlenbergia* spp. | Bluebell |
| | *Wahlenbergia stricta* subsp. *stricta* | Tall bluebell |
| P | *Xanthorrhoea minor* subsp. *lutea* | Small grass-tree |
| | *Xanthosia* spp. | Xanthosia |

**Appendix 2** Likelihood of presence assessment for every threatened species (EPBC Act and FFG Act) (including migratory/ marine EPBC Act species) recorded or with potential habitat as per a 5km radius search of the VBA and an EPBC Act PMST search.

| | | | | | Likelihood of Presence | | | | | Likelihood of Impact (for Moderate / High / Present species only) if no mitigations measures were in place | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Threatened Status** | **Source** | **Likelihood Justification** | **Present** | **High** | **Moderate** | **Low** | **Not Likely** | **Category** | **Sites** |
| *Actitis hypoleucos* | common sandpiper | Mi Ma | PMST | No VBA records within 5 km | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Anthochaera phrygia* | regent honeyeater | CR cr | PMST | no records within <40 km in VBA/Birdata/eBird | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Apus pacificus* | fork-tailed swift | Mi Ma | PMST | No records within 5 km in VBA/Birdata/eBird, but some within 10 km | | | | **All sites** | | n/a | |
| *Botaurus poiciloptilus* | Australasian bittern | En cr | PMST | No VBA records within 5 km | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Calidris acuminata* | sharp-tailed sandpiper | Mi Ma | PMST | No VBA records within 5 km | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Calidris ferruginea* | curlew sandpiper | CR cr Mi Ma | PMST | No VBA records within 5 km | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Calidris melanotos* | pectoral sandpiper | Mi Ma | PMST | No VBA records within 5 km | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Callocephalon fimbriatum* | gang-gang cockatoo | EN en | VBA | 16 records in VBA within 5km. Observed flying over Site 8 during field survey. | **Site 8** | Sites 1, 2, 3, 5, 7 | Sites 4, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 31, 32, 34, 35, 36, 37 | n/a | n/a | **Moderate** | Sites 2, 3, 5, 7, 8, 18, 20, 21, 22, 23, 24, 30, 31, 34 |
| | | | | | | | | | | **Low** | Sites 1, 4, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 25, 26, 27, 28, 32, 35, 36, 37 |
| *Canis lupus dingo* | dingo | vu | VBA | 2 records in VBA within 5 km. | n/a | n/a | **All sites** | n/a | n/a | **Low** | **All sites** |
| *Climacteris picumnus* | brown treecreeper | Vu | PMST | no records within 5 km in VBA, some within 20 km but in lowland/foothills only | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Dasyurus maculatus maculatus* | spot-tailed quoll | EN en | PMST | No VBA records within 5 km | | | **All sites** | | | **Low** | **All sites** |
| *Galaxias fuscus* | barred galaxias | EN cr | | 3 VBA records (multiple individuals) within 5 km. Shaw Creek (electrofishing), 2016, 2021 and 2022 | n/a | n/a | n/a | n/a | **All sites** | n/a | |

  

| | | | | | Likelihood of Presence | | | | | Likelihood of Impact (for Moderate / High / Present species only) if no mitigations measures were in place | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Threatened Status** | **Source** | **Likelihood Justification** | **Present** | **High** | **Moderate** | **Low** | **Not Likely** | **Category** | **Sites** |
| *Galaxias rostratus* | flat-headed galaxias | CR vu | | No VBA records within 5 km | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Galaxiella pusilla* | dwarf galaxias | VU en | | No VBA records within 5 km | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Gallinago hardwickii* | Latham's snipe | Mi Ma | PMST | No VBA records within 5 km | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Gymnobelideus leadbeateri* | Leadbeater's possum | CR cr | VBA | 33 VBA records within 5 km. No suitable habitat at the sites. | n/a | n/a | n/a | **All sites** | n/a | n/a | n/a |
| *Haliaeetus leucogaster* | white-bellied sea-eagle | en | VBA | 6 VBA records within 5km, last record from 2000. Debris net sites are too far away from the waters edge. | n/a | n/a | n/a | n/a | **All sites** | n/a | n/a |
| *Hirundapus caudacutus* | white-throated needletail | VU vu | VBA | 3 records in the VBA within 5km and an additional 8 records within 10 km. | n/a | n/a | **All sites** | n/a | n/a | **Not likely** | **All sites** |
| *Lathamus discolor* | swift parrot | CR cr | PMST | No records within 5 km in VBA, 1 Birdata rec 2019 in Warburton of single bird | | | | **All sites** | | n/a | |
| *Liopholis montana* | mountain skink | EN en | PMST | No records within 5 km in VBA, however species is often misidentified as White's skink, for which there are a few records within 5 km. Cryptic and likely under-surveyed. | n/a | n/a | Sites 3, 10, 14, 15, 28, 35 | Sites 1, 2, 4, 5, 6, 7, 8, 9, 11, 12, 13, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30, 31, 32, 34, 36, 37 | n/a | **Moderate** | Sites 3, 15, 28, 35 |
| | | | | | | | | | | **Low** | Sites 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30, 31, 32, 34, 36, 37 |
| *Lissolepis coventryi* | swamp skink | EN en | PMST | No VBA records within 5 km | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Litoria raniformis* | growling grass frog | VU vu | VBA | 8 records in VBA within 5km however most recent record was 1979. No suitable wetland habitat is present atany of the sites | n/a | n/a | n/a | n/a | **All sites** | n/a | n/a |
| *Litoria spenceri* | spotted tree frog | CR cr | PMST | No VBA records within 5 km | n/a | n/a | n/a | n/a | **All sites** | **Not likely** | **All sites** |
| *Macquaria australasica* | Macquarie perch | EN en | PMST | No VBA records within 5 km | n/a | n/a | n/a | n/a | **All sites** | n/a | |

  

| | | | | | Likelihood of Presence | | | | | Likelihood of Impact (for Moderate / High / Present species only) if no mitigations measures were in place | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Threatened Status** | **Source** | **Likelihood Justification** | **Present** | **High** | **Moderate** | **Low** | **Not Likely** | **Category** | **Sites** |
| *Mastacomys fuscus mordicus* | broad-toothed rat | VU vu | VBA and PMST | 5 records in VBA within 5km. | n/a | Site 6, 20 | Sites 4, 12, 13, 14, 15, 16, 17, 18, 19, 21, 25, 26, 27, 28, 30, 31, 35, 36, 37 | Sites 1, 2, 3, 5, 7, 8, 9, 10, 11, 22, 23, 24, 32, 34, 35 | n/a | **Moderate** | Sites 6, 12, 13, 14, 15, 17, 18, 19, 20, 21, 25, 26, 27, 28, 30, 37 |
| | | | | | | | | | | **Low** | Site 4, 16, 31, 35, 36 |
| *Miniopterus orianae oceanensis* | eastern bent-winged bat | cr | VBA | 11 VBA recs within 5 km, last recorded in 2000, looks like surveys were undertaken between 1997-2000, 9 of the 11 records are roost sites so overall, recs relate to 5-6 locations only. These are all very close to the w. arm of the UYR, <3 km of site 35, possibly under-surveyed further afield | | | **All sites,** | | | **Low** | **All sites** |
| *Monarcha melanopsis* | black-faced monarch | Mi Ma | PMST | No VBA records within 5 km, one Birdata rec from 2015 at Reefton. May occur while on passage, but not likely to be a common visitor/make significant use of the area | | | | **All sites** | | n/a | |
| *Motacilla tschutschensis* | eastern yellow wagtail | Mi | PMST | No VBA records within 5 km | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Myiagra cyanoleuca* | satin flycatcher | Mi Ma | PMST | 6 VBA records within 5 km, last record from 1989, several more recent records in Birdata, lots to west and northwest (accessible areas) | n/a | n/a | **All sites** | n/a | | **Low** | **All sites** |
| *Nannoperca obscura* | Yarra pygmy perch | VU vu | PMST | No VBA records within 5 km | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Neophema chrysostoma* | blue-winged parrot | VU | VBA and PMST | 1 rec within 5 km in VBA from 1988, may occur while on passage, but largely a lowland/foothill and coastal species | n/a | n/a | n/a | **All sites** | | **Low** | **All sites** |
| *Ninox connivens* | barking owl | cr | VBA | 2 records in VBA within 5km | n/a | n/a | Sites 1, 2, 3, 5, 6, 9, 10, 11, 12, 14, 15, 16, 17, 18, 22, 23, 25, 26, 27, 28, 30, 31, 32 | Sites 4, 7, 8, 13, 19, 20, 21, 24, 34, 35, 36, 37 | n/a | **Low** | Sites 1, 2, 3, 5, 6, 9, 10, 11, 12, 14, 15, 16, 17, 18, 22, 23, 25, 26, 27, 28, 30, 31, 32 |
| *Ninox strenua* | powerful owl | vu | VBA | 3 records in VBA within 5 km | n/a | n/a | **All sites** | n/a | n/a | **Low** | **All sites** |

