November 2021

Biodiversity Assessment
295 Warragul-Lardner Road, Warragul South, Victoria

Prepared for:

W 295 Pty Ltd ATF 295 Unit Trust

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Cover Photograph

A photograph of Hazel Creek within the study area taken during the current assessment.

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Executive Summary

Ecolink Consulting Pty Ltd was engaged by W 295 Pty Ltd ATF 295 Unit Trust, representing the landowner, to undertake a Biodiversity Assessment at 295 Warragul-Lardner Road, Warragul South, Victoria (the study area).

The Biodiversity Assessment is required to determine the ecological values of the study area to support a planning permit for the residential development of the study area, in accordance with its Urban Growth Zone 1 zoning and the Warragul Precinct Structure Plan (PSP).

The study area is located within an agricultural landscape. The study area undulates, but generally slopes towards Hazel Creek, which bisects the northern portion of the property. A tributary to Hazel Creek runs from the south-western corner of the study area, through to the creekline. A dam is located to the west of this tributary. The study area is mostly grazed by cattle, with the study area fenced into various paddocks.

A total of 104 flora species were recorded during the current assessment. This comprised 65 indigenous species, 38 exotic species, and the Victorian native, but non-indigenous, Sweet Pittosporum *Pittopsorum undulatum* (Table A1). The vegetation within the study area generally comprises open pastures, dominated by exotic vegetation, including pasture grasses such as Sweet Vernal-grass *Anthoxanthum odoratum*, White Clover *Trifolium repens*, Perennial Rye-grass *Lolium perenne,* Cocksfoot *Dactylis glomerata*, Brown-top Bent *Agrostis capillaris,* Yorkshire Fog *Holcus lanatus* and Prairie Grass *Bromus catharticus,* as well as environmental weeds such as Common Mouse-ear Chickweed *Cerastium glomeratum*, Flatweed *Hypochaeris radicata* and Capeweed *Arctotheca calendula.*

However, three patches of native vegetation were also present along the waterways. These include:

- Patch 1 includes the Hazel Creek and is representative of Ecological Vegetation Class (EVC) 136: Sedge Wetland. It is generally treeless also some trees such as the Blackwoods *Acacia melanoxylon* and some Strzelecki Gums *Eucalyptus strzeleckii* are located in close proximity. It is dominated by Tall Sedge *Carex appressa*, Broad-leaf Rush *Juncus planifolius,* Green Rush *Juncus gregiflorus,* Water Couch *Paspalum distichum,* Slender Knotweed *Persicaria decipiens* and Narrow-leaf Cumbungi *Typha domingensis*. Exotic species in this location includes Blackberry *Rubus fruticosus* spp. agg., Brown-top Bent and Yorkshire Fog and is therefore best represented by EVC 136: Sedge Wetland. It has a Habitat Hectare Score of 16 (out of 100).
- Patch 2 is located in the southern portion of the study area. It contains a diversity of native vegetation, compared with the EVC Benchmark for EVC 29: Damp Forest. This included an overstorey of Strzelecki Gum and occasional Manna Gum *Eucalyptus viminalis* over a range of shrubs such as Blackwood *Acacia melanoxylon,* Prickly Moses *Acacia verticillata*, Scented Paperbark *Melaleuca squarrosa*, Prickly Currant-bush *Coprosma quadrifida* and Common Cassinia *Cassinia aculeata,* and ferns such as Rough Tree-fern *Cyathea australis,* Hard Water-fern *Blechnum wattsii,* Soft Water-fern *Blechnum minus,* Mother Shield-fern *Polystichum proliferum* and Pouched Coral-fern *Gleichenia dicarpa.* It contains the highest quality vegetation within the study area and has a Habitat Hectare Score of 42 (out of 100);

- Patch 3 is located along the tributary to Hazel Creek in the central portion of the study area. Consistent with the Warragul PSP it is best represented by Swampy Riparian Woodland. It contains an overstorey of Strzelecki Gums but generally contains a high cover abundance of weeds in the understorey. It has a Habitat Hectare Score of 21 (out of 100).

Twenty-one fauna species were recorded within the study area during the current assessment. This included 15 native bird species and two introduced bird species, as well as four frog species. No reptiles were recorded during the assessment, although it is likely that skinks and snakes would utilise the study area on occasion. The trees are likely to provide habitat to arboreal mammals including possums and bats, which were not recorded during the current assessment.

The study area contains a large number of Strzelecki Gum which is listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). It is also listed as Critically Endangered under the *Flora and Fauna Guarantee Act 1988* (Vic). The study area was also found to have moderate to high likelihood of containing habitat for threatened flora and fauna species including:

- Giant Gippsland Earthworm *Megascolides australis* at the dam and alongside waterways;
- Warragul Burrowing Crayfish *Engaeus sternalis* alongside the dam and waterways;
- Growling Grass Frog *Litoria raniformis* at the dam and near the creekline;
- Dwarf Galaxias *Galaxiella pusilla* at the dam and near the creekline; and
- Eastern Great Egret *Ardea alba modesta* at the dam and near the creekline.

Giant Gippsland Earthworm and Warragul Burrowing Crayfish were subsequently recorded within the study area during targeted surveys for the species undertaken by Invert-Eco in October 2021. Targeted surveys for Growling Grass Frog and Dwarf Galaxias are recommended as this species is listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and on the basis that there may be direct or indirect impacts to their habitats. Surveys for Eastern Great Egret are not required because they are listed on the state *Flora and Fauna Guarantee Act 1988* (Vic) only, and impacts to this species are addressed through the *Guidelines for the Removal Destruction or Lopping of Native Vegetation*.

In this context, and based on the relevant legislation and policies, the following recommendations are made:

- Avoid native vegetation, where practicable, by:
    - Appropriate development design;
    - Retaining indigenous trees, inclusive of their Tree Protection Zone (TPZ), wherever safe and practicable;
    - Retaining patches of native vegetation, noting that TPZ can extend beyond the patch boundaries;
    - Prioritising the retention of Large Trees, and highest quality native vegetation, where deemed to have a Fair, Moderate or High arboricultural rating by the arborists' assessment that was prepared for the study area;
    - Retaining habitats, minimising and mitigating impacts to areas of suitable habitat for threatened species where feasible. This includes the habitats for Strzelecki Gum, Giant Gippsland Earthworm, and Warragul Burrowing Crayfish and potential habitats

for Dwarf Galaxias, Growling Grass Frog, and Eastern Great Egret near the creekline. It is expected that these habitat areas will be further defined after further surveys for each of these species;
    - Protecting vegetation, which is to be retained, from construction activities in accordance with a Construction Environment Management Plan. This should include fencing exclusion areas;
    - Incorporating sediment, erosion and pollution control measures in accordance with the EPA Guidelines;
- Obtain a permit to remove native vegetation where it cannot be avoided. An offset will be required for impacts to native vegetation;
- Complete targeted surveys and habitat assessments for Dwarf Galaxias, and Growling Grass Frog.. Where significant impacts to these species, or to Strzelecki Gum, may occur, a referral under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) is recommended;
- Incorporating threatened species habitat requirements (e.g., Dwarf Galaxias, Growling Grass Frog) into the wetland/retardation basin design, consistent with the Warragul PSP;
- Utilise locally indigenous species within the plant palette for future landscaping of the site;
- Prepare a Construction and Environmental Management Plan, as a condition of a future planning permit, that recommends (as a minimum):
    - Animal welfare protocols;
    - Fencing and designation of no-go areas in locations where vegetation or threatened species habitats are to be protected;
    - Only permitting the importation of soils and materials that are certified as weed-free to avoid the introduction of weeds into the study area;
    - Undertaking weed management prior to, during and post-construction. Target noxious weeds including Blackberry *Rubus fruticosus* spp. agg., Bridal Creeper *Asparagus asparagoides*, and Ragwort *Senecio jacobaea*.
    - Maintenance of vehicle hygiene of vehicles entering and leaving the study area to avoid the introduction of weed or weed pathogens into the study area;
    - Sediment, erosion and pollution control measures;
- Prepare a Restoration Plan, as a condition of a future planning permit, to improve the biodiversity values within the Hazel Creek and its tributary, as well as any proposed water treatment areas or water retardation basins.

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Introduction

Ecolink Consulting was commissioned by W 295 Pty Ltd ATF 295 Unit Trust, representing the landholder, to undertake a Biodiversity Assessment at 295 Warragul-Lardner Road, Warragul South, Victoria (the study area, Figure 1). The study area is located within the Warragul Precinct Structure Plan (PSP) area (Metropolitan Planning Authority 2014).

The landowner is proposing the residential subdivision and development of the property, consistent with its zoning as Urban Growth Zone – Schedule 1 (UGZ1), and the Warragul PSP (Metropolitan Planning Authority 2014) .

The Biodiversity Assessment is required to determine the ecological values of the study area. The assessment addresses the requirements of Clause 52.16 of the Warragul PSP by mapping and assessing the location, extent and quality of native vegetation, in accordance with the *Guidelines for the Removal, Destruction or Lopping of Native Vegetation*. The Warragul PSP states that further ecological assessments are required, at the discretion of the responsible authority, where there may be impacts to biodiversity values listed as Biodiversity and Natural Systems Requirements: R29-R35, relating to:

- Giant Gippsland Earthworm *Megascolides australis*;
- Warragul Burrowing Crayfish *Engaeus sternalis*;
- Growling Grass Frog *Litoria raniformis*;
- Dwarf Galaxias *Galaxiella pusilla*;
- Strzelecki Gum *Eucalyptus strzeleckii*;
- Southern Brown Bandicoot *Isoodon obesulus*;
- Native vegetation patches; and/or
- Indigenous trees (Metropolitan Planning Authority 2014).

The Warragul PSP also makes a range of other recommendations (G29-G35) and conditions to approval (C4-C5), which have been considered within this report (Metropolitan Planning Authority 2014).

Methods

Desktop Assessment

In order to determine the ecological values that have previously been recorded within the study area, and its vicinity, the following databases and literature were consulted:

- Planning Schemes Online (Department of Environment Land Water and Planning 2021d) to identify the planning zones and overlays relating to environmental matters e.g. Vegetation Protection Overlays, or Environmental Significance Overlays;
- The NatureKit webpage from the Department of Environment, Land, Water and Planning (DELWP) to identify the historic and current Ecological Vegetation Classes (EVCs) (Department of Environment Land Water and Planning 2021c);
- The Victorian Biodiversity Atlas (Department of Environment Land Water and Planning 2021f) for records of threatened[1] flora and fauna within three kilometres of the study area;
- The Native Vegetation Information Management System (NVIM) to determine biodiversity offset requirements (Department of Environment Land Water and Planning 2021b);
- The 'Weeds of National Significance' database (Department of Agriculture Water and the Environment 2021b);
- The Protected Matters Search Tool from the Department of Agriculture, Water and the Environment (Department of Agriculture Water and the Environment 2021a) to identify Matters of National Environmental Significance that may occur within three kilometres of the study area;
- The Warragul PSP (Metropolitan Planning Authority 2014);
- Giant Gippsland Earthworm and Warragul Burrowing Crayfish Assessment at a proposed residential development –295 Warragul-Lardner Rd, Warragul (Van Praagh 2021); and
- Arboricultural Report (John Patrick Landscape Architects Pty Ltd 2021).

Field Assessment

A site assessment was undertaken on 21 October 2021 by Principal Ecologist, Simon Scott. Simon is suitably qualified and experienced to undertake such assessments and holds a current Vegetation Quality Assessment (Habitat Hectares) Accreditation with DELWP (Department of Environment Land Water and Planning 2021e).

All flora species observed within the study area were recorded, with the exception of planted vegetation that was not considered a 'weed' (i.e. planted vegetation that was not spreading or reproducing). Where a species was not able to be confidently identified in the field, a sample was collected and later identified. Plants were identified to species level wherever possible, however, some plants that were planted, cultivars, hybrids, or plants that did not contain suitable fertile material used for identification were recorded to genus level.

