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Final Report

Biodiversity Impact Assessment for the Proposed Montrose Quarry Expansion: 56-72 Canterbury Road, Montrose, Victoria

Prepared for

Boral Land & Property Group

March 2024

Ecology and Heritage Partners Pty Ltd

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DOCUMENT CONTROL

Assessment type	Biodiversity Impact Assessment for the Proposed Montrose Quarry Expansion
Address	56-72 Canterbury Road, Montrose, Victoria
Project number	14500
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File name	14500_EHP_PFFIA_MontroseQuarryMontrose_Final_21032024
Client	Boral Land & Property Group
Bioregion	Highlands – Southern Fall
Catchment Management Authority	Melbourne Water
Council	Yarra Ranges Shire Council

VERSION CONTROL

Report versions	Comments	Comments made by:	Date submitted
Draft	Report sent to the client for review	CS	01/06/2021
Preliminary Final	Changes made throughout the report due to amended expansion footprint	CS	25/11/2021
Preliminary Final v2	Changes made throughout report due to a second amended expansion footprint	CS	22/12/2022
Final	Incorporated the results of flora and fauna targeted surveys	CS	21/03/2024

Ecology and Heritage Partners acknowledge the Traditional Owners of the country we live and work on, and we pay our respect to Elders past, present and emerging.

EXECUTIVE SUMMARY

Introduction

Ecology and Heritage Partners Pty Ltd was commissioned by Boral Land & Property Group to undertake a Biodiversity Impact Assessment for the Proposed Montrose Quarry Expansion at 56-72 Canterbury Road, Montrose, Victoria.

The purpose of this assessment was to identify the extent and type of native vegetation present within the proposed expansion footprint and to determine the likely presence of significant flora and fauna species and/or ecological communities. Flora and fauna values were also broadly mapped for the remaining property containing native vegetation outside the existing Work Authority boundary. This report presents the results of the assessment and discusses the potential ecological and legislative implications associated with the proposed action. The report also provides recommendations to address or reduce development impacts and where necessary, highlights components that require further investigations.

Methods

Relevant literature, online-resources and databases were reviewed to provide an assessment of flora and fauna values associated with the study area.

Biodiversity field assessments were undertaken on 9, 10 and 11 December 2020 and 13 September 2021 to obtain information on the flora and fauna values within the study area. Where native vegetation was identified a habitat hectare assessment was undertaken. Large Trees in patches were only mapped within and directly adjoining the proposed extraction limit boundary.

The study area was also visually assessed and active searching under and around ground debris for reptiles, frogs and small mammals was undertaken. Binoculars were also used to scan the area for birds, and observers listened for calls and searched for other signs of fauna such as nests, remains of dead animals, droppings and footprints. Potential habitat for fauna was assessed, with an emphasis on habitats that may provide shelter, food or other resources for significant species.

Suitable habitat for the nationally significant White Star-bush *Asterolasia asteriscophora* subsp. *albiflora*, Gang-gang Cockatoo *Callocephalon fimbriatum* and Southern Greater Glider *Petauroides volans* subsp. *volans* was observed as part of the biodiversity field assessments. Targeted surveys were therefore undertaken for these species on the following dates:

- White Star-bush: 19 and 20 October, and 1 November 2023.
- Gang-gang Cockatoo: 6, 7 and 8 September 2023.
- Southern Greater Glider: 7 and 8 February, and 9 and 10 May 2022.

Suitable habitat was also observed for seven State-significant flora species, in which targeted surveys were undertaken concurrently with the White Star-bush targeted survey.

It is noted that impact calculations are based on the extent of direct impacts within the proposed pit expansion. Due to the unavailability of relevant information as of the date of this report, the impact assessment has not considered indirect impacts as a result of changes to Groundwater Dependant Ecosystems, alterations to surface water flows or other associated impacts that may arise as a result of the proposal.

Results

Flora

A total of 28.471 hectares of native vegetation was identified during the habitat hectare assessment across the study area, with 323 Large Trees within these patches within or close to the proposed extraction limit, i.e. the disturbance area. The total area of native vegetation proposed to be impacted within the expanded extraction limit is 8.779 hectares, with 262 Large Trees being within this area of impacted native vegetation. The remainder of the study area comprised introduced and planted vegetation, present as pasture grass and ornamental garden species. One hundred and thirty-nine flora species were recorded within the study area, including 62 indigenous and 77 non-indigenous species.

Three species of State significant flora (Sticky Wattle *Acacia howittii*, Dandenong Wattle *Acacia strictophylla*, Mountain Bird-orchid *Chiloglottis jeanesii*) were recorded within the proposed extraction limit boundary. No other national or State-listed significant flora species were observed during the field assessment, however there is a potential that national and State-significant species would occupy the study area based on previous studies within the study area and the proximity of previous records.

Fauna

Twenty-nine fauna species were observed within the study area, comprising 23 native birds, two native butterflies, an Eastern Grey Kangaroo *Macropus giganteus*, Common Garden Skink *Lampropholis guichenoti*, the feather of a Gang-gang Cockatoo *Callocephalon fimbriatum* and what were believed to be the scats of a Wild Pig *Sus scrofa*. These species are locally common.

Although no national or State-significant species were observed during the field assessment, two nationally-significant (Gang-gang Cockatoo, Southern Greater Glider *Petauroides volans*) and six State-significant species (Barking Owl *Ninox connivens connivens*, Lace Monitor *Varanus varius*, Powerful Owl *Ninox strenua*, Sooty Owl *Tyto tenebricosa*, Southern Toadlet *Pseudophryne semimarmorata*, Speckled Warbler *Chthonicola sagittate*) were considered to have the highest likelihood of utilising habitat within or adjacent to the study area.

Ecological Communities

Two nationally listed ecological communities are predicted to occur within 10 kilometres of the study area, being the Natural Damp Grassland of the Victorian Coastal Plains and White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. However, vegetation within the study area did not meet the condition thresholds that define any nationally significant communities due to the absence of key indicator species.

Likewise, vegetation within the study area does not meet the species composition or condition threshold benchmarks for any State-significant ecological communities.

Legislation and Policy Implications

Environment Protection and Biodiversity Conservation Act 1999

There is suitable habitat within the study area for one flora species (White Star-bush) and two fauna species (Gang-gang Cockatoo, Southern Greater Glider) listed under the EPBC Act. However, the White Star-bush, Gang-gang Cockatoo and Southern Greater Glider were not observed or heard during targeted surveys.

With respect to the Gang-gang Cockatoo, this species has the potential to forage opportunistically within the study area and wider locality when in the area (i.e. they migrate between areas across Australia) and are not expected to rely on vegetation present within the study area for their needs. The Gang-gang Cockatoo targeted survey recorded 60 trees within the proposed extraction limit that were potentially suitable for nesting purposes.

Further potential impacts to matters listed under the EPBC Act will be determined following the groundwater investigation and any indirect impacts that may arise from this assessment, including an assessment against the relevant significant impact thresholds for the identified matters of NES. As such, a need for a referral to the Commonwealth Environment Minister for matters listed under the EPBC Act is to be determined.

Environment Effects Act 1978

Based on the referral criteria that consider ecological matters, it is unlikely that a referral to the Minister for Planning will be triggered based on the current development proposal. Two of the ecological criteria are only considered when the impact footprint is 10 hectares or more (the actual impact is 8.779 hectares) and thus it is highly recommended that the impact footprint not be increased to 10 hectares or more so these criteria do not contribute to the requirement for a referral.

It is important to note that the ecological assessment is based on direct terrestrial impacts and doesn't incorporate any indirect impacts that may have implications for groundwater drawdown or terrestrial groundwater dependent ecosystems. Further expert advice should be sought regarding the non-ecological criteria. The proponent has engaged a groundwater consultant to investigate this aspect of the proposed development, with the findings being reviewed by Ecology and Heritage Partners when complete to determine any potential implications regarding the EE Act.

Should the project be assessed via an EES, additional surveys for State significant flora and fauna will be required.

Flora and Fauna Guarantee Act 1988

There are confirmed records of three flora species listed as Threatened under the FFG Act (Sticky Wattle, Dandenong Wattle, Mountain Bird-orchid) and 13 flora species listed as Protected under the FFG Act (Sticky Wattle, Dandenong Wattle, Mountain Bird-orchid, Common Maidenhair *Adiantum aethiopicum*, Gristle Fern *Blechnum cartilagineum*, Common Ground-fern *Calochlaena dubia*, Common Bird-orchid *Chiloglottis valida*, Button Everlasting *Coronidium scorpioides*, Common Correa *Correa reflexa*, Common Onion-orchid *Microtis unifolia*, Showy Daisy-bush *Olearia lirata*, Cotton Fireweed *Senecio quadridentatus*, Grass Triggerplant *Stylidium graminifolium*) within the study area. No fauna species listed under the FFG Act were observed.

The FFG Act applies to public land (although there are exceptions for private land that do not apply in this case) and given the study area is privately owned, a permit under the FFG Act is not required.

Mining Resources (Sustainable Development) Act 1990

A Work Plan variation will need to be updated in order to comply with the requirements of the Act.

The study area is within Location 2, with 8.779 hectares of native vegetation and 262 Large Trees proposed to be removed. As such, the permit application is assessed under the Detailed assessment pathway.

The offset requirement for native vegetation removal are:

- 10.910 species units of habitat for Swamp Bush-pea *Pultenaea weindorferi*;
- 10.910 species units of habitat for Wine-lipped Spider-orchid *Caladenia oenochila*;
- 10.910 species units of habitat for Dandenong Wattle *Acacia strictophylla*; and
- 262 Large Trees.

Planning and Environment Act 1987

The clearing of native vegetation for mining and extractive industries is exempt from the requirement for a planning permit subject under the 'Stone Extraction' exemption detailed in Clause 52.17-7 of the Yarra Ranges Planning Scheme subject to an assessment as part of the Work Plan approval process (MRSD Act). The removal of native vegetation for the Earth Resources Industry is regulated through the Mining and Extractive Industry Work Approvals Process (DPI 2009). A Memorandum of Understanding between the former DSE and DPI recognises that native vegetation should be offset in accordance with the relevant legislation (DPI 2007).

Catchment and Land Protection Act 1994

Eight weeds listed as noxious under the CaLP Act were recorded during the assessment (Bridal Creeper *Asparagus asparagoides*, Asparagus Fern *Asparagus scandens*, Boneseed *Chrysanthemoides monilifera*, Spear Thistle *Cirsium vulgare*, Flax-leaf Broom *Genista linifolia*, Sweet Briar *Rosa rubiginosa*, Blackberry *Rubus fruticosus* spp. agg, Bulbil Watsonia *Watsonia meriana* var. *bulbillifera*). Similarly, there is evidence (scats) that the study area is currently occupied by one pest fauna species listed under the CaLP Act (Wild Pigs). Listed noxious weeds and pests should be appropriately controlled throughout the study area.

Wildlife Act 1975 and Wildlife Regulations 2013

Any persons engaged to remove, salvage, hold or relocate native fauna during construction must hold a current Management Authorisation under the *Wildlife Act 1975* issued by DEECA.

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GLOSSARY

Acronym	Description
AVW	Atlas of Victorian Wildlife
CaLP Act	*Catchment and Land Protection Act 1994*
CAM	Common Assessment Method
CMA	Catchment Management Authority
DAWE	(former) Commonwealth Department of Agriculture, Water and the Environment
DBH	Diameter at Breast Height
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DEECA	Victorian Department of Energy, Environment and Climate Action
DEDJTR	Victorian Department of Economic Development, Jobs, Transport and Resources
DELWP	(former) Victorian Department of Environment, Land, Water and Planning
DEPI	(former) Victorian Department of Environment and Primary Industries
DPI	(former) Victorian Department of Primary Industries
DSE	(former) Victorian Department of Sustainability and Environment
DTP	Victorian Department of Transport and Planning
EE Act	Environ*mental Effects Act 1978*
EES	Environment Effects Statement
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ERI	Earth Resources Industry
EVC	Ecological Vegetation Class
FFG Act	*Flora and Fauna Guarantee Act 1988*
MoU	Memorandum of Understanding
MRSD Act	*Mineral Resources (Sustainable Development) Act 1990*
NES	National Environmental Significance
NVIM Tool	Native Vegetation Information Management Tool (DELWP)
NVR report	Native Vegetation Removal report
OEH	New South Wales Office of Environment and Heritage
PMST	Protected Matters Search Tool (DCCEEW)
TRZ	Tree Retention Zone
TSSC	Threatened Species Scientific Community
VBA	Victorian Biodiversity Atlas
WoNS	Weed of National Significance

1 INTRODUCTION

1.1 Background

Ecology and Heritage Partners Pty Ltd was commissioned by Boral Land & Property Group to undertake a Biodiversity Impact Assessment for the Proposed Montrose Quarry Expansion at 56-72 Canterbury Road, Montrose, Victoria (Figure 1).

