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Detailed Flora and Fauna Assessment

Northern Highway and Wandong Road Intersection

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Ecological Limitations

The site assessment was undertaken in July 2022. This is considered to be an acceptable time of year to complete a Vegetation Quality Assessment. However, due to seasonal activity, many flora and fauna species are not detectable and additional surveys may be recommended to detect threatened species. Additional targeted surveys for threatened species and communities were undertaken throughout spring, summer and winter.

Use of Databases

The Victorian Biodiversity Atlas (VBA) database and other databases can be used to search a defined geographical area to produce species lists of flora and fauna that have been previously recorded within the search area. The database lists are only as accurate as the quality and quantity of data that have been recorded and documented from the area. The use of the database in a desktop assessment has the following limitations:

- Location details for many records (typically older records) have a relatively low degree of accuracy (≤ 1km). Thus, the database search may not pick up some records of species that were made within the site historically.
- These datasets are not exhaustive given many locations locally and across Victoria have low or in some instances no documented survey effort for one or more groups of flora and fauna. During field surveys, it is not uncommon to find species at locations for which there are few or no previous nearby database records.
- Professional experience and judgement are used through the assessment process to assess the potential for previously unrecorded threatened flora and fauna to be present within and adjoining the study site. Threatened flora and fauna records that are dated ≤1960 have been removed from our data analysis as they are not considered to provide an accurate representation of the species likely to occur within the site at present (unless stated otherwise in this report).

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Acronyms

Acronyms	Description
BCS	Bioregional Conservation Status
CaLP Act	*Catchment and Land Protection Act 1994*
CEMP	Construction Environmental Management Plan
CMA	Catchment Management Authority
DAWE	Commonwealth Department of Agriculture, Water and the Environment (Now DCCEEW)
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DBH	Diameter at Breast Height (taken 1.3 m from the ground)
DELWP	Department of Environment, Land, Water and Planning
DEPI	Department of Environment and Primary Industries (now DELWP)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EVC	Ecological Vegetation Class
FFG Act	*Flora and Fauna Guarantee Act 1988* and *Flora and Fauna Guarantee Amendment Act 2019*
GIS	Geographic Information System
Guidelines	*Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017)
ha	Hectares
HIM	Habitat Importance Maps (DELWP 2017)
km	Kilometres
LGA	Local Government Authority
m	Metres
MNES	Matters of National Environmental Significance
NVIM	Native Vegetation Information Management tool
PMST	Protected Matters Search Tool (DCCEEW)
sp.	Species (one species)
spp.	Species (more than one species)
subsp.	Subspecies
VBA	Victorian Biodiversity Atlas (DELWP)
WONS	Weed of National Significance

Executive Summary

Introduction

SMEC Australia Pty Ltd (SMEC) was commissioned by Department of Transport and Planning to undertake a Detailed Flora and Fauna Assessment for the Northern Highway and Wandong Road Intersection, Kilmore, Victoria. The assessment was undertaken in July 2022 to identify any known or potential ecological values within and adjoining the study site and inform Department of Transport and Planning of possible impacts associated with the Project. Subsequent targeted surveys for threatened species and communities were undertaken throughout spring, summer and autumn to inform Project approvals.

Results

The results of the assessment are summarised in Table 1. A summary of key legislation and policy is provided in Table 2.

Table 1: Summary of results

Value	Summary of results
Native vegetation	Native vegetation identified within the study site comprises 4.372 ha of native vegetation, including 62 large trees. Native vegetation proposed to be removed comprises 2.444 ha and 24 large trees.
Notable biodiversity values	*Local parks and reserves:* Study site is approximately 2.5km south of Monument Hill Reserve. *Local waterways and wildlife corridors:* The study site lies approximately 200 m east of an unnamed drain and 820 m east of Kilmore Creek. The road reserves of the Northern Highway support woodland habitat and act as a wildlife corridor, providing north-south connectivity for a diversity of arboreal fauna.
EPBC Act species and communities	Suitable habitat was identified within the study site for species listed under the EPBC Act. Following detailed assessment, including targeted surveys, it is considered that the project may impact habitat for the following, although impacts are unlikely to be considered 'significant': • *Flora:* Matted Flax-lily (*Dianella amoena*) • *Fauna:* Gang-gang Cockatoo (*Callocephalon fimbriatum*). • *Communities:* None Additional species considered as part of the assessment are described in Section 3.3.1.
FFG Act species and communities	Suitable habitat was identified within the study site for species and communities listed under the FFG Act. Following detailed assessment, including targeted surveys, it is considered that the project may impact habitat for the following: • *Flora:* Matted Flax-lily *Dianella amoena* • *Fauna:* None • *Communities:* Victorian Temperate Woodland Bird Community. • *Other protected flora:* Several species identified in Table 21 . Additional species considered as part of the assessment are described in Section 3.3.2.

Table 2: Summary of key legislation and policy

Legislation	Potential impact	Recommendation
***Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)**	Suitable habitat was identified within the study site for EPBC Act listed flora species, with a population of Matted Flax-lily identified during the site assessment. Suitable habitat in the form of woodland vegetation was identified for EPBC Act listed fauna species: Gang-gang Cockatoo. Details on the potential impacts to MNES is provided in Table 22.	A significant impact under the EPBC Act is considered unlikely based on the current Project design.
Environment Effects Act 1978	Native vegetation and suitable habitat for threatened species and communities were identified within the study site, both potential referral triggers under the EE Act. An EE Act self-assessment was completed (Table 23) and the Project is considered unlikely to have a significant effect on ecological matters.	A referral under the EE Act is not considered necessary on the grounds of ecological matters.
***Flora and Fauna Guarantee Act 1988* (FFG Act)**	FFG Act-listed matters with potential to be impacted by the project: • *Flora*: None; • Communities: Victorian Temperate Woodland Bird Community; • *Fauna*: None; and • *Protected flora*: Listed in Section 3.4.2.1.	A 'permit to take protected flora' is required for protected flora species and communities if they are proposed to be removed. Total impacts to the Victorian Temperature Woodland Bird community are currently estimated at 2.444 ha based on the design and proposed removal of woodland vegetation. Details of these removals must be added to the FFG Act permit for review and approval by DEECA.
Wildlife Act 1975	A range of common fauna species were identified within the study site, including species such as possums or birds that may be injured during tree removal associated with the proposed works.	A permit is required under the *Wildlife Act 1975* to carry out field investigations for the purpose of conserving, monitoring, improving or maintaining wildlife habitat within Victoria. This also includes the salvage and translocation of wildlife from a particular locality which requires a specific *Wildlife Act 1975* permit (authorised by DELWP) for the capture, handling and relocation of wildlife.
Water Act 1989	No watercourses interest the study site or are proposed to be impacted by the project.	Goulburn Broken CMA is the responsible authority for the control, management and authorisation of works and activities in or over Designated Waterways in the study site. No approval is required as there are no watercourses within or adjoining the study site.
Planning and Environment Act 1987	**Clause 52.16, Clause 52.17, the Guidelines** *Offset requirements to remove native vegetation:* 1.285 general habitat units and 24 large trees (Table 25, Section 4.2.6.1).	Planning approval from Mitchell Shire is required to remove, destroy or lop native vegetation. If approval is granted, an offset that meets the requirements in Table 25 must be secured before the native vegetation can be removed.
	Zones and Overlays The study site to the south of Wandong Road is zoned for Farming (FZ), and to the north is General (GRZ) or Low Density Residential (LDRZ). A Development Plan Overlay (DPO) applies to the north of Wandong Road.	Applicable zones and overlays have no specific requirements for native vegetation or biodiversity.

1. Introduction

1.1 Background

SMEC Australia Pty Ltd (SMEC) was commissioned by Department of Transport and Planning (DTP) to undertake a Detailed Flora and Fauna Assessment and targeted surveys for threatened species and communities for Northern Highway and Wandong Road Intersection (the Project). DTP proposes to construct road pavement with a larger footprint than the existing roadway, upgrade drainage infrastructure and install safety barriers, which will require removal of native vegetation and potential fauna habitat adjacent to the road.

The purpose of the assessment is to identify potential Project constraints related to ecological values and relevant environmental planning approvals that may be triggered by the Project components. This report outlines the findings of the desktop and site assessment and provides information regarding potential impacts to ecological values and likely permits, further site visits and documentation required to comply with State and Commonwealth legislation.

1.2 Scope of works

The scope of works includes the following:

- Database and literature review.
- Site assessment of the study site.
- Targeted surveys for threatened species listed in Sections 2.4 as determined by the field and desktop assessment.
- Reporting:
  - Biodiversity values: Description of biodiversity values identified within the study site, including species, native vegetation and habitats recorded during the site assessment.
  - Impact assessment: Determining the potential impacts of the Project on biodiversity values. This includes an assessment of the likelihood that Commonwealth and Victorian listed species and communities are present.
  - Management measures and opportunities: Identifying priority or risk areas that should be avoided if there are opportunities to modify the design. Provide recommendations for design or mitigation measures to avoid or reduce impacts.
  - Legislation and policy: Providing advice on the implications and next steps under the below legislation and policy, including whether a referral/permit/equivalent is likely to be required:
    - Environment Effects Act 1978 (EE Act)
    - *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
    - Melbourne Strategic Assessment
    - *Planning and Environment Act 1987*
    - *Flora and Fauna Guarantee Act 1988*
    - *Wildlife Act 1975*
    - *Catchment and Land Protection Act 1994*
    - *Water Act 1989*
- Further requirements: Providing a list of any further assessment or reporting that will be required.

1.3 Study site and study area

This report refers to two separate definitions describing the area assessed for the Project; *study site* and *study area*.

Study site

The study site refers to the areas that were surveyed on-ground by SMEC ecologists (Figure 1).

The study site is located on the traditional land of the Taungurung people. It includes the road reserves of Northern Highway and Wandong Road, Kilmore, Victoria.

The following information describes the study site and immediate surrounds:

- **Nearest town:** Approximately 3km south of Kilmore, Victoria.
- **Local bioregion:** Highlands - Northern Fall
- **Local Government Area (LGA):** Mitchell Shire
- **Catchment Management Authority (CMA):** Goulburn Broken
- **Local parks and reserves:** Study site is approximately 2.5km south of Monument Hill Reserve.
- **Local waterways and wildlife corridors:** The study site lies approximately 200 m east of an unnamed drain and 820 m east of Kilmore Creek. The road reserves of the Northern Highway support woodland habitat and act as a wildlife corridor, providing north-south connectivity for a diversity of arboreal fauna.

Study area

The study area refers to the study site plus a 10 km buffer area and was assessed by desktop only. The study area provides ecological context and further insight as to what ecological values may occur within the study site. This includes, but is not limited to, modelled vegetation and condition, threatened flora and fauna and ecological communities.

1.4 Definition of key terms

A definition of terms commonly used throughout this report is provided in Table 3.

Table 3: Key terms

Term	Definition
Ecological Vegetation Class (EVC)	A native vegetation type classified on the basis of a combination of its floristics, lifeforms, and ecological characteristics.
Native vegetation	Native vegetation is defined under the Victoria Planning Provisions (VPP) as *'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses'*.
Patch of native vegetation	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, forming a continuous canopy, or Any mapped wetland included in the Current wetlands map, available in DELWP systems and tools.
Scattered tree	A native canopy tree that does not form part of a patch.

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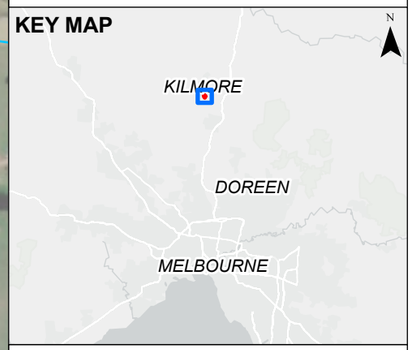
0 50 100 150 200
Meters

Scale:1:5,000 @ A3
GDA2020 MGA Zone 55

LEGEND

- Study site
- Major road
- Minor road
- Stream

KEY MAP



SOURCES:
1. Roads and Waterways © DEECA 2024
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PROJECT:	Northern Highway and Wandong Road Kilmore DDFA
PROJECT NO:	30043285
FIGURE NO:	1
FIGURE TITLE:	Study Site Location
CREATED BY:	RS17486
DATE:	8/10/2024
VERSION:	2

X:\GIS\VIC\PROJECTS\30043285 - Northern Hwy Wandong Rd Roundabout Kilmore\02_Maps\30043285 Ecology Figures\30043285 Ecology Figures.aprx\Figure 1 Data

2. Methods

2.1 Database and literature review

The following resources were reviewed:

- Australian Government EPBC Act Protected Matters Search Tool (PMST);
- Victorian Biodiversity Atlas database (DELWP) and Birdlife Australia database records;
- NatureKit Map (DELWP);
- Ecological Vegetation Class (EVC) mapping of native vegetation;
- Previous ecology reports or assessments relating to the project or study site:
  - Environment Effects Statement (Flora and Fauna): Kilmore-Wallan Bypass (EHP 2014);
- Victorian Planning Schemes online tool (VicPlan) for local government areas relevant to the study site and environment planning overlays and relevant schedules to overlays;
- Relevant state or Commonwealth legislation and policies; and
- Aerial imagery of the study site.

2.2 Site assessment

A site assessment was undertaken by two SMEC ecologists on 29 July 2022. The full extent of the study site was assessed (Figure 1). The following was undertaken during the site assessment:

- Native vegetation was assessed and mapped in accordance with current DELWP methodology described in *Vegetation Quality Assessment Manual – Guidelines for applying the habitat hectares scoring method* and *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017, the Guidelines). This included mapping of:
  - Remnant patches of native vegetation (including canopy drip line and on-ground extent of understorey collected by a surveyor to an accuracy of +-5 m).
  - Large trees within patches.
  - Large and small scattered trees.
- Habitat for State and Commonwealth listed threatened species and communities was assessed and mapped. This included:
  - The location and number of any individuals recorded in the study site, including FFG Act-listed Protected flora.
  - The location of other important fauna habitats or wildlife corridors (including opportunistic observation of hollow-bearing trees, burrows, etc.).
- Mapping other vegetation types, including planted vegetation and non-native vegetation.

Targeted surveys were undertaken for threatened species and communities with methods described in Section 2.4

2.3 Arborist assessment

An assessment of trees at the study site was undertaken by Ryder Arboriculture and Environment on 23 September 2022 (Ryder 2022). The data from the arborist assessment has been used within this report to guide vegetation impacts and retention.

2.4 Targeted surveys

2.4.1 Threatened flora

The targeted survey timing for each threatened species is outlined below in Table 4. Suitable habitat in which to conduct surveys for each species was identified using a combination of information from the initial detailed assessment of the study site and the desktop assessment. The location of any individuals identified during the assessment was recorded with a GPS (±4 m accuracy), including an estimate of the number of individuals in each location. Targeted surveys for threatened flora species were undertaken during the flowering period for each species to ensure the greatest likelihood of detectability.

Matted Flax-lily (December survey)

Surveys were undertaken in accordance with the survey guidelines for Matted Flax-lily outlined in the Biodiversity Precinct Structure Planning Kit (DSE 2010) and DCCEEW guidelines (DCCEEW 2023) in patches of suitable habitat (Herb-rich Foothill Forest).

Basalt Peppercress and Small Milkwort (December survey)

Surveys were undertaken in accordance with Draft *Survey Guidelines for Australia's Threatened Orchids* (DoE 2013) using the 'systematic targeted search parallel transects' methodology which is considered suitable for these species. Surveys were undertaken during the species' key flowering periods (i.e. December to January) in areas of suitable habitat (i.e. Grassy Woodland) within the study site.

Small-flower Wallaby-grass and Fringed Sun-orchid (October Survey)

The 'systematic targeted search parallel transects' method detailed in the Draft *Survey Guidelines for Australia's Threatened Orchids* (DEWHA 2013) was used in all areas of suitable habitat (i.e. patches of Grassy Woodland) for these species.

Table 4: Threatened flora targeted survey timing and location for each species

Scientific name	Common name	EPBC Act-listing	FFG Act-listing	Flowering period	Survey dates	Habitat surveyed
Dianella amoena	Matted Flax-lily	EN	cr	November - February	13 December 2022	Patches of Herb-rich Foothill Forest (EVC 3)
Lepidium hyssopifolium	Basalt Peppercress	EN	en	December - February		Non-native vegetation and patches of Grassy Woodland (EVC 175)
Comesperma polygaloides	Small Milkwort	-	cr	November - January		Patches of Grassy Woodland (EVC 175)
Rytidosperma monticola	Small-flower Wallaby-grass	-	en	September - December	17, 24 and 31 October 2022	
Thelymitra luteocilium	Fringed Sun-orchid	-	vu	September - October		

2.4.2 Threatened fauna

2.4.2.1 Gang-gang Cockatoo

The Gang-gang Cockatoo foraging tree assessment was completed using the arborist dataset (Ryder 2022) and the design footprint of the project. Potential Gang-gang Cockatoo foraging trees were identified using the following methods:

- *Tree species:* Potential foraging tree species were identified based on eucalypt dominated assemblages with dense, shrubby acacia, wattle and banksia understory supporting the highest

density of birds (DAWE 2022a); available literature, and database records where additional foraging or behavioural notes were noted (Birdata and eBird);

- *Tree health:* Trees in poor health or condition do not provide the same amount of nectar foraging resources as trees in good health or condition. Therefore, potential foraging trees included only trees assessed by Ryder (2022) as being in Very Good, Good/Fair and Fair condition; and
- *Tree size:* Trees were classified into the following three size classes:
  - *Large trees* - diameter at breast height (DBH) ≥ 70 cm (as 70 cm is the benchmark large tree size in the relevant Ecological Vegetation Class mapped within the study site);
  - *Medium trees* - DBH between 55 cm and up to 70 cm. Medium trees were included as a category as these trees have potential to become large trees within the next one to five years; and
  - *Small trees* - DBH ≤ 55 cm.

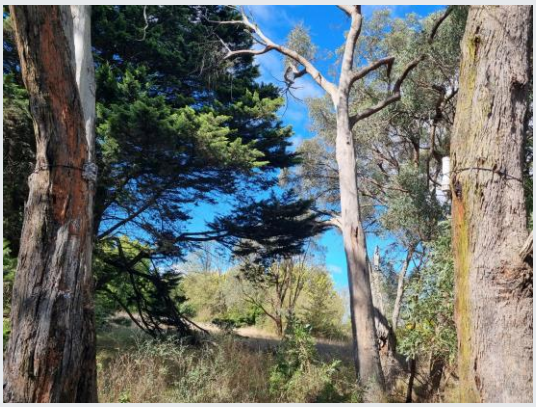
2.4.2.2 Brush-tailed Phascogale

Brush-tailed Phascogale breed between May and July with the male dying after breeding. They are the most active leading up the breeding period and are most commonly detected during Autumn (March to May). Remote camera traps are the most effective way to capture the presence or absence of Brush-tailed Phascogale within a site.

Surveys utilised the remote camera survey methodology as follows:

- A total of four infra-red cameras were deployed within areas identified as potential Brush-tailed Phascogale habitats across the study site including (Figure 5, Table 5):
  - Two cameras deployed on the northern road reserve of Northern Highway within Herb-rich Foothill Forest patches
  - Two cameras deployed on the southern road reserve of the Northern Highway within Herb-rich Foothill Forest patches.
- Cameras are Reconyx H600 Hyperfire Covert Infrared Camera devices and were set up using 'Scrape' settings which includes five captures per trigger with 'High Quality' night mode and medium/high sensitivity;
- Cameras were fixed to trees at approximately 2-3 m above the ground (facing away from the traffic and hidden from view of road users);
- An elevated fixed bait station accompanied each camera to attract the target species (located directly opposite the camera);
- The bait contained a standard mammal mix consisting of oats, golden syrup and peanut butter with added fish oil;
- The surrounding area of the bait station was sprayed with a sugar and water solution as an additional attractant;
- Cameras were left *in-situ* for 14 nights (17 April – 1 May 2023); and
- After collection, photos were analysed to detect the presence of the target species.

Table 5: Brush-tailed Phascogale camera deployment information

Site and Camera ID	Description/Comments	Camera coordinates		Photograph of camera set-up
		Longitude	*Latitude*	
BT1 **Camera #2**	Camera attached to large *Eucalyptus* sp. Bait station placed on opposite side of tree. Camera and bait height as per methodology.	37.326698°S	144.957712°E	
BT2 **Camera #28**	Camera and bait station attached to large *Eucalyptus* sp. Situated near property fence line, inside denser woodland area within road reserve.	37.325840°S	144.956879°E	
BT3 **Camera #18**	Camera and bait station positioning as per methodology. Cameras placed near hollow-bearing trees within road reserve.	37.324045°S	144.956008°E	

Site and Camera ID	Description/Comments	Camera coordinates		Photograph of camera set-up
		Longitude	*Latitude*	
BT4 **Camera #4**	Camera and bait stations attached near fence line within road reserve. Camera and bait station positioning as per methodology.	37.324073ºS	144.956593ºE	

2.4.2.3 Victorian Temperate Woodland Bird Community

A total of 24 species and subspecies constitute this FFG Act-listed community. Only one of these species is required to be detected for habitat within the study sites to be considered the *Victorian Temperate Woodland Bird Community* (VTWBC), as per advice from DEECA and BirdLife Australia (pers. comm. Peter Johnson and Chris Timewell, 2019). Typically winter and spring surveys are undertaken to detect seasonal species that may be present within the study sites at different times of the year.