  

| | | | | | Likelihood of Presence | | | | | Likelihood of Impact (for Moderate / High / Present species only) if no mitigations measures were in place | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Threatened Status** | **Source** | **Likelihood Justification** | **Present** | **High** | **Moderate** | **Low** | **Not Likely** | **Category** | **Sites** |
| *Numenius madagascariensis* | eastern curlew | CR cr Mi Ma | PMST | No VBA records within 5 km | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Ornithorhynchus anatinus* | platypus | vu | VBA | 4 VBA records within 5 km. Upper Yarra Dam (1978),Yarra River (2021) | n/a | n/a | n/a | n/a | **All sites** | n/a | n/a |
| *Ornithorhynchus anatinus* | platypus | vu | VBA | 4 VBA records within 5 km. Upper Yarra Dam (1978),Yarra River (2021). The location of each debris net is outside of Platypus habitat as there are located at upper cathment prior to permanent ofr semi-permanent streams are formed. The sediment and erosion control works are likely to provide protection of Platypus populations in the reservoir aftr a major bushfire event. | n/a | n/a | n/a | n/a | **All sites** | | |
| *Petauroides volans* | southern greater glider | EN en | VBA and PMST | 113 VBA records within 5 km. | n/a | Sites 1, 2 | Sites 3, 5, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30, 31, 34 | Sites 4, 6, 7, 8, 9, 10, 11, 12, 14, 28, 32, 35, 36, 37 | n/a | **Moderate**<br>**Low** | Sites 1, 2, 3, 5, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 31, 34<br>Sites 25, 27, 30 |
| *Petaurus australis australis* | yellow-bellied glider | VU vu | VBA and PMST | 17 VBA records witin 5km | n/a | Sites 1, 2 | Sites 3, 5, 7, 8, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 30, 31, 34 | Sites 4, 6, 9, 10, 11, 12, 13, 14, 19, 28, 32, 35, 36, 37 | n/a | **Moderate**<br>**Low** | Sites 1, 2, 3, 5, 8, 15, 16, 17, 18, 20, 21, 22, 23, 24, 26, 31, 34<br>Sites 7, 25, 27, 30 |
| *Prototroctes maraena* | australian grayling | VU en | PMST | No VBA records within 5 km | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Potorous tridactylus trisulcatus* | long-nosed potoroo | VU vu | PMST | No VBA records within >80 km, nearest recs are Westernport / Bairnsdale regions. | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Pseudomys fumeus* | smoky mouse | EN en | VBA and PMST | 8 records in the VBA within 5 km. | n/a | Sites 14, 28, 37 | Sites 8, 10, 12, 25, 30, 35, 36 | Sites 1, 2, 3, 4, 5, 6, 7, 9, 11, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 31, 32, 34 | n/a | **Moderate** | Sites 8, 10, 12, 14, 25, 28, 30, 35, 36, 37 |

  

| | | | | | Likelihood of Presence | | | | | Likelihood of Impact (for Moderate / High / Present species only) if no mitigations measures were in place | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Threatened Status** | **Source** | **Likelihood Justification** | **Present** | **High** | **Moderate** | **Low** | **Not Likely** | **Category** | **Sites** |
| *Pteropus poliocephalus* | grey-headed flying-fox | VU vu | PMST | Nearest VBA recs approx. 10-15 km away, northeast of Warburton. Theoretically, could occur within UYR region, but would be only occasional/while on passage | n/a | n/a | n/a | **All sites** | n/a | **Low** | **All sites** |
| *Pycnoptilus floccosus* | pilotbird | VU vu | VBA and PMST | 9 records in VBA within 5 km. Species heard calling at 2 sites during the filed surveys. | **Sites 22 & 23** | Sites 7, 8, 9, 24, 30, 34, 35 | Sites 1, 2, 3, 4, 6, 10, 11, 13, 15, 19, 20, 25, 26, 27, 28, 31, 32, 36, 37 | Sites 5, 12, 14, 16, 17, 18, 21 | n/a | **Moderate**<br>**Low** | Sites 4, 6, 7, 8, 9, 10, 11, 13, 15, 19, 20, 22, 23, 24, 25, 26, 27, 28, 30, 31, 32, 34, 35, 36, 37<br>Sites 1, 2, 3 |
| *Rhinolophus megaphyllus megaphyllus* | eastern horseshoe bat | en | VBA | 3 records in VBA within 5 km. Suitable foraging habitat but no suitable roosting/ breeding habitat (caves mineshafts) | n/a | n/a | **All sites** | n/a | n/a | **Low** | **All sites** |
| *Rhipidura rufifrons* | rufous fantail | Mi Ma | VBA and PMST | 11 VBA records within 5 km, last recorded in 1989. Probably would occur while on passage, lots of local records in general, including 2018 on Birdata in UYR restricted area. More likely to occur in damp forest habitat, | n/a | Sites 1, 4, 6, 7, 8, 9, 11, 13, 17, 19, 20, 21, 22, 27, 30, 31, 32 | Sites 2, 5, 10, 16, 24, 25 | Sites 3, 12, 14, 15, 18, 23, 26, 28, 34, 35, 36, 37 | n/a | **Low** | **All sites** |
| *Rostratula australis* | Australian painted-snipe | EN cr Mi | PMST | No VBA records within 5 km | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Sminthopsis leucopus* | white-footed dunnart | vu | VBA | 4 records in VBA within 5 km. | n/a | n/a | Sites 6, 10, 12, 35, 36, 37 | Sites 1, 2, 3, 4, 5, 7, 8, 9, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 31, 32, 34 | n/a | **Moderate**<br>**Low** | Sites 10, 12, 35, 36, 37<br>Site 6 |
| *Stagonopleura guttata* | diamond firetail | VU vu | PMST | No VBA/other recs within 5 km, it favours dry/open country in lowland/foothill country | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Synoicus chinensis* | king quail | en | VBA | 1 record in VBA, of an escapee bird. | n/a | n/a | n/a | n/a | **All sites** | n/a | |
| *Tyto tenebricosa* | sooty owl | en | VBA | 13 records in the VBA within 5 km | n/a | n/a | **All sites** | n/a | n/a | **Low** | **All sites** |
| *Varanus varius* | lace monitor | en | VBA | 6 records in the VBA within 5 km | n/a | **All sites** | n/a | n/a | n/a | **Low** | **All sites** |