Current operations at Montrose Quarry includes the extraction of rhyodacite and rhyolite aggregates from the exiting quarry pit. The extracted rock is transferred to the site's processing plant where several different products are prepared for sale. In response to continued market demand for construction products, Boral Land & Property Group proposes to expand the existing quarry pit into the hillside to the south and south-east of the existing extraction limit (Figure 2). This area is within Boral Land & Property Group's title land, but outside the existing Work Authority boundary. The expansion of resource extraction will require the preparation and submission of the Work Authority and Work Plan Variation and address local, State and Commonwealth policy and legislation before expansion works commence.

A previous Flora and Fauna Assessment was undertaken by Ecology Australia (2006) as part of an Environment Effects Statement (EES) for the proposed quarry expansion application at the time. However, given the time elapsed since this assessment, further flora and fauna assessments were required to be undertaken to enable an understanding of the study area's existing ecological conditions and determine the current policy and legislative implications.

The purpose of this assessment was to identify the extent and type of native vegetation present within the proposed expansion footprint and to determine the likely presence of significant flora and fauna species and/or ecological communities. Flora and fauna values were also broadly mapped for the remaining property containing native vegetation outside the existing Work Authority boundary. This report presents the results of the assessment and discusses the potential ecological and legislative implications associated with the proposed action. The report also provides recommendations to address or reduce development impacts and where necessary, highlights components that require further investigations.

1.2 Objectives

The objectives of the Flora and Fauna Impact Assessment were to:

- Review the relevant flora and fauna databases and available literature;
- Conduct a site assessment to identify flora and fauna values within the study area, particularly focussing on the proposed extraction limit;
- Provide maps showing any areas of remnant native vegetation and locations of any significant flora and fauna species, and/or fauna habitat (if present);
- Classify any flora and fauna species and vegetation communities identified or considered likely to occur within the study area in accordance with Commonwealth and State legislation;
- Identify an approvals strategy, including confirmation of implications relating to State and Commonwealth biodiversity legislation and policy;

- Recommend avoidance, minimisation and mitigation measures for the Project to avoid triggering the requirement for an EES;
- Document any opportunities and/or constraints associated with the proposed works;
- Impact assessment detailing the expected impacts from construction and operation activities and recommending measures to avoid, minimise or mitigate significant impacts;
- Discuss recommended mitigation measures to balance the needs of biodiversity with the proposed activity;
- Advise whether any additional flora and/or fauna surveys are required prior to works commencing (e.g. targeted surveys for significant flora and fauna species); and
- Consider risks and impacts to biodiversity within the study area.

Where areas of remnant vegetation were present, the following tasks were completed to address requirements under the *Guidelines for the removal, destruction or lopping of native vegetation* (the Guidelines) (Department of Environment, Land, Water and Planning [DELWP] 2017):

- A habitat hectare assessment of any areas of remnant native vegetation within the study area;
- Recommendations to address requirements under the Guidelines to minimise impacts to remnant vegetation; and,
- Identification of potential offset obligations and costs (based on the proposed quarry footprint provided by Boral Land & Property Group) associated with any native vegetation, Large Trees in patches, scattered trees and habitat for rare or threatened species proposed to be lost as a result of the proposed works.

1.3 Study Area

The property is located at 56-72 Canterbury Road, Montrose and is approximately 35 kilometres east of Melbourne's CBD (Figure 1). The study area covers the vegetated area east, south and south-east of the existing quarry pit within the property boundary (32.737 hectares), in which the habitat hectare assessment was undertaken. However, only the Large Trees were recorded within and adjoining the proposed extraction limit boundary (approximately 12.7 hectares) (Figure 2). The study area is bound by the existing Montrose Quarry pit to the north, Dr Ken Leversha Bushland Reserve to the east, rural properties and Melbourne Water Retarding Basin to the south, and residential properties to the west.

The study area contains predominantly native forested vegetation, with some small areas cleared of trees and shrubs that now contains largely exotic grasses. The study area contains several ridges and valleys and two ephemeral creek lines. One creek line runs north-south in the eastern half of the study area, which feeds into the second larger ephemeral creek line (Bungalook Creek) the runs east-west through the eastern half of the study area to the south of the proposed extraction limit boundary (Figure 2).

According to the Department of Energy, Environment and Climate Action (DEECA) NatureKit Map (DEECA 2024a), the study area is located within the Highlands – Southern Fall bioregion, Melbourne Water Catchment Management Authority (CMA) and Yarra Ranges Shire Council municipality.

2 METHODS

2.1 Desktop Assessment

Relevant literature, online-resources and databases were reviewed to provide an assessment of flora and fauna values associated with the study area. The following information sources were reviewed:

- The DEECA NatureKit Map (DEECA 2024a) and Native Vegetation Regulation (NVR) Map (DEECA 2024b) for:
    - Modelled data for location risk, native vegetation patches, scattered trees and habitat for rare or threatened species; and,
    - The extent of historic and current Ecological Vegetation Classes (EVCs).
- EVC benchmarks (DEECA 2024c) for descriptions of EVCs within the relevant bioregion;
- The Victorian Biodiversity Atlas (VBA) for previously documented flora and fauna records within the project locality (DEECA 2023a);
- Birdlife Australia (2024) for detailed descriptions and distributions of birds (both native and exotic);
- The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST) for matters of National Environmental Significance (NES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (DCCEEW 2024);
- Relevant listings under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act), including the latest Threatened (DEECA 2023b) and Protected (DELWP 2019a) Lists;
- Relevant listings under the Victorian *Catchment and Land Protection Act 1994* (CaLP Act);
- The online VicPlan Map (Department of Transport and Planning [DTP] 2024) to ascertain current zoning and environmental overlays in the study area;
- Aerial photography of the study area; and
- The previous ecological assessment relevant to the study area, being:
    - Montrose Environment Effects Statement (EES) Flora and Fauna Assessment (Ecology Australia 2006).

2.2 Field Assessments

2.2.1 Biodiversity Assessment

Field assessments were undertaken on the 9, 10 and 11 December 2020 and 13 September 2021 to obtain information on the flora and fauna values within the study area. The study area was walked by a habitat hectare assessor accredited by DEECA in the habitat hectare assessment methodology. All commonly observed vascular flora species were recorded, significant records mapped and the overall condition of vegetation and

habitats noted. EVCs were determined with reference to DEECAs pre-1750 and extant EVC mapping (DEECA 2024a) and their published descriptions (DEECA 2024c).

Where native vegetation was identified a habitat hectare assessment was undertaken following methodology described in the Vegetation Quality Assessment Manual (Department of Sustainability and Environment (DSE) 2004). Large Trees in patches and scattered trees were only mapped within the proposed extraction limit extension boundary.

Furthermore, the study area was visually assessed and active searching under and around ground debris for reptiles, frogs and small mammals was undertaken. Binoculars were also used to scan the area for birds, and observers listened for calls and searched for other signs of fauna such as nests, remains of dead animals, droppings and footprints. Potential habitat for fauna was assessed, with an emphasis on habitats that may provide shelter, food or other resources for significant species.

Suitable habitat was observed as part of the biodiversity field assessment for three Commonwealth-listed threatened flora and fauna species, being the:

- White Start-bush *Asterolasia asteriscophora* subsp. *albiflora*
- Gang-gang Cockatoo *Callocephalon fimbriatum*
- Southern Greater Glider *Petauroides volans* subsp. *volans*

Suitable habitat was also observed for seven State-listed threatened flora species.

2.2.2 *White Star-bush Targeted Survey*

Commonwealth EPBC Act Conservation Status: Critically Endangered

Victorian FFG Act Conservation Status: Critically Endangered

Species Characteristics and Previous Records

The White Star-bush is a slender upright shrub with small white flowers and grows to approximately 1.5 metres in height (Plate 1). It is endemic to the damp sclerophyll eucalypt forests of the south-eastern foothill slopes of the Dandenong Ranges, i.e. Belgrave, Monbulk, Avonsleigh and Emerald Dandenong Ranges, Victoria at elevations of approximately 150-300 metres altitude. Flowering generally occurs from early October to late November (Threatened Species Scientific Community [TSSC] 2022).

The DEECA NatureKit Tool (DEECA 2024a) contains 14 White Star-bush records within a 10-kilometre radius of the study area. While these records are all to the south-east of the study area, the vegetation closer to the creek line within the study area does however contain suitable habitat that is consistent and contiguous with the known locations.

Plate 1. White Star-bush *Asterolasia asteriscophora* subsp. *albiflora* flowers (Royal Botanic Gardens Victoria 2024a)

Survey Method

Targeted surveys for this species were undertaken on 19 and 20 October, and 1 November 2023 by three experienced ecologists. The species was observed flowering at a reference location along Bonham Road, The Patch on 19 October prior to undertaking the targeted surveys. The assessment area for this species was within the proposed extraction limit plus a 20-metre buffer to confirm presence/absence of any specimens. The assessment area was walked along five metre transects, which is in accordance with DEECAs survey method for threatened plant species outlined in the *Biodiversity Precinct Structure Planning Kit* (DSE 2010). This document is considered to contain 'best-practice' survey guidelines in the absence of a specific recommended targeted survey method for the White Star-bush.

2.2.3 State Significant Flora Targeted Surveys

As well as identifying suitable habitat for the White Star-bush during the biodiversity assessment, suitable habitat was also present for seven State-significant species. These seven species also flower around the same time as the White Star-bush, i.e. October and November, with late October to mid-November being the best time to survey all eight species (Royal Botanic Gardens Victoria 2024b). These species are:

- Sticky Wattle *Acacia howittii*
- Dandenong Wattle *Acacia strictophyla*
- Mountain Bird-orchid *Chiloglottis jeanesii*
- Netted Brake *Preris epaleata*
- Veined Spear-grass *Austrostipa rudis* subsp. *australis*
- Velvet Apple-berry *Billardiera scandens* var. *scandens* s.s.
- Wine-lipped Spider-orchid *Caladenia oenochila*

While the targeted flora surveys focused on the White Star-bush, the potential presence of the above-listed species were also incorporated into the targeted surveys.

The same survey methodology was used for these seven species as per the White Star-bush.

2.2.4 Gang-gang Targeted Surveys

Commonwealth EPBC Act Conservation Status: Endangered

Victorian FFG Act Conservation Status**:** Endangered

Species Characteristics

The Gang-gang Cockatoo is a small, stocky, yet distinct cockatoo, usually 32-37 centimetres in length with a 62 to 76-centimetre wingspan. These birds are primarily slate-grey, with the males easily identifiable with a scarlet-coloured head and wispy crest, and the females supporting yellow and pink edged underbelly feathers, giving a barred effect (Plate 2). Juveniles are similar in appearance to the females, however their crest is rudimentary, while their underparts and upper wings appear a washed-green (Higgins 1999; DAWE 2022). Their call is also distinct, often likened to a creaking gate, or a cork being pulled from a bottle (OEH 2024).

Species distribution and habitat

Gang-gang Cockatoo are endemic to south-eastern Australia. Literature for this species predominately arises from NSW, with limited published literature regarding species distribution and habitat requirements in Victoria. However, Gang-gang Cockatoo are considered to be widespread through Victoria's north-east and southern regions, with records in east Melbourne, Mornington Peninsula, and south-west Gippsland (Higgins 1999; Menkhorst *et al.* 2017; DAWE 2022).

Plate 2. Gang-gang Cockatoo Callocephalon fimbriatum. Ecology and Heritage Partners Pty Ltd.

Gang-gang Cockatoo are an altitudinal migrant, being well-adapted to cooler climates the species is most common at higher altitudes and southern latitudes (DAWE 2022). During the summer months, the species primarily occurs in mature, wet sclerophyll forests dominated by eucalypts with dense, shrubby understories dominated by wattles and banksias (NSW Scientific Committee 2008). However, during the winter months, the species migrates to lower altitudes and drier woodland habitats and open eucalypt assemblages (Shields and Crome 1992; Higgins 1999). Importantly, some overlapping of winter and summer ranges is common (Higgins 1999). Outside of the breeding season (October to January), the species can also be observed in suburban areas (i.e. Canberra, Sydney and Melbourne) including parks, gardens, and road-side plantations (DAWE 2022).

Foraging and diet

Typically feeding arboreally in small groups, foraging primarily occurs in the canopy of woodland assemblages (particularly eucalypts) (Higgins 1999). The species has a wide-ranging diet, regularly feeding on flower buds, seed pods blossoms, leaf buds, fruit and seed from native (mainly eucalypts and wattles) and ornamental/introduced species. Gang-gang Cockatoo will also feed on insect larvae (Menkhorst *et al.* 2017).