Surveys for the VTWBC were undertaken concurrently with other flora surveys (in October), and during camera deployment and set up for threatened fauna surveys (May). Nocturnal call-playback is not considered necessary in this instance as nocturnal bird species listed as part of the VTWBC are considered unlikely to occur within the study site.

The following methodologies were undertaken for both winter and spring survey periods:

- Six diurnal (daytime) bird surveys were undertaken by SMEC ecologists using the 20-minute census methodology;
- Six separate locations scattered throughout the study site were surveyed during each survey round (Figure 6);
- Each location covered approximately 2 ha of habitat, with all bird species seen or heard recorded within a 20-minute time period;
- The study site was surveyed in the morning on three separate occasions (within each survey period); and
- If a VTWBC species is encountered, a GPS point was recorded with data collected including species, count, behaviour and notes on any habitat used within the study site.

Information on each survey event is provided below in Table 6.

Table 6: Survey information for Victorian Temperate Woodland Bird Community surveys

Survey date	Start time/finish time	Temperature (min/max, °C)	Wind speed/direction (km/h)
Spring surveys:			
17/10/2022	6:53 – 11:28	4 – 10	26/S
24/10/2022	7:04 – 11:59	10 – 11	13/S
31/10/2022	7:09 – 10.28	12 – 17	25 – 35/N-NW

Survey date	Start time/finish time	Temperature (min/max, °C)	Wind speed/direction (km/h)
Winter surveys:			
17/04/2023	8:30 – 12:00	8.7 – 9.6	7/N
1/05/2023	8:05 – 10:30	6.4 – 14.3	9/S
8/05/2023	9:14 – 11:30	3.1- 11.0	20/SSW

3. Results

3.1 Native vegetation assessment

Native vegetation identified within the study site comprises 4.372 ha of native vegetation, including 62 large trees. Native vegetation proposed to be removed comprises 2.444 ha and 24 large trees. Native vegetation mapping is provided in Figure 2.

- **Patches of native vegetation:** A summary of patches of native vegetation identified within the study site is provided in Table 7. Patches of native vegetation were classified into Ecological Vegetation Classes (EVCs) listed in Table 8, with a description provided in Table 9. The results of the Vegetation Quality Assessment are provided at Appendix A3, and details about large trees within patches are provided in Appendix A4.
- **Scattered trees:** A summary of scattered trees identified within the study site is provided in Table 7, with a description provided in Table 9. Details about scattered trees are provided in Appendix A4.

Table 7: Native vegetation

Native vegetation		Extent / no. within study site	Extent / no. proposed for removal (construction boundary)[1]
Patches of native vegetation	Extent – all EVCs (ha)	4.221 ha	2.317 ha
	Large trees in patches	60	22
Scattered trees	Extent (ha)	0.151	0.127 ha
	Small scattered trees	1	0
	Large scattered trees	2	2
Total	**Native vegetation**	**4.372 ha**	**2.444 ha**
	Large trees	**62**	**24**

Table 8: Ecological Vegetation Classes (EVCs)

Bioregion	EVC (including extent of scattered trees)	Extent (ha) within study site	Extent proposed for removal (construction boundary)
Highlands - Northern Fall	Herb-rich Foothill Forest (EVC 23, Least Concern)	3.990 ha	2.094 ha
	Grassy Woodland (EVC 175, Depleted)	0.382 ha	0.350 ha
Total		**4.372 ha**	**2.444 ha**

3.2 Vegetation and habitat descriptions

A description of native vegetation (EVCs and scattered trees) recorded in the study site is provided in Table 9. A description of other vegetation and habitats recorded in the study site is provided in Table 10. Vegetation and fauna habitats are shown in Figure 2.

[1] Extent proposed to be removed has been calculated based on the construction boundary. Where the arborist has confirmed trees can be retained despite Tree Protection Zone (TPZ) encroachments of >10%, the understorey vegetation has been captured in vegetation removal only (Ryder 2022). Where trees are to be removed, the full canopy of these trees has been captured as per the requirements of the Guidelines (DELWP 2017).

Table 9: Description of native vegetation (EVCs and scattered trees)

EVC name	Description	Photograph (photographs taken on 29 July 2022)
Herb-rich Foothill Forest EVC 23 Least Concern, Highlands - Northern Fall bioregion	**EVC description (DELWP)** Occurs on relatively fertile, moderately well-drained soils on an extremely wide range of geological types and in areas of moderate to high rainfall. Occupies easterly and southerly aspects mainly on lower slopes and in gullies. A medium to tall open forest or woodland to 25 m tall with a small tree layer over a sparse to dense shrub layer. A high cover and diversity of herbs and grasses in the ground layer characterise this EVC (DELWP 2022f). **Vegetation condition** Herb-rich Foothill Forest was the dominant EVC within the study site, occurring within both road reserves of the Northern Highway (Figure 2). Herb-rich Foothill Forest habitat zones within the study site were relatively homogenous, with one patch on the north-east road reserve having a higher weed incursion and fewer large trees (habitat zone: 4A). The canopy layer contained Manna Gum (*Eucalyptus viminalis*) and Narrow-leaf Peppermint (*Eucalyptus radiata*). Canopy trees were often large in circumference and contained a variety of hollows in varying sizes (approximately 5 cm – 20 cm in diameter). All canopy species appeared to be recruiting, with a number of dense swathes of saplings observed throughout the study site. The understorey varied between dense and open throughout the study site, and typically included Blackwood (*Acacia melanoxylon*), Burgan (*Kunzea ericoides*), Black Wattle (*Acacia mearnsii*) and Common Cassinia (*Cassinia aculeata*). The groundcover was comprised of native herbs such as Bidgee-widgee (*Acaena novae-zelandiae*), Common Woodruff (*Asperula conferta*), Common Raspwort (*Gonocarpus tetragynus*) and Hairy Pennywort (*Hydrocotyle hirta*). Native grasses and graminoids (i.e. grass-likes plants) were scattered throughout the patch in low percentage cover (2% - 5% cover on average), including Common Tussock-grass (*Poa labillardierei*), wallaby-grasses (*Rytidosperma* spp.) and Black-anther Flax-lily (*Dianella revoluta*). A population of EPBC Act-listed Matted Flax-lily (*Dianella amoena*) occurred within the Herb-rich Foothill Forest EVC, located within habitat zone 6A (Figure 2). Native scrambler/climbers were interspersed amongst the branches of canopy trees and understorey trees and shrubs and comprised Small-leaved Clematis (*Clematis microphylla*) and the occasional occurrence of Purple Coral-pea (*Hardenbergia violacea*). Weeds covered 15% - 30% of the understorey and included incursions of Blackberry (*Rubus polyanthemus*), Montpellier Broom (*Genista monspessulana*) Large Quaking-grass (*Briza maxima*), Cocksfoot (*Dactylis glomerata*) and Angled Onion (*Allium triquetrum*). Fallen logs and woody debris was scattered throughout all patches. **Fauna habitat** Herb-rich Foothill Forest provided majority of available habitat within the study site for fauna. Various fauna habitat values occurred within this vegetation type, providing opportunities for a diverse range of woodland utilising fauna species. These included: • *Logs and woody debris* – shelter, breeding and foraging opportunities for smaller species such as reptiles, invertebrates and mammals. Scats of the invasive European Rabbit (*Oryctolagus cuniculus*) were observed at entrances leading under woody debris during the site assessment;	 

EVC name	Description	Photograph (photographs taken on 29 July 2022)
	• *Hollows* – shelter and breeding opportunities for arboreal fauna such as birds and mammals i.e. bats, possums and gliders. Numerous hollows of various sizes were observed during the site assessment, with some large hollows being a suitable size for larger birds to use such as Sulphur-crested Cockatoo (*Cacatua galerita*) and Barn Owl (*Tyto alba*). • *Vegetation structure diversity* – vegetation structure was diverse and included ground covers, understorey and canopy vegetation, providing foraging, shelter and movement habitat for various fauna species of different mobility capabilities. Diversity of vegetation and structure allows for a higher species richness and reduces competition from more aggressive species such as Noisy Miner (*Manorina melanocephala*) and Red Wattlebird (*Anthochaera carunculata*). • *Wildlife corridor* – habitat was relatively well connected and formed a linear strip along the road reserve, bounded by cleared land on private property. This wildlife corridor would be frequently used by fauna, particularly cryptic and elusive species that are unable to use cleared land, to move through the landscape and connect to other woodland habitat patches.	
Grassy Woodland EVC 175 Depleted, Highlands - Northern Fall	**EVC description (DELWP)** Grassy Woodland is a variable open eucalypt woodland growing to 15 m tall over a diverse ground layer of grasses and herbs. The shrub component is usually sparse. It occurs on sites with moderate fertility on gentle slopes or undulating hills on a range of geologies. **Vegetation condition** Grassy Woodland occurred in four fragmented habitat zones within the road reserve of Wandong Road. Three patches (habitat zones: 1B, 2B and 4B, Figure 2) comprised native grasses and herbs and were absent of large trees due to historical clearing. These patches were dominated by spear-grasses (*Austrostipa* spp.), Weeping Grass (*Microlaena stipoides* var. *stipoides*), Small-flower Mat-rush (*Lomandra micrantha*), wallaby-grasses and Kangaroo Grass (*Themeda triandra*) comprising up to 60% cover combined. Native herbs including Stinking Pennywort (*Hydrocotyle laxiflora*), Common Raspwort and Grassland Wood-sorrel (*Oxalis perennans*) were scattered throughout. The shrub component was sparse and included Hop Bitter-pea (*Daviesia latifolia*) at <1% cover. Within habitat zone 3B, the canopy layer comprised large Candlebark (*Eucalyptus rubida*) and Manna Gum trees amongst a shrub layer including Lightwood (*Acacia implexa*) and Silver Wattle (*Acacia dealbata*). The understorey comprised those species previously described within habitat zones 1B, 2B and 4B. Weed cover was approximately 15% cover on average and included typical grassy weed species such as Yorkshire Fog (*Holcus lanatus*) and Perennial Rye-grass (*Lolium perenne*) in open areas and Panic Veldt-grass (*Ehrharta erecta*) within the shade of trees. Weedy herbs including Common Peppercress (*Lepidium africanum*) was scattered throughout the southern road reserve of Wandong Road within the study site. **Fauna habitat** As described for Herb-rich Foothill Forest.	 

EVC name	Description	Photograph (photographs taken on 29 July 2022)
Scattered trees	**Vegetation condition** A total of three scattered trees were recorded within the study site. One of these would formerly have been part of the Herb-rich Foothill Forest EVC; however, the understorey vegetation consists of predominantly introduced species, and the trees no longer form a patch of native vegetation. This tree was small and isolated. Two large scattered trees located on Wandong Road would have formerly been part of the Grassy Woodland EVC; however, were located adjacent a row of planted Monterey Cypress (*Cupressus macrocarpa*) and were amongst a predominantly introduced understorey no longer forming a patch. These trees were dead, had a large circumference and contained hollows. **Fauna habitat** As described for Herb-rich Foothill Forest.	

Table 10: Description of other vegetation and habitats

EVC name	Description	Photograph (photographs taken on 29 July 2022)
Planted vegetation	**Vegetation** Much of the remaining vegetation is highly modified and includes scattered native grasses and introduced ornamental varieties in the adjoining properties. Commonly planted species within the study site included Kohuhu (*Pittosporum tenuifolium*), Silver Dollars (*Eucalyptus cinerea*) and Monterey Cypress. These species occurred along fence lines of neighbouring properties within the study site. A windrow of planted Monterey Cypress occurred along Wandong Road (Figure 2). **Fauna habitat** Limited fauna habitat occurred in areas of planted vegetation/modified grasslands, where only adaptable species are considered to use habitat in these areas for foraging opportunities. Species that may use modified grasslands include Common Starling (*Sturnus vulgaris*), Australian Magpie (*Gymnorhina tibicen*) and Long-billed Corella (*Cacatua tenuirostris*).	 

EVC name	Description	Photograph (photographs taken on 29 July 2022)
Non-native vegetation	**Vegetation** None-native vegetation was scattered throughout the site amongst native vegetation and included incursions of woody weeds such as Blackberry, Montpellier Broom, Sweet Briar (*Rosa rubiginosa*), Sweet Pittosporum (*Pittosporum undulatum*) and Gorse (*Ulex europaeus*). Grassy weeds occurred within open areas of the study site and comprised a mixture of Toowoomba Canary-grass (*Phalaris aquatica*), Paspalum (*Paspalum dilatatum*) and Kikuyu (*Cenchrus clandestinus*). Introduced herbs were scattered throughout the study site including Flatweed (*Hypochaeris radicata*), Cleavers (*Galium aparine*) and Angled Onion. **Fauna habitat** Non-native weedy vegetation (in particular, Blackberry) occurred amongst native vegetation and would provide habitat for introduced and adaptable native fauna for shelter, breeding and foraging opportunities. Blackberry thickets are potentially used by European Rabbit, Red Fox (*Vulpes vulpes*) and small bird species within the study site.	 

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Meters

Scale:1:750 @ A3
GDA2020 MGA Zone 55

LEGEND

- Major road
- Minor road
- Stream
- Study site
- Non-native planted vegetation
- Vegetation removal

Ecological Vegetation Class

- Herb-rich Foothill Forest (EVC 23)
- Victorian Temperate Woodland Bird Community

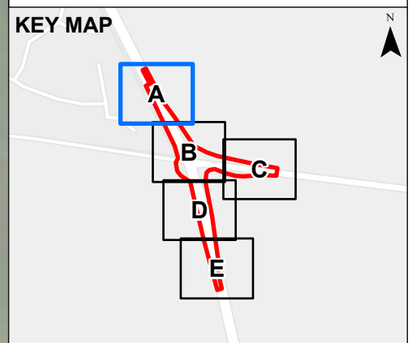
Trees to be retained

- Hollow-bearing tree
- Large tree in patch

Noxious Weeds

- Blackberry
- Spear Thistle

KEY MAP



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PROJECT NO:	30043285
FIGURE NO:	2 - A
FIGURE TITLE:	Ecological Features of the Study Site
CREATED BY:	RS17486
DATE:	28/10/2024
VERSION:	9

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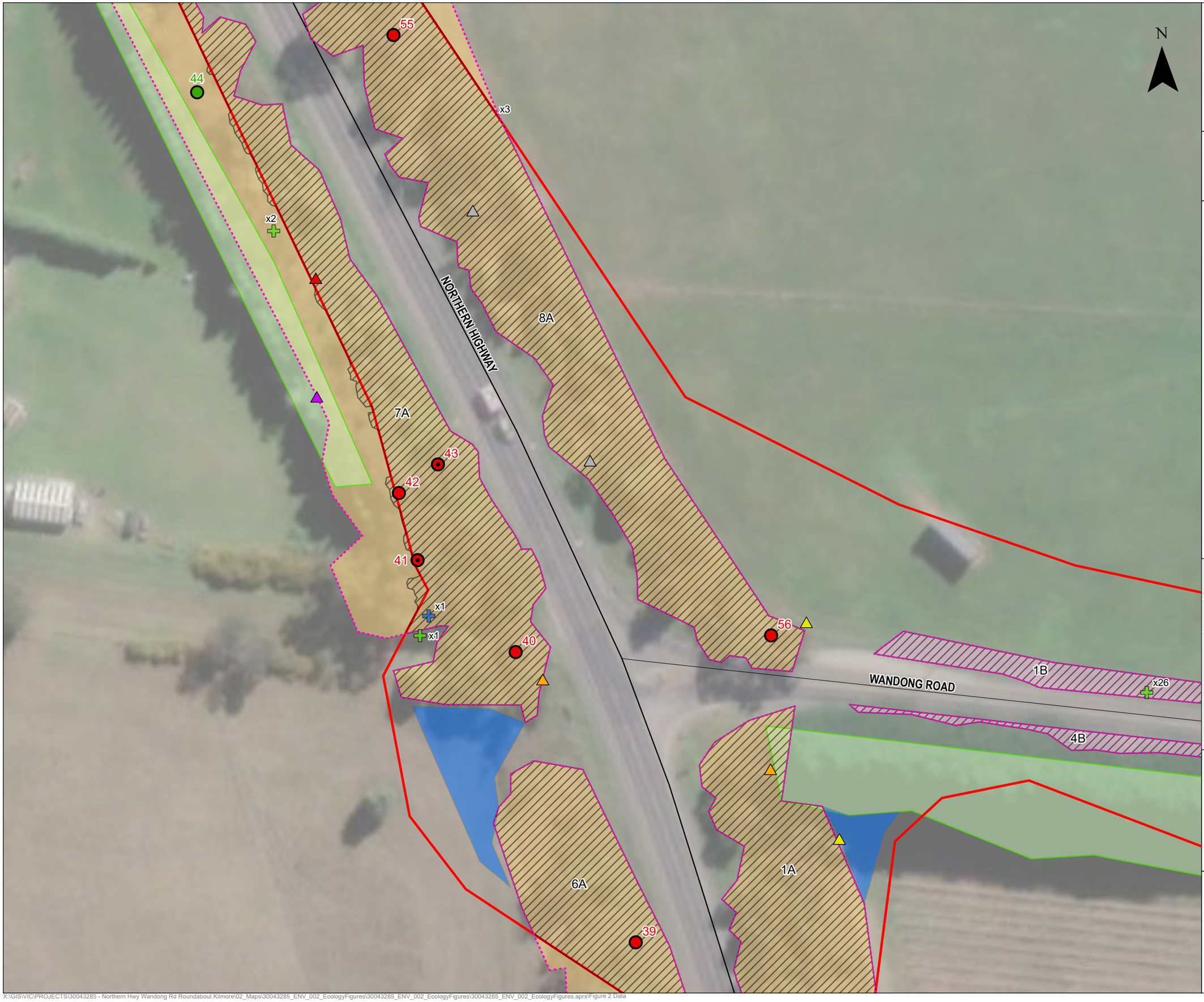

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GDA2020 MGA Zone 55

LEGEND

- Major road
- Minor road
- Stream
- Study site
- Non-native planted vegetation
- Vegetation removal
- Weed patch

Ecological Vegetation Class

- Herb-rich Foothill Forest (EVC 23)
- Grassy Woodland (EVC 175)
- Victorian Temperate Woodland Bird Community

Trees to be retained

- Large tree in patch

Trees to be removed

- Large tree in patch

FFG Act-listed Protected Flora

- Onion Orchid
- Spotted Sun-orchid

Noxious Weeds

- Angled Onion
- Blackberry
- Gorse
- Montpellier Broom
- Sweet Briar

KEY MAP

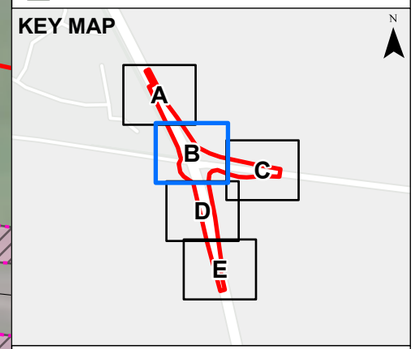

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FIGURE NO:	2 - B
FIGURE TITLE:	Ecological Features of the Study Site
CREATED BY:	RS17486
DATE:	28/10/2024
VERSION:	9

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LEGEND

- Minor road
- Stream
- Study site
- Native planted vegetation
- Non-native planted vegetation
- Vegetation removal

Ecological Vegetation Class

- Grassy Woodland (EVC 175)
- Victorian Temperate Woodland Bird Community

Trees to be removed

- Large scattered tree
- Large tree in patch

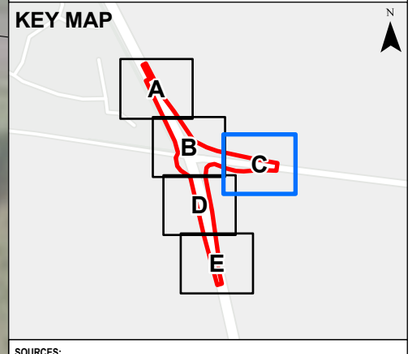
FFG Act-listed Protected Flora

- Spotted Sun-orchid

Noxious Weeds

- Montpellier Broom
- Soursob

KEY MAP



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1. Roads and Waterways © DEECA 2024
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PROJECT:	Northern Highway and Wandong Road Kilmore DDFA
PROJECT NO:	30043285
FIGURE NO:	2 - C
FIGURE TITLE:	Ecological Features of the Study Site
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VERSION:	9

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GDA2020 MGA Zone 55

LEGEND

- Major road
- Minor road
- Study site
- Vegetation removal

Ecological Vegetation Class

- Herb-rich Foothill Forest (EVC 23)
- Victorian Temperate Woodland Bird Community

Trees to be retained

- Hollow-bearing tree
- Large tree in patch

Trees to be removed

- Large tree in patch

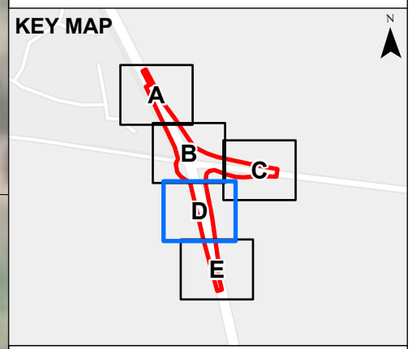
EPBC-Act Listed Threatened Flora

- Matted Flax-lily

Noxious Weeds

- Angled Onion
- Blackberry
- Gorse
- Montpellier Broom

KEY MAP



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PROJECT NO:	30043285
FIGURE NO:	2 - D
FIGURE TITLE:	Ecological Features of the Study Site
CREATED BY:	RS17486
DATE:	28/10/2024
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Scale:1:750 @ A3
GDA2020 MGA Zone 55

LEGEND

- Major road
- Stream
- Study site
- Vegetation removal

Ecological Vegetation Class

- Herb-rich Foothill Forest (EVC 23)
- Victorian Temperate Woodland Bird Community

Trees to be retained

- Hollow-bearing tree
- Small scattered tree
- Large tree in patch

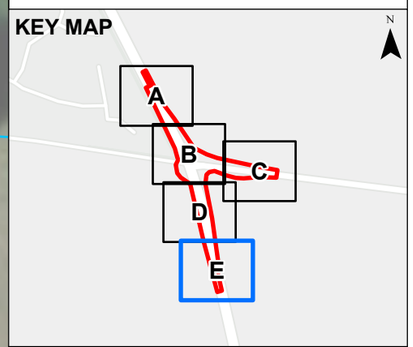
Trees to be removed

- Large tree in patch

Noxious Weeds

- Angled Onion
- Blackberry
- Montpellier Broom

KEY MAP



SOURCES:
1. Roads and Waterways © DEECA 2024
2. Basemap © MetroMap World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
Light Gray Base: Vicmap, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS

PROJECT:	Northern Highway and Wandong Road Kilmore DDFA
PROJECT NO:	30043285
FIGURE NO:	2 - E
FIGURE TITLE:	Ecological Features of the Study Site
CREATED BY:	RS17486
DATE:	28/10/2024
VERSION:	9

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3.3.1 Listed under the EPBC Act

3.3.1.1 Flora

The database review identified two EPBC Act-listed flora species that have previously been recorded within 10km of the study site (VBA, DELWP 2022a), and an additional 18 species with potential to occur (PMST, DCCEEW 2022a). These species are listed in Appendix A2 and shown in Figure 3.