[1] Threatened flora and fauna includes species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the Victorian *Flora and Fauna Guarantee Act 1988*

Vegetation communities such as EVCs and nationally significant vegetation communities were recorded (if observed) and compared with their corresponding benchmarks or thresholds to ensure that they were accurately assigned.

A list of all fauna species observed within, and immediately surrounding, the study area was produced. This list consists of species seen, heard, or identified by other evidence of their presence (e.g. feathers, scats). Leica 12 X 50 binoculars and call mimicry/playback were used to assist in the identification species.

The species, size (Diameter and Breast Height (DBH) and Tree Protection Zone (TPZ)) and location of all 'scattered' indigenous trees was recorded using an iPad mini tablet that has an internal Global Positioning System (GPS) and the GIS Pro application (accuracy +/- 5 metres). The presence of hollows and birds' nests was also noted.

The presence of fauna habitat was noted, particularly in relation to potential habitats for threatened species. The greatest amount of time was spent surveying the highest quality fauna habitats (e.g. trees, water bodies, crevices or under ground debris) during the assessment.

Ecological features such as threatened flora and fauna species, vegetation communities, scattered indigenous trees, fauna habitats, or threatened species habitats were recorded onto an iPad mini tablet that has an internal Global Positioning System (GPS) (accuracy +/- five metres), and the GIS Pro application.

General observations of the Warragul Burrowing Crayfish and Giant Gippsland Earthworm habitat outside of the study area were also noted. This included a determination on suitable habitats based on soils, topography and proximity to Hazel Creek.

Guidelines for the Removal, Destruction or Lopping of Native Vegetation

The *Guidelines for the Removal, Destruction or Lopping of Native Vegetation* (Department of Environment Land Water and Planning 2017) are required to be addressed under Clause 52.17 of the Planning Scheme. The Guidelines require that information regarding the biodiversity values of the site were obtained through:

- Site-based information that was measured or observed at a site, including:
    - Extent of native vegetation patches;
    - Large trees;
    - Native vegetation condition assessed in accordance with the *Vegetation Quality Assessment Manual – Guidelines for Applying the Habitat Hectares Scoring Method* (Department of Sustainability and Environment 2004);
    - Ecological Vegetation Classes (EVC); and
    - Sensitive wetlands and coastal areas.
- Landscape scale information that cannot be measured or observed at the site and includes maps and models procured from DELWP.

The Guidelines require a Habitat Hectare assessment in instances where the impact is to be assessed under the Detailed Assessment Pathway. A Habitat Hectare assessment was undertaken in accordance with the methodology prescribed within the *Vegetation Quality Assessment Manual – Guidelines for Applying the Habitat Hectares Scoring Method* (Department of Sustainability and

Environment 2004) at patches[2] of vegetation. All indigenous vegetation was assessed, and then assigned a quality rating based on the Habitat Hectare score (Department of Sustainability and Environment 2004).

To determine offsets, the location and species of indigenous 'scattered trees'[3], and any 'large trees'[4] within patches were mapped. Details of the location, extent of native vegetation (patches, scattered trees and large trees) that are proposed for removal was provided to DELWP who produced a Native Vegetation Removal report which details the required offsets for impacts to native vegetation patches, Large Trees and scattered trees.

Limitations and Qualifications

The following limitations and qualifications apply to this report:

- The results of the desktop assessment are reliant on data obtained from various databases and other reports. These databases all have internal vetting procedures, however the accuracy of these historical data and some of the results provided within these reports cannot be verified. The desktop assessment does, however, rely on the most accurate data available.
- As with all ecological assessments, a greater survey effort is likely to yield additional flora and fauna records. Where these additional flora and fauna records may alter the recommendations made within this report (e.g. where additional threatened species may utilise habitats within the study area, or where threatened species may be impacted by the proposed development).
- Some flora and fauna species may only be recorded during certain times or seasons (e.g. plants that only contain above-ground biomass and are only visible annually, nocturnal mammals and birds, migratory birds, or fauna identified through seasonal breeding calls such as some frog species). The author has made an informed decision about the likely presence of threatened species that may be present, or that may utilise habitats within the study area, based on a detailed desktop assessment, a review of the species' biology, and an understanding of the ecological values of the local area.

Despite these limitations to the assessment, the results gained by both a desktop and a field-assessment are adequate to address the purposes of this report.

[2] A 'patch' is defined as an area with at least 25% cover abundance of perennial native vegetation, or a group (i.e. three or more) trees forming a continuous canopy.
[3] Scattered trees are defined as a native canopy tree that does not form a patch
[4] Large trees are defined as meeting the size threshold specified in the bioregional EVC Benchmark

Results

Study Area

The property is located in Warragul South, approximately 2.5 kilometres south-west of the town centre. The study area is located within an agricultural landscape. The study area undulates, but generally slopes towards Hazels Creek, which bisects the northern portion of the study area, in an east-west direction. A tributary to Hazel Creek occurs from the south-western corner of the study area and runs through to the creekline. A dam is located to the west of this tributary. The study area is mostly grazed by cattle, with the study area fenced into various paddocks.

Flora

Flora Species

A total of 104 flora species were recorded during the current assessment. This comprised 65 indigenous species, 38 exotic species, and the Victorian native, but non-indigenous, Sweet Pittosporum *Pittopsorum undulatum* (Table A1). Sweet Pittosporum would historically have been limited to gullies and coastal areas of eastern Victoria, but is now naturalised through much of the state (Costermans 1996). It is therefore considered an environmental weed within the study area.

The vegetation within the study area generally comprises open pastures, dominated by exotic vegetation, including pasture grasses such as Sweet Vernal-grass *Anthoxanthum odoratum*, White Clover *Trifolium repens*, Perennial Rye-grass *Lolium perenne,* Cocksfoot *Dactylis glomerata*, Brown-top Bent *Agrostis capillaris,* Yorkshire Fog *Holcus lanatus* and Prairie Grass *Bromus catharticus,* as well as environmental weeds such as Common Mouse-ear Chickweed *Cerastium glomeratum*, Flatweed *Hypochaeris radicata* and Capeweed *Arctotheca calendula* (Plate 1).

Some Blackwoods *Acacia melanoxylon* occur alongside the driveway in the western portion of the study area (Plate 2). Strzelecki Gum *Eucalyptus strzeleckii* occur in the low-lying parts of the study area, including along Hazel Creek and its tributary (Plate 3). Occasional Manna-gum *Eucalyptus pryoriana* also occur further up the tributary, mixed with the Strzelecki Gums.

Hazel Creek generally does not contain trees and shrubs, but includes aquatic and semi-aquatic species such as Tall Sedge *Carex appressa*, Broad-leaf Rush *Juncus planifolius,* Green Rush *Juncus gregiflorus,* Water Couch *Paspalum distichum,* Slender Knotweed *Persicaria decipiens* and Narrow-leaf Cumbungi *Typha domingensis* (Plate 4). Exotic species in this location includes Blackberry *Rubus fruticosus* spp. agg., Brown-top Bent and Yorkshire Fog.

An artificial dam has been created to the west of the drainage line. Tall Spike-sedge *Eleocharis sphacelata* occurs within the dam, which is fringed by Common Spike-sedge *Eleocharis acuta,* Small Loosestrife *Lythrum hyssopifolia,* as well as the above-mentioned exotic species (Plate 5).

A less disturbed remnant patch of native vegetation occurs in the southern-most portion of the study area, along the tributary to Hazel Creek. It contained an overstorey of Strzelecki Gum and occasional Manna Gum. The midstorey included Blackwood *Acacia melanoxylon,* Prickly Moses *Acacia verticillata*, Scented Paperbark *Melaleuca squarrosa*, Prickly Currant-bush *Coprosma quadrifida* and Common Cassinia *Cassinia aculeata* (Plate 6). The understorey included a range of ferns, such as Rough Tree-fern *Cyathea australis,* Hard Water-fern *Blechnum wattsii,* Soft Water-fern

Blechnum minus, Mother Shield-fern *Polystichum proliferum* and Pouched Coral-fern *Gleichenia dicarpa* (Plate 7). It also included Bracken *Pteridium esculentum,* Forest Wire-grass *Tetrarrhena juncea* and herbs and climbers, including Mountain Clematis *Clematis aristata* and Wonga Vine *Pandorea pandorana*. The cover abundance of weeds was generally low at this location.

Flora Habitat/Vegetation Communities

The vegetation within the study area was required to be assessed and classified against the policy and legislation stipulated by three tiers of government:

- *Local* – Where various overlays and policies may apply pursuant to the Baw Baw Shire Council Planning Scheme (Department of Environment Land Water and Planning 2021d);
- *State* – Which includes DELWP's EVC mapping of vegetation communities (Department of Environment Land Water and Planning 2021b) and consideration under the *Guidelines for the Removal, Destruction or Lopping of Native Vegetation* (Department of Environment Land Water and Planning 2017); and,
- *Commonwealth* – where vegetation may meet 'thresholds' to be classified as a federally listed community under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Local

The study area is zoned Urban Growth Zone – Schedule 1 (UGZ1) (Department of Environment Land Water and Planning 2021d). The UGZ1 gives rise to the Warragul PSP. No overlays pertinent to this report (such as Environmental Significance Overlays or Vegetation Protection Overlays) cover the study area. It appears that the Environmental Significance Overlay – Schedule 4 (which previously included the Hazel Creek area) has been removed with the expansion of the town boundary.

The Warragul PSP maps a patch of native vegetation to the east of the drainage line, which is proposed to be retained: VR-SW-03. It also models potential Giant Gippsland Earthworm across the majority of the study area, including the Hazel Creek area and the drainage line area (Metropolitan Planning Authority 2014).

State

The study area is located within the Strzelecki Ranges bioregion. As stated, the Warragul PSP identifies one patch of native vegetation within the study area. The patch associated with the creekline is labelled VR-SW-03 within the Warragul PSP, which is described as a *'remnant patch of Swampy Riparian Woodland (EVC 83) adjacent to waterway in Spring Creek'* (Metropolitan Planning Authority 2014).

However, the site assessment confirmed that three patches of native vegetation and five scattered trees were present within the study area.

DELWP modelling of the vegetation within the study area suggests that the Hazel Creek area and some of its tributary is a complex of EVCs such as EVC 53: Swamp Scrub, EVC 191: Riparian Scrub or EVC 937: Swampy Woodland. Elsewhere, at higher elevations, the study area is EVC 29: Damp Forest (Department of Environment Land Water and Planning 2021c).

The current assessment accepts the vegetation classification of EVC 83: Swampy Riparian Woodland near the central portion of the study area, consistent with the mapping provided within the Warragul PSP (Metropolitan Planning Authority 2014). Patch 3 is EVC 83: Swampy Riparian Woodland which is described as a '*woodland to 15 metres tall generally occupying low energy streams of the foothills and plains. The lower strata are variously locally dominated by a range of large and medium shrub species on the stream levees in combination with large tussock grasses and sedges in the ground layer'* (Department of Environment Land Water and Planning 2021a).

The ferns observed, and the general absence of tussock grasses within Patch 2, suggest the presence of EVC 29: Damp Forest, not EVC 83: Swampy Riparian Woodland. DELWP describe EVC 29: Damp Forest as occurring '*on a wide range of geologies on well-developed generally colluvial soils on a variety of aspects, from sea level to montane elevations. [It is] dominated by a tall eucalypt tree layer to 30 m tall over a medium to tall dense shrub layer of broadleaved species typical of wet forest mixed with elements from dry forest types. The ground layer includes herbs and grasses as well as a variety of moisture-dependent ferns'* (Department of Environment Land Water and Planning 2021a).

The patch at Hazel Creek, Patch 1, was generally treeless and dominated by Rushes *Juncus* sp. Whilst it is likely that EVC 29: Damp Forest, or another EVC such as EVC 83: Swampy Riparian Woodland or EVC 53: Swamp Scrub, dominated the creek prior to European disturbances, the treeless areas are no longer representative of this EVC. The native vegetation patches near the dam and at the creekline are more representative of wetland EVCs due to the altered hydrology, favouring aquatic flora species. Under the Habitat Hectare assessment methodology, the assessor must use and EVC Benchmark which most closely resembles the vegetation observed (Department of Sustainability and Environment 2004). For this reason, we have assigned EVC 136: Sedge Wetland to Patch 1 which includes Hazel Creek area, some of the drainage line and the dam located in the southern-most portion of the study area. Neither of these EVCs are listed as present within the Strzelecki Ranges bioregion, and we have therefore used the EVC Benchmarks for the nearby Gippsland Plain bioregion when undertaking the Habitat Hectare assessment of Patch 1.