Breeding and nesting

Monogamous breeders, the Gang-gang Cockatoo breeding season occurs from October to January, however breeding records from late August, early September and March exist (Higgins 1999). The species nest in old-growth hollows, which primarily occur in the tree trunk and limb or within the dead sprout of large, living eucalypts (DAWE 2022). Nest and roost sites are often located near water (Beruldsen 1980; DAWE 2023), this this may be product of large hollow-bearing trees being more common. Breeding aggregations are reliant on stands of suitable hollow-bearing trees (NSW OEH 2017; Davey and Mulvaney 2020), whereby multiple nests tend to be positioned in close proximity (i.e. within a few hundred metres).

Gang-gang Cockatoo work to enlarge and create suitable nesting hollows and may return to the same nest and roost sites over multiple years (Higgins 1999). Pairs may also use nest trees over different years (Davey and

Mulvaney 2020), possibly to misnaming nest parasitism or predation (DAWE 2022). Preferred hollow attributes are presented in Table 1.

Table 1. Gang-gang Cockatoo preferred hollow attributes (Davey and Mulvaney 2020; DAWE 2022).

Hollow attribute	Dimensions
Entrance height	21.3 (minimum 12) centimetres
Entrance width	13.1 (range 9-24) centimetres
Floor diameter*	20 centimetres
Hollow depth*	50.5 (range 22-90) centimetres
Height above ground*	7.5 (5 - 9.4 metres)

*Hollow attributes considered a key component of habitat critical to the survival of Gang-gang Cockatoo (DAWE 2022)

Previous Records

The DEECA NatureKit Tool (DEECA 2024a) contains 158 Gang-gang Cockatoo records within a 10-kilometre radius of the study area. A Gang-gang Cockatoo feather was found within the study area as part of the biodiversity assessment, which indicates the species maybe utilising the study area, even if it's intermittently.

Survey Method

Targeted surveys for Gang-gang Cockatoo were undertaken across the entire study area by two ecologists experienced in the detection and identification of the species on over three days between 6 and 8 September 2023.

The surveys primarily sought to assess the condition and suitability of the vegetation within the study for foraging, nesting, and breeding purposes of the Gang-gang Cockatoo. A focus was given to the presence and suitability of hollow-bearing trees, with trees in which hollows were observed being mapped. Trees were categorised as containing small (entrance less than 30 centimetres in diameter) and/or large (entrance 30 centimetres in diameter and greater) hollows.

2.2.5 Southern Greater Glider Targeted Survey

Commonwealth EPBC Act Conservation Status: Endangered

Victorian FFG Act Conservation Status: Endangered

Species Characteristics and Previous Records

Greater Glider is the largest gliding mammal, with a head and body length of 35-46cm and a long, furry, non-prehensile tail measuring 45-60cm (DELWP 2019b). The Greater Glider is a strictly arboreal, nocturnal gliding marsupial which is endemic to south-eastern Australia (McGregor 2020). The Greater Glider varies in colour form, however, typically has a thick, dark grey-brown fur dorsally and cream-white fur ventrally, with large, distinctive ears (DELWP 2019b) (Plate 3).

Greater Gliders are vulnerable to habitat loss and disturbance due to their dependence on mature trees with large hollows for shelter and restricted specialised diet of eucalyptus leaves (McGregor 2020). Greater gliders are associated with eucalyptus forests along the Great Dividing Range from northern Queensland to southern

Victoria. In Victoria, Greater Gliders are distributed throughout forested parts of eastern Victoria, including inland and southern falls of the Great Dividing Ranges and within the Strzelecki and Strathbogie Ranges (DELWP 2019b).

Greater Glider has markedly declined over the past two decades due to the impacts of logging and fires (McLean 2018), creating fragmented, isolated populations. The presence of key habitat attributes, primarily mature hollow-bearing trees and the age of the stand, are strong determinants of the species' presence in a forest (Lindenmayer 1990). In 2016, the greater glider was listed as endangered under the EPBC Act after the species had undergone a noticeable reduction in numbers (Smith and Smith 2018).

Plate 3. Southern Greater Glider *Petauroides volans* subsp. *volans* (DELWP 2022).

The DEECA NatureKit Tool (DEECA 2024a) contains 55 Southern Greater Glider records within a 10-kilometre radius of the study area. The study area contains suitable habitat due to the presence of a mature eucalypt forest with a diversity of hollows.

Survey Method

Nocturnal Southern Greater Glider surveys were undertaken across the whole study area by two experienced zoologists. A total of three replicate transects, each surveyed twice over the survey period (i.e. six surveys), were completed over four nights, undertaken on 7 and 8 February 2022, and 9 and 10 May 2022 during weather conditions considered suitable for Southern Greater Glider activity (Table 2). The surveys were conducted in accordance with the prescribed methodology detailed in the *Survey guidelines for Australia's threatened mammals – Guidelines for detecting mammals listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999* (DSEWPC 2011).

Table 2. Targeted survey weather conditions.

Survey Date	Moon Phase (%)	Night Light	Cloud Cover (%)	Temperature	Relative Humidity (%)	Wind
07/02/2022	40	High	0	21.8	72	Light wind
08/02/2022	50	High	0	23.1	52	Light wind
09/05/2022	50	High	0	9.2	78	Calm
09/05/2022	50	High	0	8.8	87	Light Air
10/05/2022	65	High	0	12.7	83	Light Air
10/05/2022	65	High	0	12	80	Light Air

Each observer used handheld spotlights and walked the same transect 10 minutes apart at pace of 10 minutes per 100 metres (not including recording time) to survey for eye-shine or other evidence of fauna at night. Following detection, binoculars were used to identify the animal to species level. The following data was collected for each species observation:

- Name of the observer;
- Details of the species present and number of individuals detected;
- Date and time of record;
- Precise geographic location of sighting (GPS coordinates);
- Method of observation, including the sampling effort;
- Supporting evidence: if possible, photographs to allow independent confirmation of the identification; and,
- Weather and environmental conditions (e.g. temperature, wind speed, cloud cover and moon phase) were also recorded at the commencement of each transect.

The location of transects was determined through a desktop analysis of the biodiversity assessment results and considered several factors, including:

- The location of large trees which have the potential to contain hollows;
- Maximising coverage of the best available habitat;
- The density of vegetation which may limit the view of the canopy (i.e. choosing tracks which enable good visibility); and,
- The location of the proposed impact area.

Opportunistic sightings of other fauna species (including any significant species) were also recorded.

2.3 Removal, Destruction or Lopping of Native Vegetation (the Guidelines)

The clearing of native vegetation for mining and extractive industries is exempt from the requirement for a planning permit under the *Planning and Environment Act 1987* subject to an assessment as part of the work plan approval process required under the *Mineral Resources (Sustainable Development) Act 1990* (MRSD Act). The removal of native vegetation for the Earth Resources Industry (ERI) is regulated through the Mining and Extractive Industry Work Approvals Process. A Memorandum of Understanding (MoU) between the former Department of Sustainability and Environment (DSE) and Department of Primary Industries (DPI) recognises that native vegetation should be offset in accordance with the relevant legislation.

Further information regarding the legislative requirements are provided in Section 4.

2.3.1 Assessment Pathway

The Guidelines manage the impacts on biodiversity from native vegetation removal using an assessment-based approach. Two factors – extent risk and location category – are used to determine the risk associated with an

application for a permit to remove native vegetation. The location category (1, 2 or 3) has been determined for all areas in Victoria and is available on DELWP's NVIM Tool (DELWP 2022b). Determination of assessment pathway is summarised in Table 3.

Table 3. Assessment pathways for applications to remove, destroy or lop native vegetation (DELWP 2017).

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

Notes for above table: For the purpose of determining the assessment pathway of an application to remove native vegetation the extent includes any other native vegetation that was permitted to be removed on the same contiguous parcel of land with the same ownership as the native vegetation to be removed, where the removal occurred in the five year period before an application to remove native vegetation is lodged.

2.3.2 Vegetation Assessment

Native vegetation (as defined in Table 4) is assessed using two key parameters: extent (in hectares) and condition. For the purposes of this assessment, both condition and extent were determined as part of the habitat hectare assessment.

Table 4. Determination of a patch of native vegetation (DELWP 2017).

Category	Definition	Extent	Condition
Patch of native vegetation	An area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native; OR An area with three or more native canopy trees where the drip line of each tree touches the drip line of at least one other tree, forming a continuous canopy; OR any mapped wetland included in the Current Wetlands map, available in DELWP systems and tools.	Measured in hectares. Based on hectare area of the native patch.	Vegetation Quality Assessment Manual (DSE 2004). Modelled condition for Current Wetlands.
Scattered tree	A native canopy tree that does not form part of a native patch.	Measured in hectares. Each Large scattered tree is assigned an extent of 0.071 hectares (15 metre radius). Each Small scattered tree is assigned a default extent of 0.031 hectares (10 metre radius)	Scattered trees are assigned a default condition score of 0.2 (outside a patch).

Notes: Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses'.

2.3.3 *Impact Avoidance and Minimisation*

All applications to remove native vegetation must demonstrate the three-step approach of avoid, minimise and offset. This is a precautionary approach that aims to ensure that the removal of native vegetation is restricted to what is reasonably necessary, and that biodiversity is appropriately compensated for any native vegetation removal that is approved.

2.3.4 *Offsets*

Biodiversity offsets are required to compensate for the permitted removal of native vegetation. Offset obligations and offset site criteria are determined in accordance with the Guidelines (DELWP 2017) and are divided into two categories, being General Habitat Units and Species Habitat Units.

The offset requirements for native vegetation removal are calculated by DELWP and presented in a Native Vegetation Removal (NVR) Report, which are based on the vegetation condition scores determined during the biodiversity assessment.

2.4 Assessment Qualifications and Limitations

This report has been written based on the quality and extent of the ecological values and habitat considered to be present or absent at the time of the desktop and/or field assessments being undertaken.

The 'snapshot' nature of a standard biodiversity assessment meant that migratory, transitory or uncommon fauna species may have been absent from typically occupied habitats at the time of the field assessment. In addition, annual or cryptic flora species such as those that persist via underground tubers may also be absent.

A comprehensive list of all terrestrial flora and fauna present within the study area was not undertaken as this was not the objective of the assessment. Rather a list of commonly observed species was recorded to inform the habitat hectare assessment and assist in determining the broader biodiversity values present within the study area.

The assessment conducted to date has not considered potential implications of indirect impacts, including impacts to groundwater drawdown and terrestrial groundwater dependent ecosystems, or indirect impacts resulting from alterations to surface water flows. The proponent has engaged a groundwater consultant to assess the potential implications of this aspect of the proposed development. Ecology and Heritage Partners will review the groundwater consultant's findings and data to determine any potential flora and/or fauna implications, including under the *Environment Effects Act 1978* (EE Act).

Data and information held within the ecological databases and mapping programs reviewed as part of the desktop assessment are unlikely to represent all flora and fauna observations that have occurred within, and surrounding, the study area. Therefore, it is important to acknowledge that the number of documented records for the target species within and surrounding the study area is not necessarily a reflection of population size or density. Furthermore, a documented record may indicate a species' presence in an area at a given point in time, but it generally does not offer information about how a species is making use of an area (e.g. foraging, dispersing, reintroducing, etc.). This can be important information when determining the potential impact of a proposed action on a threatened species.

DEECAs survey method for threatened plant species outlined in the *Biodiversity Precinct Structure Planning Kit* (DSE 2010) specifies that the distance between transects should be no more than five metres, which was used when undertaking surveys for the White Star-bush and other threatened flora species. The assessors aimed to walk transects at this width, however the dense understorey, large intact fallen trees and/or large branch debris made this unachievable in some of the forested areas. Furthermore, the slope fell away steeply along the quarry pit boundary in the northern 'arm' of the study area, which was too unsafe to walk. Despite this, the surveys were undertaken in a comprehensive manner where possible across the study area.

Ecological values identified within the study area were recorded using a hand-held GPS or tablet with an accuracy of +/-3 metres. This level of accuracy is considered to provide an accurate assessment of the ecological values present within the study area; however, this data should not be used for detailed surveying purposes.

The terrestrial flora and fauna data collected during the field assessment and information obtained from relevant desktop sources is considered to adequately inform an accurate assessment of the broader ecological values present within the study area.

3 RESULTS

3.1 Vegetation Condition

A total of 28.471 hectares of native vegetation patches were recorded during the habitat hectare assessment, with 323 Large Trees in patches being located within or directly adjoining the proposed extraction limit footprint (Figure 2). The remainder of the study area comprised introduced and planted vegetation, present as pasture grass and ornamental garden species.

A total of 139 flora species were recorded within the study area, including 62 indigenous and 77 non-indigenous species. A list of all flora species recorded during the field assessment are provided in Appendix 1.1.