  

**Appendix 3** Species and size of *Large* and *Medium* trees assessed within the debris net sites. *Large Trees* defined as greater than or equal to the benchmark size for the relevant EVC (>60cm DBH Heathy Dry Forest, >70cm DBH Shrubby Dry and Shrubby Foothill Forests and >90 cm DBH Damp Forest.) Dead trees >40 cm DBH are considered as *Large* trees. Medium trees were those trees >60cm DBH and less than the Large Tree benchmark DBH.

| Site No | Tree No | Scientific Name | Common Name | DBH (cm) | Large Tree |
|---|---|---|---|---|---|
| Site 1. | 1 | *Dead* | Dead | 86 | y |
| | 2 | *Eucalyptus obliqua* | Messmate Stringybark | 76 | |
| | 3 | *Eucalyptus obliqua* | Messmate Stringybark | 76 | y |
| | 4 | *Eucalyptus obliqua* | Messmate Stringybark | 80 | |
| | 5 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 91 | y |
| | 6 | *Dead* | Dead | 75 | y |
| | 7 | *Eucalyptus obliqua* | Messmate Stringybark | 78 | y |
| | 8 | *Eucalyptus dives* | Broad-leaf Peppermint | 70 | y |
| | 9 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 141 | y |
| | 10 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 87 | y |
| | 11 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 78 | |
| | 12 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 155 | y |
| | 13 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 112 | y |
| | 14 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 154 | y |
| | 15 | *Dead* | Dead | 73 | y |
| | 16 | *Eucalyptus obliqua* | Messmate Stringybark | 93 | y |
| | 17 | *Dead* | Dead | 94 | y |
| | 18 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 112 | y |
| | 19 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 100 | y |
| | 20 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 162 | y |
| Site 2. | 1 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 98 | y |
| | 2 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 134 | y |
| | 3 | *Dead* | Dead | 148 | y |
| | 4 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 111 | y |
| | 5 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 95 | y |
| | 6 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 92 | y |
| | 7 | *Eucalyptus dives* | Broad-leaf Peppermint | 71 | y |
| | 8 | *Eucalyptus obliqua* | Messmate Stringybark | 78 | y |
| | 9 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 70 | y |
| | 10 | *Eucalyptus obliqua* | Messmate Stringybark | 80 | y |
| | 11 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 131 | y |
| | 12 | *Eucalyptus obliqua* | Messmate Stringybark | 88 | y |
| | 13 | *Eucalyptus obliqua* | Messmate Stringybark | 113 | y |
| | 14 | *Eucalyptus obliqua* | Messmate Stringybark | 78 | y |

  

| Site No | Tree No | Scientific Name | Common Name | DBH (cm) | Large Tree |
|---|---|---|---|---|---|
| | 15 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 70 | y |
| | 16 | *Dead* | Dead | 73 | y |
| | 17 | *Dead* | Dead | 83 | y |
| | 18 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 75 | y |
| | 19 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 72 | y |
| | 20 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 73 | y |
| **Site 3.** | 1 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 131 | y |
| | 2 | *Dead* | Dead | 91 | y |
| | 3 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 78 | y |
| | 4 | *Eucalyptus obliqua* | Messmate Stringybark | 97 | y |
| | 5 | *Eucalyptus obliqua* | Messmate Stringybark | 87 | y |
| | 6 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 76 | y |
| | 7 | *Dead* | Dead | 100 | y |
| | 8 | *Eucalyptus obliqua* | Messmate Stringybark | 78 | y |
| | 9 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 112 | y |
| | 10 | *Eucalyptus obliqua* | Messmate Stringybark | 73 | y |
| | 11 | *Eucalyptus obliqua* | Messmate Stringybark | 71 | y |
| | 12 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 103 | y |
| | 13 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 120 | y |
| | 14 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 96 | y |
| | 15 | *Dead* | Dead | 72 | y |
| | 16 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 94 | y |
| | 17 | *Eucalyptus obliqua* | Messmate Stringybark | 78 | y |
| | 18 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 76 | y |
| | 19 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 71 | y |
| | 20 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 76 | y |
| | 21 | *Eucalyptus obliqua* | Messmate Stringybark | 87 | y |
| | 22 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 126 | y |
| | 23 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 76 | y |
| | 24 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 93 | y |
| | 25 | *Eucalyptus obliqua* | Messmate Stringybark | 84 | y |
| | 26 | *Eucalyptus sp.* | | 130 | y |
| **Site 4.** | 1 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 74 | |
| | 2 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 83 | |
| | 3 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 70 | |
| | 4 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 70 | |
| | 5 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 95 | y |
| | 6 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 67 | |
| | 7 | *Eucalyptus obliqua* | Messmate Stringybark | 80 | |
| | 8 | *Dead* | Dead | 86 | y |
| | 9 | *Dead* | Dead | 79 | y |
| | 10 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 87 | |

  

| Site No | Tree No | Scientific Name | Common Name | DBH (cm) | Large Tree |
|---|---|---|---|---|---|
| Site 5. | 1 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 83 | y |
| | 2 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 76 | y |
| | 3 | *Dead* | Dead | 76 | y |
| | 4 | *Eucalyptus obliqua* | Messmate Stringybark | 84 | y |
| | 5 | *Dead* | Dead | 72 | y |
| | 6 | *Eucalyptus obliqua* | Messmate Stringybark | 81 | y |
| | 7 | *Eucalyptus obliqua* | Messmate Stringybark | 125 | y |
| | 8 | *Dead* | Dead | 106 | y |
| | 9 | *Dead* | Dead | 106 | y |
| | 10 | *Eucalyptus obliqua* | Messmate Stringybark | 96 | y |
| | 11 | *Eucalyptus obliqua* | Messmate Stringybark | 94 | y |
| | 12 | *Eucalyptus obliqua* | Messmate Stringybark | 82 | y |
| | 13 | *Eucalyptus sieberi* | Silvertop Ash | 76 | y |
| | 14 | *Eucalyptus obliqua* | Messmate Stringybark | 122 | y |
| | 15 | *Eucalyptus obliqua* | Messmate Stringybark | 98 | y |
| | 16 | *Eucalyptus obliqua* | Messmate Stringybark | 95 | y |
| | 17 | *Eucalyptus obliqua* | Messmate Stringybark | 104 | y |
| | 18 | *Eucalyptus obliqua* | Messmate Stringybark | 73 | y |
| | 19 | *Eucalyptus obliqua* | Messmate Stringybark | 82 | |
| | 20 | *Eucalyptus obliqua* | Messmate Stringybark | 83 | |
| | 21 | *Eucalyptus obliqua* | Messmate Stringybark | 70 | |
| | 22 | *Eucalyptus obliqua* | Messmate Stringybark | 119 | y |
| | 23 | *Eucalyptus obliqua* | Messmate Stringybark | 73 | |
| | 24 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 72 | y |
| | 25 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 71 | y |
| | 26 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 77 | y |
| | 27 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 71 | y |
| Site 6. | 1 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 80 | |
| | 2 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 70 | |
| | 3 | *Dead* | Dead | 75 | y |
| | 4 | *Dead* | Dead | 70 | y |
| | 5 | *Eucalyptus obliqua* | Messmate Stringybark | 75 | |
| | 6 | *Eucalyptus obliqua* | Messmate Stringybark | 73 | |
| | 7 | *Dead* | Dead | 70 | y |
| | 8 | *Dead* | Dead | 76 | y |
| | 9 | *Eucalyptus obliqua* | Messmate Stringybark | 81 | |
| | 10 | *Dead* | Dead | 86 | y |
| | 11 | *Eucalyptus obliqua* | Messmate Stringybark | 86 | |
| | 12 | *Eucalyptus obliqua* | Messmate Stringybark | 72 | |
| | 13 | *Eucalyptus obliqua* | Messmate Stringybark | 78 | |
| | 14 | *Eucalyptus obliqua* | Messmate Stringybark | 71 | |
| | 15 | *Eucalyptus obliqua* | Messmate Stringybark | 85 | |