Of these species, suitable habitat was identified within the study site for the species described below. There is no suitable habitat within the study site for the remaining species.

3.3.1.1.1 Matted Flax-lily

Conservation status

Endangered under EPBC Act; Critically endangered under FFG Act.

Description

Matted Flax-lily is a perennial, mat-forming lily that forms loose clumps up to 5 m wide (DCCEEW 2023f). It is largely confined to drier grassy woodland and grassland communities south of the Dividing Range and is now much depleted through its range (Vicflora 2023).

Suitable habitat

A patch of Matted Flax-lily was recorded immediately adjacent to the study site within habitat zone 6A (Figure 2). A similar Dianella species was recorded within habitat zone 5A, however it was determined to be the non-threatened Black-anther Flax-lily. Matted Flax-lily was previously recorded in the area during targeted surveys undertaken in 2012 by Ecology and Heritage Partners (EHP 2014). Suitable habitat for this species is located throughout the study site within patches of Herb-rich Foothill Forest.

Targeted survey result

Targeted surveys were undertaken on 13 December 2022 and no additional Matted Flax-lily were detected within areas proposed to be impacted. The population present at the study site (approximately two to three individuals) were not observed to be actively producing seed or spreading throughout the study site.

Potential impact

The Project has been designed to avoid impacts to the existing population of Matted Flax-lily identified adjacent to the study site. A Significant Impact Assessment has been provided below in Table 12 and a significant impact is considered unlikely.

Recommendation

Install No-Go Zone fencing and signage during all stages of the project to avoid any impact to the existing population.

NOTE: The implementation of mitigation measures must be confirmed by DTP.

Table 12: Significant Impact Assessment for Matted Flax-lily

Significant Impact Criteria	Significant impact without mitigation measures	Suggested mitigation measure(s) to be confirmed through consultation with DTP	Residual risk with mitigation measures*	Significant impact with mitigation measures*
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real change or possibility that it will:				
Lead to a long-term decrease in the size of a population	**Unlikely** Works have been designed to avoid the known extent of Matted Flax-lily.	Install No-Go Zone fencing and signage during all stages of the project to avoid any impact to the species including a buffer zone for the species location. If required, the translocation of Matted Flax-lily to a suitable receptor site could be an option to mitigate any impacts to the species.	**Low**	**Unlikely**
Reduce the area of occupancy of the species	**Unlikely** The works will not be removing Matted Flax-lily and will therefore not reduce the area of its occupancy.	Reduce the extent of vegetation proposed for removal where possible. Protect retained vegetation using No-Go Zone fencing and signage during construction.	**Low**	**Unlikely**
Fragment an existing population into two or more populations	**Unlikely** The works will not be removing Matted Flax-lily and will not fragment the population.	Reduce the extent of vegetation proposed for removal where possible. Protect retained vegetation using No-Go Zone fencing and signage during construction.	**Low**	**Unlikely**
Adversely affect habitat critical to the survival of a species	**Unlikely** The works will not be removing habitat critical to the species survival.	Install No-Go Zone fencing and signage during all stages of the project to avoid any impact to the species including a buffer zone for the species location. Reduce the extent of vegetation proposed for removal where possible. Protect retained vegetation using No-Go Zone fencing and signage during construction.	**Low**	**Unlikely**
Disrupt the breeding cycle of a population	**Unlikely** The works will not be disrupting the breeding cycle of Matted Flax-lily.	N/A	**Low**	**Unlikely**
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Unlikely** The works will not be removing or decreasing the habitat to the extent that the species is likely to decline.	Install No-Go Zone fencing and signage during all stages of the project to avoid any impact to the species including a buffer zone for the species location.	**Low**	**Unlikely**
Result in invasive species that are harmful to a critically endangered or	**Unlikely** The study site has invasive flora species present within habitat	Implement a CEMP that will outline measures to minimise and avoid the spread of invasive weed species.	**Low**	**Unlikely**

Significant Impact Criteria	Significant impact without mitigation measures	Suggested mitigation measure(s) to be confirmed through consultation with DTP	Residual risk with mitigation measures*	Significant impact with mitigation measures*
endangered species becoming established in the endangered or critically endangered species' habitat	suitable for the species, it is likely that remediation works post-construction will improve the habitat quality and reduce the extent of invasive species.			
Introduce disease that may cause the species to decline	**Unlikely** The works are not expected to introduce diseases that will cause the species to decline.	Implement hygiene controls during construction outlined within the project CEMP to prevent the spread of Cinnamon Fungus (*Phytophthora cinnamomi*).	**Low**	**Unlikely**
Interfere with the recovery of the species	**Unlikely** The works will not interfere with the recovery of the species. The population present at the study site (approximately two to three individuals) was not observed to be actively producing seed or spreading throughout the study site, therefore suggesting the population is not an important population. Further to this, it has been avoided as part of the Project design.	Install No-Go Zone fencing and signage during all stages of the project to avoid any impact to the species including a buffer zone for the species location.	**Low**	**Unlikely**

* Assumes the suggested mitigation measures have been applied. Suggested mitigation measure(s) must be confirmed by DTP.

3.3.1.1.2 Basalt Peppercress

Conservation status

Endangered under EPBC Act; Endangered under FFG Act.

Description

Basalt Peppercress is a small perennial herb endemic to south-eastern Australia. Its former range has been reduced due to widespread degradation and loss of grassland and grassy woodland habitats in south-eastern Australia. It is currently only known from 35 populations containing approximately 1,700 plants within Victoria (DSE 2010). Basalt Peppercress requires disturbance for seed germination and seedling recruitment, and it is known to occur in grassy eucalypt and/or Allocasuarina woodlands (DSE 2010). Almost all of the remaining populations occur in heavily modified, non-natural environments amongst exotic pasture grasses and weed species (Vicflora 2022).

There is one previous record for this species from within the study area from 2010, located approximately 8.9 km south of the study site (DELWP 2022a, 2022b).

Suitable habitat

Habitat suitable for Basalt Peppercress was recorded within the study site in patches of Grassy Woodland (EVC 175) along Wandong Road (Figure 2). A similar Lepidium species was recorded within these patches, however it and was determined to be the weedy Common Peppercress (*Lepidium africanum*).

Targeted survey result

The species was not detected during targeted surveys undertaken on 13 December 2022. Large patches of Common Peppercress (non-native) were detected along Wandong Road.

Potential impact

Basalt Peppercress was not recorded at the study site and is therefore not expected to be impacted by the Project. A significant impact assessment was not considered necessary and was not undertaken.

Recommendation

No further consideration necessary.

3.3.1.2 Fauna

The database review identified eight EPBC Act-listed fauna species that have previously been recorded within 10km of the study site (VBA, DELWP 2022a), and an additional 12 species with potential to occur (PMST, DCCEEW 2022a). These species are listed in Appendix B2 and shown in Figure 4.

Of these species, suitable habitat was identified within the study site for the species listed below and in Table 15. There is no suitable habitat within the study site for the remaining species.

3.3.1.2.1 Gang-gang Cockatoo

Conservation status

Endangered under EPBC Act; not listed under FFG Act.

Description

Gang-gang Cockatoo uses eucalypt woodland habitats for foraging, breeding and movement. Large hollows are used for nesting. Gang-gang Cockatoo are seasonal altitudinal migrants and migrate from high altitude forests to forests at lower altitudes during autumn and winter.

There are no previous records for Gang-gang Cockatoo within the study site boundary in available databases (VBA, Birdata and eBird). However, there are multiple previous records for species from within 10 km of the study site, although these are aggregated within areas that support typically intact remnant native vegetation (i.e. Monument Hill Reserve, Mount Disappointment State Forest and Kinglake National Park). Furthermore, Gang-gang Cockatoo were observed foraging on woodland habitat within the study site during the Victorian Temperate Woodland Bird Community surveys (Figure 6).

Suitable habitat

The species is likely to use habitat within the study site for occasional foraging, particularly when travelling to more suitable breeding habitat in the high altitudes (DAWE 2022a). Potential foraging habitat within the study site includes eucalyptus and acacia tree species found within the Grassy Woodland and Herb-rich Foothill Forest EVCs.

Although large hollows occur within the study site, it is considered unlikely for Gang-gang Cockatoo to use them for nesting as the species typically breeds in old growth and undisturbed forests at higher altitudes (DAWE 2022a).

Foraging tree assessment result

A total of 459 potential foraging trees were recorded within the study site. Of these, 281 potential foraging trees are likely to be impacted by the project (Table 12), including:

- 24 large eucalypts;
- 19 medium eucalypts and acacias; and
- 238 small eucalypts and acacias.

Potential foraging trees comprised eucalyptus and acacia species described in the Arborist report (Ryder 2022, Table 13).

Table 13: Gang-gang Cockatoo foraging trees likely to be impacted by the project.

Size	Species	Number within study site	Number to be removed
Large	*Eucalyptus* spp.	30	24
	Sub-total	*30*	*24*
Medium	*Eucalyptus* spp.	25	16
	Acacia spp.	3	3
	Sub-total	*28*	*19*

Size	Species	Number within study site	Number to be removed
Small	*Eucalyptus* spp.	172	129
	Acacia spp.	132	109
	Sub-total	*304*	*238*
Grand Total		**359**	**281**

Potential impact

A total of 2.444 ha of potential foraging habitat is proposed to be removed, comprising Grassy Woodland and Herb-rich Foothill Forest EVC and 281 potential foraging trees (24 large, 19 medium and 238 small trees).

A Significant Impact Assessment for this species is provided below in Table 14. It is considered unlikely that the Project will have a significant impact on Gang-gang Cockatoo when considering the number, health and size of foraging trees proposed to be removed, the availability of foraging habitat in the wider region and the highly mobile nature of the species.

Recommendation

Impacts to potential foraging species should be avoided and minimised where possible during the subsequent phases of the Project (i.e., construction). It is recommended that a Project arborist be engaged throughout the construction phase of the Project to implement tree protection measures that may retain additional trees currently proposed to be removed.

Table 14: Significant Impact Assessment for Gang-gang Cockatoo

Significant Impact Criteria	Significant impact without mitigation measures	Suggested Mitigation Measure(s) to be confirmed through consultation with DTP	Residual Risk with mitigation measure(s)	Likelihood of Significant Impact with mitigation measures*
Lead to long-term decrease in the size of a population	**Unlikely** The project is unlikely to lead to a long-term decrease in the size of the Gang-gang Cockatoo population for the following reasons: • The trees proposed to be removed are a potential foraging resource only. The trees do not provide breeding habitat. Gang-gang Cockatoo breeds in large, hollow-bearing trees, usually in mature forests, particularly in eastern Victoria and NSW (DAWE 2022a). A total of 39 of the trees proposed to be removed contain hollows of varying sizes, however, none of these are expected to provide breeding habitat for Gang-gang Cockatoo as the study site is outside of the known breeding range for the species (DAWE 2022a). • As the trees do not provide breeding habitat, their removal will not result in the death of birds. Any birds that visit the trees to forage on occasion would fly away as a result of the disturbance caused by construction and tree lopping/removal. • The species is unlikely to be dependent on trees in the study site. The trees proposed to be removed are common in the local area (a variety of common acacias and eucalypts), and do not provide a unique or restricted food resource. Gang-gang Cockatoo has a wide-ranging diet and is known to feed on >130 plant species across 25 plant families (DAWE 2022a). The species forages in road reserves, parks and	Install No-Go Zone fencing and signage during all stages of the project to avoid any unnecessary impact to additional foraging trees that are proposed to be retained adjacent to the construction zone. Ensure a qualified zoologist undertakes fauna pre-clearance surveys when removing any vegetation, particularly hollow-bearing trees.	Low	Unlikely

Significant Impact Criteria	Significant impact without mitigation measures	Suggested Mitigation Measure(s) to be confirmed through consultation with DTP	Residual Risk with mitigation measure(s)	Likelihood of Significant Impact with mitigation measures*
	gardens in both native and non-native trees. • The trees proposed to be removed are unlikely to provide a favoured or repeat foraging resource for this species. Data available in the VBA, Birdata and eBird indicate that birds are more likely to visit Monument Hill Reserve, Mount Disappointment State Forest and Kinglake National Park, with the study site visited on an occasional basis.			
Reduce the area of occupancy by the species	**Unlikely** The project is unlikely to reduce the area of occupancy of Gang-gang Cockatoo for the following reasons: • The area of occupancy for the Gang-gang Cockatoo is estimated to be stable and at 30,000 km^2 (3 million ha) (DAWE 2022a). Approximately 2.444 ha including 281 foraging trees of varying size and health status are proposed to be removed, which represents 0.00008% of the area of occupancy for the species. • Post-construction landscape planting will include trees suitable for Gang-gang Cockatoo, which over time will compensate for the removal of foraging habitat.	Engage a project arborist to undertake preventative and remedial tree works prior to civil construction commencing.	Low	Unlikely
Fragment an existing population into two or more population	**Unlikely** The project is unlikely to fragment an existing population into two or more populations for the following reasons: • Gang-gang Cockatoo is a seasonal migrant and covers a broad area for foraging during the non-breeding season. Individuals routinely fly over potential barriers and habitat gaps.	N/A	Low	Unlikely

Significant Impact Criteria	Significant impact without mitigation measures	Suggested Mitigation Measure(s) to be confirmed through consultation with DTP	Residual Risk with mitigation measure(s)	Likelihood of Significant Impact with mitigation measures*
	• The removal of trees associated with the project will not create a habitat gap or other barrier that would result in fragmentation of the population.			
Adversely affect habitat critical to the survival of a species	**Unlikely** Based on the species' approved Conservation Advice (DAWE 2022), habitat critical to the survival of the Gang-gang Cockatoo includes: • Tall mountain forests and woodlands during the summer months. • Drier more open eucalypt forest and woodlands at lower altitudes during winter months. • All foraging habitat during both the breeding and non-breeding season. • Hollow-bearing trees, which are a key component of their breeding habitat. This includes stands of trees within or adjacent to known breeding areas, that are likely to become hollow bearing in future years. Given the wording of the Conservation Advice, it is noted that *any* impact on foraging habitat (e.g., removal of a single, small tree) could be interpreted as an adverse effect on "habitat critical to the survival", and therefore a potential significant impact under the EPBC Act. However, recent revised advice received from DCCEEW identified that the SIA for an endangered species should be applied when determining whether an impact is likely to adversely impact habitat critical to the survival of a species, with the Conservation Advice used as a guide rather than a strict policy document. Therefore, the project is unlikely to adversely affect habitat critical to the	Further reduce the removal of foraging habitat within the study site by engaging a project arborist to undertake preventative and remedial tree works prior to civil construction commencing, and following recommendations outlined by the Arborist Impact Assessment (Ryder 2022).	Low	Unlikely

Significant Impact Criteria	Significant impact without mitigation measures	Suggested Mitigation Measure(s) to be confirmed through consultation with DTP	Residual Risk with mitigation measure(s)	Likelihood of Significant Impact with mitigation measures*
	survival of Gang-gang Cockatoo for the following reasons: • Habitat proposed to be removed does not meet that described in the first point of "habitat critical to the survival". Habitat within the study site is not a tall mountain forest. • Trees to be removed may provide a foraging resource, however the tree species are common in the local area, do not provide a unique or restricted food resource, and are unlikely to provide a favoured or repeat foraging resource for Gang-gang Cockatoo (further detail on these points is provided against the above criterion *"lead to a long-term decrease in the size of a population"*).			
Disrupt the breeding cycle of a population	**Unlikely** There are no breeding records of Gang-gang Cockatoo in the greater Melbourne region. Gang-gang Cockatoos favour old growth forest and woodland for breeding. The species nests in suitable hollow-bearing trees, with hollows a minimum of 12 cm high, 9cm wide and 22cm deep, between 5–9.4 m above the ground (DAWE 2022). Although 39 of the trees proposed to be removed contain hollows of varying sizes and depths, they are not expected to provide breeding habitat due to the low altitude of the study site and that they are not within or adjacent to a known breeding area.	N/A	Low	Unlikely
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent	**Unlikely** The project is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the	As per the recommendations outlined by Ryder (2022), engage a project arborist to undertake preventative and	Low	Unlikely

Significant Impact Criteria	Significant impact without mitigation measures	Suggested Mitigation Measure(s) to be confirmed through consultation with DTP	Residual Risk with mitigation measure(s)	Likelihood of Significant Impact with mitigation measures*
that the species is likely to decline.	extent that Gang-gang Cockatoo is likely to decline. Approximately 2.444 ha of foraging habitat is proposed to be removed, however the species is unlikely to decline as a result of this impact. Rationale to support this assertion is provided in the above criterion *"lead to a long-term decrease in the size of a population"*.	remedial tree works prior to civil construction commencing.		
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	**Unlikely** The project is unlikely to result in invasive species becoming established. A broad range of introduced pest animal and plant species are already established within the study site and surrounds. The project is not expected to lead to any new invasive species becoming established in the species habitat. The Conservation Advice identifies two threats impacting Gang-gang Cockatoo that could relate to invasive species: Competition for nest hollows with other species and Nest predation by Common Brushtail Possum. As per above, the project is unlikely to exacerbate any existing threats to the species.	N/A	Low	Unlikely
Introduce disease that may cause the species to decline	**Unlikely** The Conservation Advice identifies one disease in the list of threats impacting Gang-gang Cockatoo: Psittacine beak and feather disease. The Project is unlikely to influence the occurrence or severity of this disease, or any other disease known to affect cockatoos.	N/A	Low	Unlikely
Interfere with the recovery of the species	**Unlikely** The project is unlikely to interfere with the recovery of Gang-gang Cockatoo.	As per the recommendations outlined by Ryder (2022), engage a project arborist to undertake preventative and	Low	Unlikely

Significant Impact Criteria	Significant impact without mitigation measures	Suggested Mitigation Measure(s) to be confirmed through consultation with DTP	Residual Risk with mitigation measure(s)	Likelihood of Significant Impact with mitigation measures*
	Approximately 2.444 ha of foraging habitat is proposed to be removed, however the recovery of the species is unlikely to be affected as a result of this impact. Rationale to support this assertion is provided in the above criterion *"lead to a long-term decrease in the size of a population*	remedial tree works prior to civil construction commencing.		