Commonwealth

The modelling used by the Protected Matters Search Tool (PMST) suggests that Natural Damp Grassland of the Victorian Coastal Plains, listed as Critically Endangered under the EPBC Act, is likely to occur within three kilometres of the study area (Department of Agriculture Water and the Environment 2021a). However, the vegetation within the study area did not meet the description of, or the condition thresholds to meet, this community. It is concluded that this nationally significant ecological communities do not occur within the study area.

The PMST also identifies two Wetlands of International Importance (Ramsar wetlands) within the same catchment as the study area. The study area is located approximately 150 km upstream of the Gippsland Lakes and 40 km upstream of the Western Port Wetlands of International Importance. However, it is unlikely that any of these wetlands will be significantly impacted by the proposed residential development.

Vegetation Quality Assessment

The study area contains three patches of native vegetation. These patches differed in their quality (Table 1, Figure 1):

- Patch 1 includes the Hazel Creek. It is generally treeless also some trees such as the Backwoods and some Strzelecki Gums are located in close proximity. It is dominated by Rushes and is therefore best represented by EVC 136: Sedge Wetland. It has a Habitat Hectare Score of 16 (out of 100);
- Patch 2 is located in the southern portion of the study area. It contains a high diversity of native vegetation within the study area compared with the EVC Benchmark for EVC 29: Damp Forest. It contains the highest quality vegetation within the study area and has a Habitat Hectare Score of 42 (out of 100);
- Patch 3 is located along the tributary to Hazel Creek in the central portion of the study area. Consistent with the Warragul PSP is best represented by Swampy Riparian Woodland. It contains an overstorey of Strzelecki Gums, but generally contains a high cover abundance of weeds in the understorey. It has a Habitat Hectare Score of 21 (out of 100).

Table 1. Habitat Hectare assessment results

Patch			1	2	3
Bioregion			Strzelecki Ranges*	Strzelecki Ranges	Strzelecki Ranges
EVC name			Sedge Wetland	Damp Forest	Swampy Riparian Woodland
EVC number			136	29	83
Conservation rating within bioregion			Vulnerable	Endangered	Endangered
Assessment Criteria		**Max. Score**	**Patch Score**	**Patch Score**	**Patch Score**
Site Condition	a. Large old trees	10	N/A	3	3
	b. Canopy cover	5	N/A	4	2
	c. Understorey	25	5	15	5
	d. Lack of weeds	15	0	7	0
	e. Recruitment	10	3	3	1
	f. Organic litter	5	2	5	5
	g. Logs	5	N/A	2	2
	h. Total (sum of a-g)	**75**	**10**	**39**	**18**
	i. Standardised score		**14**	**N/A**	**N/A**
Landscape Value	j. Patch size	10	1	2	2
	k. Neighbourhood	10	1	1	1
	l. Distance to core	5	0	0	0
m. Habitat Score (sum of h-l)		**100**	**16**	**42**	**21**
n. Habitat score out of 1 (m÷100)		1	0.16	0.42	0.21
Large Trees**			**2**	**13**	**11**

Table Notes:

* EVC Benchmarks from Gippsland Plan bioregion were used, as these EVC Benchmarks are not provided for the Strzelecki Ranges bioregion

**Large Tree DBH is 90cm DBH based on the EVC 29: Damp Forest EVC Benchmark.

Scattered Trees

Six scattered indigenous trees were recorded within the study area or who's tree protection zones extended into the study area (Table 2). This included two previously recorded by the arborist (Trees 1 and 56), as well as four which were not recorded by the arborist as they fell outside of the assessment area for that study (Trees I, J, K, L).

Table 2. Species, Size and Location of Scattered Trees

Tree No.	Species	DBH	TPZ	Latitude	Longitude
1	Blackwood	49	5.88	145.9037	-38.1759
56	Strzelecki Gum	240	15	145.9067	-38.1801
I	Blackwood	76	9.12	145.9036	-38.1764
J	Blackwood	53	6.36	145.9036	-38.1763
K	Strzelecki Gum	211	15	145.9053	-38.1769
L	Strzelecki Gum	163	15	145.9041	-38.1782

Table Note:

- Trees 1 and 56 are assigned tree numbers assigned by the arborist. Trees I, J, K and L were beyond the assessment area of the arborist (John Patrick Landscape Architects Pty Ltd 2021), but within the study area for the current assessment.
- Tree 56 was outside the study area, but its tree protection zone extended into the study area.
- Blackwoods are not scattered trees within EVC 29: Damp Forest or EVC 83: Swampy Riparian Woodland but have been assigned as scattered trees as they occur near the treeless EVC 136: Sedge Wetland.

Threatened Flora Species

Nine threatened flora species have previously been recorded within three kilometres of the study area (Department of Environment Land Water and Planning 2021f). An additional six threatened flora species are predicted to occur within the study area based on the Protected Matters Search Tool (Department of Agriculture Water and the Environment 2021a).

A consolidated list of these threatened flora species, as well as their conservation status under the EPBC Act and the *Flora and Fauna Guarantee Act 1988* (Vic) (FFG Act), their preferred habitats and the likelihood of occurrence is provided in Table A3.

Strzelecki Gum has been widely recorded throughout the local area. Strzelecki Gum is listed as Vulnerable under the EPBC Act. It is also listed as Critically Endangered under the FFG Act. Strzelecki Gum is a large tree to 40 metres in height with mottled reddish-brown, smooth bark and 20 centimetre long ovate to lanceolate leaves. Strzelecki Gum flowers in spring with an inflorescence of usually seven, ovoid buds, approximately eight millimetres long, which produce obconical fruits to six millimetres long, and lacking a stalk. The species occurs on ridges, slopes and streambanks with deep fertile soils and is largely restricted to the western section of the Strzelecki Range, from Neerim South in the north, south to Foster, and with a few isolated records from the Otway ranges (Walsh and Entwistle 1996). Strzelecki Gum was recorded within patches of native vegetation and as scattered trees alongside waterways during the current assessment.

Other species listed in Table A3 are considered unlikely to occur within the study area on the basis that their habitat requirements are not met, or due to the high level of modification of habitats (Table A3).

Fauna

Fauna Species

Twenty-one fauna species were recorded within the study area during the current assessment. This included 15 native bird species and two introduced bird species, as well as four frog species. No reptiles were recorded during the assessment, although it is likely that skinks and snakes would utilise the study area on occasion. The trees are likely to provide habitat to arboreal mammals including possums and bats which were not recorded during the current assessment. Further discussion of fauna species encountered is included below.

Fauna Habitats

The habitats for native wildlife are generally modified. The study area contains open exotic grasslands, with occasional indigenous scattered trees throughout the paddock. Open exotic grasslands provide limited fauna habitat but are expected to provide foraging habitat for a range of birds. Australia Magpie *Cracticus tibicen* and Magpie-lark *Grallina cyanoleuca* were recorded in these areas. Ground-dwelling fauna may move across the paddocks when moving to higher quality habitats.

The dam, drainage line and creek lines provided aquatic habitats. Waterfowl such as Grey Teal *Anas gracilis* and Purple Swamphen *Porphyrio porphyrio* were recorded in areas of open water and nearby fringing vegetation. Four frog species, including Common Froglet *Crinia signifera,* Southern Brown Tree Frog *Litoria ewingii,* Spotted Marsh Frog *Limnodynastes tasmaniensis* and Pobblebonk *Limnodynastes dumerilii,* were recorded in this location. Potential habitats for Growling Grass Frog, Giant Gippsland Earthworm and Warragul Burrowing Crayfish were also recorded in these locations (see below).

Mature trees were generally also located along the waterways. Trees provide roosting and nesting opportunities for birds and bats, with many of the trees providing tree hollows. Eastern Rosella *Platycercus eximius* and Galah *Eolophus roseicapilla* were nesting in hollow-bearing trees during the current assessment. Mammals such as Common Ringtail Possums *Pseudocheirus peregrinus* also likely to forage in the canopy of these trees, whilst micro-bats may use the fissures and flaking bark as diurnal roosting locations on occasion.

Small bird species were recorded where the trees were densest, and where the understorey vegetation was present in the southern portion of the study area. These areas provided foraging, shelter and possibly nesting opportunities for Grey Fantail *Rhipidura albiscapa,* Grey Shrike-thrush *Colluricincla harmonica,* Brown Thornbill *Acanthiza pusilla,* Yellow-rumped Thornbill *Acanthiza chrysorrhoa* and Superb Fairywren *Malurus cyaneus.*

Threatened Fauna Species and Communities

Seven threatened fauna species have previously been recorded within three kilometres of the study area (Department of Environment Land Water and Planning 2021f) (Figure 2). A further 16 threatened fauna species are predicted to occur within the study area, based on the PMST

(Department of Agriculture Water and the Environment 2021a). A consolidated list of these threatened fauna species, as well as their conservation status under the EPBC Act and the FFG Act, their preferred habitats and the likelihood of occurrence is provided in Table A4.

No threatened fauna species were recorded during the current assessment. Many of the threatened species identified in the desktop assessment are unlikely to occur as their habitat requirements are not met within the study area, or due to the high level of modification of habitats (Table A4).

However, four nationally significant species have a moderate or high likelihood of occurrence within the study area: Growling Grass Frog, Dwarf Galaxias, Giant Gippsland Earthworm and Warragul Burrowing Crayfish.

Growling Grass Frog is listed a Vulnerable on the EPBC Act and it is also listed as Vulnerable on the FFG Act. Growling Grass Frog has not historically been recorded within the vicinity of the study area in the Victorian Biodiversity Atlas (Department of Environment Land Water and Planning 2021f). However, it was one of the species identified as having the potential to occur within the Warragul PSP (Metropolitan Planning Authority 2014) and it is identified as 'species or species habitat likely to occur within area' within the PMST (Department of Agriculture Water and the Environment 2021a). The habitat provided by the dam and creekline is of moderate quality for the frog due to its relatively large size and areas of open water. It also has emergent sedges and rushes, as well as submerged vegetation. Whilst we understand that although direct impacts to the creekline and dam are not proposed, indirect impacts associated with drainage and stormwater may be required. We therefore recommend that targeted surveys for this species are undertaken to confirm presence or absence and to refine that habitat mapping for this species, and to recommend appropriate mitigation measures.

The Giant Gippsland Earthworm is listed as Vulnerable on the EPBC Act and it is listed as Endangered the FFG Act. It is most commonly found in association with creeks and drainage lines, usually above areas prone to flooding (Van Praagh 2007). In more elevated areas, they tend to associate with underground springs and soaks, in gullies or south-facing slopes with terracettes (Van Praagh 2007). They are generally found in cleared areas supporting pasture grasses that are adjacent to native vegetation (Department of the Environment and Energy 2017). In the western Strzelecki Ranges the Giant Gippsland Earthworm is generally found in the deep blue-grey clay-like soils over cretaceous rocks (Department of the Environment and Energy 2017) or red clayey soils (Van Praagh 1992). It has previously been recorded to the east of the study area, associated with the same creekline which occurs within the study area. Habitats for these species are mapped throughout the majority of the property within the Warragul PSP (Metropolitan Planning Authority 2014). Surveys were subsequently undertaken for the species by Invert-Eco in October 2021 (Van Praagh 2021). Giant Gippsland Earthworm habitat was recorded along a 360 metre stretch of the north-south drainage line that runs through the middle of the study area (Van Praagh 2021).