3.1.1 Patches of Native Vegetation

Native vegetation in the study area is representative of two EVCs: Herb-rich Foothill Forest (EVC 23) and Shrubby Gully Forest (EVC 938). The presence of these EVCs is generally consistent with the modelled 2005 native vegetation mapping (DEECA 2024a). Specific details relating to the observed EVCs are provided below.

The results of the habitat hectare assessment are provided in Appendix 1.2.

Herb-rich Foothill Forest

Herb-rich Foothill Forest typically occupies easterly and southerly aspects typically on lower slopes and in gullies. It is characterised by eucalypts to 25 metres tall with an understorey tree or large shrub layer over a sparse to dense medium shrub layer. The ground layer comprises a high cover and diversity of herbs and grasses (DEECA 2024c).

Two distinct habitat zones of differing quality were observed within the study area, being HrFF1 and HrFF2. A large majority (25.08 hectares, 99.5%) of the patches identified as Herb-rich Foothill Forest were assigned HrFF1 and consisted of intact forests with a diversity of native species at all strata. The canopy layer within these patches consisted of eucalypts dominated by Messmate Stringybark *Eucalyptus obliqua*, with infrequent occurrences of Red Stringybark *Eucalyptus macrorhyncha*, Bundy *Eucalyptus goniocalyx* and Narrow-leaf Peppermint *Eucalyptus radiata* (Plate 4). These trees generally ranged in height between 20 to 30 metres, with several of the larger trees containing a range of hollow sizes.

The shrub layer in patches of HrFF1 contained a diversity of native species, including Silver Wattle *Acacia dealbata*, Prickly Current-bush *Coprosma quadrifida*, Sweet Bursaria *Bursaria spinosa*, Burgan *Kunzea ericoides*, Prickly Tea-tree *Leptospermum continentale* and Common Cassinia *Cassinia aculeata* (Plate 5). The distribution of the native shrub layer was patchy throughout HrFF1, as there were large areas where Austral Bracken *Pteridium esculentum* dominated the understory, particularly where the large trees have fallen over and left gaps in the canopy layer (Plate 6).

Native grasses occured throughout HrFF1, being more common towards the western half of the study area. Species included Tall Spear-grass *Austrostipa pubinodis*, Weeping Grass *Microlaena stipoides* subsp. *stipoides*, Forest Wire-grass *Tetrarrhena juncea* and Common Love Grass *Eragrostis brownii* (Plate 7).

Plate 4. A canopy dominated by Messmate Stringybark within a patch of HrFF1. Tree number 161 to the right of this photo is on Figure 2c (Ecology and Heritage Partners 10/12/2020).

Plate 5. An assortment of native shrubs (largely Showy Daisy-bush) in HrFF1 near tree number 52 on Figure 2b (Ecology and Heritage Partners 10/12/2020).

Plate 6. A dense understorey of Austral Bracken within a patch of HrFF1 near tree number 158 on Figure 2c (Ecology and Heritage Partners 10/12/2020).

Plate 7. A patch of Tall Spear-grass within HrFF1 near tree number 63 on Figure 2b (Ecology and Heritage Partners Pty Ltd 10/12/2020).

The ground layer contained a rich assortment of herbs and creepers. A selection of species observed included Honey-pots *Acrotriche serrulata*, Tall Bluebell *Wahlenbergia stricta* subsp. *stricta*, Annual Fireweed *Senecio glomeratus*, Blue Pincushion *Brunonia australis*, Button Everlasting *Coronidium scorpioides*, Mountain Clematis *Clematis aristata* and Twining Glycine *Glycine clandestina*.

Two orchid species were also identified within HrFF1, being one location comprising approximately 30 specimens of Common Bird-orchid *Chiloglottis valida* (Plate 8) and a single Common Onion-orchid *Microtis unifolia* in another location (Figure 2). Both species were observed within the proposed extraction limit footprint.

Two small constructed ponds were located within the proposed expanded extraction limit within HrFF1 (Figure 2) and comprised typical water-loving species, including Tall Spike-sedge *Eleocharis sphacelata* and Hollow Rush *Juncus amabilis* (Plate 9; Plate 10). The southern pond contained very little Common water at the time

of assessment. The northern pond contained water; however, it was relatively shallow (approximately 80 centimeters deep) and may be subject to periodic drying in drier conditions.

Seven small patches of HrFF2 totaling 0.13 hectares were located towards the study area's western and southern boundaries and were of lower quality than HrFF1. The largest of these patches in the study area's north-western corner compriseed two Messmate Stringybark and a mid-layer of Blackwood *Acacia melanoxylon*, while the remaining six patches contain Blackwood only (Plate 11). The understorey vegetation in these patches was dominated by environmental weeds such as Sweet Vernal-grass *Anthoxanthum odoratum*, Common Sow-thistle *Sonchus oleraceus* and Yorkshire Fog *Holcus lanatus*.

Plate 8. Approximately 30 Common Bird-orchid plants near tree number 67 on Figure 2b (Ecology and Heritage Partners Pty Ltd 10/12/2020).

Plate 9. A thick cover of Tall Spike-sedge within the southern pond on Figure 2 (Ecology and Heritage Partners Pty Ltd 10/12/2020).

Plate 10. Scattered occurrences of Hollow Rush throughout the northern pond on Figure 2 (Ecology and Heritage Partners Pty Ltd 10/12/2020).

Plate 11. A patch of HrFF2 with two Blackwoods along the study area's western boundary (Ecology and Heritage Partners 10/12/2020).

Shrubby Gully Forest

Shrubby Gully Forest is characterised by an open eucalypt forest to 30 metres tall. It is restricted to low gradient gullies on minor streams within foothill environments. The understorey is dominated by shrubs, sedges and ferns, with herbs and grasses present but in low diversity (DEECA 2024c).

One patch of Shrubby Gully Woodland (SGW1) covering 2.05 hectares was present within the study area along Bungalook Creek and supported a dense cover of sedges and ferns under a canopy of Messmate Stringybark and Swamp Gum *Eucalyptus viminalis* (Plate 12; Figure 2). Common understorey species included Thatch Sword-sedge *Gahnia radula*, Variable Sword-sedge *Lepidosperma laterale* var. *laterale* and Austral Bracken. This patch was generally in moderate to good condition.

Plate 12. A patch of Shrubby Gully Forest within the study area along its eastern boundary (Ecology and Heritage Partners Pty Ltd 12/04/2021).

3.1.2 Large Trees in Patches

A total of 323 Large Trees in the HrFF1 patch were recorded within or directly adjoining the proposed extraction limit footprint (Figure 2; Appendix 1.3). These consisted of 251 Messmate Stringybark, 18 Red Stringybark, 17 Bundy and 13 dead eucalypt stags (Plate 4; Plate 13; Plate 14).

Plate 13. Two Large Trees (Messmate Stringybark) in HrFF1 on either side of this photo (Tree numbers 127 and 128 on Figure 2b) (Ecology and Heritage Partners 11/12/2020).

Plate 14. One Large Tree (Bundy) (Tree number 8 on Figure 2a) towards the boundary of HrFF1 (Ecology and Heritage Partners Pty Ltd 11/12/2020).

3.1.3 Scattered Trees

No scattered trees were recorded within the study area.

3.1.4 Introduced and Planted Vegetation

The open areas not supporting native vegetation patches towards the study area's south-western end consisted of exotic pasture grasses, and ornamental shrubs and trees typically found in garden settings (Figure 2). The pasture grasses included Sweet Vernal-grass, Yorkshire Fog, Paspalum *Paspalum dilatatum* and Bearded Oat *Avena barbata* (Plate 15). The ornamental shrubs and trees present varied greatly and included Irish Strawberry Tree *Arbutus unedo*, Liquidambar *Liquidambar styraciflua*, English Yew *Taxus baccata*, Purple-leaf Cherry-plum *Prunus cerasifera* 'Nigra', Japanese Maple *Acer palmatum*, Radiata Pine *Pinus radiata* and Monterey Cypress *Hesperocyparis macrocarpa* (Plate 16).

There was also an area of planted native vegetation towards the north-eastern end of the study area (Figure 2), which were documented as planted vegetation on quarry documents prepared in the 1990s. Species in this area included the Southern Blue Gum *Eucalyptus globulus* subsp. *globulus*, wattles *Acacia* spp. and hakeas *Hakea* spp.

Plate 15. Open exotic grassland along the study area's western boundary (Ecology and Heritage Partners Pty Ltd 10/12/2020).

Plate 16. A row of Monterey Cypress along the study area's northern boundary towards the study area's western side (Ecology and Heritage Partners Pty Ltd 10/12/2020).

The patches of Herb-rich Foothill Forest and Shrubby Gully Forest contained a selection of exotic weedy species, with many of the grassy and herbaceous weeds concentrated around the periphery of the patches as a result of encroachment from the adjoining open non-native areas. The highly invasive environmental weed (as listed by the Yarra Ranges Shire Council) Sweet Pittosporum *Pittosporum undulatum* occurred throughout the patches of native vegetation in various densities. While there were many locations where their distribution was sparse to moderate, there were some locations where it was the only understory species present (Plate 17).

Noxious weeds, as defined under the CaLP Act, were present within the study area in very limited numbers. No large infestations were observed, however individual or small groups of noxious weeds were distributed throughout the native vegetation patches and non-vegetated areas. The eight noxious weeds observed were

Asparagus Fern *Asparagus scandens* (Plate 18), Boneseed *Chrysanthemoides monilifera*, Flax-leaf Broom *Genista linifolia*, Blackberry *Rubus fruticosus* spp. agg., Bridal Creeper *Asparagus asparagoides*, Bulbil Watsonia *Watsonia meriana* var. *bulbillifera*, Spear Thistle *Cirsium vulgare* and Sweet Briar *Rosa rubiginosa*. The first five are also Weeds of National Significance (WoNS).

Plate 17. A dense coverage of Sweet Pittosporum within HrFF1 near tree number 12 on Figure 2a (Ecology and Heritage Partners Pty Ltd 11/12/2020).

Plate 18. A small Asparagus Fern within HrFF1 near tree number 12 on Figure 2a (Ecology and Heritage Partners Pty Ltd 11/12/2020).

3.2 Fauna Habitat

3.2.1 Forested Areas

Herb-rich Foothill Forest and Shrubby Gully Forest are the two EVCs that occur throughout the study area and provide an important resource for both arboreal and ground dwelling fauna species. Most eucalypts within the study area are mature, providing an array of small to large hollows, bark fissures and crevices. These are likely to be used for shelter and nesting by a range of arboreal fauna including parrots, microbats, possums, gliders and owls. Small to medium-sized hollows provide habitat for smaller species such as parrots, rosellas, glides and insectivorous bats, while large hollows can take many decades to form and provide critical habitat for large owls (e.g. Powerful Owl *Ninox strenua*, Barking Owl *Ninox connivens*) and the Brush-tail Possum *Trichosurus vulpecula*.

A high diversity of birds were observed foraging within the canopy during the fauna assessments (Appendix 2.1), including the Striated Thornbill *Acanthiza lineata*, Yellow-faced Honeyeater *Lichenostomus chrysops*, Rainbow Lorikeet *Trichoglossus haematodus*, Little Eagle *Hieraaetus morphnoides* and Grey Butcherbird *Cracticus torquatus*.

A group of Bell Miners *Manorina melanphrys*, a honeyeater endemic to south-eastern Australia, were observed towards the study area's southern boundary approximately halfway along. These birds generally form colonies of up to 200 birds, with the Bell Minors observed within this location containing a large colony. Approximately half of the mature eucalypts in this location were displaying signs of dieback, indicating that the Bell Miners may have contributed to this.

The State-significant fauna species Powerful Owl has been previously recorded within ten kilometres of the study area, with the Powerful Owl being recorded three times within the study area (Appendix 2.2 and Figure 4). Several observations of Powerful Owls and other indications of their presence (i.e. scats, regurgitated pellets, feathers, feed roosts) were recorded during the Ecology Australia (2006) study. Within Victoria, Powerful Owl mostly occurs to the south of the 36°30' line of latitude. This is the largest owl species in Australia. It prefers tall open sclerophyll forest and woodlands, requiring large, hollow-bearing eucalypts for breeding. Suitable nesting hollows are generally considered to be up to 50 centimetres wide, and one metre deep (Cooke *et al* 2002). The Powerful Owl prefers areas with dense scrub nearby but has been recorded in a variety of wooded habitats. It prefers large tracts of continuous forest but will sometimes occur in more fragmented landscapes or near permanent streams dominated by Mountain Grey Gum *Eucalyptus cypellocarpa* and other eucalypts. It is occasionally recorded in parklands and adjoining suburban areas, but rarely, if ever, breed in these areas (Higgins 1999). The study area contained 57 hollows that were 30 centimetres and greater, which was assessed as part of the Gang-gang Cockatoo targeted survey (refer to Section 3.5.2). Based on the presence of previous records within the study area, presence of large hollows and habitat suitability, the Powerful Owl is still likely to use habitat resources within the study area for nesting, roosting and foraging.