  

| Site No | Tree No | Scientific Name | Common Name | DBH (cm) | Large Tree |
|---|---|---|---|---|---|
| Site 7. | 1 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 109 | y |
| | 2 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 132 | y |
| | 3 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 102 | y |
| | 4 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 154 | y |
| | 5 | *Dead* | Dead | 106 | y |
| | 6 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 146 | y |
| | 7 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 127 | y |
| | 8 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 138 | y |
| | 9 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 158 | y |
| | 10 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 92 | y |
| | 11 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 113 | y |
| | 12 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 102 | y |
| | 13 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 99 | y |
| | 14 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 102 | y |
| | 15 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 138 | y |
| | 16 | *Dead* | Dead | 134 | y |
| | 17 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 151 | y |
| | 18 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 148 | y |
| | 19 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 107 | y |
| | 20 | *Dead* | Dead | 109 | y |
| Site 8. | 1 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 121 | y |
| | 2 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 119 | y |
| | 3 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 140 | y |
| | 4 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 133 | y |
| | 5 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 102 | y |
| | 6 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 93 | y |
| | 7 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 138 | y |
| | 8 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 92 | y |
| | 9 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 111 | y |
| | 10 | *Dead* | Dead | 91 | y |
| | 11 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 122 | y |
| Site 9. | 1 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 74 | |
| | 2 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 73 | |
| | 3 | *Dead* | Dead | 98 | y |
| | 4 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 99 | y |
| | 5 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 75 | |
| | 6 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 103 | y |
| | 7 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 92 | y |
| Site 10. | 1 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 157 | y |
| | 2 | *Eucalyptus sp.* | Dead | 70 | y |
| | 3 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 92 | Y |
| Site 11. | 1 | *Eucalyptus dives* | Broad-leaf Peppermint | 62 | |

  

| Site No | Tree No | Scientific Name | Common Name | DBH (cm) | Large Tree |
|---|---|---|---|---|---|
| | 2 | *Eucalyptus obliqua* | Messmate Stringybark | 67 | |
| | 3 | *Eucalyptus obliqua* | Messmate Stringybark | 66 | |
| | 4 | *Eucalyptus obliqua* | Messmate Stringybark | 71 | y |
| | 5 | *Dead* | Dead | 119 | y |
| | 6 | *Eucalyptus dives* | Broad-leaf Peppermint | 78 | y |
| | 7 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 67 | |
| | 8 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 127 | y |
| | 9 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 106 | y |
| | 10 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 103 | y |
| | 11 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 100 | y |
| | 12 | *Eucalyptus obliqua* | Messmate Stringybark | 68 | |
| | 13 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 70 | |
| | 14 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 125 | y |
| | 15 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 96 | y |
| | 16 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 61 | |
| | 17 | *Eucalyptus obliqua* | Messmate Stringybark | 81 | |
| | 18 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 127 | y |
| | 19 | *Eucalyptus obliqua* | Messmate Stringybark | 85 | |
| | 20 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 102 | y |
| | 21 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 126 | y |
| | 22 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 72 | |
| | 23 | *Eucalyptus obliqua* | Messmate Stringybark | 62 | |
| | 24 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 97 | y |
| **Site 12.** | 1 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 135 | y |
| | 2 | *Dead* | Dead | 75 | y |
| | 3 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 75 | y |
| **Site 13.** | 1 | *Eucalyptus obliqua* | Messmate Stringybark | 82 | |
| | 2 | *Dead* | Dead | 72 | y |
| | 3 | *Dead* | Dead | 76 | y |
| | 4 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 190 | y |
| | 5 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 170 | y |
| | 6 | *Dead* | Dead | 175 | y |
| | 7 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 96 | y |
| | 8 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 172 | y |
| | 9 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 220 | y |
| | 10 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 91 | y |
| **Site 14.** | 1 | *Eucalyptus dives* | Broad-leaf Peppermint | 64 | y |
| | 2 | *Eucalyptus dives* | Broad-leaf Peppermint | 60 | y |
| | 3 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 64 | |
| | 4 | *Eucalyptus dives* | Broad-leaf Peppermint | 65 | y |
| | 5 | *Eucalyptus dives* | Broad-leaf Peppermint | 68 | y |
| | 6 | *Eucalyptus dives* | Broad-leaf Peppermint | 93 | y |

  

| Site No | Tree No | Scientific Name | Common Name | DBH (cm) | Large Tree |
|---|---|---|---|---|---|
| | 7 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 67 | y |
| | 8 | *Eucalyptus dives* | Broad-leaf Peppermint | 81 | y |
| | 9 | *Eucalyptus dives* | Broad-leaf Peppermint | 74 | y |
| | 10 | *Eucalyptus dives* | Broad-leaf Peppermint | 81 | y |
| | 11 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 104 | y |
| **Site 15.** | 1 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 60 | y |
| | 2 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 67 | y |
| | 3 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 60 | y |
| | 4 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 81 | y |
| | 5 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 66 | y |
| | 6 | *Eucalyptus dives* | Broad-leaf Peppermint | 77 | y |
| | 7 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 83 | y |
| | 8 | *Eucalyptus dives* | Broad-leaf Peppermint | 77 | y |
| | 9 | *Eucalyptus dives* | Broad-leaf Peppermint | 77 | y |
| **Site 16.** | 1 | *Dead* | Dead | 95 | y |
| | 2 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 104 | y |
| | 3 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 118 | y |
| | 4 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 171 | y |
| | 5 | *Dead* | Dead | 80 | y |
| | 6 | *Dead* | Dead | 128 | y |
| | 7 | *Dead* | Dead | 129 | y |
| | 8 | *Dead* | Dead | 119 | y |
| | 9 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 132 | y |
| | 10 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 119 | y |
| | 11 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 147 | y |
| | 12 | *Dead* | Dead | 134 | y |
| | 13 | *Eucalyptus dives* | Broad-leaf Peppermint | 93 | y |
| | 14 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 126 | y |
| **Site 17.** | 1 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 91 | y |
| | 2 | *Dead* | Dead | 135 | y |
| | 3 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 76 | |
| | 4 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 91 | y |
| | 5 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 94 | y |
| | 6 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 151 | y |
| | 7 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 91 | y |
| | 8 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 139 | y |
| | 9 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 92 | y |
| | 10 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 93 | y |
| | 11 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 105 | y |
| | 12 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 148 | y |
| | 13 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 92 | y |
| | 14 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 94 | y |