* Assumes the suggested mitigation measures have been applied. Suggested mitigation measure(s) must be confirmed by DTP.

3.3.1.2.2 Additional species considered as part of the Preliminary Site Assessment

Species identified in Table 15 were considered as part of the preliminary site assessment. Impacts were considered unlikely, and no further consideration was deemed necessary.

Table 15: Description of fauna species listed under the EPBC Act

Species	Description
Swift Parrot *Lathamus discolor*	***Conservation status**:* Critically Endangered and Marine under the EPBC Act; critically endangered under the FFG Act. ***Description**:* Swift Parrots are a highly mobile and dispersive species, where they breed in Tasmania and migrate to mainland Australia during winter months. During their over-wintering period in Victoria, they are widely dispersed and opportunistically utilise woodland habitat wherever key flowering eucalyptus tree species are available for foraging. Key foraging tree species were not detected within the study site. However woodland habitat may be visited infrequently by Swift Parrot as a 'stepping stone' when migrating to other habitat patches within the surrounding landscape. There are no previous records for Swift Parrot from within the study site on available online resources (VBA, eBird, Birdata). There are multiple previous records within the broader study area including within the town of Kilmore, north of the study site, and south of the study site within Yan Yean Reservoir Reserve. ***Recommendation**:* Due to the absence of key foraging tree species (Ryder 2022), this species is unlikely to be impacted by the project. No further consideration necessary.
White-throated Needletail *Hirundapus caudacutus*	***Conservation status**:* Vulnerable and Migratory/Marine under the EPBC Act; vulnerable under the FFG Act. ***Description**:* Seasonal non-breeding summer migrants that have large distributions within Australia. They may visit the study site for aerially foraging and are unlikely to roost within woodland habitat available within the study site. ***Recommendation**:* As this species is predominantly aerial it is unlikely to use terrestrial habitat in the study site. Therefore, it is unlikely to be impacted by the project and no further consideration necessary.
Rufous Fantail *Rhipidura rufifrons* and **Satin Flycatcher** *Myiagra cyanoleuca*	***Conservation status**:* Migratory and Marine under the EPBC Act. ***Description**:* These bird species are spring/summer migrants to Victoria and utilise woodland habitat for foraging, shelter and movement. Woodland habitat within the study site may be visited on rare occasions by these species as a 'stepping stone' when migrating to other habitat patches within the surrounding landscape. ***Recommendation**:* These species are unlikely to be impacted by the project and no further consideration necessary.

3.3.1.3 Communities

The database review identified four EPBC Act-listed communities with potential to occur within 10km of the study site (PMST, DCCEEW 2022a). These communities are listed in Appendix C1.

Of these communities, none were recorded within the study site.

3.3.2 Listed under the FFG Act

3.3.2.1 Flora

The database review identified nine FFG Act-listed flora species that have previously been recorded within 10km of the study site (VBA, DELWP 2022a). These species are listed in Appendix A2 and shown in Figure 3.

Of these species, suitable habitat was identified within the study site for the species listed in Table 16 (species listed under both the FFG Act and the EPBC Act were described in Section 3.3.1). There is no suitable habitat within the study site for the remaining species.

Table 16: Description of flora species listed under the FFG Act

Species	Description
Fringed Sun-orchid *Thelymitra luteocilium*	***Conservation status**:* Vulnerable under the FFG Act. ***Description**:* Fringed Sun-orchid is a species of orchid that is endemic to south-eastern Australia. It has a scattered occurrence within the state and is relatively rare within Victoria. It occurs within low shrubby or open forests or within open rocky sites and requires well-draining soils (Vicflora 2022). There is one previous record for this species from within the study area from 1995 approximately 3.5 km north-east of the study site (DELWP 2022a, 2022b). Although this record is not recent, it should be noted that it can be difficult to detect the presence of sun-orchids without surveying for them during suitable times of the year as they are only known to flower on hot and humid days with Fringed Sun-orchid flowering between September and October (Vicflora 2022). ***Suitable habitat:*** Suitable habitat was recorded for this species in patches of Grassy Woodland (EVC 175) within the study site. ***Targeted survey results:*** Targeted surveys did not detect the species within the study site. Three individual sun-orchids (*Thelymitra* sp.) were recorded on the western road reserve of Northern Highway (Figure 2) opposite Wandong Road; however these were determined to be a common Sun Orchid species: Spotted Sun-orchid (*Thelymitra ixioides*). ***Potential impact:*** This species was not recorded at the study site and is therefore not expected to be impacted by the Project. ***Recommendation**:* No further consideration is necessary.
Small-flower Wallaby-grass *Rytidosperma monticola*	***Conservation status**:* Endangered under the FFG Act. ***Description**:* Small-flower Wallaby-grass is a compact, tufted perennial grass that flowers between September and December (Vicflora 2022). It occurs in dry, grassy woodland (Vicflora 2022) such as the vegetation recorded within patches of Grassy Woodland (EVC 175) within the study site. It can be difficult to confirm this species presence wen not flowering due to a lack of diagnostic features in other plant material. There are three previous records for Small-flower Wallaby-grass from within the study area within the road reserve of the Northern Highway, with the closest record approximately 3.5 km south of the study site (DELWP 2022a, 2022b). ***Suitable habitat:*** Suitable habitat for this species was recorded within the study site in patches of Grassy Woodland (EVC 175). A number of wallaby-grass species were present within the study site with the majority initially unable to be identified to species level as they were not flowering during the initial site assessment. ***Targeted survey results:*** Small-flower Wallaby-grass was not detected within the study site during targeted surveys. One species of Wallaby-grass was recorded and identified to be the non-threatened Bristly Wallaby-grass (*R. setaceum*). ***Potential impact:*** This species was not recorded at the study site and is therefore not expected to be impacted by the Project. ***Recommendation**:* No further consideration is necessary.
Small Milkwort *Comesperma polygaloides*	***Conservation status**:* Critically endangered under the FFG Act. ***Description**:* Small Milkwort is an erect, perennial forb which grows to 10-20 cm tall arising from woody underground rhizomes. It has distinct pink to mauve flowers in terminal racemes (Vicflora 2022). It occurs in grassland and grassy woodland communities in central and south-western areas of Victoria (Vicflora 2022). It flowers between November and January (Vicflora 2022). There is one previous record for this species from within the study area, located approximately 3 km north-east of the study site (DELWP 2022a, 2022b). ***Suitable habitat:*** Suitable habitat for this species was recorded within the study site in patches of Grassy Woodland (EVC 175). ***Targeted survey results:*** This species was not detected within the study site during targeted surveys. ***Potential impact:*** This species was not recorded at the study site and is therefore not expected to be impacted by the Project. ***Recommendation**:* No further consideration is necessary.

3.3.2.2 Fauna

The database review identified 37 FFG Act-listed fauna species that have previously been recorded within 10km of the study site (VBA, DELWP 2022a). These species are listed in Appendix A2 and shown in Figure 4.

The Victorian Biodiversity Atlas (VBA) (DELWP 2022a) identified 37 FFG Act-listed fauna species that have previously been recorded within the study area (i.e., within 10km of the study site). These species are listed in Appendix A2 and shown in Figure 4.

Of these species, suitable habitat was identified within the study site for the species listed below and in Table 18 (species listed under both the FFG Act and the EPBC Act were described in Section 3.3.1). There is no suitable habitat within the study site for the remaining species.

3.3.2.2.1 Brush-tailed Phascogale

Conservation status

Vulnerable under the FFG Act.

Description

Brush-tailed Phascogale utilise woodland habitat for foraging and utilises hollow-bearing trees for shelter and nesting opportunities. The species is known to occur within the greater Kilmore area, both in reserves such as Monument Hill as well as utilising woodland habitats and scattered trees in road reserves (EHP 2014), particularly for movement and dispersal between larger habitat patches.

Suitable habitat

Suitable habitat for this species was recorded throughout the study site within the woodland vegetation of Herb-rich Foothill Forest.

Targeted survey result

This species was not detected within the study site during targeted surveys. Two other non-threatened species were detected via the camera traps including: one Common Ring-tailed Possum (*Pseudocheirus peregrinus*) at BT #4 and one Black Rat (*Rattus rattus*) at BT #2 (Table 17, Figure 5).

Table 17: Brush-tailed Phascogale remote camera trap results (17 April – 1 May 2023)

Site	Camera ID	Comments/observations	Photograph
BT1	ID2	No brush-tailed phascogale detected. No other fauna species detected.	N/A
BT2	ID28	No brush-tailed phascogale detected. Black Rat (*Rattus rattus*) identified during camera check.	
BT3	ID18	No brush-tailed phascogale detected. No other fauna species detected.	N/A

Site	Camera ID	Comments/observations	Photograph
BT4	ID4	No brush-tailed phascogale detected. Common Ring-tailed Possum (*Pseudocheirus peregrinus*) identified during camera check.	

Potential impact

This species was not recorded at the study site and is therefore not expected to be impacted by the Project.

Recommendation

No further consideration is necessary.

3.3.2.2.2 Additional species considered as part of the Preliminary Site Assessment

Species identified in Table 18 were considered as part of the preliminary site assessment. Impacts were considered unlikely, and no further consideration was deemed necessary.

Table 18: Description of fauna species listed under the FFG Act

Species	Description
Barking Owl *Ninox connivens*	***Conservation status:*** Critically endangered under the FFG Act. ***Description:*** Barking Owl are highly mobile, territorial and utilise woodland habitat for foraging and roosting opportunities and hollow-bearing trees for nesting. Barking Owl was detected during targeted surveys in 2014 within woodland habitat at Monument Hill, Kilmore (EHP 2014). Woodland habitat within the study site may provide opportunities for movement, foraging and dispersal for this species. However, it is considered unlikely for Barking Owl to use trees within the study site for nesting or roosting given the high amounts of disturbance from traffic and the linear nature of the habitat patch. ***Recommendation:*** This species is unlikely to be impacted by the project and no further consideration necessary.
Black Falcon *Falco subniger*	***Conservation status:*** Critically endangered under the FFG Act. ***Description:*** Black Falcons occur in isolated woodlands and arid areas, with nesting typically occurring along tree-lined creeks or inland river systems. Black Falcon may fly over or forage in the study site on very rare occasions, however, it is unlikely to use woodland habitats for nesting or roosting given the high amounts of disturbance from traffic and the linear nature of the habitat patch. ***Recommendation:*** This species is unlikely to be impacted by the project and no further consideration necessary.
Little Eagle *Hieraaetus morphnoides*	***Conservation status:*** Vulnerable under the FFG Act. ***Description:*** Little Eagles occur in woodland, open country and arid environments, with nesting typically occurring along tree-lined watercourses or open woodland. Woodland habitat within the study site provides occasional foraging opportunities for Little Eagle. However, it is considered unlikely that the species would use trees within the study site for nesting or roosting given the high amounts of disturbance from traffic and the linear nature of the habitat patch. ***Recommendation:*** This species is unlikely to be impacted by the project and no further consideration necessary.

Species	Description
Powerful Owl *Ninox strenua*	***Conservation status**:* Vulnerable under the FFG Act. ***Description**:* Powerful Owls are highly mobile, territorial and utilise woodland habitat for foraging and roosting opportunities and use hollow-bearing trees for nesting. Powerful Owl was detected during targeted surveys in 2014 on Paynes Road, Kilmore (EHP 2014) and has a previous record at Monument Hill, Kilmore (DELWP 2022b). Woodland habitat within the study site may facilitate dispersal of sub adult birds between woodland patches in the surrounding landscape and be used for opportunistic foraging by adult birds. However, it is considered unlikely that the species would use trees within the study site for nesting or roosting given the high amounts of disturbance from traffic and the linear nature of the habitat patch. ***Recommendation**:* This species is unlikely to be impacted by the project and no further consideration necessary.

3.3.2.3 Communities

Suitable habitat was identified within the study site for the communities described below.

3.3.2.3.1 Victorian Temperate Woodland Bird Community

Description

The FFG Act-listed Victorian Temperate Woodland Bird Community has been defined as a suite of bird species, mainly associated with drier woodlands on the slopes and plains north of the Great Dividing Range. This community is synonymous with drier woodlands dominated by Box, Stringybark, Ironbark, Yellow Gum or River Red-gum or by Buloke or Cypress Pine. The community identifies 24 key woodland-dependant bird species, with the presence of one or more species representative of the community. The community lists another 21 woodland-associated bird species that are known to occur in the same habitat but are not included in the FFG Act listing.

Woodland-dependant bird species and key eucalypt species (e.g. ironbarks and stringybarks) were not observed during the initial site assessment. However, dry woodland habitat within the study site provides opportunities for foraging, dispersal, shelter and nesting for a number of these species. This habitat also comprises an important wildlife corridor for birds connecting to other woodland habitat in the surrounding landscape. Potential woodland-dependant bird species that were initially considered possible to visit the study site included Brown-headed Honeyeater (*Melithreptus brevirostris*), Little Lorikeet (*Parvipsitta pusilla*) and Jacky Winter (*Microeca fascinans*).

Targeted survey results

Results of spring surveys are outlined below in Table 19. Winter surveys are outlined below in Table 20.

The Victorian Temperate Woodland Bird Community is considered present within the study site (Figure 6). Brown-headed Honeyeater (*Melithreptus brevirostris*), a woodland-dependant member of the VTWBC was identified within site 3 during the winter survey period. Additionally, an associated VTWBC member Dusky Woodswallow (*Artamus cyanopterus*) was identified within site 4 during spring surveys. A full list of bird species identified during spring and winter survey periods is provided in Appendix C3.

Table 19: Victorian Temperate Woodland Bird Community Spring survey results (17 October, 24 October, and 31 October 2022).

Survey	Date	Sites surveyed	Comments	VTWBC observations
Survey 1	17 October 2022	Sites 1 - 6	30 bird species identified across survey sites (28 native and 2 non-native species).	Associated VTWBC species Dusky Woodswallow (*Artamus cyanopterus*) identified within site 4.
Survey 2	24 October 2022	Sites 1 - 6	33 bird species identified across survey sites (29 natives and 4-non-native species).	No VTWBC species identified within survey areas.

Survey	Date	Sites surveyed	Comments	VTWBC observations
Survey 3	31 October 2022	Sites 1 - 6	28 bird species identified across survey sites (25 native and 3 non-native species).	No VTWBC species identified within survey areas.

Table 20: Victorian Temperate Woodland Bird Community Winter survey results (April 17, May 1, and May 8 2023).

Survey	Date	Sites surveyed	Comments	VTWBC observations
Survey 1	17 April 2023	Sites 1 – 6	28 bird species identified across survey sites (26 native and 2 non-native species).	VTWBC species Brown-headed Honeyeater (*Melithreptus brevirostris*) identified within site 3.
Survey 2	1 May 2023	Sites 1 – 6	27 bird species identified across survey sites (24 native and 3 non-native species).	No VTWBC species identified within survey areas.
Survey 3	8 May 2023	Sites 1 - 6	23 bird species identified across survey sites (23 native and 3 non-native species).	No VTWBC species identified within survey areas.

Potential impact

The Project is proposing to remove woodland vegetation associated with the threatened community. This equates to 2.444 ha of woodland vegetation (Figure 2).

Recommendations

Obtain an FFG Act permit for the removal of 2.444 ha of woodland vegetation associated with the community (Figure 2).

3.3.2.4 Other protected flora

An FFG Act permit is required for removal of flora that is listed as 'protected' under the FFG Act. A permit is required for impacts to:

- Plant taxa listed as threatened under the FFG Act (discussed in Section 3.3.2.1);
- Plant taxa belonging to communities listed as threatened under the FFG Act (discussed in Section 3.3.2.3); and
- Plant taxa that are declared protected by the Minister. These are taxa which are not threatened but require protection for other reasons. This includes:
  - Generally protected flora that require a permit for removal under any circumstance.
  - Restricted use protected flora that require a permit for removal for sale, or removal for personal use.

Any removal of FFG Protected flora where the intent is not to obtain a specimen of the plant, but to simply remove it, is defined as *incidental take* under the FFG Act[2].

Protected flora species that require a permit for removal for this Project that were recorded within the study site are summarised in Table 21

[2] Declared Protected Flora Guidelines: https://www.environment.vic.gov.au/conserving-threatened-species/protected-flora-and-listed-fish

Table 21: FFG Act protected flora recorded within the study site

Scientific name	Common name	Estimated number/extent within study site	Estimated number/extent proposed for removal (construction boundary)[3]
Plant taxa listed as threatened			
No threatened flora recorded within the study site			
Plant taxa belonging to communities listed as threatened under the FFG Act			
Victorian Temperate Woodland Bird Community Plant taxa belonging to this community are indicated in Appendix A-1.		4.372 ha	2.444 ha
Plant Taxa that are declared protected by the Minister (Restricted use[4]) – do not require a permit for removal for this Project			
Acacia mearnsii	Black Wattle	35	20
Plant Taxa that are declared protected by the Minister (Generally protected) - require a permit for removal for this Project			
Microtis sp.	Onion Orchid	29	29
Thelymitra ixioides	Spotted Sun-orchid	3	3

[3] Extent proposed to be removed has been calculated based on the construction boundary. Where the arborist has confirmed trees can be retained despite Tree Protection Zone (TPZ) encroachments of >10%, the understorey vegetation has been captured in vegetation removal only (Ryder 2022). Where trees are to be removed, the full canopy of these trees has been captured as per the requirements of the Guidelines (DELWP 2017).
[4] Permit not required for their removal for the Project, therefore their estimated numbers has been excluded and is not required.