The State-significant fauna species Barking Owl has been previously recorded within ten kilometres of the study area (Appendix 2.2 and Figure 4). One Barking Owl observation was made along the eastern boundary of the study area during the same Ecology Australia (2006) study as per the Powerful Owl assessment. The Barking Owl may occupy habitats within the study area on rare occasions.

The State-significant species Sooty Owl *Tyto tenebricosa* has been observed within a 10-kilometre radius of the study area, and although most of the study area does not contain the preferred habitat for the species given it typically inhabits dense forest such as rainforest gullies, the forested habitat along Bungalook Creek may be used by the species on an infrequent basis.

There were a small number of Eastern Grey Kangaroos *Macropus giganteus* observed within the study area. Eastern Grey Kangaroo home range is likely to encompass most of the study area, due to a presence of water sources, suitable protective habitat and palatable grass species throughout most of the study area. The study area is accessible from adjacent areas to the east and south.

Areas of forest provide suitable habitat for a diversity of small mammals, birds, reptiles and frogs. Microbats are likely to forage for insects within and around this vegetation and small native mammals such as Bush Rat *Rattus fuscipes*, Swamp Rat *Rattus lutreolus* and Agile Antechinus *Antechinus agilis* are likely to use these areas either as residents or as visitors on a frequent basis. Frogs and reptiles (e.g. water dragons) are likely to utilise the creek line for habitat and breeding. Habitat within the study area is contiguous with areas of habitat adjoining the study area.

An exotic herbivore scat was observed, which may have been a Wild Pig *Sus scrofa*. The scat was on a well-worn track in the long grass that lead to creek line, however there were no signs of pig diggings or prints.

3.2.2 Open Grassland

Open grassland containing exotic grass species are found towards the western side of the study area, which are likely to be used as a foraging resource by common generalist birds which are tolerant of modified open

areas, including foraging nocturnal and diurnal raptors. Common opportunist species observed within this grassland area were the Crimson Rosella *Platycercus elegans* and Sulphur-crested Cockatoo *Cacatua galerita*.

3.2.3 Waterbodies

Two small constructed ponds and a creek line (Bungalook Creek) were observed within the study area (Figure 2). The ponds likely provide limited habitat opportunities for native fauna, as one was almost dry and the other contained approximately 80 centimetres of water at the time of assessment that may be subject to periodic drying in drier conditions. These ponds do, however, provide a drinking source for fauna within the study area and may provide temporary/limited habitat for frogs and ducks. The creek line was also relatively shallow and narrow (no more than 1.5 metres wide). As well as providing a drinking source, the creek line ran along the base of a damp gully that would provide good habitat for water-loving species such as frogs.

3.3 Removal, Destruction or Lopping of Native Vegetation (the Guidelines)

The below clearing scenario is based on the proposed extraction limit boundary extension area and the outer edge of the tree canopy that just falls outside this boundary, including outside the proposed extraction limit boundary extension area into the existing extraction limit boundary (Figure 2).

3.3.1 Vegetation proposed to be removed

The study area is within Location 2, with 8.779 hectares of native vegetation and 262 Large Trees proposed to be removed. As such, the permit application is assessed under the Detailed assessment pathway (Table 5).

Condition scores for vegetation proposed to be removed are provided in Appendix 1.2.

Table 5. Removal of Native Vegetation (the Guidelines) (DELWP 2017).

Assessment pathway	Detailed
Location Category	2
Total Extent (past and proposed) (ha)	8.779
Extent of past removal (ha)	0.000
Extent of proposed removal (ha)	8.779
Large Trees (scattered and in patches) to be removed (no.)	262
Small scattered trees to be removed (no.)	0
EVC Conservation Status of vegetation to be removed	Herb-rich Foothill Forest: Gippsland Plain bioregion (which covers the western quarter of the study area): Vulnerable Highlands – Southern Fall bioregion (which covers the eastern three-quarters of the study area): Least Concern

3.3.2 *Offset Targets*

The offset requirement for native vegetation removal is:

- 10.910 species units of habitat for Swamp Bush-pea *Pultenaea weindorferi*;
- 10.910 species units of habitat for Wine-lipped Spider-orchid *Caladenia oenochila*;
- 10.910 species units of habitat for Dandenong Wattle *Acacia strictophylla*; and
- 262 Large Trees.

A summary of proposed vegetation losses and associated offset requirements is presented in Table 6 and the NVR report is presented in Appendix 3.

Table 6. Offset Targets.

Species Offsets Required	10.910 species units of habitat for Swamp Bush-pea 10.910 species units of habitat for Wine-lipped Spider-orchid 10.910 species units of habitat for Dandenong Wattle
Large Trees	262
Vicinity (catchment/council)	Melbourne Water CMA / Yarra Ranges Shire Council

3.4 Significance Assessment

3.4.1 *Flora*

The VBA contains records of eight nationally significant and 56 State significant flora species previously recorded within 10 kilometres of the study area (DEECA 2023a). The PMST nominated an additional 14 nationally significant species which have not been previously recorded but have the potential to occur in the locality (DCCEEW 202) (Appendix 1.4). One national and seven State-significant species were observed within or considered to have the highest likelihood of being present within or adjacent to the study area (Appendix 2.2), which are described in Table 7, along with the suitable survey period for their identification/presence.

No nationally-significant flora were recorded during the initial biodiversity assessment or targeted flora surveys. The significance assessment identified potential habitat for the White Star-bush, which was listed as Critically Endangered under the EPBC Act on 5 October 2022 (Appendix 1.4), however no specimens were observed during the targeted survey.

One specimen each of the State-significant Sticky Wattle and Dandenong Wattle were observed within the proposed extraction limit during the initial biodiversity assessment, with an additional Dandenong Wattle specimen being observed during the flora targeted survey (Figure 2; Figure 5). Sticky Wattle has a conservation status of Vulnerable and Dandenong Wattle has a conservation status of Endangered in Victoria under the FFG Act (DEECA 2023b).

The Mountain Bird-orchid was recorded by Ecology Australia (2006) within the proposed expansion footprint, which is listed as Vulnerable in Victoria under the FFG Act (DEECA 2023b). Approximately 105 Mountain Bird-orchid plants were recorded during the flora targeted survey towards the north-eastern end of the study area within the proposed extraction limit boundary (Figure 2; Figure 5).

Four other State-significant species that were considered to have the highest likelihood of being present within or adjacent to the study area include the Netted Brake *Pteris epaleata*, Veined Spear-grass *Austrostipa rudis* subsp. *australis*, Velvet Apple-berry *Billardiera scandens* var. *scandens* s.s. and Wine-lipped Spider-orchid *Caladenia oenochila*. None of these species were observed during the targeted flora survey.

The Sticky Wattle, Dandenong Wattle and Mountain Bird-Orchid are also listed as Protected under the FFG Act (DELWP 2019a), as well as 10 other species observed within the study area. These were the Common Maidenhair *Adiantum aethiopicum*, Gristle Fern *Blechnum cartilagineum*, Common Ground-fern *Calochlaena dubia*, Common Bird-orchid, Button Everlasting *Coronidium scorpioides*, Common Correa *Correa reflexa*, Common Onion-orchid, Showy Daisy-bush *Olearia lirata*, Cotton Fireweed *Senecio quadridentatus* and Grass Triggerplant *Stylidium graminifolium*.

Table 7. State-significant flora observed within or with the highest likelihood of occurrence within the study area.

Common Name	Scientific Name	Previous Records and Habitat	Suitable Survey Period
National Significance			
White Star-bush	*Asterolasia asteriscophora* subsp. *albiflora*	There are 14 documented records of this species within 10 kilometres of the study area, the most recent being in 2019 (DEECA 2023a) (Appendix 1.4). These records are found at the south-eastern extent of the Dandenong Ranges, however there is suitable habitat within the study area in the form of damp eucalypt forests along Bungalook Creek. A targeted survey for this species was undertaken on 19 and 20 October, and 1 November 2023, with the species confirmed to be flowering at a near-by references site. No White Star-bush plants were observed within the study area.	October – late November (targeted survey completed)
State Significance			
Sticky Wattle	*Acacia howittii*	There are seven documented records of this species within 10 kilometres of the study area, the most recent being in 2020 (DEECA 2023a) (Figure 3; Appendix 1.4). A single specimen was observed within the proposed expansion footprint. It is endemic to Victoria and is confined to the moist forests of eastern Victoria.	Anytime (targeted survey completed)
Dandenong Wattle	*Acacia strictophylla*	Two specimens of this species were observed within the proposed expansion limit. Four records of this species were recorded within the study area in 2003 (DEECA 2023a) (Figure 3; Appendix 1.4), with only one of these previous records being confirmed as part of this assessment, i.e. an additional plant was observed that was not previously recorded. A further seven previous records occur with two kilometres of the study area that were recorded between 1985 and 2019 (Figure 3; Appendix 1.4). It prefers the riparian zone on hillsides in open woodland and tall forests. This species is restricted to the Dandenong Ranges where it is locally common.	August – November (targeted survey completed)

Common Name	Scientific Name	Previous Records and Habitat	Suitable Survey Period
Mountain Bird-orchid	*Chiloglottis jeanesii*	There are 26 documented records of Mountain Bird-orchid within 10 kilometres of the study area, the most recent being in 2018 (DEECA 2023a) (Figure 3; Appendix 1.4). The Ecology Australia (2006) study recorded this species within the study area, including within the proposed extraction limit. Five groups containing a total of approximately 105 specimens were recorded as part of the flora targeted surveys towards the north-eastern end of the study area within the proposed extraction limit (Figure 5).	November – December (targeted survey completed)
Netted Brake	*Pteris epaleata*	There are 13 documented records of this species within 10 kilometres of the study area, the most recent being in 2000 (DEECA 2023a) (Figure 3; Appendix 1.4). This species is rare in the Dandenong Ranges and prefers stream banks and damp flats in shady forests and would therefore most likely be observed along Bungalook Creek.	Anytime (targeted survey completed)
Veined Spear-grass	*Austrostipa rudis* subsp. *australis,*	There are nine documented records of this species within 10 kilometres of the study area, the most recent being in 2017 (DEECA 2023a) (Figure 3; Appendix 1.4). The Ecology Australia (2006) study recorded *Austrostipa rudis* within the Boral parcel (unclear whether it was in the current study area), however the report does not specify whether it was subsp. *australis*. Veined Spear-grass is uncommon, growing in cool areas in open forests.	November – March (targeted survey completed)
Velvet Apple-berry	*Billardiera scandens* var. *scandens* s.s.	There are 17 documented records of this species within 10 kilometres of the study area, the most recent being in 2009 (DEECA 2023a) (Figure 3; Appendix 1.4). The Ecology Australia (2006) study recorded Common Apple-berry *Billardiera scandens* var. *scandens* s.l. within the study area, however this is not the same as Velvet Apple-berry. The Common Apple-berry generally occurs in dry open forests.	September – February (targeted survey completed)
Wine-lipped Spider-orchid	*Caladenia oenochila,*	There are 24 documented records of this species within 10 kilometres of the study area, the most recent being in 2021 (DEECA 2023a) (Figure 3; Appendix 1.4). This species prefers woodland environments.	October – November (targeted survey completed)

3.4.2 Fauna

Twenty-nine fauna species were observed within the study area, comprising 23 native birds, two native butterflies, an Eastern Grey Kangaroo *Macropus giganteus*, Common Garden Skink *Lampropholis guichenoti*, the feather of a Gang-gang Cockatoo *Callocephalon fimbriatum* and what were believed to be the scats of a Wild Pig (Appendix 2.1). All the species are locally common.

The VBA contains records of 24 nationally significant and 44 State significant fauna species previously recorded within 10 kilometres of the study area (DEECA 2023a). The PMST nominated an additional 22 nationally significant species which have not been previously recorded but have the potential to occur in the locality (DCCEEW 2024) (Appendix 2.2).

Two nationally-significant and five State-significant species considered to have the highest likelihood of utilising habitat within or adjacent to the study area (Appendix 2.2), which are described below along with the suitable survey period for their identification/presence (Table 8).

Table 8. Significant fauna with the highest likelihood of occurrence within the study area.