  

| Site No | Tree No | Scientific Name | Common Name | DBH (cm) | Large Tree |
|---|---|---|---|---|---|
| | 15 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 91 | y |
| | 16 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 95 | y |
| | 17 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 154 | y |
| **Site 18.** | 1 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 124 | y |
| | 2 | *Dead* | Dead | 73 | y |
| | 3 | *Dead* | Dead | 82 | y |
| | 4 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 71 | y |
| | 5 | *Dead* | Dead | 71 | y |
| | 6 | *Dead* | Dead | 73 | y |
| | 7 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 124 | y |
| | 8 | | Dead | 107 | y |
| | 9 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 136 | y |
| | 10 | *Dead* | Dead | 76 | y |
| | 11 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 71 | y |
| | 12 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 73 | y |
| | 13 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 76 | y |
| | 14 | *Dead* | Dead | 73 | y |
| | 15 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 72 | y |
| **Site 19.** | 1 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 110 | y |
| | 2 | *Dead* | Dead | 140 | y |
| | 3 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 84 | |
| | 4 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 82 | |
| | 5 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 80 | |
| | 6 | *Eucalyptus obliqua* | Messmate Stringybark | 72 | |
| | 7 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 165 | y |
| | 8 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 155 | y |
| | 9 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 120 | y |
| | 10 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 75 | |
| **Site 20.** | 1 | *Dead* | Dead | 144 | y |
| | 2 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 110 | y |
| | 3 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 134 | y |
| | 4 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 136 | y |
| | 5 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 142 | y |
| | 6 | *Dead* | Dead | 140 | y |
| | 7 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 140 | y |
| | 8 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 160 | y |
| | 9 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 76 | |
| | 10 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 72 | |
| | 11 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 140 | y |
| | 12 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 91 | y |
| | 13 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 80 | |
| | 14 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 82 | |

  

| Site No | Tree No | Scientific Name | Common Name | DBH (cm) | Large Tree |
|---|---|---|---|---|---|
| | 15 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 170 | y |
| | 16 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 74 | |
| | 17 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 90 | y |
| | 18 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 170 | y |
| **Site 21.** | 1 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 120 | y |
| | 2 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 95 | y |
| | 3 | *Eucalyptus obliqua* | Messmate Stringybark | 105 | y |
| | 4 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 70 | |
| | 5 | *Eucalyptus obliqua* | Messmate Stringybark | 80 | |
| | 6 | *Dead* | Dead | 65 | y |
| | 7 | *Dead* | Dead | 180 | y |
| | 8 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 120 | y |
| | 9 | *Eucalyptus obliqua* | Messmate Stringybark | 70 | |
| | 10 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 100 | y |
| | 11 | *Dead* | Dead | 80 | y |
| | 12 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 95 | y |
| | 13 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 80 | |
| **Site 22.** | 1 | *Eucalyptus obliqua* | Messmate Stringybark | 87 | |
| | 2 | *Eucalyptus obliqua* | Messmate Stringybark | 68 | |
| | 3 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 71 | |
| | 4 | *Eucalyptus obliqua* | Messmate Stringybark | 86 | |
| | 5 | *Eucalyptus obliqua* | Messmate Stringybark | 69 | |
| | 6 | *Eucalyptus dives* | Broad-leaf Peppermint | 62 | |
| | 7 | *Eucalyptus obliqua* | Messmate Stringybark | 123 | y |
| | 8 | *Eucalyptus obliqua* | Messmate Stringybark | 67 | |
| | 9 | *Eucalyptus obliqua* | Messmate Stringybark | 69 | |
| | 10 | *Eucalyptus obliqua* | Messmate Stringybark | 90 | y |
| | 11 | *Eucalyptus obliqua* | Messmate Stringybark | 75 | |
| | 12 | *Eucalyptus obliqua* | Messmate Stringybark | 71 | |
| | 13 | *Eucalyptus obliqua* | Messmate Stringybark | 80 | |
| | 14 | *Dead* | Messmate Stringybark | 62 | y |
| | 15 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 104 | y |
| | 16 | *Dead* | Messmate Stringybark | 84 | y |
| | 17 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 78 | |
| | 18 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 86 | |
| | 19 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 115 | y |
| | 20 | *Eucalyptus obliqua* | Messmate Stringybark | 99 | y |
| | 21 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 102 | y |
| **Site 23.** | 1 | *Eucalyptus sieberi* | Silvertop Ash | 57 | |
| | 2 | *Eucalyptus sieberi* | Silvertop Ash | 70 | y |
| | 3 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 93 | y |
| | 4 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 67 | |

  

| Site No | Tree No | Scientific Name | Common Name | DBH (cm) | Large Tree |
|---|---|---|---|---|---|
| | 5 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 87 | y |
| | 6 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 90 | y |
| | 7 | *Eucalyptus obliqua* | Messmate Stringybark | 159 | y |
| | 8 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 61 | |
| | 9 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 64 | |
| | 10 | *Eucalyptus obliqua* | Messmate Stringybark | 80 | y |
| | 11 | *Eucalyptus obliqua* | Messmate Stringybark | 87 | y |
| | 12 | *Eucalyptus obliqua* | Messmate Stringybark | 97 | y |
| | 13 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 71 | y |
| | 14 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 137 | y |
| | 15 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 61 | |
| | 16 | *Eucalyptus obliqua* | Messmate Stringybark | 106 | y |
| | 17 | *Eucalyptus obliqua* | Messmate Stringybark | 86 | y |
| | 18 | *Dead* | Messmate Stringybark | 65 | y |
| | 19 | *Dead* | Messmate Stringybark | 68 | y |
| | 20 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 67 | |
| | 21 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 64 | |
| | 22 | *Eucalyptus obliqua* | Messmate Stringybark | 61 | |
| **Site 24.** | 1 | *Dead* | Messmate Stringybark | 73 | y |
| | 2 | *Eucalyptus obliqua* | Messmate Stringybark | 99 | y |
| | 3 | *Eucalyptus obliqua* | Messmate Stringybark | 63 | |
| | 4 | *Dead* | Dead | 87 | y |
| | 5 | *Eucalyptus obliqua* | Messmate Stringybark | 86 | y |
| | 6 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 95 | y |
| | 7 | *Dead* | Dead | 71 | y |
| | 8 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 83 | y |
| | 9 | *Dead* | Dead | 82 | y |
| | 10 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 60 | |
| | 11 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 78 | y |
| | 12 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 81 | y |
| | 13 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 61 | |
| | 14 | *Eucalyptus obliqua* | Messmate Stringybark | 98 | y |
| | 15 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 69 | |
| | 16 | *Eucalyptus obliqua* | Messmate Stringybark | 77 | |
| | 17 | *Dead* | Dead | 102 | y |
| | 18 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 83 | |
| | 19 | *Eucalyptus obliqua* | Messmate Stringybark | 100 | y |
| | 20 | *Eucalyptus obliqua* | Messmate Stringybark | 66 | |
| | 21 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 93 | y |
| | 22 | *Dead* | Dead | 101 | y |
| | 23 | *Dead* | Dead | 88 | y |
| | 24 | *Eucalyptus obliqua* | Messmate Stringybark | 79 | y |