The Warragul Burrowing Crayfish is listed as Critically Endangered on the FFG Act. The distribution of this species is largely limited to creeks and tributaries near Drouin and Warragul. A population of this species is known to occur further downstream of the study area, along the same creekline that runs through the study area, and we consider that it has a high likelihood of occurrence within the creekline within the study area. Whilst we understand that direct impacts to the creekline are not proposed, indirect impacts associated with drainage and stormwater may be required. Surveys were

subsequently undertaken for the species by Invert-Eco in October 2021 (Van Praagh 2021). Warragul Burrowing Crayfish habitat was recorded in the north and south of the study area, along the drainage lines (Van Praagh 2021).

Dwarf Galaxias are listed as Vulnerable under the EPBC Act and Endangered under the FFG Act. Dwarf Galaxias are a small freshwater fish endemic to south-eastern Australia that occur only in Victoria, South Australia and Tasmania. The Dwarf Galaxias most commonly occurs in slow flowing and still, shallow, permanent and temporary, freshwater habitats such as swamps, drains and the backwaters of streams and creeks, often (but not always) containing dense aquatic macrophytes and emergent plants (Saddlier *et. al.* 2010). Whilst we understand that direct impacts to the creekline are not proposed, indirect impacts associated with drainage and stormwater may be required. We therefore recommend that targeted surveys are undertaken to confirm presence or absence and to refine that habitat mapping for this species, and to recommend appropriate mitigation measures (consistent with the requirements of the Warragul PSP).

In addition, we also expect that waterbirds such Eastern Great Egret *Ardea alba modesta* may opportunistically forage at the dam. This species is listed as Vulnerable on the FFG Act, however, the study area is unlikely to provide important habitat (e.g. breeding habitat) to a resident population of the species. There is no statutory obligation for further surveys for these species, and additional surveys are not recommended.

Discussion

A detailed summary of the legislation that was considered when preparing this report is provided in Appendix 2. The discussion presented in this section of the report does not reiterate information provided in Appendix 2, but summarises the results and recommendations arising from the interpretation of this legislation.

Environment Protection and Biodiversity Conservation Act 1999 (Cth)

The desktop assessment identified seven flora and 18 fauna species, as well as one threatened ecological community, listed under the EPBC Act, which may occur within the study area. Three threatened species, have now been confirmed as being present within the study area:

- Strzelecki Gum along Lardner Road and near the creekline;
- Giant Gippsland Earthworm at, and near, the creekline in the middle of the study area; and,
- Warragul Burrowing Crayfish at, and near, the creeklines in the north and south of the study area.

There is also a moderate or high likelihood that two additional EPBC Act-listed species may persist within the study area:

- Growling Grass Frog at the dam; and,
- Dwarf Galaxias.

We recommend that impacts to potential habitats for the species known to occur within the study area be avoided and minimised wherever practicable. Impact mitigation considerations are presented within the Invert-Eco assessment report, and should be implemented as far as practicable (Van Praagh 2021).

Targeted surveys for the two additional EPBC Act species (Dwarf Galaxias and Growling Grass Frog) are also recommended, due to impacts (direct or indirect) to potential habitat for these species. The findings of these surveys will inform more detailed avoidance and mitigation recommendations for the subsequent development plan, to ensure regulatory approval for the development. Where there is a significant residual impact to these species, based on the Significant Impact Guidelines (Department of the Environment 2013), an EPBC Act referral will be required. DAWE will then determine if the impact is a controlled action. Pending the results of these additional assessments, it is likely that a referral will be recommended if impacts to the areas identified by Invert-Eco will be impacted for drainage works or other infrastructure or development purposes.

Although modelling used by the Protected Matters Search Tool (PMST) suggests that Natural Damp Grassland of the Victorian Coastal Plains, listed as Critically Endangered, threatened ecological community is likely to occur near the study area, the site assessment confirmed that it does not occur.

Flora and Fauna Guarantee Act 1988 (Vic)

The desktop assessment identified none flora species and 23 fauna species listed under the FFG Act that may occur within the study area (Tables A3 and A4). There is the potential for FFG Act-listed species to occur within the study area including Growling Grass Frog, Dwarf Galaxias, and Eastern

Great Egret. However, the study area is not listed as critical habitat for any of these species and there is no requirement for additional surveys for any of these species under this Act (notwithstanding that some species surveys are recommended pursuant to the EPBC Act, as described above). Strzelecki Gum, Giant Gippsland Earthworm, and Warragul Burrowing Crayfish are also listed on the FFG Act and impacts to habitats for these species are discussed above.

The FFG Act also lists species as 'protected flora' on public land. Protected flora includes whole families or genera, (as well as species), such as daisies, heaths, orchids, and most Acacias. These species and genera are not necessarily regarded as threatened, but require an approved 'protected flora licence or permit' from DELWP prior to their removal when located on public land.

A portion of the study area is located within public land, in this case the Warragul-Lardner Road road reserve. This road reserve will be impacted by future development and a *Permit to Take Protected Flora* will be required for impacts to protected flora species in this location.

Planning and Environment Act 1987 (Vic)

The proposed residential development would require planning permit approval from the Baw Baw Shire Council prior to the removal, destruction or lopping of native vegetation (Department of Environment Land Water and Planning 2021d). The applicant is required to follow the Warragul PSP (discussed below).

Catchment and Land Protection Act 1994 (Vic)

Primary considerations of the *Catchment and Land Protection Act 1994* (Vic) relate to soil and water conservation, as well as the management of pest plants and animals. The study area contains three weed species that are listed as 'noxious' within the Port Phillip and Westernport Catchment Management Area: Blackberry *Rubus fruticosus* spp. agg., Bridal Creeper *Asparagus asparagoides*, and Ragwort *Senecio jacobaea* are all listed as 'Regionally Controlled'. The proponent is required to 'control the spread' of all 'Regionally Controlled' species from their property (Port Phillip and Westernport Catchment Management Authority 2011).

In addition, Blackberry and Bridal Creeper are also listed as Weeds of National Significance (Department of Agriculture Water and the Environment 2021b), although there are no additional legislative obligations to manage weeds under this listing.

The proposed development should aim to remove these plants when construction commences, and ensure they are removed during the future landscaping and maintenance of the study area. It is expected that weed management would form part of a Construction Environment Management Plan(or equivalent), which is likely to be required as a condition of a future planning permit. As a minimum, this should include:

- Maintenance of vehicle hygiene and vehicle wash-down areas;
- Using clean fill (if required);
- Managing noxious weeds that may establish post-construction through appropriate management techniques;
- Avoiding the use of noxious species during any landscaping of the property; and

- Implementing sediment, erosion and pollution control measures prior to and during construction (EPA Victoria 1991; EPA Victoria 1996).

It is also recommended that locally indigenous species be considered within the plant palette for future landscaping of the site, as appropriate.

Wildlife Act 1975 (Vic)

It is likely that some locally common species of fauna will be displaced by the proposed development. Furthermore, there remains a low likelihood that animals may be accidentally injured when disturbing soil and removing vegetation. All native vertebrate wildlife is protected under the *Wildlife Act 1975* (Vic), and therefore contractors must use due care when removing vegetation and fill from the study area. It is recommended that a zoologist or wildlife handler salvage any wildlife from trees prior to their removal. It is also recommended that fauna management protocols be included in the Construction Environment Management Plan recommended above.

Guidelines for the Removal, Destruction or Lopping of Native Vegetation

The Three-step Approach

Applicants who wish to remove native vegetation, within the UGZ1, need not address the Guidelines for the Removal, Destruction of Lopping of Native Vegetation which are referenced in Clause 52.17 of the planning scheme. Rather, the applicant is required to address the requirements of the Warragul PSP, in accordance with Clause 52.16 of the planning scheme

Warragul Precinct Structure Plan

The Warragul PSP generally identifies the study area for residential development and nominated a connector road into the study area, effectively advocating the loss of some native vegetation.

However, R29-R35 of the Warragul PSP states the following requirements relating to biodiversity:

- *'Development applications for land covered by Giant Gippsland Earthworm (GGE) Environmental Significance Overlay 4 (ESO4) must be accompanied by an assessment of the potential impact on GGE habitat, following the requirements of Schedule 4 to the ESO. For land where GGE is either confirmed or assumed to be present, applications must indicate how negative impact on GGE habitat has been avoided, minimised or offset. The GGE Reference Document to the ESO4 can be used to assist applications in assessing impact and for identifying measures to mitigate negative impact on GGE habitat.*
- *Development applications for land covered by natural waterways, drainage lines or seepages must be accompanied by an assessment of the potential impact of the development on the habitat of Warragul Burrowing Crayfish (WBC). For land where WBC is either confirmed or assumed to be present, applications must indicate how negative impact on WBC habitat has been avoided, minimised or offset.*
- *Development applications which include the upgrading, modification or construction of wetland and/or retardation basins must be accompanied by a plan that examines the feasibility of incorporating threatened species habitat requirements (e.g., Dwarf Galaxias, Growling Grass Frog) into the wetland/retardation basin design. Habitat construction guidelines for threatened species can be obtained from the responsible authority.*

- *Any public infrastructure to be located adjacent to retained biodiversity assets must be designed and located in a manner so as to avoid or minimise current and future negative impacts.*
- *To evaluate the success of approved building or works within or adjacent to biodiversity assets, threatened species monitoring/management must be undertaken at specific locations, at the discretion of the responsible authority.*
- *When relevant, developers must take into consideration Significant Impact Guidelines and mitigation measures for nationally threatened species listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (Strzelecki Gum, Giant Gippsland Earthworm, Growling Grass Frog, Dwarf Galaxias).*
- *Development adjacent to retained native vegetation or species habitat must be located and designed in a manner so as to avoid or minimise negative impacts. Permanent buffers must be established around all retained native vegetation, including buffers to ensure the protection of trees (Tree Protection Zone) and those to protect residents and assets from potential tree failure (Tree Safety Buffer). Tree Protection Zones must follow the Australian Standard for the protection of trees on development sites (AS 49702009), unless otherwise agreed by the responsible authority. Adequate Tree Safety Buffer distances can be obtained from the responsible authority.'*

Nevertheless, we provide the following recommendations and Avoidance and Minimisation Statement to assist with the finalisation of the development design and to address the principles of the *Guidelines for the Removal, Destruction or Lopping of Native Vegetation* (Department of Environment Land Water and Planning 2017).

Avoidance and Minimisation Statement

As stated above, the applicant is required to consider the three-step approach specified under the Guidelines, including to iteratively avoid, minimise and offset the loss of native vegetation. These objectives are consistent with the UGZ1, and the Warragul PSP, which aims to retain biodiversity values within the PSP where practicable. It is therefore recommended that:

- Development design is considerate of the native vegetation and that roads, building envelopes and infrastructure be sited away from native vegetation;
- Indigenous trees, inclusive of their Tree Protection Zone, be avoided wherever safe and practicable as recommended by the arborist report (John Patrick Landscape Architects Pty Ltd 2021), with priority given to the retention of the nationally significant Strzelecki Gums;
- When considering the removal of native vegetation, priority is given to:
    - The retention of Large Trees, Strzelecki Gums, where deemed to have a Fair, Moderate or High arboricultural rating by the arborists (John Patrick Landscape Architects Pty Ltd 2021);
    - The retention of vegetation along waterways, which is unlikely to be developed in any case; and
    - Vegetation which as well as the highest quality native vegetation;
- Retained trees include protection of the Tree Protection Zone identified within the arborist's report (John Patrick Landscape Architects Pty Ltd 2021), which is consistent with the *Australian Standards for the Protection of Trees on Development Sites* (Standards Australia 2009);

- Habitats for threatened species are retained, impacts minimised and mitigated. This includes Strzelecki Gum, Giant Gippsland Earthworm and Warragul Burrowing Crayfish near the creekline and potential habitats for Dwarf Galaxias, and Growling Grass Frog. Impact minimisation measures for Giant Gippsland Earthworm and Warragul Burrowing Crayfish are provided in Section 6 of the report prepared for these species and should be incorporated in the development design (Van Praagh 2021). It is expected that these habitat areas and mitigation measures will be further refined and defined following targeted surveys for Growling Grass Frog and Dwarf Galaxias;
- Vegetation which is to be retained is protected from construction activities, in accordance with a Construction Environment Management Plan. This should include fencing exclusion areas;
- Sediment, erosion and pollution control measures, in accordance with the EPA Guidelines (EPA Victoria 1991; EPA Victoria 1996), are incorporated in the Construction Environment Management Plan;
- Areas of retained native vegetation and flora and fauna habitats, along the creekline, are improved in accordance within Restoration Plan (or equivalent); and
- Offsets are provided for all vegetation deemed lost, including all vegetation retained on lots smaller than 4000 m^2.