Common Name	Scientific Name	Previous Records and Habitat	Suitable Survey Period
National Significance			
Gang-gang Cockatoo	*Callocephalon fimbriatum*	There are 158 records of the Gang-gang Cockatoo located within 10 kilometres of the study area. The most recent record was in 2020 (DEECA 2023a) (Figure 4; Appendix 2.2). This bird is typically found in higher altitude tall montane forests and woodlands with dense understoreys during summer. They then move to lower altitudes during winter where the forests and woodlands are drier and more open. They require tall trees for nest hollows (Department of Agriculture, Water and the Environment [DAWE] 2022). As such, the species may frequent the study area for food or shelter in the cooler months and utilise tree hollows, however the study area is unlikely to provide important or limiting habitat for this species. A targeted survey for this species was undertaken between 6 and 8 September 2023 to primarily assess the condition and suitability of vegetation within the study area for foraging, nesting and breeding purposes, with tree hollows being mapped across the study area. No evidence of the Gang-gang Cockatoo was observed; however, hollows were recorded within 121 trees across the study area of various sizes (Figure 6).	Anytime (targeted survey completed)
Southern Greater Glider	*Petauroides volans*	There are 55 records of the nationally significant Southern Greater Glider located within the Dandenong Ranges National Park within 10 kilometres of the study area, the most recent being in 2022 (DEECA 2023a) (Figure 4; Appendix 2.2). This species is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows where it shelters during the day (Goldingay 2012; Smith *et al*. 2007). Home ranges are typically small due to its limited dispersal ability (Gibbons and Lindenmayer 2002; Lindenmayer *et al*. 2000; Taylor and Goldingay 2009). Due to the presence of mature eucalypts which contain hollows of all sizes within the study area that provide suitable habitat, contiguous nature of the canopy between the study area and Dandenong Ranges National Park facilitating travel and abundance of records in the local vicinity, there is a high likelihood that the Southern Greater Glider occupies (or at least frequents) the study area. A targeted survey was undertaken for this species on 7 an 8 February, and 9 and 10 May 2022 during weather conditions considered suitable for Southern Greater Glider activity. No Southern Greater Gliders were detected during the survey.	February – May (targeted survey completed)

Common Name	Scientific Name	Previous Records and Habitat	Suitable Survey Period
State Significance			
Barking Owl	*Ninox connivens connivens*	There are three records of Barking Owl from the local area with the most recent in 2000 approximately 600 metres south-west of the study area (DEECA 2023a) (Figure 4). There is potential habitat within the study area, most likely on the fringes of the forested areas where they interface the open grassland areas (Clemann and Loyn 2001).	Anytime
Lace Monitor	*Varanus varius*	There are 23 documented records of Lace Monitor within 10 kilometres of the study area, with the most recent in 2022. Three of these records are within approximately 1.9 kilometres of the study area (DEECA 2023a) (Figure 4; Appendix 2.2). Lace Monitors are found in both open and closed forests, frequently scaling trees for food and shelter.	September – May
Powerful Owl	*Ninox strenua*	There are 246 documented records of Powerful Owl within 10 kilometres of the study area, the most recent in 2022. Three of these records are in the study area, with a further five records within 600 metres of it (DEECA 2023a) (Figure 4; Appendix 2.2). The Ecology Australia (2006) study also recorded Powerful Owl within the study area, including within the proposed extraction limit. This species relies on large hollows in mature eucalypts to nest (Bilney 2013), which are present across the study area and within the surrounding mature forests. The presence of hollows was undertaken within the study area as part of the Gang-gang Cockatoo targeted survey, with the results presented in Section 3.5.2. The targeted survey recorded 57 hollows of 30 centimetres or greater within the study area, 26 of which were in the proposed extraction limit. Some of the larger hollows could provide suitable nesting habitat for the Powerful Owl.	May – June, October – December
Sooty Owl	*Tyto tenebricosa*	There are 51 documented records of Sooty Owl within 10 kilometres of the study area, with the most recent in 2021 (DEECA 2023a) (Figure 4; Appendix 2.2). This species typically inhabits dense forest such as rainforest gullies, with the forested habitat along Bungalook Creek generally fitting this description, albeit it covers a limited area within the study area. This habitat may be used by the species on an infrequent basis.	Anytime
Speckled Warbler	*Chthonicola sagittate*	There are 22 records of Speckled Warbler from the local area, the most recent being in 2000 (DEECA 2023a) (Figure 4; Appendix 2.2). This species inhabits mainly grassy ground layer of dry sclerophyll forests and woodlands, often with scattered shrubs in understorey as found in the study area. This species is endemic to eastern Australia and south-eastern Australia and sedentary. There is potential habitat within the Her-rich Foothill Forest within the study area (Figure 2).	Anytime

3.4.3 *Ecological Communities*

Two nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DCCEEW 2024):

- Natural Damp Grassland of the Victorian Coastal Plains; and
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

However, vegetation within the study area did not meet the condition thresholds that define any nationally significant communities due to the absence of key indicator species. That is, the vegetation structure of Natural Damp Grassland of the Victorian Coastal Plains is a tussock grassland dominated by herbaceous species with less than 5% projective foliage cover of trees and larger shrubs. Likewise, the three species listed in the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community were not present within the study area.

Likewise, vegetation within the study area does not meet the species composition or condition threshold benchmarks for any State-significant ecological communities.

3.5 Targeted Surveys

3.5.1 *White Star-bush and other Flora Species Targeted Survey*

Although the study area provides suitable habitat characteristics for the EPBC Act-listed White Star-bush and it was confirmed to be flowing at a nearby reference site at the time if the targeted survey, no individuals were recorded within the study area along the transects (Figure 5).

Furthermore, five FFG Act-listed species (Mountain Bird-orchid, Netted Brake, Veined Spear-grass, Velvet Apple-berry and Wine-lipped Spider-orchid), were also not recorded during the targeted survey despite being undertaken during their flowering times. One individual each of the Sticky Wattle and Dandenong Wattle were observed during the biodiversity assessment fieldwork, however no further individuals were recorded during the targeted survey.

3.5.2 *Gang-gang Cockatoo Targeted Survey*

The objective of the tree hollow site assessment was to determine the suitability of hollow-bearing trees for breeding and nesting of Gang-gang Cockatoo. A summary of the hollow attributes is provided in Table 9 and on Figure 6.

Overall, 121 hollow-bearing trees were assessed within the study area, with these trees containing 155 small hollows and 57 large hollows, with the small hollows being potentially suitable for Gang-gang Cockatoo nesting given their preferred hollow criteria (Table 1). Sixty hollow-bearing trees were located within the proposed extraction limit, with 73 small hollows being observed within these trees.

Table 9. Summary of hollow attributes. A total of 121 hollow-bearing trees were observed within the study area, with 60 hollow-bearing trees being within the proposed extraction limit.

Hollow size (centimetres)*	Number of hollows within the study area	Number of hollows within the proposed extraction limit
Small: <30	155	73
Large: 30 and greater	57	26
Total number of hollows	**212**	**99**

*Estimated from the ground using binoculars. Several trees contained multiple hollows, with each hollow being counted separately and classified as a small or large hollow.

3.5.3 Southern Greater Glider Targeted Survey

Despite the availability of suitable habitat within the study area, Southern Greater Glider was not identified within the study area (Figure 7). Several other native species were identified within the study area during the targeted surveys, including Sugar Glider *Petaurus breviceps*, Eastern Ringtail Possum *Pseudocheirus peregrinus,* Common Brushtail Possum *Trichosurus vulpecula* and Eastern Barn Owl *Tyto alba* (Table 10; Figure 7).

The area surrounding Dr Ken Leversha Reserve and the forested areas adjacent to the quarry are isolated from other large patches of suitable habitat, such as Mount Dandenong National Park where the Southern Greater Glider has been previously recorded (DEECA 2023a). Barriers to movement in the form of roads and residential housing adjacent to these areas are likely to limit the capacity for dispersal opportunities to occur to and from the study area and may explain absence of Southern Greater Gliders in the disturbance area.

Table 10. Summary of Greater Glider survey results.

Transect Number	Survey Date	Approximate transect length (metres)	Survey length (minutes)	Number of Greater Glider Observed	Opportunistic Sightings
Transect 1 – Survey 1	07/02/2022	1000	101	0	Sugar Glider (1 sighting); Common Ringtail Possum (2 sightings); Eastern Barn Owl (1 sighting)
Transect 1 – Survey 2	08/02/2022	1000	103	0	Common Ringtail Possum (2 sightings)
Transect 2 – Survey 1	09/05/2022	1000	101	0	Common Ringtail Possum (2 sightings)
Transect 2 – Survey 2	10/05/2022	1000	100	0	Common Ringtail Possum (5 sightings)
Transect 3 – Survey 1	09/05/2022	1000	100	0	Common Ringtail Possum (3 sightings)
Transect 3 – Survey 2	10/05/2022	1000	101	0	Common Ringtail Possum (1 sighting); Common Brushtail Possum (2 sightings)

4 LEGISLATIVE AND POLICY IMPLICATIONS

4.1 *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)

The EPBC Act establishes a Commonwealth process for the assessment of proposed actions likely to have a significant impact on any matters of National Environment Significance (NES) (Table 11).

Table 11. Potential impacts to matters of NES.

Matter of NES	Potential Impacts
World Heritage properties	The proposed action will not impact any properties listed for World Heritage.
National Heritage places	The proposed action will not impact any places listed for national heritage.
Ramsar wetlands of international significance	There are no wetlands within 10 kilometres of the study area and thus the development will not likely impact any important wetlands.
Threatened species and ecological communities	No nationally significant flora listed under the EPBC Act were recorded within the study area, however there is suitable habitat for White Star-bush (refer to Sections 2.2.2 and 3.4.1). No nationally significant fauna listed under the EPBC Act were recorded within the study area. There is suitable habitat for the Gang-gang Cockatoo (refer to Sections 2.2.4 and 3.4.2) and Southern Greater Gilder (refer to Sections 2.2.5 and 3.4.2). A Gang-gang Cockatoo feather was found within the study area, however no birds were observed or heard during the biodiversity field assessments (refer to Section 3.4.2). No ecological community listed under the EPBC Act were recorded within the study area (Section 3.4.3). Targeted surveys were undertaken for the White Star-bush, Gang-gang Cockatoo and Southern Greater Gilder. However, none of these species were observed or heard during these surveys.
Migratory and marine species	There is no marine habitat within the study area and the study area would not be classed as an 'important habitat' as defined under the EPBC Act Policy Statement 1.1 Principal Significant Impact Guidelines (DoE 2013), in that it does not contain: • Habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species; • Habitat utilised by a migratory species which is at the limit of the species range; or, • Habitat within an area where the species is declining. The White-throated Needletail is classed as a migratory bird under the EBPC Act and occurs along the entire length of the eastern Australian coast when in Australia. It is not considered to rely on habitat within the study area for foraging or roosting purposes given its large distribution range and ability to occupy a range of habitat types, e.g. agricultural land, open forests and rainforests.
Commonwealth marine area	The proposed action will not impact any Commonwealth marine areas.
Nuclear actions (including uranium mining)	The proposed action is not a nuclear action.
Great Barrier Reef Marine Park	The proposed action will not impact the Great Barrier Reef Marine Park.

Water resources impacted by coal seam gas or mining development	Unknown - Outside the scope of this assessment. A groundwater consultant has been engaged to assess the development's potential impacts to groundwater matters.

4.1.1 Implications

There is suitable habitat within the study area for one flora species (White Star-bush) and two fauna species (Southern Greater Glider, Gang-gang Cockatoo) listed under the EPBC Act.

A targeted survey was undertaken for the White Star-bush, Southern Greater Glider and Gang-gang Cockatoo, with no individuals being observed or heard.

Potential impacts to matters listed under the EPBC Act will be determined following the groundwater investigation and any indirect impacts that may arise from this assessment, including an assessment against the relevant significant impact thresholds for the identified matters of NES. As such, a need for a referral to the Commonwealth Environment Minister for matters listed under the EPBC Act is to be determined.

4.2 *Environment Effects Act 1978* (Victoria)

The EE Act provides for assessment of proposed actions that can have a significant effect on the environment via the preparation of an EES. A project with potential adverse environmental effects that, individually or in combination, could be significant in a regional or State context should be referred. Actions that may be referred for an EES decision are discussed in Table 12.

Table 12. Referral criteria under the EE Act.

Referral criteria	Potential Impacts
Individual potential environmental effects Individual types of potential effects on the environment that might be of regional or State significance, and therefore warrant referral of a project, are:	
Potential clearing of 10 hectares or more of native vegetation from an area that: • is of an EVC identified as endangered by DELWP in accordance with Appendix 2 of Victoria's Native Vegetation Management – A Framework for Action (DSE 2002); • is of Very High conservation significance (as defined in accordance with Appendix 3 of Victoria's Native Vegetation Management – A Framework for Action (DSE 2002); or, • is not authorised under an approved Forest Management Plan or Fire Protection Plan	No. The proposed impact area within the area outside the existing extraction limit boundary is 8.779 hectares.
Potential long-term loss of a significant proportion (1-5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria	Unlikely. There is potential habitat for several threatened flora (Table 7) and fauna (Table 8) species within the study area. These species generally have a widespread distribution range, and the removal of individuals within the study area is unlikely to result in a long-term loss of a significant proportion of known remaining habitat or population of these species within Victoria.