  

| Site No | Tree No | Scientific Name | Common Name | DBH (cm) | Large Tree |
|---|---|---|---|---|---|
| | 25 | *Eucalyptus obliqua* | Messmate Stringybark | 77 | y |
| | 26 | *Eucalyptus obliqua* | Messmate Stringybark | 67 | |
| | 27 | *Dead* | Dead | 78 | y |
| | 28 | *Eucalyptus obliqua* | Messmate Stringybark | 112 | y |
| | 29 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 78 | |
| | 30 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 70 | |
| | 31 | *Dead* | Dead | 108 | y |
| | 32 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 72 | y |
| | 33 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 88 | y |
| **Site 25.** | 1 | *Eucalyptus dives* | Broad-leaf Peppermint | 62 | |
| | 2 | *Eucalyptus dives* | Broad-leaf Peppermint | 68 | |
| | 3 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 72 | y |
| | 4 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 90 | y |
| | 5 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 90 | y |
| | 6 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 76 | y |
| | 7 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 94 | y |
| | 8 | *Dead* | Dead | 78 | y |
| | 9 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 60 | |
| | 10 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 74 | y |
| | 11 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 61 | |
| | 12 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 86 | y |
| | 13 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 114 | y |
| | 14 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 67 | |
| | 15 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 84 | |
| | 16 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 76 | y |
| | 17 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 64 | |
| | 18 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 65 | |
| | 19 | *Eucalyptus dives* | Brown Stringybark | 74 | |
| | 20 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 61 | |
| | 21 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 148 | y |
| | 22 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 78 | y |
| | 23 | *Dead* | Dead | 76 | y |
| | 24 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 76 | y |
| | 25 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 76 | y |
| | 26 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 76 | y |
| | 27 | *Eucalyptus dives* | Broad-leaf Peppermint | 60 | |
| | 28 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 76 | y |
| | 29 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 79 | y |
| | 30 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 75 | y |
| **Site 26.** | 1 | *Eucalyptus dives* | Broad-leaf Peppermint | 63 | |
| | 2 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 71 | y |
| | 3 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 63 | |

  

| Site No | Tree No | Scientific Name | Common Name | DBH (cm) | Large Tree |
|---|---|---|---|---|---|
| | 4 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 61 | |
| | 5 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 78 | y |
| | 6 | *Eucalyptus dives* | Broad-leaf Peppermint | 74 | y |
| | 7 | *Eucalyptus sieberi* | Silvertop Ash | 60 | |
| | 8 | *Eucalyptus dives* | Broad-leaf Peppermint | 65 | |
| | 9 | *Eucalyptus dives* | Broad-leaf Peppermint | 61 | |
| | 10 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 68 | |
| | 11 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 60 | |
| | 12 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 60 | |
| | 13 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 65 | |
| | 14 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 65 | |
| | 15 | *Dead* | Dead | 66 | y |
| | 16 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 85 | y |
| | 17 | *Eucalyptus sieberi* | Silvertop Ash | 82 | y |
| | 18 | *Eucalyptus sieberi* | Silvertop Ash | 72 | y |
| | 19 | *Eucalyptus sieberi* | Silvertop Ash | 60 | |
| | 20 | *Eucalyptus sieberi* | Silvertop Ash | 61 | |
| | 21 | *Eucalyptus sieberi* | Silvertop Ash | 60 | |
| | 22 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 103 | y |
| | 23 | *Eucalyptus sieberi* | Silvertop Ash | 96 | y |
| | 24 | *Eucalyptus sieberi* | Silvertop Ash | 85 | y |
| | 25 | *Eucalyptus sieberi* | Silvertop Ash | 81 | y |
| **Site 27.** | 1 | *Dead* | Dead | 112 | y |
| | 2 | *Eucalyptus obliqua* | Messmate Stringybark | 81 | |
| | 3 | *Eucalyptus dives* | Broad-leaf Peppermint | 70 | |
| | 4 | *Dead* | Dead | 80 | y |
| | 5 | *Eucalyptus obliqua* | Messmate Stringybark | 78 | |
| | 6 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 70 | |
| | 7 | *Eucalyptus dives* | Broad-leaf Peppermint | 70 | |
| | 8 | *Dead* | Dead | 76 | y |
| | 9 | *Eucalyptus dives* | Broad-leaf Peppermint | 78 | |
| | 10 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 77 | |
| | 11 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 112 | y |
| | 12 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 81 | |
| | 13 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 100 | y |
| | 14 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 115 | y |
| **Site 30.** | 1 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 66 | |
| | 2 | *Dead* | Dead | 106 | y |
| | 3 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 85 | |
| | 4 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 156 | y |
| | 6 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 111 | y |
| | 7 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 114 | y |

  

| Site No | Tree No | Scientific Name | Common Name | DBH (cm) | Large Tree |
|---|---|---|---|---|---|
| | 8 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 225 | y |
| | 9 | *Dead* | Dead | 110 | y |
| | 9 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 83 | |
| | 10 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 104 | y |
| | 11 | *Eucalyptus obliqua* | Messmate Stringybark | 73 | |
| | 12 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 87 | |
| | 13 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 134 | y |
| **Site 31.** | 1 | *Dead* | Narrow-leaf Peppermint | 81 | y |
| | 2 | *Eucalyptus obliqua* | Messmate Stringybark | 90 | y |
| | 3 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 77 | |
| | 4 | *Eucalyptus obliqua* | Messmate Stringybark | 71 | |
| | 5 | *Eucalyptus dives* | Broad-leaf Peppermint | 72 | |
| | 6 | *Eucalyptus dives* | Broad-leaf Peppermint | 90 | y |
| | 7 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 74 | |
| | 8 | *Dead* | Dead | 95 | y |
| | 9 | *Dead* | Dead | 75 | y |
| | 10 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 147 | y |
| | 11 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 116 | y |
| | 12 | *Dead* | Dead | 98 | y |
| | 13 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 70 | |
| | 14 | *Eucalyptus baxteri s.s.* | Brown Stringybark | 70 | y |
| | 15 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 125 | y |
| **Site 32.** | 1 | *Eucalyptus obliqua* | Messmate Stringybark | 72 | y |
| | 2 | *Dead* | Dead | 104 | y |
| | 3 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 77 | |
| | 4 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 83 | |
| | 5 | *Dead* | Dead | 86 | y |
| | 6 | *Dead* | Dead | 82 | y |
| | 7 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 87 | y |
| | 8 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 98 | y |
| | 9 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 92 | y |
| | 10 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 139 | y |
| | 11 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 113 | y |
| | 12 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 110 | y |
| | 13 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 109 | y |
| | 14 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 115 | y |
| **Site 34.** | 1 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 120 | y |
| | 2 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 112 | y |
| | 3 | *Eucalyptus sieberi* | Silvertop Ash | 106 | y |
| | 4 | *Dead* | Dead | 72 | y |
| | 5 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 72 | y |
| | 6 | *Dead* | Dead | 99 | y |

  

| Site No | Tree No | Scientific Name | Common Name | DBH (cm) | Large Tree |
|---|---|---|---|---|---|
| | 7 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 96 | y |
| | 8 | *Dead* | Dead | 84 | y |
| | 9 | *Dead* | Dead | 99 | y |
| | 10 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 100 | y |
| | 11 | *Dead* | Dead | 70 | y |
| | 12 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 155 | y |
| | 13 | *Eucalyptus sieberi* | Silvertop Ash | 90 | y |
| | 14 | *Eucalyptus sieberi* | Silvertop Ash | 70 | y |
| | 15 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 78 | y |
| | 16 | *Eucalyptus goniocalyx s.l.* | Long-leaf Box | 70 | y |
| | 17 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 71 | y |
| | 18 | *Eucalyptus radiata subsp. radiata* | Narrow-leaf Peppermint | 70 | y |
| | 19 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 78 | y |
| | 20 | *Eucalyptus cypellocarpa* | Mountain Grey-gum | 70 | y |
| **Site 35.** | 1 | *Eucalyptus dives* | Broad-leaf Peppermint | 67 | y |
| | 2 | *Eucalyptus dives* | Broad-leaf Peppermint | 68 | y |
| | 3 | *Eucalyptus dives* | Broad-leaf Peppermint | 85 | y |

  