Offsets

It is expected that we will determine offsets once the development plan has been finalised (based on the above recommendations), and the retention status of native vegetation is known.

References

Costermans L (1996). 'Native Trees and Shrubs of South-eastern Australia.' (Lansdowne: Sydney).

Department of Agriculture Water and the Environment (2021a). The Protected Matters Search Tool. Available at http://www.environment.gov.au/arcgis-framework/apps/pmst/pmst.jsf. Accessed 10 January 2021. Department of Agriculture, Water and the Environment, Canberra.

Department of Agriculture Water and the Environment (2021b). Weeds of National Significance. Available at http://www.weeds.org.au/WoNS/. Accessed 10 January 2021. Department of the Environment, Canberra.

Department of Environment and Primary Industries (2013). 'Permitted Clearing of Native Vegetation; Biodiversity Assessment Guidelines.' (Department of Environment and Primary Industries: Melbourne).

Department of Environment Land Water and Planning (2017). 'Guidelines for the Removal, Destruction or Lopping of Native Vegetation.' (Department of Environment Land Water and Planning: Melbourne).

Department of Environment Land Water and Planning (2021a). EVC Benchmarks. Available at www.depi.vic.gov.au Accessed 10 January 2021. Department of Environment Land Water and Planning, Melbourne.

Department of Environment Land Water and Planning (2021b). Native Vegetation Information Management System. Available at www.nvim.depi.vic.gov.au. Accessed 10 January 2021. Department of Environment Land Water and Planning, Melbourne.

Department of Environment Land Water and Planning (2021c). NatureKit. Available at http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit. Accessed 10 January 2021. Department of Environment Land Water and Planning, Melbourne.

Department of Environment Land Water and Planning (2021d). Planning Schemes Online. Available at http://services.land.vic.gov.au/maps/pmo.jsp. Accessed 10 January 2021. Department of Environment Land Water and Planning, Victoria.

Department of Environment Land Water and Planning (2021e). Vegetation Quality Assessment list of accredited assessors. Available at https://www.environment.vic.gov.au/__data/assets/pdf_file/0026/51785/DELWP-VQA-AccreditedAssessorList8July2019.wbk.pdf. Accessed 10 January 2021. Department of Environment, Land, Water and Planning, Melbourne.

Department of Environment Land Water and Planning (2021f). Victorian Biodiversity Atlas. Available at https://vba.dse.vic.gov.au/vba/index.jsp. Accessed 10 January 2021. Department of Environment Land Water and Planning, Melbourne.

Department of Sustainability and Environment (2004). 'Habitat Hectares Native Vegetation: Sustaining a Living Landscape. Vegetation Quality Assessment Manual – Guidelines for Applying the Habitat Hectares Scoring Method. Version 1.3.' (Department of Sustainability and Environment: Melbourne).

Department of Sustainability and Environment (2007). 'Ministerial Guidelines for the environmental assessment of environmental effects under the Environmental Effects Act 1978 ' Department of Sustainability and Environment, Melbourne.

Department of the Environment (2013). 'Matters of National Environmental Significance; Significant Impact Guidelines 1.1, Environment Protection and Biodiversity Conservation Act 1999.' Department of the Environment, Canberra.

Department of the Environment and Energy (2017). *Megascolides australis* — Giant Gippsland Earthworm in Species Profile and Threats Database. Available at http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=64420. Accessed 19 June 2017. Department of the Environment and Energy, Canberra.

EPA Victoria (1991). 'Construction Techniques for Sediment Pollution Control.' (Environment Protection Agency: Melbourne).

EPA Victoria (1996). 'Environmental Guidelines for Major Construction Sites.' (Environment Protection Authority: Melbourne).

John Patrick Landscape Architects Pty Ltd (2021). 'Arboricultural Report: 295 Warragul-Lardner Road, Warragul.' John Patrick Landscape Architects Pty Ltd, Richmond.

Metropolitan Planning Authority (2014). 'Warragul Precinct Structure Plan.' Metropolitan Planning Authority, Melbourne.

Port Phillip and Westernport Catchment Management Authority (2011). 'Port Phillip and Westernport Invasive Plant and Animal Strategy.' Port Phillip and Westernport Catchment Management Authority, Frankston.

Standards Australia (2009). 'Australian Standard: Protection of trees on development sites (AS 4970 - 2009).' (Standards Australia: Sydney).

Van Praagh BD (1992). The Ecology, Distribution and Conservation of the Giant Gippsland Earthworm *Megascolides australis* McCoy 1878. *Soil Biology and Biochemistry* **24**, 1363-1368.

Van Praagh BD (2021). Giant Gippsland Earthworm and Warragul Burrowing Crayfish Assessment at a proposed residential development –295 Warragul-Lardner Rd, Warragul Unpublished report for Bayport. (Van Praagh BD: Craigieburn).

Van Praagh BD, Yen, A L, Rosengren, N (2007). The Conservation of the Giant Gippsland Earthworm *Megascolides australis* in realtion to its distribution in the landscape. *The Victorian Naturalist* **124**, 249-253.

Walsh N and Entwistle T (1996). 'Flora of Victoria: Volume 3. Dicotyledons: Winteraceae to Myrtaceae.' (Inkata Press: Melbourne).

Plates

Plate 1. Exotic pastures generally dominate the study area.

Plate 2. Blackwoods alongside the driveway and Hazel Creek in the western portion of the study area.

Plate 3. A scattered indigenous Strzelecki Gum south of Hazel Creek.

Plate 4. Hazel Creek forms a patch of native vegetation (Patch 1) due to the cover abundance of Rushes and Sedges.

Plate 5. Patch 3 includes an artificial dam containing indigenous Spike-sedges and Rushes.

Plate 6. Patch 2 has a moderate cover of trees and shrubs.

Plate 7. Patch 2 also includes a range of indigenous ferns.

Figures

Tree numbers taken from arboricultural report (John Patrick Architects Pty Ltd 2021), tree letters are based on the current assessment.

Figure 1: Results of the current assessment

295 Warragul-Lardner Rd, Warragul, Victoria

Legend

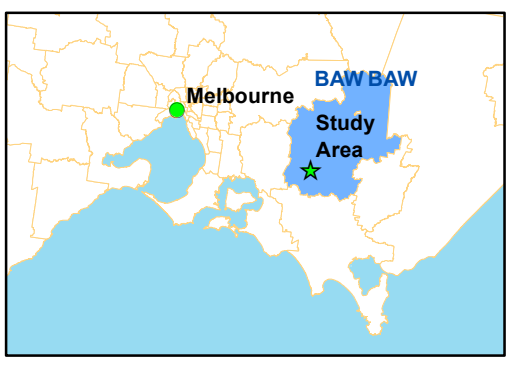
- Study Area
- Patches of Native Vegetation

Large Trees in Patches

- Manna Gum
- Strzelecki Gum

Scattered Trees

- Blackwood
- Strzlecki Gum
- ESO4 Giant Gippsland Earthworm Habitat Protection Areas



P/N 2088 Figure 1. October 2021. Aerial photography: Nearmap. 16 September 2021.

Note: some threatened species points have been shifted for display purposes

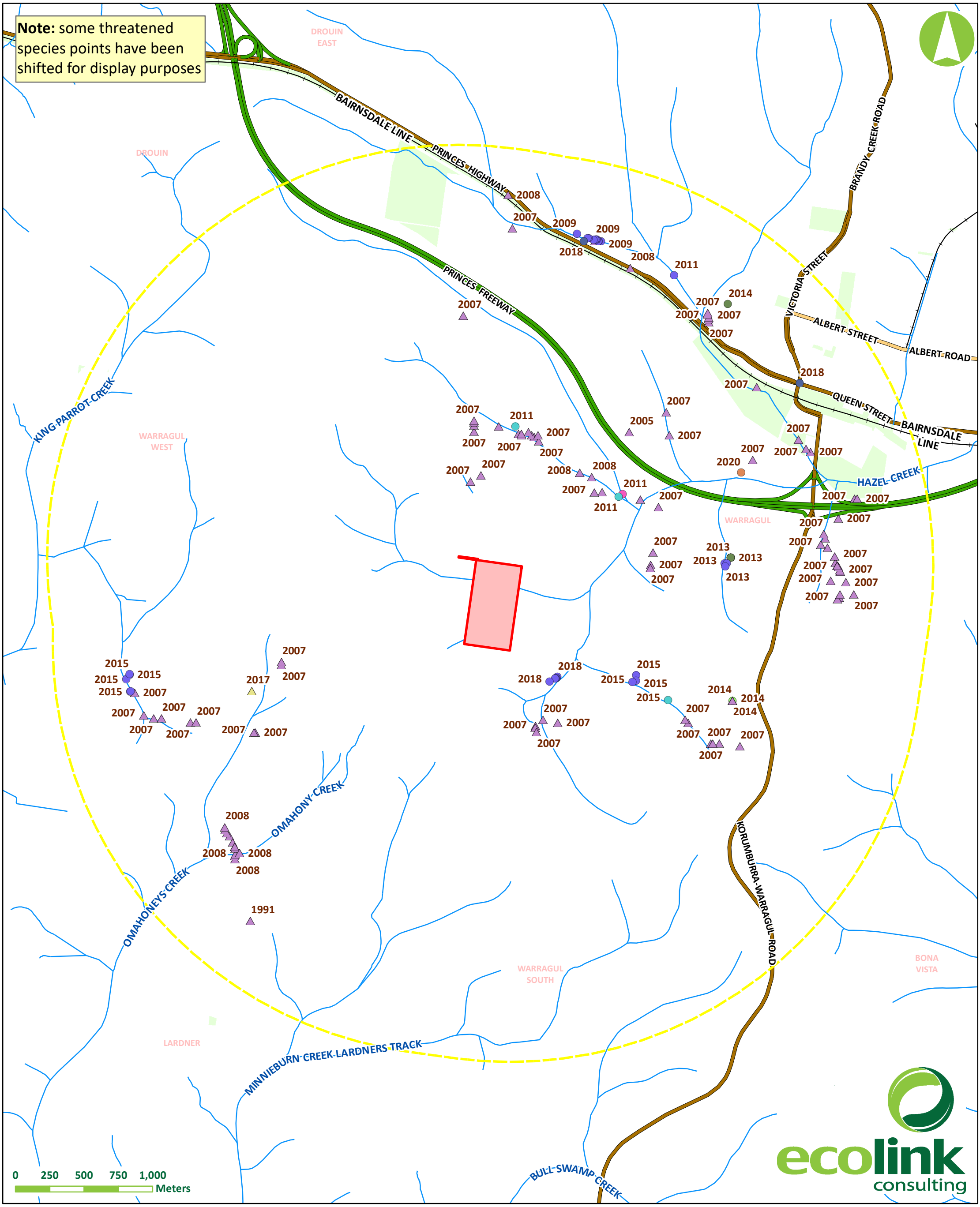


Figure 2: Threatened flora and fauna within 3kms of the study area in the past 30 years.

295 Warragul-Lardner Road, Warragul, Victoria

Legend

- Study Area
- 3km Study Area Buffer

Common Name

- Eastern Great Egret
- White-throated Needletail
- Platypus
- Dwarf Galaxias
- Flinders Pygmy Perch
- Giant Gippsland Earthworm
- Warragul Burrowing Crayfish
- Giant Honey-myrtle
- Salt Lawrencia
- Strzelecki Gum
- Public Land

Appendices

Appendix 1. Flora and Fauna Tables.