Referral criteria	Potential Impacts
Potential long-term change to the ecological character of a wetland listed under the Ramsar Convention or in 'A Dictionary of Important Wetlands in Australia'	No. The impact area is not listed under the Ramsar Convention or in 'A Dictionary of Important Wetlands in Australia'.
Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long time	Unlikely. However, a hydrologist/geologist will be able to provide more information with respect to potential effects. The proponent has engaged a groundwater consultant to investigate this aspect of the proposed development's potential impacts. While Bungalook Creek and the Melbourne Water retarding basin are to the south of the impact area, expanding the quarry pit from within the existing quarry should have no adverse water quality impacts (e.g. sediment runoff, erosion, chemical spills) to these areas.
Potential extensive or major effect on the health, safety or well-being of a human community, due to emissions to air or water or chemical hazards or displacement of residents	Unknown. Outside the scope of this report.
Potential greenhouse gas emissions exceeding 200,000 tonnes of carbon dioxide equivalent per annum, directly attributable to the operation of the facility	Unknown. Outside the scope of this report.
A combination of potential environmental effects A combination or 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, are:	
Potential clearing of 10 hectares or more of native vegetation, unless authorised under an approved Forest Management Act or Fire Protection Plan	No. The proposed impact area within the area outside the existing extraction limit boundary is 8.779 hectares.
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*	Unlikely. The impact footprint is not within an environmental overlay, although it does directly adjoin Environmental Significant Overlay – Schedule 1 (ESO1-B29) along its eastern boundary. The study area does not adjoin any national parks, with the closest nation park being Dandenong Ranges National Park approximately one kilometre to the east.

Referral criteria	Potential Impacts
Matters listed under the FFG Act: • Potential loss of a significant area of a listed ecological community; • Potential loss of a genetically important population of an endangered or threatened species; • Potential loss of critical habitat; or, • Potential significant effects on habitat values of a wetland supporting migratory birds.	Unlikely. Vegetation in the study area does not align with any FFG-Act listed ecological communities. Three FFG Act-listed flora species were observed within the study area. These included one Sticky Wattle (Vulnerable), two Dandenong Wattle (Endangered) and approximately 105 Mountain Bird-orchid (Vulnerable) specimens (DEECA 2023b). All species have several populations from the Dandenong Ranges area eastwards into Gippsland. The development's impact footprint will result in forest loss that contains large trees with a variety of hollow sizes which would likely be habitat for important fauna, e.g. Powerful Owl. Given that there will be approximately 48 hectares of mature forest outside the impact footprint within and directly adjoining the study area containing tree hollows that will remain, the loss of 8.779 hectares within the study area is not considered to be a comparatively large loss of critical habitat. Furthermore, Dandenong Ranges National Park is situated approximately one kilometre east of the study area, which contains mature forests with numerous hollow-bearing trees over several square kilometres. Based on the above discussion, it is not considered that the loss of 8.779 hectares of forest will result in the potential loss of a genetically important or significant species, or the potential loss of critical habitat for significant species. The study area does not include a wetland that supports migratory birds.
Potential extensive or major effects on land stability, acid sulphate soils or highly erodible soils over the short of long term	Unknown. Outside the scope of this report.
Potential extensive or major effects on beneficial uses of waterbodies over the long term due to changes in water quality, streamflows or regional groundwater levels	Unknown. Outside the scope of this report.
Potential extensive or major effects on social or economic well-being due to direct or indirect displacement of non-residential land use activities	Unknown. Outside the scope of this report.
Potential for extensive displacement of residences or severance or residential access to community resources due to infrastructure development	Unknown. Outside the scope of this report.
Potential significant effects on the amenity of a substantial number of residents, due to extensive or major, long-term changes in visual, noise and traffic conditions	Unknown. Outside the scope of this report.
Potential exposure of a human community to severe or chronic health or safety hazards over the short or long term, due to emissions to air or water or noise chemical hazards or associated transport	Unknown. Outside the scope of this report.
Potential extensive or major effects on Aboriginal cultural heritage	Unknown. Outside the scope of this report.

Referral criteria	Potential Impacts
Potential extensive or major effects on cultural heritage places listed on the Heritage Register of the Archaeological Inventory under the *Heritage Act 1995*.	Unknown. Outside the scope of this report.

4.2.1 *Implications*

Based on the referral criteria that consider ecological matters, it is unlikely that a referral to the Minister for Planning will be triggered based on the current development proposal. Two of the ecological criteria are only considered when the impact footprint is 10 hectares or more (the actual impact is 8.779hectares) and thus it is highly recommended that the impact footprint not be increased to 10 hectares or more so these criteria do not contribute to the requirement for a referral.

It is important to note that the ecological assessment is based on direct terrestrial impacts and doesn't incorporate any indirect impacts that may have implications for groundwater drawdown or terrestrial groundwater dependent ecosystems. Further expert advice should be sought regarding the non-ecological criteria. The proponent has engaged a groundwater consultant to investigate this aspect of the proposed development, with the findings being reviewed by Ecology and Heritage Partners when complete to determine any potential implications regarding the EE Act.

Should the project be assessed via an EES, additional surveys for State significant flora and fauna will be required.

4.3 *Flora and Fauna Guarantee Act 1988* (Victoria)

The FFG Act is the primary legislation dealing with biodiversity conservation and sustainable use of native flora and fauna in Victoria. Proponents are required to apply for an FFG Act Permit to 'take' threatened and/or protected flora species, listed vegetation communities and listed fish species in areas of public land (e.g. within road reserves, drainage lines and public reserves/parks). An FFG Act permit is generally not required for removal of species or communities on private land, or for the removal of habitat for a listed terrestrial fauna species.

The *Flora and Fauna Guarantee Amendment Act 2019* (the Amendment Act) came into effect on 1 June 2020 and now applies the FFG Act to Crown land and private/freehold land that is managed by a public authority. The Amendment Act requires consideration of biodiversity across government to ensure decisions and policies are made with proper consideration of the potential impacts on biodiversity.

4.3.1 *Implications*

There are confirmed records of three flora species listed as Threatened under the FFG Act (Sticky Wattle, Dandenong Wattle, Mountain Bird-orchid) and 13 flora species listed as Protected under the FFG Act (Sticky Wattle, Dandenong Wattle, Mountain Bird-orchid, Common Maidenhair, Gristle Fern, Common Ground-fern, Common Bird-orchid, Button Everlasting, Common Correa, Common Onion-orchid, Showy Daisy-bush, Cotton Fireweed, Grass Triggerplant) within the study area. No fauna species listed under the FFG Act were observed. The FFG Act applies to public land (although there are exceptions for private land that do not apply in this case) and given the study area is privately owned, a permit under the FFG Act is not required.

4.4 *Mineral Resources (Sustainable Development) Act 1990* (Victoria)

Mineral exploration, extractive industry and mining in Victoria is regulated under the MRSD Act (DPI 2008). The purpose of this Act is to encourage an economically viable mining industry that operates in a way that is compatible with the environmental, social and economic objectives of the state.

If native vegetation is present within the study area, a rehabilitation plan must be prepared that describes how native vegetation will be protected during the production phase of the project (DPI 2010) as well as:

- Complying with the Commonwealth EPBC Act and the State FFG Act;
- Following Victoria's *Guidelines for the removal, destruction and lopping of native vegetation* (DELWP 2017); and,
- Preparing an Offset Management Plan (OMP) if vegetation is removed.

The obligations of the Guidelines are applied through the specific mechanism of the relevant legislation (in this case, the MRSD Act) and where applicable vegetation avoidance and/or minimisation must be demonstrated, then offset any clearing must be applied and documented (DPI 2009).

4.4.1 *Implications*

A variation to the existing Work Plan will need to be prepared. A detailed buffer and rehabilitation plan will need to be prepared, which includes:

- Assessment of pre- and post-mining flora and fauna;
- Provision of habitat corridors;
- Weed management; and,
- Monitoring of flora and fauna (including weeds).

For a Work Plan to be approved, DELWP and the Department of Economic Development, Jobs, Transport and Resources (DEDJTR) must be satisfied of "*all necessary planning consents and approvals*" including where Victoria's native vegetation policy requires action, has been addressed (DPI 2009).

The study area is within Location 2, with 8.779 hectares of native vegetation and 262 Large Trees proposed to be removed. As such, the permit application falls under the Detailed assessment pathway.

The offset requirement for native vegetation removal are:

- 10.910species units of habitat for Swamp Bush-pea;
- 10.910 species units of habitat for Wine-lipped Spider-orchid;
- 10.910 species units of habitat for Dandenong Wattle; and
- 262 Large Trees.

4.5 *Planning and Environment Act 1987* (Victoria)

The *Planning and Environment Act 1987* outlines the legislative framework for planning in Victoria and for the development and administration of planning schemes. All planning schemes contain native vegetation provisions at Clause 52.17, which requires a planning permit from the relevant local Council to remove, destroy or lop native vegetation, unless an exemption at Clause 52.17-7 of the Victoria Planning Provisions applies.

4.5.1 Local Planning Scheme

The study area is located within the Yarra Ranges Shire Council. The following zoning and overlays apply (DELWP 2021f):

- Green Wedge A Zone – Schedule 1 (GWAZ1)
- Special Use Zone – Schedule 6 (SUZ6)
- Bushfire Management Overlay (BMO)

4.5.2 The Guidelines

The State Planning Policy Framework and the decision guidelines at Clause 12.01 Biodiversity and Clause 52.17 Native Vegetation require Planning and Responsible Authorities to have regard for the Guidelines (DELWP 2017).

4.5.3 Implications

The clearing of native vegetation for mining and extractive industries is exempt from the requirement for a planning permit subject under the 'Stone Extraction' exemption detailed in Clause 52.17-7 of the Yarra Ranges Planning Scheme subject to an assessment as part of the Work Plan approval process (MRSD Act). The removal of native vegetation for the Earth Resources Industry (ERI) is regulated through the Mining and Extractive Industry Work Approvals Process (DPI 2009). A Memorandum of Understanding (MoU) between the former DSE and DPI recognises that native vegetation should be offset in accordance with relevant legislation (DPI 2007).

4.6 *Catchment and Land Protection Act 1994* (Victoria)

Eight noxious weeds under the CaLP Act were recorded during the assessment (Bridal Creeper, Asparagus Fern, Boneseed, Spear Thistle, Flax-leaf Broom, Sweet Briar, Blackberry, Bulbil Watsonia). Similarly, there is evidence (scats) that the study area is currently occupied by one pest fauna species listed under the CaLP Act (Wild Pig). Listed noxious weeds and pests should be appropriately controlled throughout the study area.

4.7 *Wildlife Act 1975* and Wildlife Regulations 2013 (Victoria)

The *Wildlife Act 1975* (and associated Wildlife Regulations 2013) is the primary legislation in Victoria providing protection and management for wildlife. Authorisation for habitat removal may be obtained under the *Wildlife Act 1975* through a licence granted under the *Forests Act 1958*, or under any other Act such as the *Planning and Environment Act 1987*. Any persons engaged to remove, salvage, hold or relocate native fauna during construction must hold a current Management Authorisation under the *Wildlife Act 1975* issued by DELWP.

5 MITIGATION MEASURES

5.1 Avoid and Minimise Statement

Due to the nature of the proposed development (extractive industry), the avoidance of native vegetation impacts within the proposed extraction limit extension footprint cannot be achieved. However, the footprint does account for the indirect construction works associated with the quarry's development in this footprint, which means that no further native vegetation loss is expected to occur outside the footprint. It is important to note that the ecological assessment is based on direct terrestrial impacts and doesn't incorporate any indirect impacts that may have implications for groundwater drawdown or terrestrial groundwater dependent ecosystems

Efforts to minimise impacts to native vegetation as much as reasonably practicable has been undertaken through three iterations of the proposed extraction limit, which have reduced its extent each time. The proposed extraction limit was initially 10.798 hectares, which was then reduced to 9.777 hectares, with the current extent being 8.779.

As part of the development of the Work Plan, additional measures to ensure that further, indirect impacts on biodiversity are minimised will be incorporated. This can be achieved via engineering solutions to reduce run-off, wastewater treatment, and rehabilitation works within the buffer areas and post extractive industry activities.