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Meters

Scale:1:80,000 @ A3
GDA2020 MGA Zone 55

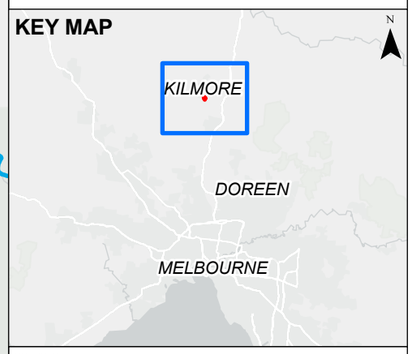
LEGEND

- Study site
- Study area
- Major road
- River

Threatened Flora Species

- Basalt Peppercress
- Dwarf Silver-wattle
- Fringed Sun-orchid
- Giant Honey-myrtle
- Matted Flax-lily
- Pale Swamp Everlasting
- Slender Bitter-cress
- Small Milkwort
- Small-flower Wallaby-grass
- Yarra Gum

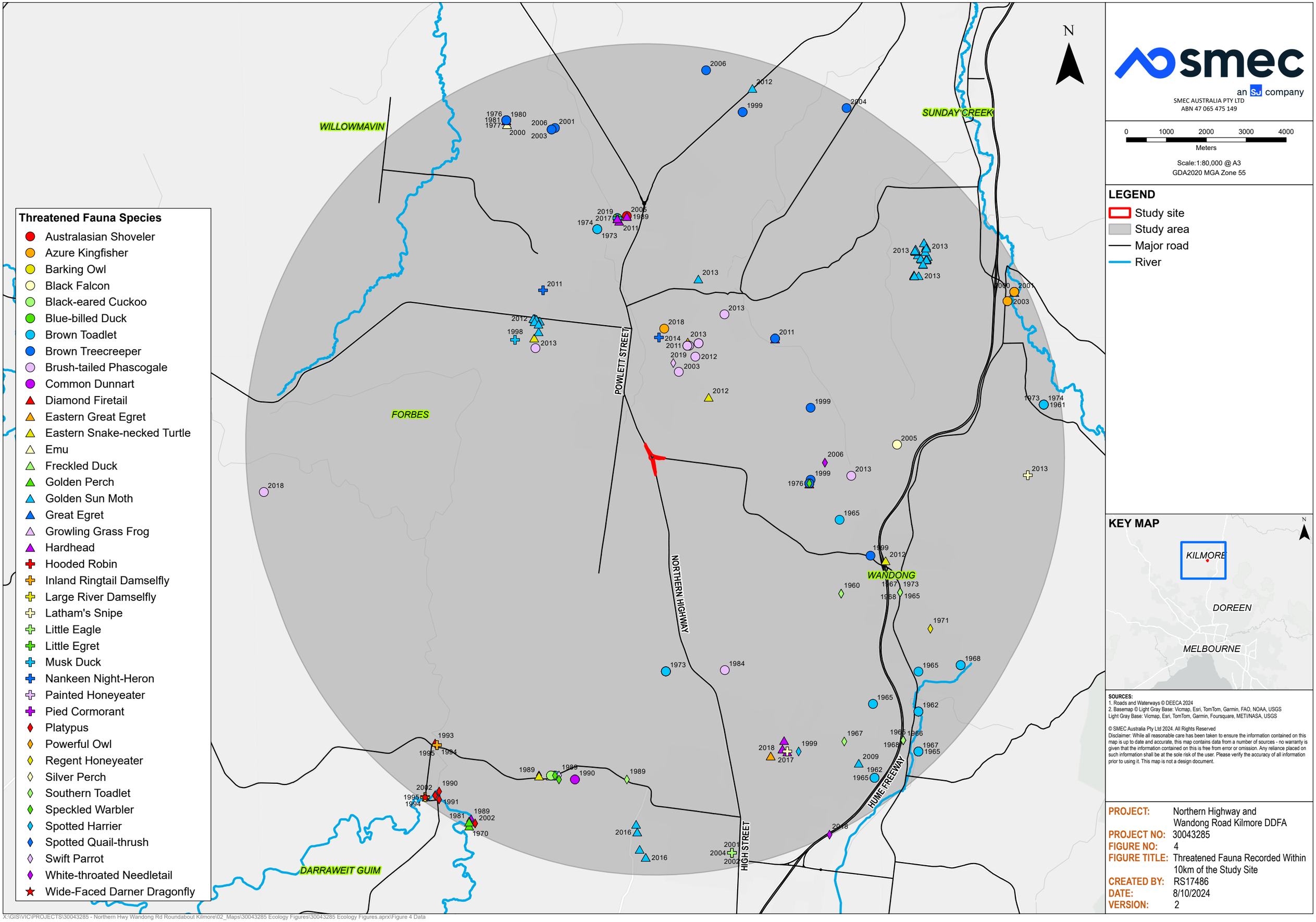
KEY MAP



SOURCES:
1. Roads and Waterways © DEECA 2024
2. Basemap © Light Gray Base: Vicmap, Esri, TomTom, Garmin, FAO, NOAA, USGS
Light Gray Base: Vicmap, Esri, TomTom, Garmin, Foursquare, MET/NASA, USGS

PROJECT:	Northern Highway and Wandong Road Kilmore DDFA
PROJECT NO:	30043285
FIGURE NO:	3
FIGURE TITLE:	Threatened Flora Recorded Within 10km of the Study Site
CREATED BY:	RS17486
DATE:	8/10/2024
VERSION:	2

X:\GIS\VIC\PROJECTS\30043285 - Northern Hwy Wandong Rd Roundabout Kilmore\02_Maps\30043285 Ecology Figures\30043285 Ecology Figures.aprx\Figure 3 Data



Threatened Fauna Species

- Australasian Shoveler
- Azure Kingfisher
- Barking Owl
- Black Falcon
- Black-eared Cuckoo
- Blue-billed Duck
- Brown Toadlet
- Brown Treecreeper
- Brush-tailed Phascogale
- Common Dunnart
- Diamond Firetail
- Eastern Great Egret
- Eastern Snake-necked Turtle
- Emu
- Freckled Duck
- Golden Perch
- Golden Sun Moth
- Great Egret
- Growling Grass Frog
- Hardhead
- Hooded Robin
- Inland Ringtail Damselfly
- Large River Damselfly
- Latham's Snipe
- Little Eagle
- Little Egret
- Musk Duck
- Nankeen Night-Heron
- Painted Honeyeater
- Pied Cormorant
- Platypus
- Powerful Owl
- Regent Honeyeater
- Silver Perch
- Southern Toadlet
- Speckled Warbler
- Spotted Harrier
- Spotted Quail-thrush
- Swift Parrot
- White-throated Needletail
- Wide-Faced Darner Dragonfly

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ABN 47 065 475 149

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Meters

Scale:1:80,000 @ A3
GDA2020 MGA Zone 55

LEGEND

- Study site
- Study area
- Major road
- River

KEY MAP

PROJECT:	Northern Highway and Wandong Road Kilmore DDFA
PROJECT NO:	30043285
FIGURE NO:	4
FIGURE TITLE:	Threatened Fauna Recorded Within 10km of the Study Site
CREATED BY:	RS17486
DATE:	8/10/2024
VERSION:	2

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0 30 60 90 120
Meters

Scale:1:3,071 @ A3
GDA2020 MGA Zone 55

LEGEND

- Brush-tailed Phascogale Targeted Survey Locations
- Major road
- Minor road
- Stream
- Study site

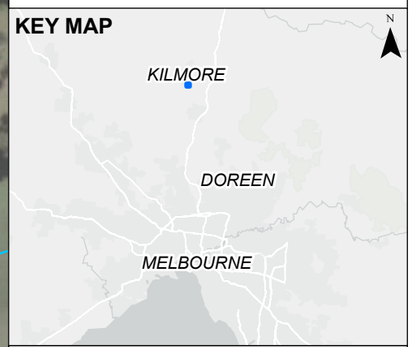
FFG Act-listed community

- Victorian Temperate Woodland Bird Community

Ecological Vegetation Class

- Herb-rich Foothill Forest (EVC 23)
- Grassy Woodland (EVC 175)

KEY MAP



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1. Roads and Waterways © DEECA 2024
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PROJECT:	Northern Highway and Wandong Road Kilmore DDFA
PROJECT NO:	30043285
FIGURE NO:	5
FIGURE TITLE:	Brush-tailed Phascogale Camera deployment
CREATED BY:	RS17486
DATE:	8/10/2024
VERSION:	2

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0 30 60 90 120
Meters

Scale:1:3,500 @ A3
GDA2020 MGA Zone 55

LEGEND

- Major road
- Minor road
- Stream
- Study site

Threatened fauna

- Gang-gang Cockatoo

VTWBC species

- Brown-headed Honeyeater

VTWBC associated species

- Dusky Woodswallow
- Survey Site Location

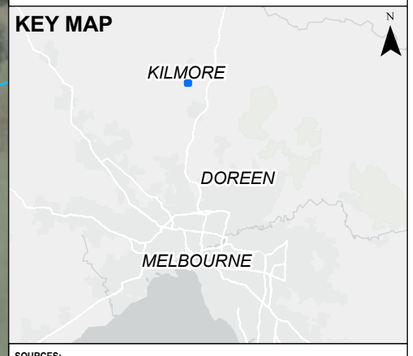
FFG Act-listed community

- Victorian Temperate Woodland Bird Community

Ecological Vegetation Class

- Herb-rich Foothill Forest (EVC 23)
- Grassy Woodland (EVC 175)

KEY MAP



SOURCES:
1. Roads and Waterways © DEECA 2024
2. Basemap © MetroMap Light Gray Base: Vicmap, Esri, TomTom, Garmin, FAO, NOAA, USGS
World Imagery: Maxar

PROJECT:	Northern Highway and Wandong Road Kilmore DDFA
PROJECT NO:	30043285
FIGURE NO:	6
FIGURE TITLE:	Victorian Temperate Woodland Bird Community survey locations
CREATED BY:	RS17486
DATE:	8/10/2024
VERSION:	2

X:\GIS\VIC\PROJECTS\30043285 - Northern Hwy Wandong Rd Roundabout Kilmore\02_Maps\30043285_ENV_002_EcologyFigures\30043285_ENV_002_EcologyFigures\30043285_ENV_002_EcologyFigures.aprx\Figure6_SurveyLocations

4. Legislation and policy

4.1 Commonwealth legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) is the Australian Government's primary piece of environmental legislation to protect and manage nationally and internationally important species, communities and heritage places, known as Matters of National Environmental Significance (MNES). If a MNES could be impacted by a proposed action, an assessment of the potential impacts against the relevant EPBC Act significant impact criteria must be completed. If there is potential for a significant impact to occur the proposed action must be referred to the federal Environment Minister for assessment under the EPBC Act.

Potential impacts to matters listed under the EPBC Act are listed in Table 22. Please note that this table includes only MNES that pertain to ecology. Department of Transport and Planning must ensure that additional MNES are adequately addressed (world heritage properties, national heritage places, nuclear actions, water resources).

Potential impact

Suitable habitat was identified within the study site for EPBC Act listed flora species, with a population of Matted Flax-lily identified during the site assessment. Suitable habitat in the form of woodland vegetation was identified for EPBC Act listed fauna species: Gang-gang Cockatoo. Details on the potential impacts to MNES is provided in Table 22.

Table 22: Potential impacts to matters listed under the EPBC Act

Species	Potential impact	Recommendation
Ramsar sites	The PMST identifies the following Ramsar wetlands: • NSW Central Murray State Forests • Banrock Station Wetland Complex • Hattah-Kulkyne Lakes • Riverland • The Coorong, and Lakes Alexandrina and Albert Wetland • Gunbower Forest These sites are located >100 km upstream of the study site and the proposed works do not include impacts to any waterway. Therefore, Ramsar sites are unlikely to be impacted.	Referral not required. No further action necessary.
Species and communities	Suitable habitat was identified within the study site for Matted Flax-lily and Gang-gang Cockatoo (Section 3.3.1). An assessment of the potential impacts to these species was completed and a significant impact is considered unlikely. Refer to Section 3.3.1 for Significant Impact Assessments for these species. Additional species identified in Section 3.3.1 may use habitat within the study site on occasion, however, are unlikely to be impacted by the Project.	Referral not required. No further action necessary.
Migratory species	White-throated Needletail may fly or aerially forage over the study site. Rufous Fantail and Satin Flycatcher may opportunistically move through the study site However, these species are unlikely to be impacted and no further consideration is required. See Section 3.3.1.2 for more information.	Referral not required. No further action necessary.
Commonwealth marine areas	None within 10km of the study site.	N/A
The great barrier reef marine park	Not within 10km of the study site.	N/A

Recommendations

A significant impact under the EPBC Act is considered unlikely based on the current Project design.

4.2 State (Victorian) legislation

4.2.1 Environment Effects Act 1978

The *Environmental Effects Act 1978* (EE Act) provides for an assessment of proposed Projects that are capable of having a significant effect on the environment. The Ministerial Guidelines for Environment Effects Statements (DSE 2006) outlines the referral criteria to determine whether a project could have a significant effect on the environment should be referred to the Minister. Projects that trigger the referral criteria must be referred to the Minister administering the EE Act to decide if an Environmental Effects Statement (EES) should be prepared. EE Act referral criteria that relate to ecological matters are listed in Table 23.

Potential impact

Native vegetation and suitable habitat for threatened species and communities were identified within the study site, both potential referral triggers under the EE Act. An EE Act self-assessment was completed (Table 23) and the Project is considered unlikely to have a significant effect on ecological matters. The relevant referral criteria and a response to each are provided in Table 23.

Table 23: EE Act referral criteria that relate to ecological matters

Referral criteria	Response
Individual types of potential effects on the environment that might be of regional or State significance, and therefore warrant referral of a project:	
Potential clearing of 10 ha or more of native vegetation from an area that: • is of an Ecological Vegetation Class identified as endangered by the Department of Sustainability and Environment (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	**Criteria not met.** Native vegetation identified within the study site comprises 4.372 ha of native vegetation, including 62 large trees. Native vegetation proposed to be removed comprises 2.444 ha and 24 large trees.
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	**Criteria not met.** The project is unlikely to result in the long-term loss of a significant proportion of a known remaining habitat or population of threatened species listed in Section 3.3.
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'	**Criteria not met.** None within 10km of the study site. Ramsar or DIWA wetlands are unlikely to be impacted by the proposed action.
Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term	**Criteria not met.** Aquatic, estuarine or marine sites are unlikely to be impacted by the proposed action.
A combination of two or more of the following types of potential effects on the environment that might be of regional or State significance, and therefore warrant referral of a project:	
Potential clearing of 10 ha or more of native vegetation, unless authorised under an approved Forest Management Plan or Fire Protection Plan	**Criteria not met.** Native vegetation identified within the study site comprises 4.372 ha of native

Referral criteria	Response
	vegetation, including 62 large trees. Native vegetation proposed to be removed comprises 2.444 ha and 24 large trees.
Matters listed under the *Flora and Fauna Guarantee Act 1988*: • potential loss of a significant area of a listed ecological community; or • potential loss of a genetically important population of an endangered or threatened species (listed or nominated for listing), including as a result of loss or fragmentation of habitats; or • potential loss of critical habitat; or • potential significant effects on habitat values of a wetland supporting migratory bird species	**Criteria not met.** The project is unlikely to significantly impact matters listed under the FFG Act.
Potential extensive or major effects on landscape values of regional importance, especially where recognised by a planning scheme overlay or within or adjoining land reserved under the *National Parks Act 1975*	**Criteria not met.** Extensive or major effects on landscape values of regional importance are unlikely. The study site is not located within any zones or overlays specific to landscape values or biodiversity.

Recommendations

A referral under the EE Act is not considered necessary on the grounds of ecological matters.

4.2.2 Flora and Fauna Guarantee Act 1988

The *Flora and Fauna Guarantee Act 1988* (FFG Act) and *Flora and Fauna Guarantee Amendment Act 2019* is the key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes. In performing any of their functions that may reasonably be expected to impact on biodiversity in Victoria, a Minister and public authority must give proper consideration to the objectives of the FFG Act.

A permit is required for impacts to:

- Plant taxa listed as threatened under the FFG Act;
- Plant taxa belonging to communities listed as threatened under the FFG Act; and
- Plant taxa that are declared protected by the Minister. These are taxa which are not threatened but require protection for other reasons. This includes:
  - Generally protected flora that require a permit for removal under any circumstance.
  - Restricted use protected flora that require a permit for removal for sale, or removal for personal use.

Any removal of FFG Protected flora where the intent is not to obtain a specimen of the plant, but to simply remove it, is defined as *incidental take* under the FFG Act[5].

A permit is not required under the FFG Act for impacts to terrestrial fauna. Vertebrate fauna species are already protected under the *Wildlife Act 1975* (refer Section 4.2.4); however penalties apply for taking threatened wildlife listed under the FFG Act.

Potential impact

FFG Act-listed matters with potential to be impacted by the project:

[5] Declared Protected Flora Guidelines: https://www.environment.vic.gov.au/conserving-threatened-species/protected-flora-and-listed-fish

- Flora: None;
- Communities: Victorian Temperate Woodland Bird Community;
- Fauna: None; and
- Protected flora: Listed in Section 3.3.2.4.

Threatening processes relevant to the project include:

- Habitat fragmentation as a threatening process for fauna in Victoria;
- Invasion of native vegetation by environmental weeds;
- Loss of coarse woody debris from Victorian native forests and woodlands;
- Loss of hollow-bearing trees from Victorian native forests; and
- Use of Phytophthora-infected gravel in construction of roads, bridges and reservoirs.

Recommendations

A 'permit to take protected flora' is required for protected flora species and communities if they are proposed to be removed. Total impacts to the Victorian Temperature Woodland Bird community are currently estimated at 2.444 ha based on the design and proposed removal of woodland vegetation. Details of these removals must be added to the FFG Act permit for review and approval by DEECA.

4.2.3 Catchment and Land Protection Act 1994

The key piece of legislation governing the management and classification of noxious weeds and pest animals throughout Victoria is the *Catchment and Land Protection Act 1984* (CaLP Act). The Act aims to Project primary production, Crown land, the environment and community health from the effects of noxious weeds and pest animals (Agriculture Victoria 2021). The CaLP Act requires landowners to manage noxious weeds and pest animals on their land. This includes the prevention of spread, direct management or in some instance's eradication of regionally prohibited or controlled weeds and pest animal species on their land (Agriculture Victoria 2021).

Potential impact

Noxious weeds listed under the *Catchment and Land Protection Act 1994* (CaLP Act) and/or as a Weed of National Significance (WONS), and pest fauna that were identified within the study site are listed in Table 24.

Table 24: Noxious weeds, WONS and pest fauna identified within the study site

Group	Scientific name	Common name	Listing[6]
Pest flora	*Allium triquetrum*	Three-corner Garlic	CaLP (R)
	Cirsium vulgare	Spear Thistle	CaLP (R)
	Genista monspessulana	Montpellier Broom	CaLP (C), WONS
	Oxalis pes-caprae	Soursob	CaLP (R)
	Rosa Rubiginosa	Sweet Briar	CaLP (C)
	Rubus polyanthemus	Blackberry	CaLP (C), WONS
	Ulex europaeus	Gorse	CaLP (C), WONS
Pest fauna	*Oryctolagus cuniculus*	European Rabbit	Established pest animal

[6] C = Listed as Regionally Controlled under the CaLP Act, R = Listed as Restricted under the CaLP Act

Recommendations

It is recommended that a suitably prepared Construction Environmental Management Plan (CEMP) is developed by the contractor to ensure appropriate risk management measures are implemented during works to comply with the broader objectives of the CaLP Act.

4.2.4 *Wildlife Act 1975* and Wildlife Regulations 2013

The *Wildlife Act 1975* and Wildlife Regulations 2013 are both Victorian legislation that prevent harm to wildlife. Authorisation is required under the *Wildlife Act 1975* to carry out field investigations for the purpose of conserving, monitoring, improvement or maintaining wildlife habitat within Victoria.

Potential impact

A range of common fauna species were identified within the study site, including species such as possums or birds that may be injured during tree removal associated with the proposed works.

Recommendations

A permit is required under the *Wildlife Act 1975* to carry out field investigations for the purpose of conserving, monitoring, improving or maintaining wildlife habitat within Victoria. This also includes the salvage and translocation of wildlife from a particular locality which requires a specific *Wildlife Act 1975* permit (authorised by DELWP) for the capture, handling and relocation of wildlife.

Any works requiring the removal of wildlife within or adjoining the study site be undertaken by suitably qualified and licenced personnel. Appropriate mitigation measures must be employed during the vegetation removal, such as directional clearing towards areas of remaining habitat, and suitable protocols and contingency measures to manage any injured or displaced fauna during construction.

4.2.5 Water Act 1989

The *Water Act 1989* regulates the management and use of all water under the control of the Crown in Victoria. The Act provides Water Authorities with a range of enforcement powers and imposes obligations on persons and organisations not to interfere with assets of Water Authorities, waterways and water.

Works and activities in, under, on or over the bed and banks of Designated Waterways in Victoria require a Works on Waterways Permit from the relevant Catchment Management Authority. Designated Waterways are declared under the *Water Act 1989*.

Potential impact

No watercourses interest the study site or are proposed to be impacted by the project.

Recommendations

Goulburn Broken CMA is the responsible authority for the control, management and authorisation of works and activities in or over Designated Waterways in the study site. No approval is required as there are no watercourses within or adjoining the study site.

4.2.6 Planning and Environment Act 1987

The *Planning and Environment Act 1987* (P&E Act) governs the planning framework for the use and development of land in Victoria. The P&E Act provides procedures for the preparation and amendment of the Victoria Planning Provisions and the planning schemes. The removal of native vegetation is regulated via specific Clauses in the local planning schemes, which are administered by the relevant Local Government Area (LGA). Clauses relevant to the Project are discussed below.

4.2.6.1 Zones and Overlays

The local planning schemes regulate the type of use and development that can be implemented in a given area via zones and overlays. Zones specify how the land can be developed or built on and what

is prohibited. Overlays set further restrictions on the land in terms of design, vegetation, heritage, flood levels or water catchment.

Potential impact

The study site to the south of Wandong Road is zoned for Farming (FZ), and to the north is General (GRZ) or Low Density Residential (LDRZ). A Development Plan Overlay (DPO) applies to the north of Wandong Road.

Recommendations

Applicable zones and overlays have no specific requirements for native vegetation or biodiversity.

4.2.6.2 Clause 52.17 and the Guidelines

Clause 52.17 of the local planning schemes specifies the requirement to obtain a planning permit to remove, destroy or lop native vegetation. The *Guidelines for the removal, destruction or lopping of native vegetation* (the Guidelines) is an incorporated document that sets out how to assess and compensate for the removal of native vegetation, with native vegetation impact and offset requirements specified in a *Native vegetation removal report* (NVR report) provided by DELWP.

Potential impact

The native vegetation impact and offset requirements are specified in the NVR report (Appendix D) and summarised in Table 25. Native vegetation impacts have been calculated in conjunction with the Arborist Impact Assessment (Ryder 2022). DTP must ensure that arborist recommendations are adhered to throughout the Project's life to ensure no additional tree losses occur as a result of the Project.

Table 25: Native vegetation impact and offset requirements

Native vegetation within the study site	Assessment pathway	Detailed
	Native vegetation extent (ha)	2.444 ha
	Large trees (no.)	24
	Location category	1
Offset requirements to remove the native vegetation	Offset type	General
	Offset amount	1.285 general habitat units
	Vicinity	Goulburn Broken Catchment Management Authority (CMA) or Mitchell Shire Council
	Min. strategic biodiversity value score	0.409
	Large trees (no.)	24
Offset availability	A review of DEECA's online Native Vegetation Credit Register traded credits information (current to 29/10/2024) confirmed that credit sites that meet the above requirements are currently available (Appendix F).	