Table A1. Flora recorded within the study area

Origin	Common Name	Scientific Name	Weeds of National Significance	Noxious Weeds Classification
*	Angled Onion	*Allium triquetrum*	-	-
*	Annual Meadow-grass	*Poa annua*	-	-
*	Annual Veldt-grass	*Ehrharta longiflora*	-	-
	Austral Bracken	*Pteridium esculentum*	-	-
	Austral Mulberry	*Hedycarya angustifolia*	-	-
	Bat's Wing Fern	*Histiopteris incisa*	-	-
	Bidgee-widgee	*Acaena novae-zelandiae*	-	-
*	Blackberry	*Rubus fruticosus* spp. agg.	Yes	Controlled
	Blackwood	*Acacia melanoxylon*	-	-
*	Bridal Creeper	*Asparagus asparagoides*	Yes	Restricted
	Broad-leaf Rush	*Juncus planifolius*	-	-
*	Brown-top Bent	*Agrostis capillaris*	-	-
	Burgan	*Kunzea ericoides*	-	-
*	Cape Weed	*Arctotheca calendula*	-	-
*	Carrot	*Daucus carota*	-	-
*	Cleavers	*Galium aparine*	-	-
*	Clustered Dock	*Rumex conglomeratus*	-	-
*	Cocksfoot	*Dactylis glomerata*	-	-
	Common Apple-berry	*Billardiera scandens*	-	-
	Common Bottle-daisy	*Lagenophora stipitata*	-	-
	Common Cassinia	*Cassinia aculeata* subsp. *aculeata*	-	-
*	Common Centaury	*Centaurium erythraea*	-	-
	Common Maidenhair	*Adiantum aethiopicum*	-	-
*	Common Sow-thistle	*Sonchus oleraceus*	-	-
	Common Spike-sedge	*Eleocharis acuta*	-	-
*	Common Vetch	*Vicia sativa*	-	-
	Couch	*Cynodon dactylon* var. *dactylon*	-	-
	Crane's Bill	*Geranium* spp.	-	-
*	Creeping Buttercup	*Ranunculus repens*	-	-
*	Curled Dock	*Rumex crispus*	-	-
*	Cut-leaf Crane's-bill	*Geranium dissectum*	-	-
	Duckweed	*Lemna minor*	-	-
	Fireweed Groundsel	*Senecio linearifolius*	-	-
	Fishbone Water-fern	*Blechnum nudum*	-	-
*	Flatweed	*Hypochaeris radicata*	-	-
*	Forget-me-not	*Myosotis scorpioides*	-	-

Origin	Common Name	Scientific Name	Weeds of National Significance	Noxious Weeds Classification
	Forest Hound's-tongue	*Hackelia latifolia*	-	-
	Forest Starwort	*Stellaria flaccida*	-	-
	Forest Wire-grass	*Tetrarrhena juncea*	-	-
*	Great Brome	*Bromus diandrus*	-	-
	Green Rush	*Juncus gregiflorus*	-	-
	Hairy Pennywort	*Hydrocotyle hirta*	-	-
	Hard Water-fern	*Blechnum wattsii*	-	-
*	Hawthorn	*Crataegus monogyna*	-	-
	Hazel Pomaderris	*Pomaderris aspera*	-	-
	Hop Goodenia	*Goodenia ovata*	-	-
	Ivy-leaf Violet	*Viola hederacea* sensu Entwisle (1996)	-	-
	Kangaroo Apple	*Solanum aviculare*	-	-
	Kidney-weed	*Dichondra repens*	-	-
	Loose-flower Rush	*Juncus pauciflorus*	-	-
	Manna Gum	*Eucalyptus viminalis*	-	-
	Messmate Stringybark	*Eucalyptus obliqua*	-	-
	Mother Shield-fern	*Polystichum proliferum*	-	-
	Mountain Clematis	*Clematis aristata*	-	-
	Musk Daisy-bush	*Olearia argophylla*	-	-
	Narrow-leaf Cumbungi	*Typha domingensis*	-	-
	Narrow-leaf Wattle	*Acacia mucronata* subsp. *longifolia*	-	-
*	Onion Grass	*Romulea rosea*	-	-
*	Panic Veldt-grass	*Ehrharta erecta*	-	-
*	Paspalum	*Paspalum dilatatum*	-	-
*	Perennial Rye-grass	*Lolium perenne*	-	-
	Pouched Coral-fern	*Gleichenia dicarpa*	-	-
*	Prairie Grass	*Bromus catharticus*	-	-
	Prickly Currant-bush	*Coprosma quadrifida*	-	-
	Prickly Moses	*Acacia verticillata*	-	-
	Prickly Tea-tree	*Leptospermum continentale*	-	-
*	Ragwort	*Senecio jacobaea*	-	Controlled
	Red-fruit Saw-sedge	*Gahnia sieberiana*	-	-
*	Ribwort	*Plantago lanceolata*	-	-
*	Rough Sow-thistle	*Sonchus asper*	-	-
	Rough Tree-fern	*Cyathea australis*	-	-
	Scented Paperbark	*Melaleuca squarrosa*	-	-
	Screw Fern	*Lindsaea linearis*	-	-
*	Sheep Sorrel	*Acetosella vulgaris*	-	-
	Slender Dodder-laurel	*Cassytha glabella*	-	-
	Slender Knotweed	*Persicaria decipiens*	-	-

Origin	Common Name	Scientific Name	Weeds of National Significance	Noxious Weeds Classification
*	Small-flowered Mallow	*Malva parviflora*	-	-
*	Smooth Flatweed	*Hypochaeris glabra*	-	-
	Snowy Daisy-bush	*Olearia lirata*	-	-
	Soft Crane's-bill	*Geranium potentilloides*	-	-
	Soft Water-fern	*Blechnum minus*	-	-
*	Spear Thistle	*Cirsium vulgare*	-	-
	Spiny-headed Mat-rush	*Lomandra longifolia*	-	-
	Stinkwood	*Zieria arborescens* subsp. *arborescens*	-	-
	Strzelecki Gum	***Eucalyptus strzeleckii***	**-**	**-**
	Swamp Gum	*Eucalyptus ovata*	-	-
	Swamp Paperbark	*Melaleuca ericifolia*	-	-
#	Sweet Pittosporum	*Pittosporum undulatum*	-	-
*	Sweet Vernal-grass	*Anthoxanthum odoratum*	-	-
	Tall Sedge	*Carex appressa*	-	-
	Tall Spike-sedge	*Eleocharis sphacelata*	-	-
	Tassel Sedge	*Carex fascicularis*	-	-
	Trailing Speedwell	*Veronica plebeia*	-	-
*	Turnip	*Brassica spp.*	-	-
	Variable Sword-sedge	*Lepidosperma laterale*	-	-
	Water Couch	*Paspalum distichum*	-	-
	Water Plantain	*Alisma plantago-aquatica*	-	-
	Weeping Grass	*Microlaena stipoides* var. *stipoides*	-	-
*	White Arum-lily	*Zantedeschia aethiopica*	-	-
*	White Clover	*Trifolium repens* var. *repens*	-	-
	Wonga Vine	*Pandorea pandorana subsp. pandorana*	-	-
*	Yorkshire Fog	*Holcus lanatus*	-	-

Table Notes:

* – Exotic. **Bold** – Strzelecki Gum is listed as Vulnerable under the EPBC Act and Critically Endangered under the FFG Act

This table does not include ornamental plants, trees or shrubs that were not spreading or reproducing beyond where they were planted.

Table A2. Fauna species recorded within the study area

Origin	Common Name	Scientific Name
Birds		
	Australian Magpie	*Cracticus tibicen*
	Australian Reed-warbler	*Acrocephalus australis*
	Brown Thornbill	*Acanthiza pusilla*
	Chestnut Teal	*Anas castanea*
*	Common Starling	*Sturnus vulgaris*
	Crimson Rosella	*Platycercus elegans*
	Eastern Rosella	*Platycercus eximius*
	Eurasian Coot	*Fulica atra*
*	European Goldfinch	*Carduelis carduelis*
	Galah	*Eolophus roseicapilla*
	Grey Fantail	*Rhipidura albiscapa*
	Grey Teal	*Anas gracilis*
	Grey Shrike-thrush	*Colluricincla harmonica*
	Magpie-lark	*Grallina cyanoleuca*
	Purple Swamphen	*Porphyrio porphyrio*
*	Spotted Dove	*Spilopelia chinensis*
	Superb Fairywren	*Malurus cyaneus*
	Welcome Swallow	*Hirundo neoxena*
	Willie Wagtail	*Rhipidura leucophrys*
	Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*
Amphibians		
	Common Froglet	*Crinia signifera*
	Pobblebonk	*Limnodynastes dumerilii*
	Southern Tree Frog	*Litoria ewingii*
	Spotted Marsh Frog	*Limnodynastes tasmaniensis*

Table Notes:

* - Introduced species

Table A3. Threatened flora species that have previously been recorded within, or within 3 kilometres of the study area (Department of Environment Land Water and Planning 2021f), or that has habitat that may occur within the vicinity of the study area (Department of Agriculture Water and the Environment 2021a).

Common Name	Species Name	National Status	FFG Act Status	Habitat Preferences	Most Recent Record	Habitat Present on Site	Likelihood of Presence*
Clover Glycine	*Glycine latrobeana*	Vulnerable	Vulnerable	Grassy woodland; plains grassland; box woodland; dry sclerophyll forest.	NPR	No	Unlikely
Dense Leek-orchid	*Prasophyllum spicatum*	Vulnerable	Critically Endangered	Coastal and hinterland heath and heathy woodland	NPR	No	Unlikely
Giant Honey-myrtle	*Melaleuca armillaris subsp. armillaris*	-	Endangered	Mainly confined to near-coastal sandy heaths, scrubs slightly raised above saltmarsh, riparian scrubs, rocky coastlines and foothill outcrops eastwards from about Marlo. Occurrences to the west are naturalised.	2014 (1)	No	Unlikely
Green-striped Greenhood	*Pterostylis chlorogramma*	Vulnerable	Endangered	Open forest and woodland	NPR	No	Unlikely
Matted Flax-lily	*Dianella amoena*	Endangered	Critically Endangered	Grassy Wetland; Red Gum woodland; plains grassland; grassy woodlands.	NPR	No	Unlikely
River Swamp Wallaby-grass	*Amphibromus fluitans*	Vulnerable	-	Beside swamps in grassy low open forest, riparian scrub. Required moist soils, tolerates inundation.	NPR	No	Unlikely
Salt Lawrencia	*Lawrencia spicata*	-	Endangered	An occasional component	2017 (1)	No	Unlikely

Common Name	Species Name	National Status	FFG Act Status	Habitat Preferences	Most Recent Record	Habitat Present on Site	Likelihood of Presence*
				of saltmarsh communities along the coast, rare in saline depressions and around salt lakes of south-western Victoria			
Strzelecki Gum	*Eucalyptus strzeleckii*	Vulnerable	Critically Endangered	Fragmented populations in the Strzelecki Ranges, on a range of sites including ridges, slopes and along the banks of streams, but particularly foothills and flats	2014 (327)	No	Present
Swamp Everlasting	*Xerochrysum palustre*	Vulnerable	Critically Endangered	Seasonal or permanent wetlands	NPR	No	Unlikely

Table Notes:

NPR – Not previously recorded

*** Likelihood of Presence Definitions**:

Unlikely – Site does not contain habitat and/or it is outside the species' known, current distribution.

Low –Site contains some marginal habitat, but the species was not observed and has not been recently recorded in previous surveys in the area.

Moderate – Site contains preferred habitat that may support a population of the species. However, other factors, such as fragmentation, disturbance or predators may be impacting any local population.

High - Site contains the preferred habitat which is likely to support the species.

Present – Preferred habitat is present on the site, and the species was observed on the site, or recently recorded at the site.

NPR – No previous record, modelled presence only under the EPBC Protected Matters Search results (Department of Agriculture Water and the Environment 2021a).

Table A4. Threatened fauna species that have previously been recorded within, or within 3 kilometres of the study site (Department of Environment Land Water and Planning 2021f), or that has habitat that may occur within the vicinity of the site (Department of Agriculture Water and the Environment 2021a).