## Appendix 4 Habitat Scores for each Debris net site

| Debris netsSite No. | | | 1 | | 2 | | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Habitat Zone | | HZ1 | HZ2A and B | HZ1 | HZ2 | HZ1 | HZ1 | HZ1 | HZ2 |
| **Bioregion** | | | **HSF** | **HSF** | **HSF** | **HSF** | **HSF** | **HSF** | **HSF** | **HSF** |
| **EVC #: Name** | | | **Damp Forest 29** | **Shrubby Foothill Forest 45** | **Damp Forest 29** | **Shrubby Foothill Forest 45** | **Shrubby Dry Forest 21** | **Damp Forest 29** | **Shrubby Foothill Forest 45** | **Damp Forest 29** |
| **Bioregional Conservation Status** | | | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** | | **Least Concern** | **Least Concern** | **Least Concern** |
| | | **Max Score** | | | | | | | | |
| Site Condition | Large Old Trees | 10 | 8 | 8 | 8 | 8 | 6 | 4 | 6 | 4 |
| | Canopy Cover | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | Lack of Weeds | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| | Understorey | 25 | 20 | 15 | 15 | 15 | 15 | 20 | 20 | 20 |
| | Recruitment | 10 | 10 | 6 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Organic Litter | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | Logs | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | **Total Site Score** | **75** | **68** | **59** | **63** | **63** | **61** | **64** | **66** | **64** |
| | EVC standardiser | - | | | | | | | | |
| | **Adj. Site Score** | - | 68 | 59 | 63 | 63 | 61 | 64 | 66 | 64 |
| Landscape value | Patch Size | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Neighbourhood | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Distance to Core Area | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| **Habitat Score** | | **100** | **93** | **84** | **88** | **88** | **86** | **89** | **91** | **89** |
| **Habitat Score / 100** | | **1** | **0.93** | **0.84** | **0.88** | **0.88** | **0.86** | **0.89** | **0.91** | **0.89** |

  

| Debris netsSite No. | | | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|
| | | Habitat Zone | HZ1 | HZ1 | HZ1 | HZ1 |
| Bioregion | | | HSF | HSF | HSF | HSF |
| EVC #: Name | | | Damp Forest 29 | Damp Forest 29 | Damp Forest 29 | Damp Forest 29 |
| Bioregional Conservation Status | | | Least Concern | Least Concern | Least Concern | Least Concern |
| | | Max Score | | | | |
| Site Condition | Large Old Trees | 10 | 4 | 8 | 6 | 4 |
| | Canopy Cover | 5 | 5 | 5 | 5 | 5 |
| | Lack of Weeds | 15 | 15 | 15 | 15 | 15 |
| | Understorey | 25 | 20 | 20 | 20 | 20 |
| | Recruitment | 10 | 10 | 10 | 10 | 10 |
| | Organic Litter | 5 | 5 | 5 | 5 | 5 |
| | Logs | 5 | 5 | 5 | 4 | 4 |
| | **Total Site Score** | **75** | **64** | **68** | **65** | **63** |
| | EVC standardiser | - | | | | |
| | **Adj. Site Score** | - | 64 | 68 | 65 | 63 |
| Landscape value | Patch Size | 10 | 10 | 10 | 10 | 10 |
| | Neighbourhood | 10 | 10 | 10 | 10 | 10 |
| | Distance to Core Area | 5 | 5 | 5 | 5 | 5 |
| **Habitat Score** | | **100** | **89** | **93** | **90** | **88** |
| **Habitat Score / 100** | | **1** | **0.89** | **0.93** | **0.9** | **0.88** |
| **Patch Area (ha)** | | | | | | |

  

| Debris netsSite No. | | | 10 | | | 11 | | 12 |
|---|---|---|---|---|---|---|---|---|
| | | Habitat Zone | HZ1A and B | HZ2A and B | HZ3 | HZ1 | HZ2 | HZ1 |
| **Bioregion** | | | **HSF** | **HSF** | **HSF** | **HSF** | **HSF** | **HSF** |
| **EVC #: Name** | | | **Damp Forest 29** | **Heathy Dry Forest 20** | **Damp Forest 29** | **Damp Forest 29** | **Shrubby Foothill Forest 45** | **Shrubby Foothill Forest 45** |
| **Bioregional Conservation Status** | | | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** |
| | | **Max Score** | | | | | | |
| Site Condition | Large Old Trees | 10 | 4 | 4 | 0 | 6 | 6 | 4 |
| | Canopy Cover | 5 | 3 | 3 | 0 | 5 | 5 | 3 |
| | Lack of Weeds | 15 | 15 | 13 | 9 | 15 | 15 | 15 |
| | Understorey | 25 | 20 | 25 | 15 | 20 | 20 | 20 |
| | Recruitment | 10 | 6 | 10 | 1 | 10 | 10 | 10 |
| | Organic Litter | 5 | 5 | 5 | 3 | 5 | 5 | 5 |
| | Logs | 5 | 3 | 4 | 0 | 5 | 5 | 5 |
| | **Total Site Score** | **75** | **56** | **64** | **28** | **66** | **66** | **62** |
| | EVC standardiser | - | | | | | | |
| | **Adj. Site Score** | - | 56 | 64 | 28 | 66 | 66 | 62 |
| Landscape value | Patch Size | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Neighbourhood | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Distance to Core Area | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| **Habitat Score** | | **100** | **81** | **89** | **53** | **91** | **91** | **87** |
| **Habitat Score / 100** | | **1** | **0.81** | **0.89** | **0.53** | **0.91** | **0.91** | **0.87** |
| **Patch Area (ha)** | | | | | | | | |

  

| Debris netsSite No. | | | 13 | 14 | | 15 | 16 | |
|---|---|---|---|---|---|---|---|---|
| | | Habitat Zone | HZ1 | HZ1 | HZ2 | HZ 1 | HZ 1 | HZ2 |
| **Bioregion** | | | **HSF** | **HSF** | **HSF** | **HSF** | **HSF** | **HSF** |
| **EVC #: Name** | | | **Damp Forest 29** | **Heathy Dry Forest 20** | **Damp Forest 29** | **Heathy Dry Forest 20** | **Shrubby Foothill Forest 45** | **Damp Forest 29** |
| **Bioregional Conservation Status** | | | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** |
| | | **Max Score** | | | | | | |
| Site Condition | Large Old Trees | 10 | 4 | 6 | 6 | 6 | 6 | 6 |
| | Canopy Cover | 5 | 3 | 5 | 5 | 5 | 5 | 5 |
| | Lack of Weeds | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| | Understorey | 25 | 20 | 20 | 20 | 25 | 20 | 20 |
| | Recruitment | 10 | 10 | 6 | 10 | 10 | 10 | 5 |
| | Organic Litter | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | Logs | 5 | 5 | 5 | 4 | 5 | 5 | 5 |
| | **Total Site Score** | **75** | **62** | **62** | **65** | **71** | **66** | **61** |
| | EVC standardiser | - | | | | | | |
| | **Adj. Site Score** | - | 62 | 62 | 65 | 71 | 66 | 61 |
| Landscape value | Patch Size | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Neighbourhood | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Distance to Core Area | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| **Habitat Score** | | **100** | **87** | **87** | **90** | **96** | **91** | **86** |
| **Habitat Score / 100** | | **1** | **0.87** | **0.87** | **0.9** | **0.96** | **0.91** | **0.86** |
| **Patch Area (ha)** | | | | | | | | |