Recommendations

Planning approval from Mitchell Shire is required to remove, destroy or lop native vegetation. If approval is granted, an offset that meets the requirements in Table 25 must be secured before the native vegetation can be removed.

The Guidelines further specify that an application to remove native vegetation must demonstrate that the three-step approach[7] of avoid, minimise and offset has been applied. Recommended measures to avoid and minimise impacts are provided in Sections 5.1 and 5.3.

[7] The *Guidelines for the removal, destruction or lopping of native vegetation* describe the three-step approach:

1. **Avoid** the removal, destruction or lopping of native vegetation;

A response to each of the application requirements under the Guidelines is provided in Table 26.

Table 26: Application requirements under the *Guidelines for the removal, destruction or lopping of native vegetation*.

No.	Application requirement	Response
1.	Information about the native vegetation to be removed. ***A NVR report from DEECA systems and tools contains information required to address this application requirement.***	A Native Vegetation Removal Report (NVR Report) is provided in Appendix E and summarised in Table 25.
2.	Topographic and land information relating to the native vegetation to be removed, showing ridges, crests and hilltops, wetlands and waterways, slopes of more than 20 percent, drainage lines, low lying areas, saline discharge areas, and areas of existing erosion, as appropriate. This may be represented in a map or plan.	The road reserve is located on a flat plain adjacent to rural properties containing flat paddocks used for grazing livestock. A number of unnamed drainage lines run within the road reserve throughout the study site. There are no waterways within or adjoining the study site.
3.	Recent, dated photographs of the native vegetation to be removed.	Photographs representative of the native vegetation to be removed is provided in Section 3.2, Table 9.
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.	N/A
5.	An avoid and minimise statement.	Recommended measures to avoid and minimise impacts are provided in Sections 5. An avoid and minimise statement is provided below in Section 5.1.
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 that applies to the native vegetation to be removed.	N/A
7.	Where the removal of native vegetation is to create defendable space, a written statement explaining why the removal of native vegetation is necessary.	N/A
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.	N/A
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.	Third Party offsets will be secured via a registered offset broker or DTPs existing registered offset broker. Evidence that offsets are available is attached in Appendix E and must be attached to the planning permit application. A Native Vegetation Removal (NVR) report for the project has been obtained from DELWP detailing offset requirements (See Appendix D and E).
Additional application requirements for applications in the Detailed Assessment Pathway:		

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

No.	Application requirement	Response
10.	Additional application requirements for applications in the Detailed Assessment Pathway:	A detailed site assessment report of the native vegetation to be removed has been completed by SMEC, with the results provided in this report.
	A habitat hectare assessment of any patches of native vegetation, including the condition, extent, Ecological Vegetation Class and bioregional conservation status.	A habitat hectare assessment is provided in Appendix A3.
	The location, number, circumference and species of any large trees within patches.	Information about large trees within patches is provided in Appendix A4.
	The location, number, circumference and species of any scattered trees, and whether each tree is small or large.	Information about scattered trees is provided in Appendix A4.
11.	Information about impacts on rare or threatened species habitat. ***A NVR report from DEECA systems and tools contains information required to address this application requirement.***	A NVR Report is provided in Appendix D and summarised in Section 4.2.6.2. Species offsets are not required. Additional information about threatened species is provided in Section 3.3.

5. Recommendations

5.1 Avoid and minimise statement (written in consultation with DTP)

The following Avoid and Minimise Statement has been developed in accordance with the *Application requirement 5: Avoid and minimise statement* guidelines outlined on page 12 of the *Assessor's handbook for applications to remove, destroy or lop native vegetation* (DELWP 2018b) and in consultation with Department of Transport.

The Department of Transport and Planning (DTP) proposes to undertake safety upgrades to the Northern Highway/Wandong Road intersection, Kilmore, Victoria (the study site), as part of the wider Kilmore Bypass Project. Proposed upgrades include the construction of a roundabout at the existing T-Intersection, the construction of road pavement with a larger footprint than the existing roadway, upgrades to drainage infrastructure and installation of safety barriers, which will require removal of native vegetation and potential fauna habitat adjacent to the road.

A footprint of vegetation proposed for removal includes:

- 2.444 ha of native vegetation comprising two EVCs: Herb-rich Foothill Forest (EVC 23, BCS of least concern) and Grassy Woodland (EVC 175, BCS of depleted) and 24 large trees;
- Plant taxa associated with the FFG Act-listed fauna community: *Victorian Temperate Woodland Bird Community*; and
- Suitable foraging habitat for Gang-gang Cockatoo.

The proposed project footprint has been designed to impact the smallest area possible to avoid overall impacts on native vegetation and fauna habitats during the initial planning phase of the project. DTP has minimised the vegetation removal scope along the Northern Highway by:

- Reducing the extent of the proposed footprint on the south-western side of the road reserve to avoid a known population of Matted Flax-lily, which was identified as the area with the highest ecological value;
- Reducing the radius of the roundabout to the smallest area allowable for the vehicles utilising the road;
- Reducing the width of the traffic lanes and traffic islands to the smallest width allowable under VicRoads Standards;
- Designing the batters to a 2:1 formation to reduce the material formation behind the barriers;
- Reducing the barrier spacing to allow for the steeper batter formation;
- Reducing the shoulder widths to 0.7 m, which is the smallest width allowable for this speed zone; and,
- Further reducing the vegetation proposed to be removed and large trees to be impacted by implementing advice received from the Arborist Assessment (Ryder 2022).

The removal of 24 large trees, many of which contain hollows, has been reduced from an initial impact of 42 large trees. This can be achieved so long as DTP follow the recommendations outlined within the Arborist Assessment (Ryder 2022).

DTP is committed to undertaking mitigation measures to protect retained vegetation including implementing stringent No-Go Zones during construction, tree protection zones and clear signage to avoid impacts on threatened species and retained trees.

DTP has confirmed that no further opportunities to avoid impacts to native vegetation are available for the Project without compromising the scope of works required for safety upgrades at the intersection.

5.2 Areas to prioritise for impact avoidance and minimisation

The Project should be designed to avoid impacts to biodiversity values wherever possible. Areas to be prioritised for impact avoidance include (areas identified on Figure 2):

- Hollow-bearing trees;
- Large trees;
- Areas identified as habitat for threatened species (e.g. Matted Flax-lily and Gang-gang Cockatoo); and
- Areas recorded as native vegetation.

5.3 Recommended remediation and mitigation measures

DTP is committed to identifying and implementing remediation measures that are above and beyond those necessary due to statutory requirements. The following remediation measures are recommended to mitigate impacts to biodiversity values:

- Implement No-Go Signage and fencing for Matted Flax-lily and habitat trees that are retained during construction;
- Undertake any vegetation removal from April through to July to avoid the breeding season of most common native wildlife species, particularly birds, frogs, and reptiles. If this timing cannot be achieved, SMEC recommends engaging a Project ecologist to undertake pre-clearance surveys prior to vegetation removal, and to be present to relocate any displaced fauna species within 100 m, with details to be outlined within a Fauna Management Plan (FMP);
- Investigate the opportunity to replace tree hollows if hollow-bearing trees are removed with nest boxes or chainsaw hollows of similar sizes. Hollows from felled trees should be repurposed within the local area; and
- Investigate the opportunity to undertake revegetation post-construction with a diverse range of native vegetation suitable to the site and in line with species and diversity recorded within the EVC that formerly occupied the site, as much as is practicable.

5.4 Further requirements

A summary of further assessment and reporting required is provided below:

- Apply for a planning permit to remove native vegetation from the Minister for Planning and secure offsets via a registered offset broker prior to the removal of native vegetation;
- Obtain an FFG Act permit to remove protected flora and vegetation that is associated with the Victoria Temperate Woodland Bird Community;
- Follow recommendations outlined within the arboriculture assessment to retain trees despite Tree Protection Zone (TPZ) encroachments of >10% (Ryder 2022); and
- Develop a document (such as a Construction Environment Management Plan and/or Fauna Management Plan) that addresses environmental management required pre, during and after construction such as:
  - Details on no-go zones for threatened species
  - Weed management
  - Fencing of native vegetation to be retained
  - Erosion and sediment control
  - Fauna pre-clearance survey procedures
  - Fauna management procedures to manage potential impacts to wildlife that may be using hollows and habitat that is proposed to be removed.

References

Agriculture Victoria 2024 Information on CaLP Act-listed weeds can be accessed at: https://agriculture.vic.gov.au/biosecurity/protecting-victoria/legislation-policy-and-permits/consolidated-lists-of-declared-noxious-weeds-and-pest-animals

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Appendix A - Flora

Key

Introduced species:

CaLP	*Catchment and Land Protection Act 1994*
CaLP (C)	Listed as controlled under the CaLP Act
CaLP (R)	Listed as restricted under the CaLP Act
WONS	Weed of National Significance
*	Introduced species
#	Native but may be alien species
Planted	Species has been planted

Threatened species:

EPBC	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FFG	*Flora and Fauna Guarantee Act 1988*
CR	Critically Endangered under the EPBC Act
EN	Endangered under the EPBC Act
VU	Vulnerable under the EPBC Act
cr	Critically Endangered under the FFG Act
en	Endangered under the FFG Act
vu	Vulnerable under the FFG Act
P	Protected under the FFG Act

Likelihood:

Present	Presence of species confirmed on site during site assessment or relevant reports
Likely	Suitable habitat and numerous recent or proximity species records within or adjacent to study site
Possible	Potentially suitable habitat and average amounts of recent species records within or adjacent to study site
Unlikely	No suitable habitat and lack of species records within or adjacent study site

A1: Flora species recorded within the study site

Scientific Name	Common Name	Status
Native		
Acacia dealbata	Silver Wattle	
Acacia implexa	Lightwood	
Acacia mearnsii	Black Wattle	P – restricted use
Acacia melanoxylon	Blackwood	
Acaena echinata	Sheep's Burr	
Acaena novae-zelandiae	Bidgee-widgee	
Asperula conferta	Common Woodruff	
Austrostipa spp.	Spear Grass	
Cassinia aculeata subsp. *aculeata*	Common Cassinia	
Clematis microphylla	Small-leaved Clematis	
Daviesia latifolia	Hop Bitter-pea	
Dianella amoena	Matted Flax-lily	EN, cr, P – generally protected
Dianella revoluta	Black-anther Flax-lily	
Eleocharis acuta	Common Spike-sedge	
Eucalyptus cinerea	Silver Dollars	Planted
Eucalyptus dives	Broad-leaf Peppermint	
Eucalyptus radiata	Narrow-leaf Peppermint	
Eucalyptus rubida	Candlebark	
Eucalyptus viminalis	Manna Gum	
Geranium spp.	Crane's Bill	
Gonocarpus tetragynus	Common Raspwort	
Hardenbergia violacea	Purple Coral-pea	
Hydrocotyle hirta	Hairy Pennywort	
Hydrocotyle laxiflora	Stinking Pennywort	

Scientific Name	Common Name	Status
Juncus amabilis	Hollow Rush	
Juncus spp.	Rush	
Kunzea ericoides	Burgan	
Leptospermum continentale	Prickly Tea-tree	
Lomandra micrantha	Small-flower Mat-rush	
Microlaena stipoides var. stipoides	Weeping Grass	
Microtis sp.	Onion Orchid	P – generally protected
Oxalis perennans	Grassland Wood-sorrel	
Oxalis spp.	Wood-sorrel	
Pelargonium australe	Austral Stork's-bill	
Poa labillardierei	Common Tussock-grass	
Poa spp.	Tussock Grass	
Rytidosperma fulvum	Copper-awned Wallaby-grass	
Rytidosperma setaceum.	Bristly Wallaby-grass	
Senecio pinnatifolius	Variable Groundsel	
Senecio quadridentatus	Cotton Fireweed	
Themeda triandra	Kangaroo Grass	
Thelymitra ixioides	Spotted Sun-orchid	P – generally protected
Introduced		
Acacia decurrens	Early Black-wattle	*
Acetosella vulgaris	Sheep Sorrel	*
Agapanthus praecox	Agapanthus	*
Allium triquetrum	Angled Onion	* CaLP (R)
Anthoxanthum odoratum	Sweet Vernal-grass	*
Avena fatua	Wild Oat	*
Brassica spp.	Turnip	*
Briza maxima	Large Quaking-grass	*
Briza minor	Lesser Quaking-grass	*
Bromus catharticus	Prairie Grass	*
Cenchrus clandestinus	Kikuyu	*
Centaurium erythraea	Common Centaury	*
Cerastium glomeratum	Sticky Mouse-ear Chickweed	*
Cirsium vulgare	Spear Thistle	* CaLP (R)
Cotoneaster glaucophyllus	Large-leaf Cotoneaster	*
Cupressus macocarpa	Monterey Cypress	*
Dactylis glomerata	Cocksfoot	*
Ehrharta erecta	Panic Veldt-grass	*
Erigeron bonariensis	Flaxleaf Fleabane	*
Euphorbia peplus	Petty Spurge	*
Fumaria bastardii	Bastard's Fumitory	*
Galium aparine	Cleavers	*
Genista monspessulana	Montpellier Broom	* WoNS, CaLP (C)
Holcus lanatus	Yorkshire Fog	*
Hypochaeris radicata	Flatweed	*
Ilex aquifolium	English Holly	*
Lepidium africanum	Common Peppercress	*
Lolium perenne	Perennial Rye-grass	*
Malva parviflora	Small-flower Mallow	*

Scientific Name	Common Name	Status
Oxalis pes-caprae	Soursob	* CaLP (R)
Paspalum dilatatum	Paspalum	*
Phalaris aquatica	Toowoomba Canary-grass	*
Pinus radiata	Radiata Pine	*
Pittosporum tenuifolium	Kohuhu	*
Pittosporum undulatum	Sweet Pittosporum	#
Plantago coronopus	Buck's-horn Plantain	*
Plantago lanceolata	Ribwort	*
Prunus spp.	Prunus	*
Romulea rosea	Onion Grass	*
Rosa rubiginosa	Sweet Briar	* CaLP (C)
Rubus polyanthemus	Blackberry	* WoNS, CaLP (C)
Sonchus asper	Rough Sow-thistle	*
Sonchus oleraceus	Common Sow-thistle	*
Ulex europaeus	Gorse	* WoNS, CaLP (C)

A2: Threatened flora and likelihood of occurrence in the study site

Scientific Name	Common Name	EPBC	FFG	Count	Last record	Habitat description	Source	Likelihood of occurrence within the study site
Acacia nanodealbata	Dwarf Silver-wattle	-	vu	1	1988	Known from forests in the Healesville-Warburton area, the top of Mt Macedon, near Creswick, and in the Otway Range.	VBA	Unlikely, Dwarf Silver-wattle is a highly visible species and was not detected during the site assessment.
Amphibromus fluitans	River Swamp Wallaby-grass, Floating Swamp Wallaby-grass	VU	-	-	N/A - PMST Only	Apparently confined to permanent swamps principally along the Murray River Between Wodonga and Echuca, uncommon to rare in the south probably due to alteration of habitat.	PMST	Unlikely, no previous records for this species within proximity to the study site.
Caladenia versicolor	Candy Spider-orchid	VU	-	-	N/A - PMST Only	Found mainly in woodlands dominated by *Eucalyptus leucoxylon* (Yellow Gum), on seasonally inundated sandy loams.	PMST	Unlikely, no previous records for this species within proximity to the study site.
Comesperma polygaloides	Small Milkwort	-	cr	1	2011	Occasional on heavier soils (clays, alluvium) supporting grassland and grassy woodland communities in central and south-western areas.	VBA	Unlikely, not detected during targeted surveys.
Coronidium gunnianum	Pale Swamp Everlasting	-	cr	1	2010	Widespread throughout the state except for the north-west and the alpine and adjacent mountainous areas, and usually at low elevations (under c. 1 m) where mostly in grasslands and riverine *Eucalyptus camaldulensis* woodland on soils that are prone to inundation.	VBA	Unlikely, absence of suitable habitat and inundated soils present within the study site.
Dianella amoena	Matted Flax-lily	EN	cr	2	2011	Largely confined to drier grassy woodland and grassland communities south of the Dividing Range and now much depleted through its range.	VBA, PMST	Present, located immediately adjacent to the study site. This species is considered possible to occur within the study site. Targeted surveys are recommended to confirm the species extent within the study site.
Diuris basaltica	Small Golden Moths Orchid, Early Golden Moths	EN	-	-	N/A - PMST Only	Confined to the basalt plains of south-western Victoria, growing in native grassland and grassy woodland. Largely confined to road reserves.	PMST	Unlikely, no previous records for this species within proximity to the study site.

Scientific Name	Common Name	EPBC	FFG	Count	Last record	Habitat description	Source	Likelihood of occurrence within the study site
Diuris fragrantissima	Sunshine Diuris, Fragrant Doubletail, White Diuris	EN	-	-	N/A - PMST Only	Extremely rare, restricted to remnant dry grassland on the basalt plains near Sunshine, west of Melbourne and near Wodonga. Restricted to the basalt plains immediately to the north and west of Melbourne, growing in native grassland. One of Victoria's most endangered orchids, now confined to a single site where only three plants were seen 21-26.	PMST	Unlikely, no previous records for this species within proximity to the study site.
Dodonaea procumbens	Trailing Hop-bush	VU	-	-	N/A - PMST Only	This species grows in low-lying, often winter-wet areas in woodland, low open forests, healthland and grasslands, on sands and clays. Victorian populations have been recorded in various plant communities including grassy woodland dominated by River Red Gum in western Victoria, heathy dry forest in central Victoria, damp heath in far-western Victoria, and sedge wetland, healthy woodland and damp heathland in eastern Victoria.	PMST	Unlikely, no previous records for this species within proximity to the study site.
Eucalyptus aggregata	Black Gum	VU	-	-	N/A - PMST Only	In Victoria, restricted to Woodend-Gisborne region.	PMST	Unlikely, no previous records for this species within proximity to the study site.
Eucalyptus yarraensis	Yarra Gum	-	cr	1	2011	Endemic in Victoria extending west from Glengarry to Melbourne and north-west to Daylesford and Ararat.	VBA	Unlikely, Yarra Gum is a highly visible species and was not detected during the site assessment.
Glycine latrobeana	Clover Glycine, Purple Clover	VU	-	-	N/A - PMST Only	Widespread but of sporadic occurrence and rarely encountered. Grows mainly in grasslands and grassy woodlands.	PMST	Unlikely, no previous records for this species within proximity to the study site.
Lachnagrostis adamsonii	Adamson's Blown-grass, Adamson's Blowngrass	EN	-	-	N/A - PMST Only	Apparently endemic in Victoria. The species is known only by the type specimen, collected near Melbourne (1853), and a few recent (1987, 199) collections from slightly saline, seasonally wet areas on and near the volcanic plain south of Skipton and at Glenthompson toward Hamilton.	PMST	Unlikely, no previous records for this species within proximity to the study site.
Lepidium aschersonii	Spiny Pepper-cress	VU	-	-	N/A - PMST Only	Mostly on heavy clay soil near salt lakes on volcanic plain, but with outlying records from near Lake Omeo.	PMST	Unlikely, no previous records for this species within proximity to the study site.

Scientific Name	Common Name	EPBC	FFG	Count	Last record	Habitat description	Source	Likelihood of occurrence within the study site
***Lepidium hyssopifolium* s.s.**	Basalt Peppercress	EN	en	1	2010	Collected from scattered sites on the volcanic plain, but now much reduced from its former range and recorded recently only from e.g. Moorabool, Winchelsea, Bacchus Marsh, Woodend, Trentham. Most recent collections are from disturbed, rather weedy sites. One collection from near Port Fairy is noteworthy for its occurrence in a slightly saline estuary amongst saltmarsh and fringing sedgeland.	VBA, PMST	Unlikely, not detected during targeted surveys.
Leucochrysum albicans* subsp. *tricolor	Hoary Sunray, Grassland Paper-daisy	EN	-	-	N/A - PMST Only	Very rare in Victoria, the only recent collections from volcanic grassland remnants in the Wickliffe, Willaura, Streatham, Inverleigh and Creswick districts. All other Victorian collections were made last century, from e.g. Mt Cole, the Grampians and the Port Fairy district.	PMST	Unlikely, no previous records for this species within proximity to the study site.
Melaleuca armillaris* subsp. *armillaris	Giant Honey-myrtle	-	en	2	2005	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 naturalized.	VBA	Unlikely to occur within the study site (outside of species natural range, if present this species is likely to have been planted).
Pimelea spinescens* subsp. *spinescens	Plains Rice-flower, Spiny Rice-flower, Prickly Pimelea	CR	-	-	N/A - PMST Only	Grows in grassland or open shrubland on basalt-derived soils west of Melbourne.	PMST	Unlikely, no previous records for this species within proximity to the study site.
Pomaderris vacciniifolia	Round-leaf Pomaderris	CR	-	-	N/A - PMST Only	Endemic in moist forest and scrubs in the upper catchment of the Yarra, Plenty and Yea rivers.	PMST	Unlikely, no previous records for this species within proximity to the study site.
Prasophyllum validum	Sturdy Leek-orchid, Mount Remarkable Leek-orchid	VU	-	-	N/A - PMST Only	Apparently endemic to Victoria where scattered across northern, north-eastern (Chiltern area) and western open forest and woodland communities on stony and sandy soils.	PMST	Unlikely, no previous records for this species within proximity to the study site.
Pterostylis chlorogramma	Green-striped Greenhood	VU	-	-	N/A - PMST Only	Apparently localized in Victoria, but exact range uncertain due to confusion with closely allied species. Grows in moist areas of heathy and shrubby forest, on well-drained soils.	PMST	Unlikely, no previous records for this species within proximity to the study site.