Common Name	Species Name	National Status	Victorian Status	Habitat Preferences	Most Recent Record	Habitat Present on Site	Likelihood of Presence*
Birds							
White-throated Needletail	*Hirundapus caudacutus*	Vulnerable	Vulnerable	Aerial insectivore that rarely lands to perch, often sleeping on the wing	2014 (1)	No	Low
Australian Painted-snipe	*Rostratula australis*	Endangered	Critically Endangered	Uncommon summer migrant to Victoria. Lowlands on shallow freshwater swamps with emergent vegetation, and flooded salt marshes.	NPR	No	Unlikely
Eastern Curlew	*Numenius madagascariensis*	Critically Endangered	Critically Endangered	Estuaries, tidal mudflats, mangroves, shallow river margins, coastal or inland	NPR	No	Unlikely
Curlew Sandpiper	*Calidris ferruginea*	Critically Endangered	Critically Endangered	Estuaries, tidal mudflats, mangroves, shallow river margins, coastal or inland	NPR	No	Unlikely
Australasian Bittern	*Botaurus poiciloptilus*	Endangered	Critically Endangered	Reed beds, dense vegetation of freshwater swamps and creeks.	NPR	No	Unlikely
Eastern Great Egret	*Ardea alba modesta*	-	Vulnerable	Floodwaters, rivers and shallows of wetlands, intertidal mud flats.	2018 (2)	Yes	Moderate
Grey Falcon	*Falco hypoleucos*	-	Vulnerable	Shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast	NPR	No	Unlikely
Swift Parrot	*Lathamus discolor*	Critically Endangered	Critically Endangered	Winter migrant from Tasmania. Generally prefers Box-Ironbark forests and woodlands inland of the Great Dividing Range during winter.	NPR	No	Unlikely
Painted Honeyeater	*Grantiella picta*	Vulnerable	Vulnerable	Open box-ironbark forests and woodlands, particularly where trees are infested with	NPR	No	Unlikely

Common Name	Species Name	National Status	Victorian Status	Habitat Preferences	Most Recent Record	Habitat Present on Site	Likelihood of Presence*
				mistletoe.			
Regent Honeyeater	*Anthochaera phrygia*	Critically Endangered	Critically Endangered	Depends on nectar and insects from Box-Ironbark Eucalypt forests. Only breeding habitat lies in Northeast Victoria and central coast of NSW	NPR	No	Unlikely
Mammals							
Platypus	*Ornithorhynchus anatinus*	-	Vulnerable	Freshwater rivers and streams.	2020 (1)	No	Unlikely
Spot-tailed Quoll	*Dasyurus maculatus maculatus*	Endangered	Endangered	Forests including large intact areas of vegetation for foraging.	NPR	No	Unlikely
Southern Brown Bandicoot	*Isoodon obesulus obesulus*	Endangered	Endangered	Heathy forest, heathland and coastal scrub.	NPR	No	Unlikely
Southern Greater Glider	*Petauroides volans*	Vulnerable	Vulnerable	Wet sclerophyll forests, requires large tree hollows for nesting	NPR	No	Unlikely
Long-nosed Potoroo	*Potorous tridactylus trisulcatus*	Vulnerable	Vulnerable	Heathy woodland	NPR	No	Unlikely
Broad-toothed Rat	*Mastacomys fuscus mordicus*	Vulnerable	Vulnerable	A range of habitats from sub-alpine to coastal heathland, with high vegetative coverage in high rainfall areas	NPR	No	Unlikely
Grey-headed Flying-fox	*Pteropus poliocephalus*	Vulnerable	Vulnerable	Roost sites commonly occur in gullies, in vegetation with dense canopy cover and close to water.	NPR	No	Low
Frogs							
Growling Grass Frog	*Litoria raniformis*	Vulnerable	Vulnerable	Permanent lakes, swamps, dams and lagoons.	NPR	Yes	Moderate
Fish							
Australian Grayling	*Prototroctes*	Vulnerable	Endangered	Clear gravelly streams; deep slow flowing	NPR	No	Low

Common Name	Species Name	National Status	Victorian Status	Habitat Preferences	Most Recent Record	Habitat Present on Site	Likelihood of Presence*
	maraena			pools.			
Dwarf Galaxias	*Galaxiella pusilla*	Vulnerable	Endangered	Slow moving waters, including ephemeral drains.	2011 (1)	Yes	Moderate
Flinders Pygmy Perch	*Nannoperca* sp. 1	-	Vulnerable	A range of freshwater habitats, preferably with structure	2015 (3)	No	Low
Invertebrates							
Giant Gippsland Earthworm	*Megascolides australis*	Vulnerable	Endangered	Usually associated with deep blue-grey clay-like soils near creek banks (especially smaller tributaries of the Bass River), soaks, river flats or on slopes with a southerly or westerly aspect and is rarely found on north facing slopes, in the western Strzelecki Ranges.	2018 (35)	Yes	Present **
Warragul Burrowing Crayfish	*Engaeus sternalis*	-	Critically Endangered	Only known current locations of the species are on Labertouche Creek and Wattle Creek (a tributary of Labertouche Creek) in West Gippsland.	2014 (6)	Yes	Present **

Table Notes:

This table excludes species listed exclusively as 'migratory' or 'marine' under the EPBC Protected Matters Search results (Department of Agriculture Water and the Environment 2021a).

NPR – Not previously recorded

*** Likelihood of Presence Definitions:**

Unlikely – Site does not contain habitat and/or it is outside the species' known, current distribution. Birds and bats may fly over.

Low –Site contains some marginal habitat, but the species was not observed and has not been recorded in previous recent surveys in the area. Birds and bats may fly over.

Moderate – Site contains preferred habitat that may support a population of the species. Birds and bats may opportunistically or seasonally forage at the site.

High – Site contains preferred habitat which is likely to support the species. Birds and bats are likely to regularly (at least seasonally) forage or roost at the site.

Present – Preferred habitat is present on the site, and the species was observed on the site, or recently recorded on the site.

NPR– No previous record, modelled presence only under the EPBC Protected Matters Search results (Department of Agriculture Water and the Environment 2021a).

** Presence determined by targeted species surveys undertaken by Invert-Eco (Van Praagh 2021).

Appendix 2. Legislation

Commonwealth Legislation

***Environment Protection and Biodiversity Conservation Act 1999* (Cth)**

The *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) is to provide for the conservation of 'Matters of National Environmental Significance'. The Act defines eight Matters of National Environmental Significance:

- World Heritage properties;
- National Heritage Places;
- Ramsar wetlands of international significance;
- Nationally listed threatened species and ecological communities;
- Listed migratory species;
- Commonwealth marine areas;
- The Great Barrier Reef Marine Park; and,
- Nuclear actions.

Under the Act, actions that are likely to have a significant impact upon Matters of National Environmental Significance require approval from the Federal Environment Minister. This approval is sought through a referral process for a particular action. An action includes any project, development, undertaking, activity or series of activities. Consideration of the requirement for an 'EPBC Referral' to the Minister has been made within this report.

State Legislation

Environmental Effects Act

The *Environment Effects Act 1978* (Vic) provides for assessment of proposed projects (works) that are capable of having a significant effect on the environment. The Act does this by enabling the Minister administering the Environment Effects Act to decide that an Environment Effects Statement (EES) should be prepared.

The Minister might typically require a proponent to prepare an EES when:

- There is a likelihood of regionally or State significant adverse effects on the environment
- There is a need for integrated assessment of potential environmental effects (including economic and social effects) of a project and relevant alternatives, and
- Normal statutory processes would not provide a sufficiently comprehensive, integrated and transparent assessment (Department of Sustainability and Environment 2007).

Referral criteria: individual potential environmental effects

- Individual types of potential effects on the environment that might be of regional or State significance, and therefore warrant referral of a project, are:
- Potential clearing of 10 ha or more of native vegetation from an area that:
    - is of an Ecological Vegetation Class identified endangered by the Department of Sustainability and Environment (in accordance with Appendix 2 of Victoria's Native Vegetation Management Framework); 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
- Potential long-term change to the ecological character of a wetland listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia'
- Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term
- Potential extensive or major effects on the health, safety or well-being of a human community, due to emissions to air or water or chemical hazards or displacement of residences
- Potential greenhouse gas emissions exceeding 200,000 tonnes of carbon dioxide equivalent per annum, directly attributable to the operation of the facility (Department of Sustainability and Environment 2007).

***Flora and Fauna Guarantee Act 1988* (Vic)**

The *Flora and Fauna Guarantee Act 1998* (Vic) (FFG Act) provides a legal framework for enabling and promoting the conservation of all Victoria's native flora and fauna, and to enable management of potentially threatening processes on public land. The Act lists native species, communities, and processes that threaten native flora and fauna, under Schedules of the Act. This enables the assessor and regulators to establish management measures to mitigate impacts on listed values within Victoria.

A 'Protected Flora and Fauna Licence or Permit' from DELWP is required to 'take' listed flora species that are members of listed communities or protected flora from public land. 'Taking' flora is defined as any action which results in the removal or death of a native plant. A permit is not required under the FFG Act for private land, unless listed species are present and the land is declared 'critical habitat' for the species.

An evaluation of the likelihood of the presence of significant flora and fauna species on the subject site, including those listed under the FFG Act that have previously been recorded in the vicinity of the site, has been undertaken.

***Planning and Environment Act 1987* (Vic)**

The *Planning and Environment Act 1987* (Vic) (P&E Act), later amended by the *Planning and Environment (Planning Schemes) Act 1996* (Vic) provides the foundation of planning schemes in Victoria. Planning schemes set out policies and provisions for the development and protection of land within each municipality in Victoria.

The *Planning and Environment (Planning Schemes) Act 1996* provides for the Minister for Planning to prepare a set of standard provisions for planning schemes called the Victoria Planning Provisions (VPP). The VPP is a state-wide reference document or template from which planning schemes are

sourced and constructed. Incorporation of references such as the *Guidelines For the Removal, Destruction or Lopping of native vegetation* into Section 12 of the VPP ensures that all municipalities must consider this policy. Local zones and overlays, such as Environmental Significance Overlays, may be incorporated into Section 30 and 40 of the planning provisions by each Council, but only remain relevant within that municipality.

The objectives of the P&E Act are to integrate local land use, development planning and development policy with environmental, social, economic, conservation and resource management policies at State, regional and municipal levels through a set of planning schemes. The Act also establishes a clear procedure for public participation in decision making in amending planning schemes.

Some important sections of the planning scheme, in relation to the ecological values of a site, include:

- Section 12 of the State Planning Policy Framework, which identifies, and aims to protect, key biodiversity assets from inappropriate development;
- Clause 52.17 which identifies where native vegetation removal is exempt from requiring a planning permit; and
- Clause 66 which identifies all of the mandatory referral authorities. In particular, the Victorian Department of Environment, Land Water and Planning is identified as the recommending referral authority if a proponent proposes:
    - *'To remove, destroy or lop native vegetation in the Detailed Assessment Pathway as defined in the Guidelines for the removal, destruction or lopping of native vegetation;*
    - *To remove, destroy or lop native vegetation if a property vegetation plan applies to the site; and*
    - *To remove, destroy or lop native vegetation on Crown land which is occupied or managed by the responsible authority' (Department of Environment Land Water and Planning 2021d)*.

***Catchment and Land Protection Act 1994* (Vic)**

The *Catchment and Land Protection Act 1994* (Vic) (CALP Act) is the principal legislation relating to the management of pest plants and animals in Victoria. Under this Act, landowners have a responsibility to avoid causing or contributing to land degradation. Where possible, landowners are required to conserve soil, protect water resources, eradicate 'regionally prohibited' weeds, prevent the growth and spread of 'regionally controlled' weeds and control pest animals. The CALP Act lists the species that are considered weeds and pest animals.