  

| Debris netsSite No. | | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|
| | | HZ1 | HZ1 | HZ1 | HZ1 | HZ1 | HZ 1 |
| **Bioregion** | | **HSF** | **HSF** | **HSF** | **HSF** | **HSF** | **HSF** |
| **EVC #: Name** | | **Damp Forest 29** | **Shrubby Foothill Forest 45** | **Damp Forest 29** | **Damp Forest 29** | **Damp Forest 29** | **Damp Forest 29** |
| **Bioregional Conservation Status** | | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** |
| | | | | | | | |
| Site Condition | Large Old Trees | 8 | 8 | 4 | 6 | 4 | 6 |
| | Canopy Cover | 5 | 5 | 3 | 5 | 5 | 5 |
| | Lack of Weeds | 13 | 15 | 15 | 15 | 15 | 15 |
| | Understorey | 20 | 20 | 25 | 25 | 25 | 20 |
| | Recruitment | 10 | 10 | 10 | 10 | 10 | 10 |
| | Organic Litter | 5 | 5 | 5 | 5 | 5 | 5 |
| | Logs | 5 | 5 | 5 | 5 | 5 | 5 |
| | **Total Site Score** | **66** | **68** | **67** | **71** | **69** | **66** |
| | EVC standardiser | | | | | | |
| | **Adj. Site Score** | 66 | 68 | 67 | 71 | 69 | 66 |
| Landscape value | Patch Size | 10 | 10 | 10 | 10 | 10 | 10 |
| | Neighbourhood | 10 | 10 | 5 | 10 | 10 | 10 |
| | Distance to Core Area | 5 | 5 | 5 | 5 | 5 | 5 |
| **Habitat Score** | | **91** | **93** | **87** | **96** | **94** | **91** |
| **Habitat Score / 100** | | **0.91** | **0.93** | **0.87** | **0.96** | **0.94** | **0.91** |
| **Patch Area (ha)** | | | | | | | |

  

| Debris netsSite No. | | | 23 | 24 | | 25 | | 26 | 27 |
|---|---|---|---|---|---|---|---|---|---|
| | Habitat Zone | | HZ 1 | HZ 1 | HZ 2A and B | HZ1 | HZ2A and B | HZ1 | HZ1 |
| **Bioregion** | | | **HSF** | **HSF** | **HSF** | **HSF** | **HSF** | **HSF** | **HSF** |
| **EVC #: Name** | | | **Shrubby Foothill Forest 45** | **Damp Forest 29** | **Shrubby Foothill Forest 45** | **Damp Forest 29** | **Shrubby Foothill Forest 45** | **Shrubby Foothill Forest 45** | **Damp Forest 29** |
| **Bioregional Conservation Status** | | | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** |
| | | **Max Score** | | | | | | | |
| Site Condition | Large Old Trees | 10 | 8 | 4 | 8 | 8 | 10 | 6 | 6 |
| | Canopy Cover | 5 | 5 | 3 | 5 | 3 | 5 | 5 | 5 |
| | Lack of Weeds | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| | Understorey | 25 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| | Recruitment | 10 | 10 | 6 | 10 | 10 | 10 | 10 | 10 |
| | Organic Litter | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | Logs | 5 | 5 | 3 | 5 | 5 | 5 | 5 | 5 |
| | **Total Site Score** | **75** | **68** | **56** | **68** | **66** | **70** | **66** | **66** |
| | EVC standardiser | - | | | | | | | |
| | **Adj. Site Score** | - | 68 | 56 | 68 | 66 | 70 | 66 | 66 |
| Landscape value | Patch Size | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Neighbourhood | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Distance to Core Area | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| **Habitat Score** | | **100** | **93** | **81** | **93** | **91** | **95** | **91** | **91** |
| **Habitat Score / 100** | | **1** | **0.93** | **0.81** | **0.93** | **0.91** | **0.95** | **0.91** | **0.91** |
| **Patch Area (ha)** | | | | | | | | | |

  

| Debris netsSite No. | | | 28 | 30 | 31 | | 32 | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Habitat Zone | HZ1 | HZ1 | HZ1 | HZ2 | HZ1A and B | HZ2A and B | HZ3 |
| **Bioregion** | | | **HSF** | **HSF** | **HSF** | **HSF** | **HSF** | **HSF** | **HSF** |
| **EVC #: Name** | | | **Heathy Dry Forest 20** | **Damp Forest 29** | **Damp Forest 29** | **Shrubby Foothill Forest 45** | **Shrubby Foothill Forest 45** | **Damp Forest 29** | **Damp Forest 29** |
| **Bioregional Conservation Status** | | | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** |
| | | **Max Score** | | | | | | | |
| Site Condition | Large Old Trees | 10 | 0 | 8 | 6 | 8 | 6 | 6 | 0 |
| | Canopy Cover | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 0 |
| | Lack of Weeds | 15 | 15 | 11 | 15 | 15 | 13 | 13 | 6 |
| | Understorey | 25 | 15 | 20 | 20 | 20 | 20 | 20 | 15 |
| | Recruitment | 10 | 6 | 10 | 5 | 10 | 10 | 10 | 3 |
| | Organic Litter | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 0 |
| | Logs | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 0 |
| | **Total Site Score** | **75** | **50** | **64** | **61** | **68** | **63** | **63** | **24** |
| | EVC standardiser | - | | | | | | | |
| | **Adj. Site Score** | - | 50 | 64 | 61 | 68 | 63 | 63 | 24 |
| Landscape value | Patch Size | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Neighbourhood | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | Distance to Core Area | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| **Habitat Score** | | **100** | **75** | **89** | **86** | **93** | **88** | **88** | **49** |
| **Habitat Score / 100** | | **1** | **0.75** | **0.89** | **0.86** | **0.93** | **0.88** | **0.88** | **0.49** |
| **Patch Area (ha)** | | | | | | | | | |

  

| Debris netsSite No. | | | 34 | 35 | 36 | 37 |
|---|---|---|---|---|---|---|
| | | Habitat Zone | HZ1 | HZ1 | HZ1 | HZ1 |
| **Bioregion** | | | **HSF** | **HSF** | **HSF** | **HSF** |
| **EVC #: Name** | | | **Shrubby Foothill Forest 45** | **Heathy Dry Forest 20** | **Shrubby Foothill Forest 45** | **Shrubby Foothill Forest 45** |
| **Bioregional Conservation Status** | | | **Least Concern** | **Least Concern** | **Least Concern** | **Least Concern** |
| | | **Max Score** | | | | |
| Site Condition | Large Old Trees | 10 | 8 | 3 | 3 | 4 |
| | Canopy Cover | 5 | 5 | 5 | 5 | 5 |
| | Lack of Weeds | 15 | 15 | 15 | 15 | 15 |
| | Understorey | 25 | 20 | 20 | 15 | 15 |
| | Recruitment | 10 | 10 | 6 | 10 | 6 |
| | Organic Litter | 5 | 5 | 5 | 5 | 5 |
| | Logs | 5 | 5 | 5 | 4 | 5 |
| | **Total Site Score** | **75** | **68** | **59** | **57** | **55** |
| | EVC standardiser | - | | | | |
| | **Adj. Site Score** | - | 68 | 59 | 57 | 55 |
| Landscape value | Patch Size | 10 | 10 | 10 | 10 | 10 |
| | Neighbourhood | 10 | 10 | 10 | 10 | 10 |
| | Distance to Core Area | 5 | 5 | 5 | 5 | 5 |
| **Habitat Score** | | **100** | **93** | **84** | **82** | **80** |
| **Habitat Score / 100** | | **1** | **0.93** | **0.84** | **0.82** | **0.8** |
| **Patch Area (ha)** | | | | | | |

  

  