Scientific Name	Common Name	EPBC	FFG	Count	Last record	Habitat description	Source	Likelihood of occurrence within the study site
Rutidosis leptorhynchoides	Button Wrinklewort	EN	-	-	N/A - PMST Only	In Victoria confined to basaltic grasslands between Rokewood and Melbourne where endangered due to loss of habitat (formerly occurring as far west as Casterton, and on the Gippsland Plain near Newry).	PMST	Unlikely, no previous records for this species within proximity to the study site.
Rytidosperma monticola	Small-flower Wallaby-grass	-	en	3	2005	Mostly in dryish grassy woodland, chiefly through central and north-eastern Victoria (e.g. Ararat, Warby Range), but with isolated occurrences in the far east (e.g. Mt Delegate, upper Genoa R), but rather rare in Victoria.	VBA	Unlikely, not detected during targeted surveys.
Senecio macrocarpus	Large-fruit Fireweed, Large-fruit Groundsel	VU	-	-	N/A - PMST Only	Largely confined to Themeda grasslands on loamy clay soils derived from basalt near Melbourne, west to Skipton area. Also known from auriferous ground near Stawell.	PMST	Unlikely, no previous records for this species within proximity to the study site.
Senecio psilocarpus	Swamp Fireweed, Smooth-fruited Groundsel	VU	-	-	N/A - PMST Only	Rare in Victoria, restricted to a few herb-rich winter-wet swamps south and west from c. Ballarat, growing on volcanic clays or peat soils.	PMST	Unlikely, no previous records for this species within proximity to the study site.
Thelymitra luteocilium	Fringed Sun-orchid	-	vu	1	1995	Scattered and rare in Victoria, often in moist depressions. Flowers Sep.-Oct. Grows among low shrubs in open forest, mallee scrub or in open rocky sites in well-drained and moisture-retentive soils.	VBA	Unlikely, not detected during targeted surveys.
Xerochrysum palustre	Swamp Everlasting, Swamp Paper Daisy	VU	-	-	N/A - PMST Only	Occurs in lowland swamps, usually on black cracking clay soils, scattered from near the South Australian border north-west of Portland to Bairnsdale district, but rare due to habitat depletion.	PMST	Unlikely, no previous records for this species within proximity to the study site.

A3: Vegetation Quality Assessment (habitat hectares) results table

Habitat Zone			1A-3A, 5A-8A	4A	3B	1B-2B, 4B
EVC number			**HNF_0023**	**HNF_0023**	**HNF_0175**	**HNF_0175**
Bioregion			Highlands Northern Fall	Highlands Northern Fall	Highlands Northern Fall	Highlands Northern Fall
EVC name			Herb-rich Foothill Forest	Herb-rich Foothill Forest	Grassy Woodland	Grassy Woodland
Conservation rating within bioregion			Least Concern	Least Concern	Depleted	Depleted
Patch score		***Max.***				
Site Condition	*Large old trees*	***10***	8	5	10	0
	Canopy cover	***5***	4	2	3	0
	Understorey	***25***	15	15	15	15
	Lack of weeds	***15***	0	0	4	6
	Recruitment	***10***	5	10	5	3
	Organic litter	***5***	5	5	5	5
	Logs	***5***	5	3	5	0
	Subtotal		42	40	47	29
	Score standardiser		1	1	1	1
	Total (Subtotal x standardiser)	***75***	**42**	**40**	**47**	**29**
Landscape Value	*Patch size*	***10***	4	4	4	4
	Neighbourhood	***10***	1	1	1	1
	Distance to core	***5***	1	1	1	1
Habitat score		***100***	**48**	**46**	**53**	**35**
Habitat score out of 1 (i.e. ÷100)		***1***	**0.48**	**0.46**	**0.53**	**0.35**

A4: Trees recorded in the study site

Large Trees in Patches

SMEC Tree ID	Scientific name	Common name	Circumference (cm) measured at 1.3 m above the ground	Hollow-bearing (yes/no)	Ryder Tree ID[8]	Impact assessment	Additional comments
1	*Eucalyptus ovata*	Swamp Gum	270.2	Yes	179	Lost	
2	*Eucalyptus viminalis*	Manna Gum	314.2	No	32	Lost	
3	*Eucalyptus viminalis*	Manna Gum	223.1	No	42	Lost	
4	*Eucalyptus* sp.	Stag	219.9	Yes	63	Lost	
5	*Eucalyptus radiata*	Narrow-leaf Peppermint	285.9	Yes	71	Lost	
6	*Eucalyptus viminalis*	Manna Gum	292.2	Yes	72	Lost	
7	*Eucalyptus viminalis*	Manna Gum	279.6	Yes	81	Lost	
8	*Eucalyptus radiata*	Narrow-leaf Peppermint	257.6	Yes	84	Lost	
9	*Eucalyptus radiata*	Narrow-leaf Peppermint	254.5	No	99	Retained	
10	*Eucalyptus viminalis*	Manna Gum	251.3	No	109	Lost	
11	*Eucalyptus viminalis*	Manna Gum	508.9	No	111	Retained	
12	*Eucalyptus viminalis*	Manna Gum	326.7	No	118	Retained	
13	*Eucalyptus viminalis*	Manna Gum	245	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted were not mapped within the arborist report. Tree confirmed as retained.
14	*Eucalyptus* sp.	Stag	282.7	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
15	*Eucalyptus viminalis*	Manna Gum	317.3	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted were not mapped within the arborist report. Tree

[8] N/A - Not captured by arborist. The Guidelines have been applied to determine impact outcome.

SMEC Tree ID	Scientific name	Common name	Circumference (cm) measured at 1.3 m above the ground	Hollow-bearing (yes/no)	Ryder Tree ID[8]	Impact assessment	Additional comments
							confirmed as retained.
16	*Eucalyptus viminalis*	Manna Gum	260.8	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
17	*Eucalyptus viminalis*	Manna Gum	298.5	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
18	*Eucalyptus viminalis*	Manna Gum	399	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
19	*Eucalyptus viminalis*	Manna Gum	323.6	Yes	135	Lost	
20	*Eucalyptus viminalis*	Manna Gum	320.4	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
21	*Eucalyptus viminalis*	Manna Gum	245	No	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
22	*Eucalyptus viminalis*	Manna Gum	229.3	No	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree

SMEC Tree ID	Scientific name	Common name	Circumference (cm) measured at 1.3 m above the ground	Hollow-bearing (yes/no)	Ryder Tree ID[8]	Impact assessment	Additional comments
							confirmed as retained.
23	*Eucalyptus viminalis*	Manna Gum	257.6	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
24	*Eucalyptus viminalis*	Manna Gum	298.5	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
25	*Eucalyptus viminalis*	Manna Gum	358.1	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
26	*Eucalyptus viminalis*	Manna Gum	226.2	No	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
27	*Eucalyptus viminalis*	Manna Gum	223.1	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
28	*Eucalyptus viminalis*	Manna Gum	430.4	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
29	*Eucalyptus* sp.	Stag	276.5	Yes	138	Retained	

SMEC Tree ID	Scientific name	Common name	Circumference (cm) measured at 1.3 m above the ground	Hollow-bearing (yes/no)	Ryder Tree ID[8]	Impact assessment	Additional comments
30	*Eucalyptus* sp.	Stag	251.3	No	N/A	Retained	As per arborist methodology, trees that are not impacted were not mapped within the arborist report. Tree confirmed as retained.
31	*Eucalyptus viminalis*	Manna Gum	381.7	Yes	136	Retained	
32	*Eucalyptus viminalis*	Manna Gum	219.9	No	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
33	*Eucalyptus* sp.	Stag	219.9	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
34	*Eucalyptus radiata*	Narrow-leaf Peppermint	248.2	No	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
35	*Eucalyptus radiata*	Narrow-leaf Peppermint	241.9	Yes	152	Retained	TPZ encroachment of 18% however, the arborist has confirmed this tree as retained.
36	*Eucalyptus radiata*	Narrow-leaf Peppermint	257.6	No	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
37	*Eucalyptus viminalis*	Manna Gum	345.6	Yes	185	Retained	

SMEC Tree ID	Scientific name	Common name	Circumference (cm) measured at 1.3 m above the ground	Hollow-bearing (yes/no)	Ryder Tree ID[8]	Impact assessment	Additional comments
38	*Eucalyptus viminalis*	Manna Gum	282.7	No	184	Lost	
39	*Eucalyptus viminalis*	Manna Gum	229.3	No	208	Lost	
40	*Eucalyptus* sp.	Stag	251.3	No	229	Lost	
41	*Eucalyptus radiata*	Narrow-leaf Peppermint	326.7	Yes	250	Lost	
42	*Eucalyptus radiata*	Narrow-leaf Peppermint	219.9	No	256	Lost	
43	*Eucalyptus radiata*	Narrow-leaf Peppermint	289	Yes	259	Lost	
44	*Eucalyptus radiata*	Narrow-leaf Peppermint	219.9	No	N/A	Retained	As per arborist methodology, trees that are not impacted are not mapped within the arborist report. Tree confirmed as retained.
45	*Eucalyptus radiata*	*Eucalyptus radiata*	289	No	296	Retained	TPZ encroachment of 33% however, the arborist has confirmed this tree as retained.
46	*Eucalyptus dives*	Broad-leaf Peppermint	273.3	No	N/A	Retained	As per arborist methodology, trees that are not impacted were not mapped within the arborist report. Tree confirmed as retained.
47	*Eucalyptus dives*	Broad-leaf Peppermint	235.6	Yes	N/A	Retained	
48	*Eucalyptus* sp.	Stag	267	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted were not mapped within the arborist report. Tree confirmed as retained.
49	*Eucalyptus dives*	Broad-leaf Peppermint	307.9	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted were not mapped within the arborist report. Tree

SMEC Tree ID	Scientific name	Common name	Circumference (cm) measured at 1.3 m above the ground	Hollow-bearing (yes/no)	Ryder Tree ID[8]	Impact assessment	Additional comments
							confirmed as retained.
50	*Eucalyptus radiata*	Narrow-leaf Peppermint	248.2	No	403	Retained	
51	*Eucalyptus* sp.	Stag	301.6	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted were not mapped within the arborist report. Tree confirmed as retained.
52	*Eucalyptus* sp.	Stag	235.6	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted were not mapped within the arborist report. Tree confirmed as retained.
53	*Eucalyptus* sp.	Stag	223.1	Yes	N/A	Retained	As per arborist methodology, trees that are not impacted were not mapped within the arborist report. Tree confirmed as retained.
54	*Eucalyptus* sp.	Stag	292.2	Yes	400	Retained	
55	*Eucalyptus radiata*	Narrow-leaf Peppermint	226.2	No	375	Lost	
56	*Eucalyptus radiata*	Narrow-leaf Peppermint	267	No	305	Lost	
57	*Eucalyptus viminalis*	Manna Gum	323.6	No	431	Lost	
58	*Eucalyptus radiata*	Narrow-leaf Peppermint	317.3	Yes	436	Lost	
59	*Eucalyptus rubida*	Candlebark	226.2	No	477	Lost	
60	*Eucalyptus viminalis*	Manna Gum	223.1	No	482	Lost	

Scattered Trees

Tree ID	Scientific Name	Common Name	Size Class (Large/Small)	Circumference (cm) measured at 1.3 m above ground	Hollow-bearing (yes/no)	Ryder Tree ID	Impact
61	*Eucalyptus viminalis*	Manna Gum	Small	125.7	No	139	Retained
62	*Eucalyptus* sp.	Stag	Large	380.1	Yes	487	Lost
63	*Eucalyptus* sp.	Stag	Large	383.3	Yes	488	Lost

Appendix B - Fauna

Key

Threatened species:

EPBC	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FFG	*Flora and Fauna Guarantee Act 1988*
CR	Critically Endangered under the EPBC Act
EN	Endangered under the EPBC Act
VU	Vulnerable under the EPBC Act
Mi	Migratory under the EPBC Act
Ma	Marine under the EPBC Act
cr	Critically Endangered under the FFG Act
en	Endangered under the FFG Act
vu	Vulnerable under the FFG Act

Introduced species:

CaLP	Listed as an established pest animal under the *Catchment and Land Protection Act 1994*
*	Introduced species

Likelihood:

Present	Presence of species confirmed on site during site assessment or relevant reports
Likely	Species likely to traverse and use suitable habitat within or immediately adjacent the study site
Possible	Species may traverse (including fly-over) or use semi-suitable habitat within or immediately adjacent the study site
Unlikely	No suitable habitat and lack of species records within or adjacent study site

B1: Fauna species recorded within the study site

Common name	Scientific name	Status
Amphibians		
Common Froglet	*Crinia signifera*	-
Birds		
Australian Magpie	*Gymnorhina tibicen*	-
Australian Wood Duck	*Chenonetta jubata*	-
Australian White Ibis	*Threskiornis molucca*	-
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	-
Brown Thornbill	*Acanthiza pusilla*	-
Buff-rumped Thornbill	*Acanthiza reguloides*	-
Brown-headed Honeyeater	*Melithreptus brevirostris*	VTWBC
Common Blackbird	*Turdus merula*	*
Common Myna	*AcriDTPheres tristis*	*
Common Starling	*Sturnus vulgaris*	*
Crimson Rosella	*Platycercus elegans*	-
Dusky Woodswallow	*Artamus cyanopterus*	Associated with VTWBC
Eastern Rosella	*Platycercus eximius*	-
Eurasian Skylark	*Alauda arvensis*	-
European Starling	*Sturnus vulgaris*	*
Flame Robin	*Petroica phoenicea*	-
Galah	*Eolophus roseicapilla*	-
Gang-gang Cockatoo	*Callocephalon fimbriatum*	EN
Grey Fantail	*Rhipidura albiscapa*	-
Grey Shrike-thrush	*Colluricincla harmonica*	-
Grey Currawong	*Strepera versicolor*	-
House Sparrow	*Passer domesticus*	-
Laughing Kookaburra	*Dacelo novaeguineae*	-
Little Corella	*Cacatua sanguinea*	-
Little Pied Cormorant	*Microcarbo melanoleucos*	-
Little Raven	*Corvus mellori*	-
Long-billed Corella	*Cacatua tenuirostris*	-
Magpie-lark	*Grallina cyanoleuca*	-

Common name	Scientific name	Status
Nankeen Kestrel	*Falco cenchroides*	-
New Holland Honeyeater	*Phylidonyris novaehollandiae*	-
Pacific Black Duck	*Anas superciliosa*	-
Pied Currawong	*Strepera graculina*	-
Rainbow Lorikeet	*Trichoglossus molucannus*	-
Red Wattlebird	*Anthochaera carunculata*	-
Shining-Bronze Cuckoo	*Chrysococcyx lucidus*	-
Silvereye	*Zosterops lateralis*	-
Straw-necked Ibis	*Threskiornis spinicollis*	-
Striated Pardalote	*Pardalotus striatus*	-
Striated Thornbill	*Acanthiza lineata*	-
Sulphur-crested Cockatoo	*Cacatua galerita*	-
Superb Fairy-wren	*Malurus cyaneus*	-
Wedge-tailed Eagle	*Aquila audax*	-
White-browed Scrubwren	*Sericornis frontalis*	-
White-faced Heron	*Egretta novaehollandiae*	-
Welcome Swallow	*Hirundo neoxena*	-
Willie Wagtail	*Rhipidura leucophrys*	-
Yellow-faced Honeyeater	*Caligavis chrysops*	-
Yellow Thornbill	*Acanthiza nana*	-
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	-
Mammals		
Eastern Grey Kangaroo	*Macropus giganteus*	-
European Rabbit	*Oryctolagus cuniculus*	*, CaLP

B2: Threatened fauna and likelihood of occurrence in the study site

Common Name	Scientific Name	EPBC	FFG	Mi/Ma	Count	Last record	Habitat Description	Source	Likelihood of occurrence
Amphibians									
Brown Toadlet	*Pseudophryne bibronii*	-	en	-	80	1989	Occurs in dry forest, woodland and grassland habitat, where they shelter under leaf litter in damp depressions.	VBA	Unlikely
Growling Grass Frog	*Litoria raniformis*	VU	vu	-	3	1988	Occurs in still or slow-flowing waterbodies with a high cover of emergent and submerged vegetation. Can be found in agricultural and pastoral land with permanent waterbodies providing there is sufficient cover of emergent, fringing or submerged vegetation.	VBA, PMST	Unlikely
Southern Toadlet	*Pseudophryne semimarmorata*	-	en	-	23	1990	Occurs in dry forest, woodland and grassland habitat, where they shelter under leaf litter in damp depressions.	VBA	Unlikely
Birds									
Australasian Shoveler	*Spatula rhynchotis*	-	vu	-	9	2019	Prefers large, deep open freshwater lakes and dams with dense vegetated margins for breeding.	VBA	Unlikely
Barking Owl	*Ninox connivens*	-	cr	-	1	2013	Occurs in open woodlands and open forests, including Box Ironbark and riparian River Red Gum habitats, as well as some foothill habitats on granitic slopes.	VBA	Unlikely
Black Falcon	*Falco subniger*	-	cr	-	3	2007	Found along tree-lined watercourses and in isolated woodlands, mainly in arid and semi-arid areas. It roosts in trees at night and often on power poles by day.	VBA	Possible
Blue-billed Duck	*Oxyura australis*	-	vu	-	3	2018	Prefers large, deep open freshwater lakes and dams with dense vegetated margins for breeding.	VBA	Unlikely
Common Sandpiper	*Actitis hypoleucos*	-	vu	Mi/Ma	-	N/A - PMST Only	Found on intertidal mudflats of estuaries, lagoons, mangroves, as well as beaches, rocky shores and around lakes, dams and floodwaters.	PMST	Unlikely
Curlew Sandpiper	*Calidris ferruginea*	CR	cr	Mi/Ma	-	N/A - PMST Only	Found on intertidal mudflats of estuaries, lagoons, mangroves, as well as beaches, rocky shores and around lakes, dams and floodwaters.	PMST	Unlikely
Diamond Firetail	*Stagonopleura guttata*	-	vu	-	2	1976	Found in open grassy woodland, heath and farmland or grassland with scattered trees.	VBA	Unlikely
Eastern Curlew	*Numenius madagascariensis*	CR	cr	Mi/Ma	-	N/A - PMST Only	Found on intertidal mudflats and sandflats, often with beds of seagrass, on sheltered coasts, especially estuaries, mangrove swamps, bays, harbours and lagoons.	PMST	Unlikely

Common Name	Scientific Name	EPBC	FFG	Mi/Ma	Count	Last record	Habitat Description	Source	Likelihood of occurrence
Eastern Great Egret	*Ardea alba modesta*	-	vu	-	1	2018	Frequents tidal mudflats, saltwater and freshwater wetlands, and mangroves.	VBA	Unlikely
Fork-tailed Swift	*Apus pacificus*	-	-	Mi/Ma	-	N/A - PMST Only	spend most of their time in the air and roost on cliffs or walls.	PMST	Unlikely
Freckled Duck	*Stictonetta naevosa*	-	en	-	2	2017	Prefers large, deep open freshwater lakes and dams with dense vegetated margins for breeding.	VBA	Unlikely
Gang-gang Cockatoo	*Callocephalon fimbriatum*	EN	-	-	20	2018	During summer, the Gang-gang Cockatoo is found in tall mountain forests and woodlands, with dense shrubby understoreys. In winter, Gang-gangs will move to lower altitudes into drier, more open forests and woodlands. At this time, they may be seen by roadsides and in parks and gardens of urban areas. They require tall trees for nest hollows.	VBA	Possible
Grey Falcon	*Falco hypoleucos*	VU	vu	-	-	N/A - PMST Only	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	PMST	Unlikely
Hardhead	*Aythya australis*	-	vu	-	23	2020	Prefers large, deep open freshwater lakes and dams with dense vegetated margins for breeding.	VBA	Unlikely
Hooded Robin	*Melanodryas cucullata*	-	vu	-	5	1999	Found in lightly timbered woodland, mainly dominated by acacia and/or eucalypts.	VBA	Unlikely
Latham's Snipe	*Gallinago hardwickii*	-	-	Mi/Ma	2	2017	They usually inhabit open, freshwater wetlands with low, dense vegetation e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies.	VBA, PMST	Unlikely
Little Eagle	*Hieraaetus morphnoides*	-	vu	-	5	2005	Little Eagles utilise Yellow Box-Red Gum grassy woodland which is a component of the EPBC Act-listed ecological community: White Box-Yellow Box-Red Gum Grassy Woodland and Derived Native Grassland. Habitat for the Little Eagle in the South Eastern Highlands bioregion is under ecological stress generally and regional population decline of the species is evident. Also found in Mid and Lower Murray Valley where wetlands and irrigated farmlands adjoin River Red Gum woodlands and forests. Little Eagles are absent from areas of high urbanisation and dense forests, and more abundant in open woodland.	VBA	Possible
Little Egret	*Egretta garzetta*	-	en	-	1	2000	Frequents tidal mudflats, saltwater and freshwater wetlands, and mangroves.	VBA	Unlikely