***Wildlife Act 1975* (Vic)**

Victoria's *Wildlife Act 1975* (Vic) and the *Wildlife Regulations 2002* (Vic) protect all indigenous vertebrate fauna, some non-indigenous vertebrate fauna, and some invertebrate fauna listed as 'threatened' under the FFG Act. The *Wildlife Act 1975* (Vic) prevents intentional injury to wildlife and stipulates that a licence should be granted where there is a possibility that wildlife are injured, or where wildlife is to be kept, relocated or traded.

In most cases, where the proponent is planning to develop a site, a planning permit approval provides this licencing approval, however, this report advises if an additional permit is required. Circumstances where this legislation may not be relevant is where fish are involved, on public land where additional regulatory approval is required, or where other permits are required (such as where fauna are required to undergo invasive procedures or installation of telemetry systems).

***Fisheries Act 1995* (Vic)**

The *Fisheries Act 1995* (Vic) provides the legislative framework for the regulation, management conservation of Victorian fish species and their habitats. As with the Victorian *Wildlife Act 1975* described above, the key method to ensure compliance is through licencing. Where fish, or their habitats, are likely to be impacted, this report will identify additional requirements.

Other relevant policy

***Guidelines for the Removal, Destruction or Lopping of Native Vegetation* (Department of Environment Land Water and Planning 2017c)**

The *Guidelines for the Removal, Destruction or Lopping of Native Vegetation* (Department of Environment Land Water and Planning 2017) were released by DELWP in December 2017. A permit to remove native vegetation under clause 52.16 and 52.17 of the Victoria Planning Provisions is required unless:

- The table of exemptions to this clause specifically states that a permit is not required;
- It is native vegetation or an area specified in the schedule to the clause;
- A Native Vegetation Precinct Plan corresponding to the land is incorporated into the relevant planning scheme; or
- Bushfire exemptions apply in bushfire prone areas (Department of Environment Land Water and Planning 2017).

The Guidelines describe the permitting process for applications to remove native vegetation on private and public property within Victoria. A key strategy of the State Planning Policy Framework, relating to biodiversity, is to ensure that there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation. This is achieved through iteratively applying the three-step approach:

1. Avoiding the removal, destruction or lopping of native vegetation.
2. Minimising impacts from the removal, destruction or lopping of native vegetation that cannot be avoided.
3. Providing an offset to compensate for the biodiversity impact from the removal, destruction or lopping of native vegetation (Department of Environment Land Water and Planning 2017; p. 4).

Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses' (Department of Environment Land Water and Planning 2017).

Native vegetation is further classified into two categories (Department of Environment Land Water and Planning 2017):

- A remnant patch of native vegetation (measured in hectares) is either:
    - An area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native, or
    - Any area with three or more native canopy trees where the drip line of each tree touches the drip line of at least one other tree, forming a continuous canopy, or
    - Any mapped wetland included in the *Current Wetlands Map*, available in DELWP systems and tools.

OR

- A scattered tree (measured in number of trees), is a native canopy tree that does not form a patch (Department of Environment Land Water and Planning 2017).

In addition, a canopy tree with a Diameter at Breast Height (DBH) greater than or equal to the large tree benchmark for the relevant bioregional EVC is defined as a large tree. Large trees can be either a large scattered tree or a large tree within a patch.

The contribution that is made by native vegetation to the biodiversity values of Victoria is determined through an assessment of both site-based information and landscape scale information.

At a site-based level, the contribution is determined through an assessment of:

- The extent of native vegetation;
- The number of large trees (either within a patch or scattered trees), relative to the appropriate EVC benchmark;
- The native vegetation condition, which is determined through a Habitat Hectare assessment
- The conservation status of the Ecological Vegetation Class (EVC) to which the vegetation can be classified; and,
- The presence of sensitive wetlands and coastal areas.

At a landscape scale, the value of the vegetation is determined with reference to its strategic context in the Victorian landscape (Department of Environment and Primary Industries 2013). This is determined by the vegetation's 'Strategic Biodiversity Score' (SBS) and its 'Habitat Importance Score' (HIS) for its value to rare and threatened species (Department of Environment Land Water and Planning 2017).

All native vegetation within Victoria has a SBS that has been determined through spatial modelling, based on its rarity, level of depletion, species habitats, and condition and connectivity (Department of Environment Land Water and Planning 2017). SBS scores are between 0 and 1 and are used to determine the offset required for the loss of that vegetation. Native vegetation only has a HIS score if it is habitat for a particular rare or threatened species (Department of Environment Land Water and Planning 2017). There are two types of rare or threatened species habitats that may be provided by native vegetation:

- **Highly localised habitats for rare or threatened species** – where impact to this particular patch of native vegetation could result in a significant biodiversity impact, such as a breeding colony or species with a limited geographic extent.
- **Dispersed rare or threatened species habitats** – where habitat for the threatened species has become depleted or fragmented over time (Department of Environment Land Water and Planning 2017).

The HIS is used to apply the decision guidelines in relation to the removal of a patch of native vegetation and to determine offset requirements (Department of Environment Land Water and Planning 2017).

Applications to remove native vegetation are categorised against one of three assessment pathways. These pathways are categorised as:

- Basic – limited impacts on biodiversity.
- Intermediate – could impact on large trees, endangered EVCs, and sensitive wetlands and coastal areas.
- Detailed – could impact on large trees, endangered EVCs, sensitive wetlands and coastal areas, and could significantly impact on habitat for rare or threatened species (Department of Environment Land Water and Planning 2017).

This is initially determined in two ways, based on the 'location map' and the extent risk of the vegetation proposed to be removed. The location risk is determined with reference to the *Native Vegetation Location Risk* map available on DELWP's website (Department of Environment Land Water and Planning 2021b). This map shows whether native vegetation is classified as Location 1, 2 or 3.

The extent risk is determined based on the amount of native vegetation that is proposed for removal and includes the area (in hectares) of impact to native vegetation, the number of scattered trees, and the number of large trees (Table A5).

Table A5. Assessment pathways for removal of remnant patches of native vegetation (Department of Environment Land Water and Planning 2017).

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

All applications to remove native vegetation must include the following information:

1. Information about the native vegetation to be removed, including:
    a. The assessment pathway and reason for the assessment pathway;
    b. A description of the native vegetation to be removed;

   c. Maps showing the native vegetation and property in context;
   d. The offset requirement, determined in accordance with section 5 of the Guidelines that will apply if the native vegetation is approved to be removed.
2. Topographic and land information relating to the native vegetation to be removed;
3. Recent, dated photographs of the native vegetation to be removed;
4. Details of any other native vegetation approved to be removed, or that was removed without the required approvals, on the same property or on contiguous land in the same ownership as the applicant, in the five year period before the application for a permit is lodged;
5. An 'Avoid and Minimise' statement;
6. A copy of any Property Vegetation Plan contained within an agreement made pursuant to section 69 of the *Conservation, Forests and Lands Act 1987* (Vic) that applies to the native vegetation to be removed;
7. Where the removal of native vegetation is to create defendable space, a written statement explaining why the removal of native vegetation is necessary;
8. If the application is under Clause 52.16, a statement that explains how the proposal responds to the Native Vegetation Precinct Plan considerations at decision guideline 8, and
9. An offset statement providing evidence that an offset that meets the offset requirements for the native vegetation to be removed has been identified, and can be secured in accordance with the Guidelines (Department of Environment Land Water and Planning 2017; p. 20-21).

If the application will be assessed under the Detailed Assessment Methodology, the following additional requirements apply:

10. A site assessment report of the native vegetation to be removed, including:
    a. A habitat hectare assessment of any patches of native vegetation, including the condition, extent (in hectares), Ecological Vegetation Class and bioregional conservation status.
    b. The location, number, circumference (in centimetres measured at 1.3 metres above ground level) and species of any large trees within patches.
    c. The location, number, circumference (in centimetres measured at 1.3 metres above ground level) and species of any scattered trees, and whether each tree is small or large.
11. Information about impacts on rare or threatened species habitat, including:
    a. The relevant section of the Habitat importance map for each rare or threatened species requiring a species offset.
    b. For each rare or threatened species that the native vegetation to be removed is habitat for, according to the Habitat importance maps: - the species' conservation status - the proportional impact of the removal of native vegetation on the total habitat for that species - whether their habitats are highly localised habitats, dispersed habitats, or important areas of habitat within a dispersed species habitat (Department of Environment Land Water and Planning 2017; p. 22).

Ten decisions guidelines are identified within the Guidelines that the responsible or referral authority must consider when deciding on an application to remove native vegetation. These are summarised as follows:

1. The degree to which the application avoids and minimises impacts to native vegetation, and where vegetation is proposed to be removed, the highest quality vegetation is avoided;
2. The role that the vegetation to be removed has in relation to landscape services such as erosion control, ground-water quality, waterway quality;
3. The role of the vegetation in the preservation of landscape features;
4. Whether any part of the native vegetation to be removed, destroyed or lopped is protected under the *Aboriginal Heritage Act 2006* (Vic);
5. The need to remove, destroy or lop native vegetation to create defendable space to reduce the risk of bushfire to life and property, having regard to other available bushfire risk mitigation measures;
6. Whether the native vegetation to be removed is in accordance with any Property Vegetation Plan that applies to the site;
7. Whether an offset that meets the offset requirements for the native vegetation to be removed has been identified and can be secured in accordance with the Guidelines;
8. Whether the application is consistent with a Native Vegetation Precinct Plan (where relevant);
9. For applications in both the Intermediate and Detailed Assessment Pathway only, the impacts on biodiversity values that would occur as a result of vegetation removal; and,
10. For applications in the Detailed Assessment Pathway only, the impacts on habitat for rare or threatened species (Department of Environment Land Water and Planning 2017).

Offset requirements

In all cases where native vegetation is approved for removal, the proponent is liable for the security of an offset site that meets the requirements under the Guidelines. An offset can be either a:

- First party offset – on the same property as the proposed removal of native vegetation, or on another property owned or managed (in the case of Crown land) by the party requiring the offset, or
- Third party offset – on another party's property. Third party offsets are traded as native vegetation credits.

In most cases a third party offset is the simplest and most cost effective means of securing the required offset.

There are three components to offset requirements:

1. Offset type (general or species).
2. Offset amount (measured in general or species habitat units).
3. Offset attributes.

Two types of offset are identified: General Offsets and Specifies Offsets. Specific Offsets may only be required if the native vegetation to be removed is habitat for rare or threatened species that are identified in an Intermediate or Detailed Assessment Pathway application (Department of Environment Land Water and Planning 2017). To determine this, a 'Specific Biodiversity Equivalence Score' is calculated by multiplying the habitat hectares with the HIS for each species that may be impacted. For each of the species, this figure is divided by the sum of all the Specific Biodiversity Value Scores calculated for the remaining vegetation under investigation to give a specific offset threshold for each species. If the amount of vegetation removed exceeds this threshold, then a Specific Offset is required. If it does not exceed the threshold, then only a General Habitat Offset is required (Table A6)(Department of Environment Land Water and Planning 2017).

Table A6 summarises the offset requirements for each of the Assessment Pathways and offset types.

Table A6. Offset requirements for the removal of native vegetation

Assessment Pathway	Offset Type	Offset amount		Offset attributes	
		Risk Adjusted Biodiversity Equivalence	Species Habitat Requirement	Vicinity	Strategic Biodiversity Score
Basic Assessment Pathway	General offset	1.5 times the general biodiversity equivalence score[1] of the native vegetation to be removed.	No restrictions.	In the same Catchment Management Authority boundary as the native vegetation to be removed.	At least 80 per cent of the SBS of the native vegetation to be removed.
Intermediate or Detailed Assessment Pathway	General offset	1.5 times the general biodiversity equivalence score of the native vegetation to be removed.	No restrictions.	In the same Catchment Management Authority boundary as the native vegetation to be removed.	At least 80 per cent of the SBS of the native vegetation to be removed.
	Specific offset	For each species impacted, 2 times the specific biodiversity equivalence score of the native vegetation to be removed.	Likely habitat for each rare or threatened species that a specific offset is required for, according to the specific-general offset test.	No restrictions.	No restrictions.

[1] The general biodiversity equivalence score is determined by multiplying the vegetation's habitat hectare score by its SBS.