Common Name	Scientific Name	EPBC	FFG	Mi/Ma	Count	Last record	Habitat Description	Source	Likelihood of occurrence
Musk Duck	*Biziura lobata*	-	vu	-	6	2021	Prefers large, deep open freshwater lakes and dams with dense vegetated margins for breeding.	VBA	Unlikely
Painted Honeyeater	*Grantiella picta*	VU	vu	-	1	1988	Occurs in box-gum woodland and box-ironbark forests with high presence of mistletoe for foraging.	VBA, PMST	Unlikely
Pectoral Sandpiper	*Calidris melanotos*	-	-	Mi/Ma	-	N/A - PMST Only	Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	PMST	Unlikely
Pilotbird	*Pycnoptilus floccosus*	VU	-	-	-	N/A - PMST Only	Pilotbirds are strictly terrestrial, living on the ground in dense forests with heavy undergrowth	PMST	Unlikely
Powerful Owl	*Ninox strenua*	-	vu	-	4	2013	Found in open forests and woodlands, as well as along sheltered gullies in wet forests with dense understoreys, especially along watercourses. Needs old growth trees to nest.	VBA	Possible
Regent Honeyeater	*Anthochaera phrygia*	CR	cr	-	1	1971	Occurs in dry open forest or woodlands comprising ironbarks, Yellow Box, White and Yellow Gum.	VBA	Unlikely
Rufous Fantail	*Rhipidura rufifrons*	-	-	Mi/Ma	2	1999	The Rufous Fantail is found in rainforest, dense wet forests, swamp woodlands and mangroves, preferring deep shade, and is often seen close to the ground. During migration, it may be found in more open habitats or urban areas.	VBA, PMST	Possible
Satin Flycatcher	*Myiagra cyanoleuca*	-	-	Mi/Ma	-	N/A - PMST Only	The Satin Flycatcher is found in tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests.	PMST	Possible
Sharp-tailed Sandpiper	*Calidris acuminata*	-	-	Mi/Ma	-	N/A - PMST Only	Sharp-tailed Sandpiper prefers the grassy edges of shallow inland freshwater wetlands. It is also found around sewage farms, flooded fields, mudflats, mangroves, rocky shores and beaches. Its breeding habitat in Siberia is the peat-hummock and lichen tundra of the high Arctic.	PMST	Unlikely
Speckled Warbler	*Pyrrholaemus sagittatus*	-	en	-	8	1999	Occurs in eucalypt woodlands and forests with a grassy understory.	VBA	Unlikely
Swift Parrot	*Lathamus discolor*	CR	cr	Ma	3	2019	Migrates to mainland Australia in winter. Forages in dry sclerophyll forests and woodlands, suburban parks and gardens and flowering fruit trees.	VBA	Possible

Common Name	Scientific Name	EPBC	FFG	Mi/Ma	Count	Last record	Habitat Description	Source	Likelihood of occurrence
White-throated Needletail	*Hirundapus caudacutus*	VU	vu	Mi/Ma	7	2006	Highly aerial species occurring over a variety of habitat types.	VBA, PMST	Possible, aerial foraging only
Yellow Wagtail	*Motacilla flava*	-	-	Mi	-	N/A - PMST Only	inhabits open country near water, such as wet meadows.	PMST	Unlikely
Fish									
Australian Grayling	*Prototroctes maraena*	VU	en	-	-	N/A - PMST Only	Occurs within streams and rivers in both fresh and brackish water environments. Larvae and early juvenile stages occur out at sea, before juveniles return to freshwater environments.	PMST	Unlikely
Murray Cod	*Maccullochella peelii*	VU	en	-	-	N/A - PMST Only	Endemic to the Murray-Darling Basin, translocated population in the Yarra River.	PMST	Unlikely
Silver Perch	*Bidyanus bidyanus*	CR	en	-	1	1981	Endemic to the Murray-Darling system and introduced into some Victorian river systems. Occur in rivers, large streams and lakes.	VBA	Unlikely
Southern Pygmy Perch (Murray-Darling Basin lineage)	*Nannoperca australis (Murray-Darling lineage)*	VU	vu	-	-	N/A - PMST Only	Southern Pygmy Perch usually occur amongst aquatic vegetation in a wide range of environments. The species has a patchy distribution due population declines in recent years - especially in New South Wales.	PMST	Unlikely
Yarra Pygmy Perch	*Nannoperca obscura*	VU	vu	-	-	N/A - PMST Only	Typically occurs in lakes, ponds and slow-flowing rivers and is usually associated with large amounts of aquatic vegetation.	PMST	Unlikely
Invertebrates									
Golden Sun Moth	*Synemon plana*	VU	vu	-	65	2016	Occurs in grassland dominated by wallaby grasses (Rytidosperma spp.) or Chilean Needle Grass (Nassella neesiana).	VBA	Unlikely
Mammals									
Broad-toothed Rat (mainland)	*Mastacomys fuscus mordicus*	VU	vu	-	-	N/A - PMST Only	Preferred habitats include alpine and subalpine heathlands, grassland adjacent to boulder outcrops, swamps, sedgelands, coastal grassy or shrubby dunes. Requires high vegetation cover.	PMST	Unlikely
Brush-tailed Phascogale	*Phascogale tapoatafa*	-	vu	-	12	2018	Occurs in dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Nest in tree hollows.	VBA	Unlikely, not detected during

Common Name	Scientific Name	EPBC	FFG	Mi/Ma	Count	Last record	Habitat Description	Source	Likelihood of occurrence
									targeted surveys
Common Dunnart	*Sminthopsis murina murina*	-	vu	-	1	1990	Occur in dry sclerophyll forests and mallee heathlands.	VBA	Unlikely
Grey-headed Flying-fox	*Pteropus poliocephalus*	VU	vu	-	-	N/A - PMST Only	Widely distributed across eastern Australia feeding on nectar from a variety of eucalypt species and fruits in rainforest habitats and farmland.	PMST	Unlikely
Platypus	*Ornithorhynchus anatinus*	-	vu	-	7	2002	Platypus is endemic to Australia and is dependent on rivers, streams and bodies of freshwater. They feed in both slow-moving and rapid (riffle) parts of streams, but show preference to coarser bottom substrates, particularly cobbles and gravel. When not foraging, the Platypus spends most of the time in its burrow in the bank of the river, creek or a pond.	VBA	Unlikely
Yellow-bellied Glider (south-eastern)	*Petaurus australis australis*	VU	-	-	-	N/A - PMST Only	The Yellow-bellied Glider (south-eastern) occurs in eucalypt-dominated woodlands and forests, including both wet and dry sclerophyll forests.	PMST	Unlikely
Reptiles									
Striped Legless Lizard	*Delma impar*	VU	en	-	-	N/A - PMST Only	Occurs in tussock grasslands with cracking clay soils and imbedded rock.	PMST	Unlikely

Appendix C - Communities

C1: EPBC Act-listed communities listed on the PMST database

EPBC Act-listed community	Conservation status	Corresponding Ecological Vegetation Class in study site	Present in study site
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Grassy Woodland (EVC 175)	Not Present
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	None	Not Present
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	None	Not Present
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	None	Not Present

C2: Key diagnostic characteristics and condition thresholds assessment for *Grassy Eucalypt Woodland of the Victorian Volcanic Plain.*

Key diagnostic characteristics:

Key diagnostic characteristics	Key diagnostic characteristics assessment response
Distribution is limited to the Victorian Volcanic Plain Bioregion (Interim Biogeographical Regionalisation of Australia (IBRA) Version 6)	**Not met** The study site is located within the South Eastern Highlands IBRA Bioregion and does therefore not meet the key diagnostic criteria to be considered the threatened ecological community. No further assessment necessary.

C3: Victorian Temperate Woodland Bird Community species recorded during spring 2022 and winter 2023 targeted surveys

Common name	Scientific name	Status
Australian Magpie	*Gymnorhina tibicen*	-
Australian Wood Duck	*Chenonetta jubata*	-
Australian White Ibis	*Threskiornis molucca*	-
Buff-rumped Thornbill	*Acanthiza reguloides*	-
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	-
Brown-headed Honeyeater	*Melithreptus brevirostris*	VTWBC
Brown Thornbill	*Acanthiza pusilla*	-

Common name	Scientific name	Status
Common Blackbird	*Turdus merula*	*
Common Myna	*AcriDTPheres tristis*	*
Crimson Rosella	*Platycercus elegans*	-
Dusky Woodswallow	*Artamus cyanopterus*	Associated with VTWBC
Eastern Rosella	*Platycercus eximius*	-
Eurasian Skylark	*Alauda arvensis*	-
European Starling	*Sturnus vulgaris*	*
Galah	*Eolophus roseicapilla*	-
Gang-gang Cockatoo	*Callocephalon fimbriatum*	EN
Grey Fantail	*Rhipidura albiscapa*	-
Grey Shrike-thrush	*Colluricincla harmonica*	-
Grey Currawong	*Strepera versicolor*	-
House Sparrow	*Passer domesticus*	-
Laughing Kookaburra	*Dacelo novaeguineae*	-
Little Corella	*Cacatua sanguinea*	-
Long-billed Corella	*Cacatua tenuirostris*	-
Little Raven	*Corvus mellori*	-
Little Pied Cormorant	*Microcarbo melanoleucos*	-
Magpie-lark	*Grallina cyanoleuca*	-
Nankeen Kestrel	*Falco cenchroides*	-
New Holland Honeyeater	*Phylidonyris novaehollandiae*	-
Pacific Black Duck	*Anas superciliosa*	-
Pied Currawong	*Strepera graculina*	-
Rainbow Lorikeet	*Trichoglossus moluccanus*	-
Red Wattlebird	*Anthochaera carunculata*	-
Shining-Bronze Cuckoo	*Chrysococcyx lucidus*	-
Silvereye	*Zosterops lateralis*	-
Straw-necked Ibis	*Threskiornis spinicollis*	-
Striated Pardalote	*Pardalotus striatus*	-
Striated Thornbill	*Acanthiza lineata*	-
Sulphur-crested Cockatoo	*Cacatua galerita*	-
Superb Fairywren	*Malurus cyaneus*	-
Welcome Swallow	*Hirundo neoxena*	-

Common name	Scientific name	Status
Wedge-tailed Eagle	*Aquila audax*	-
White-browed Scrubwren	*Sericornis frontalis*	-
White-faced Heron	*Egretta novaehollandiae*	-
Willie Wagtail	*Rhipidura leucophrys*	-
Yellow Thornbill	*Acanthiza nana*	-
Yellow-faced Honeyeater	*Caligavis chrysops*	-
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	-

Appendix D – Native vegetation removal report

Native vegetation removal report

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

Date of issue: **26/05/2023**
Time of issue: **4:29 pm**

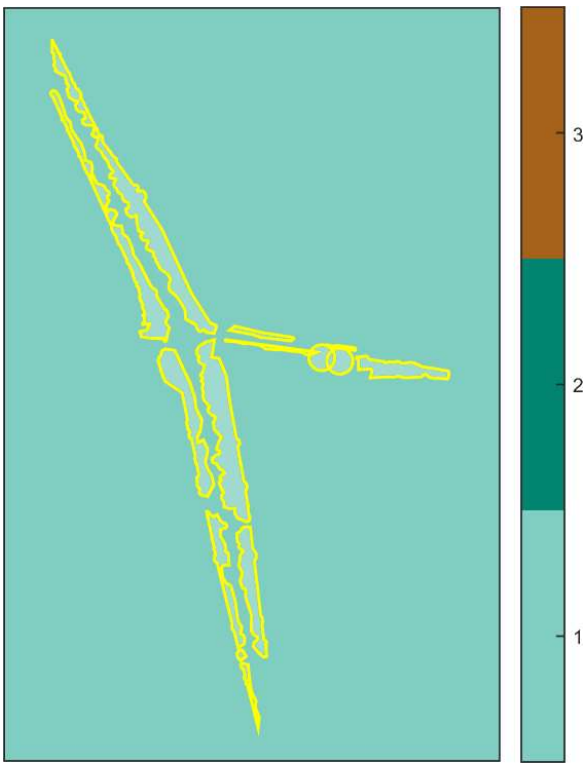
Report ID: SME_2023_012

Project ID	30043285_NorthernHwy_VegetationRemoval_20230524

Assessment pathway

Assessment pathway	**Detailed Assessment Pathway**
Extent including past and proposed	2.444 ha
Extent of past removal	0.000 ha
Extent of proposed removal	2.444 ha
No. Large trees proposed to be removed	24
Location category of proposed removal	Location 1 The native vegetation is not in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map), sensitive wetland or coastal area. Removal of less than 0.5 hectares in this location will not have a significant impact on any habitat for a rare or threatened species

1. Location map



Offset requirements if a permit is granted

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

General offset amount[1]	1.285 general habitat units
Vicinity	Goulburn Broken Catchment Management Authority (CMA) or Mitchell Shire Council
Minimum strategic biodiversity value score[2]	0.409
Large trees	24 large trees

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

Appendix 1 includes information about the native vegetation to be removed

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

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

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

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

Next steps

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

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

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

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

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

Additional application requirements must be met including:

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

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

For more information contact the DELWP Customer Service Centre 136 186

www.delwp.vic.gov.au

Appendix 1: Description of native vegetation to be removed

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

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

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

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

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

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

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

Native vegetation to be removed

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	**Type**	**BioEVC**	**BioEVC conservation status**	**Large tree(s)**	**Partial removal**	**Condition score**	**Polygon Extent**	**Extent without overlap**	**SBV score**	**HI score**	**Habitat units**	**Offset type**
1-a	Patch	hnf_0023	Least Concern	7	no	0.480	0.505	0.505	0.553		0.282	General
2-a	Patch	hnf_0023	Least Concern	2	no	0.480	0.214	0.214	0.587		0.122	General
3-a	Patch	hnf_0023	Least Concern	0	no	0.480	0.008	0.008	0.510		0.004	General
4-a	Patch	hnf_0023	Least Concern	0	no	0.460	0.030	0.030	0.510		0.016	General
5-a	Patch	hnf_0023	Least Concern	0	no	0.480	0.153	0.153	0.462		0.081	General
6-a	Patch	hnf_0023	Least Concern	3	no	0.480	0.278	0.278	0.416		0.142	General
7-a	Patch	hnf_0023	Least Concern	4	no	0.480	0.350	0.350	0.516		0.191	General
8-a	Patch	hnf_0023	Least Concern	2	no	0.480	0.556	0.556	0.513		0.303	General
1-b	Patch	hnf_0175	Depleted	0	no	0.350	0.037	0.037	0.540		0.015	General
2-b	Patch	hnf_0175	Depleted	0	no	0.350	0.008	0.008	0.540		0.003	General
3-b	Patch	hnf_0175	Depleted	4	no	0.530	0.153	0.153	0.434		0.087	General

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	**Type**	**BioEVC**	**BioEVC conservation status**	**Large tree(s)**	**Partial removal**	**Condition score**	**Polygon Extent**	**Extent without overlap**	**SBV score**	**HI score**	**Habitat units**	**Offset type**
4-b	Patch	hnf_0175	Depleted	0	no	0.350	0.025	0.025	0.540		0.010	General
1-C	Scattered Tree	hnf_0175	Depleted	1	no	0.200	0.071	0.064	0.540		0.015	General
2-C	Scattered Tree	hnf_0175	Depleted	1	no	0.200	0.071	0.062	0.540		0.014	General

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

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

Species common name	Species scientific name	Species number	Conservation status	Group	Habitat impacted	% habitat value affected
Deane's Wattle	*Acacia deanei subsp. paucijuga*	504201	Rare	Dispersed	Habitat importance map	0.0002
Matted Flax-lily	*Dianella amoena*	505084	Endangered	Dispersed	Habitat importance map	0.0002
Trailing Hop-bush	*Dodonaea procumbens*	501090	Vulnerable	Dispersed	Habitat importance map	0.0001
Yarra Gum	*Eucalyptus yarraensis*	501326	Rare	Dispersed	Habitat importance map	0.0001
Golden Sun Moth	*Synemon plana*	15021	Critically endangered	Dispersed	Habitat importance map	0.0001
Speckled Warbler	*Chthonicola sagittatus*	10504	Vulnerable	Dispersed	Habitat importance map	0.0000
Square-tailed Kite	*Lophoictinia isura*	10230	Vulnerable	Dispersed	Habitat importance map	0.0000
Late-flower Flax-lily	*Dianella tarda*	505085	Vulnerable	Dispersed	Habitat importance map	0.0000
Lanky Buttons	*Leptorhynchos elongatus*	501941	Endangered	Dispersed	Habitat importance map	0.0000
Small Milkwort	*Comesperma polygaloides*	500798	Vulnerable	Dispersed	Habitat importance map	0.0000
Barking Owl	*Ninox connivens connivens*	10246	Endangered	Dispersed	Habitat importance map	0.0000
White-throated Needletail	*Hirundapus caudacutus*	10334	Vulnerable	Dispersed	Habitat importance map	0.0000

Habitat group

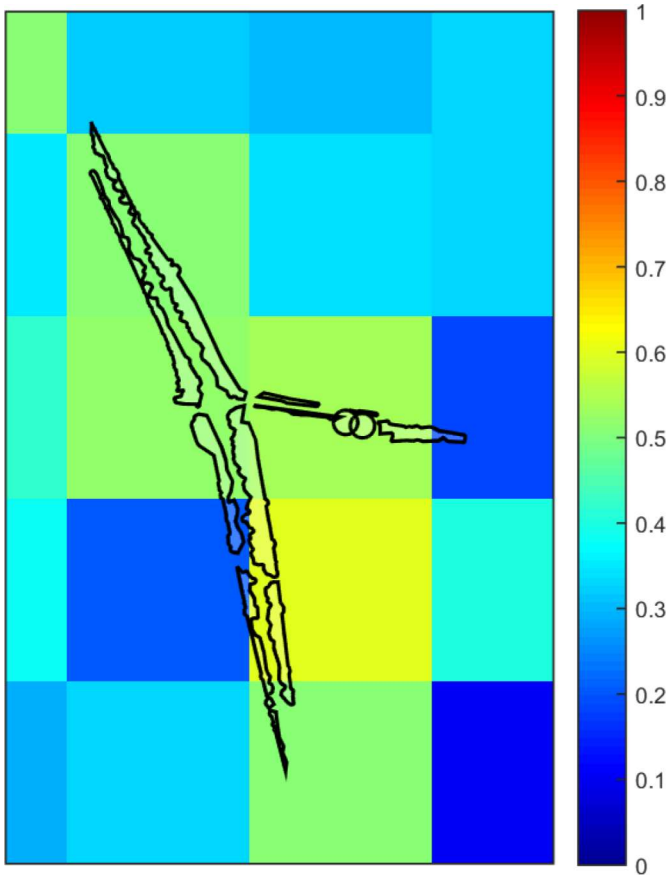
- Highly localised habitat means there is 2000 hectares or less mapped habitat for the species
- Dispersed habitat means there is more than 2000 hectares of mapped habitat for the species

Habitat impacted

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

Appendix 3 – Images of mapped native vegetation

2. Strategic biodiversity values map



3. Aerial photograph showing mapped native vegetation

4. Map of the property in context

Yellow boundaries denote areas of proposed native vegetation removal.

Appendix E – Report of available native vegetation offsets

Report of available native vegetation credits

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

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

Date and time: 29/10/2024 10:27 **Report ID: 27029**

What was searched for?

General offset

General habitat units	Strategic biodiversity value	Large trees	Vicinity (Catchment Management Authority or Municipal district)	
1.285	0.409	24	CMA	Goulburn Broken
			or LGA	Mitchell Shire

Details of available native vegetation credits on 29 October 2024 10:27

These sites meet your requirements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
VC_CFL-3075_01	7.854	37	Goulburn Broken	Greater Shepparton City	Yes	Yes	No	VegLink

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

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

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

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

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
VC_CFL-3747_01	11.546	332	Goulburn Broken	Mansfield Shire	Yes	Yes	No	Contact NVOR

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

Next steps

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

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

Broker contact details

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

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

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