5.2 Best Practice Mitigation Measures

Recommended measures to mitigate impacts upon terrestrial and aquatic values present within the study area include:

- Minimise impacts to native vegetation and habitats through construction and micro-siting techniques, including fencing retained areas of native vegetation. If indeed necessary, trees should be lopped or trimmed rather than removed. Similarly, soil disturbance and sedimentation along creek lines should be avoided or kept to a minimum, to avoid, or minimise impacts to fauna habitats;
- All contractors should be aware of ecologically sensitive areas to minimise the likelihood of inadvertent disturbance to areas marked for retention. Native vegetation (areas of sensitivity) should be included as a mapping overlay on any construction plans;
- Tree Protection Zones (TPZs) should be implemented to prevent indirect losses of native vegetation during construction activities (DSE 2011). A TPZ applies to a tree and is a specific area above and below the ground, with a radius 12 x the Diameter at Breast Height (DBH). At a minimum standard a TPZ should consider the following:
    - A TPZ of trees should be a radius no less than two metres or greater than 15 metres;
    - Construction, related activities and encroachment (i.e. earthworks such as trenching that disturb the root zone) should be excluded from the TPZ;
    - Where encroachment is 10% or more of the total area of the TPZ, the tree should be considered as lost and offset accordingly (unless an arboricultural report specifies otherwise);

  - Directional drilling may be used for works within the TPZ without being considered encroachment. The directional bore should be at least 600 millimetres deep;
  - The above guidelines may be varied if a qualified arborist confirms the works will not significantly damage the tree (including stags / dead trees). In this case the tree would be retained, and no offset would be required; and,
  - Where the minimum standard for a TPZ has not been met an offset may be required.
- Removal of any habitat trees or shrubs (particularly hollow-bearing trees or trees/shrubs with nests) should be undertaken between February and September to avoid the breeding season for most fauna species. If any habitat trees or shrubs are proposed to be removed, this should be undertaken under the supervision of an appropriately qualified zoologist to salvage and translocate any displaced fauna. A Fauna Management Plan may be required to guide the salvage and translocation process;
- Any trees containing hollows could be lopped or felled in a way that retains the hollows, which can then be relocated to another location in the study area and continue to be used as habitat;
- Seed collections and/or plant cuttings could be taken from known occurrences of State-significant species within the proposed extraction limit to propagate by reputable native nursery operators. Likewise, plant salvage/translocations could be performed for those species in which seeds or cuttings cannot be taken, e.g. orchids;
- Where possible, construction stockpiles, machinery, roads, and other infrastructure should be placed away from areas supporting native vegetation, Large Trees and/or water bodies;
- Ensure that best practice sedimentation and pollution control measures are undertaken at all times, in accordance with Environment Protection Authority guidelines (EPA 2020a; EPA 2020b; Victorian Stormwater Committee 1999) to prevent offsite impacts to waterways and wetlands; and
- As indigenous flora provides valuable habitat for indigenous fauna, it is recommended that any landscape plantings that are undertaken as part of the proposed works are conducted using indigenous species sourced from a local provenance, rather than exotic deciduous trees and shrubs.

5.3 Offset Impacts and Strategy

According to DEECAs Native Vegetation Offset Register (DEECA 2024d), there is one offset site within the Melbourne Water CMA or Yarra Ranges Shire Council region that can be used to satisfy the entire Species Habitat Units and Large tree offset requirements. There is a second offset site that can satisfy the Species Habitat Units for Swamp Bush-pea and the Large Trees. An offset register search statement identifying the relevant offsite sites is provided in Appendix 4.

An alternative option is to source a portion of the offset requirements on-site (i.e. first-party offsets), which will reduce the number of offset requirements needing to be sourced from a third-party. A Native Vegetation Offset Report is provided in Appendix 5, which demonstrates that approximately one-third (31%) of the Species Habitat Units for the three species listed on the NVR report (Section 3.3.2; Appendix 3) can be attained on-site should the proponent choose to establish the native vegetation proposed to be retained as a registered offset site.

6 FURTHER REQUIREMENTS

Further requirements associated with development of the study area, as well as additional studies or reporting that may be required, are provided in Table 13.

Table 13. Further requirements associated with development of the study area.

Relevant Legislation	Implications	Further Action
Environment Protection and Biodiversity Conservation Act 1999	There is suitable habitat within the study area for one flora species (White Star-bush) and two fauna species (Southern Greater Glider, Gang-gang Cockatoo) listed under the EPBC Act. A targeted survey was undertaken for the White Star-bush, Gang-gang Cockatoo and Southern Greater Glider, with no individuals being observed or heard. Potential impacts to matters listed under the EPBC Act will be determined following the groundwater investigation and any indirect impacts that may arise from this assessment, including an assessment against the relevant significant impact thresholds for the identified matters of NES. As such, a need for a referral to the Commonwealth Environment Minister for matters listed under the EPBC Act is to be determined.	Await the results of the groundwater investigation for other potential implications. Depending on the above results, a referral to the Commonwealth Environment Minister at DCCEEW may need to be submitted.
Environment Effects Act 1978	Based on the referral criteria that consider ecological matters, it is unlikely that a referral to the Minister for Planning will be triggered based on the current development proposal. Two of the ecological criteria are only considered when the impact footprint is 10 hectares or more (the actual impact is 8.779 hectares) and thus it is highly recommended that the impact footprint not be increased to 10 hectares or more so these criteria do not contribute to the requirement for a referral. It is important to note that the ecological assessment is based on direct terrestrial impacts and doesn't incorporate any indirect impacts that may have implications for groundwater drawdown or terrestrial groundwater dependent ecosystems. Further expert advice should be sought regarding the non-ecological criteria. The proponent has engaged a groundwater consultant to investigate this aspect of the proposed development, with the findings being reviewed by Ecology and Heritage Partners when complete to determine any potential implications regarding the EE Act. Should the project be assessed via an EES, additional surveys for State significant flora and fauna will be required.	Await the results of the groundwater investigation for additional potential ecological implications. Other non-ecological criteria will require further investigation.

Relevant Legislation	Implications	Further Action
Flora and Fauna Guarantee Act 1988	There are confirmed records of three flora species listed as Threatened under the FFG Act (Sticky Wattle, Dandenong Wattle, Mountain Bird-orchid) and 13 flora species listed as Protected under the FFG Act (Sticky Wattle, Dandenong Wattle, Mountain Bird-orchid, Common Maidenhair, Gristle Fern, Common Ground-fern, Common Bird-orchid, Button Everlasting, Common Correa, Common Onion-orchid, Showy Daisy-bush, Cotton Fireweed, Grass Triggerplant) within the study area. No fauna species listed under the FFG Act were observed. The FFG Act applies to public land (although there are exceptions for private land that do not apply in this case) and given the study area is privately owned, a permit under the FFG Act is not required.	No further action required.
Mining Resources (Sustainable Development) Act 1990	A Work Plan variation will need to be updated in order to comply with the requirements of the MRSD Act. The study area is within Location 2, with 8.779 hectares of native vegetation and 262 Large Trees proposed to be removed. As such, the permit application is assessed under the Detailed assessment pathway. The offset requirement for native vegetation removal are: • 10.910 species units of habitat for Swamp Bush-pea; • 10.910 species units of habitat for Wine-lipped Spider-orchid; • 10.910 species units of habitat for Dandenong Wattle; and • 262 Large Trees.	Prepare and submit a variation to the Work Plan.
Planning and Environment Act 1987	The clearing of native vegetation for mining and extractive industries is exempt from the requirement for a planning permit subject under the 'Stone Extraction' exemption detailed in Clause 52.17-7 of the Whittlesea Planning Scheme subject to an assessment as part of the work plan approval process (MRSD Act).	No further action required (for native vegetation removal).
Catchment and Land Protection Act 1994	Eight weed species listed under the CaLP Act were recorded within the study area (Bridal Creeper, Asparagus Fern, Boneseed, Spear Thistle, Flax-leaf Broom, Sweet Briar, Blackberry, Bulbil Watsonia). The scats of one pest animal were also recorded within the study area. To meet requirements under the CaLP Act, listed noxious weeds and pests should be appropriately controlled throughout the study area.	Listed noxious weeds and pests should be appropriately controlled throughout the study area.
Wildlife Act 1975	Any persons engaged to conduct salvage and translocation or general handling of terrestrial fauna species must hold a current Management Authorisation.	Ensure wildlife specialists hold a current Management Authorisation.

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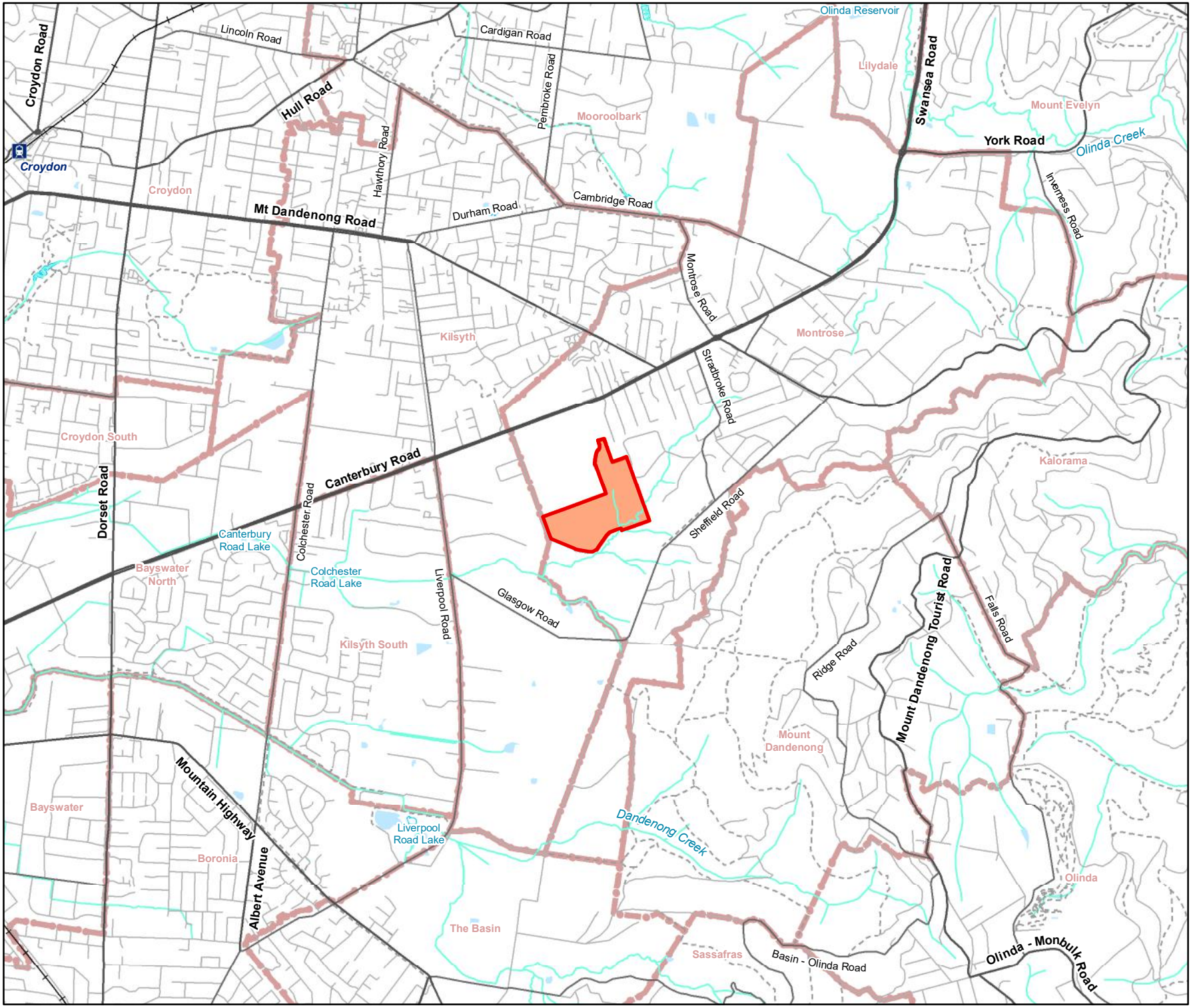


Legend

- Study Area
- Railway
- Major Road
- Collector Road
- Minor Road
- Proposed Road
- Minor Watercourse
- Permanent Waterbody
- Wetland/Swamp
- Localities

Figure 1

Location of the study area

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

0 500 1,000
Metres

Map Scale: 1:40,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

Legend

- Study Area
- Bioregions
- Large Tree in patch
- Common Bird-orchid
- Common Onion-orchid
- Pond
- Impacted tree
- Tree for potential offset
- Planted vegetation

FFG Act Listed Flora

- Dandenong Wattle (Endangered)
- Mountain Bird-orchid (Vulnerable)
- Sticky Wattle (Vulnerable)

Ecological Vegetation Classes

- Herb-rich Foothill Forest (EVC 23)
- Shrubby Gully Forest (EVC 938)
- Proposed impacted vegetation
- Vegetation for potential offset

Extension proposal limits

- Existing extraction limit
- Property boundary
- Work authority boundary
- Proposed extraction limit (disturbance area)
- Pit crest

Figure 2 Overview

Ecological features

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

N

0 80 160

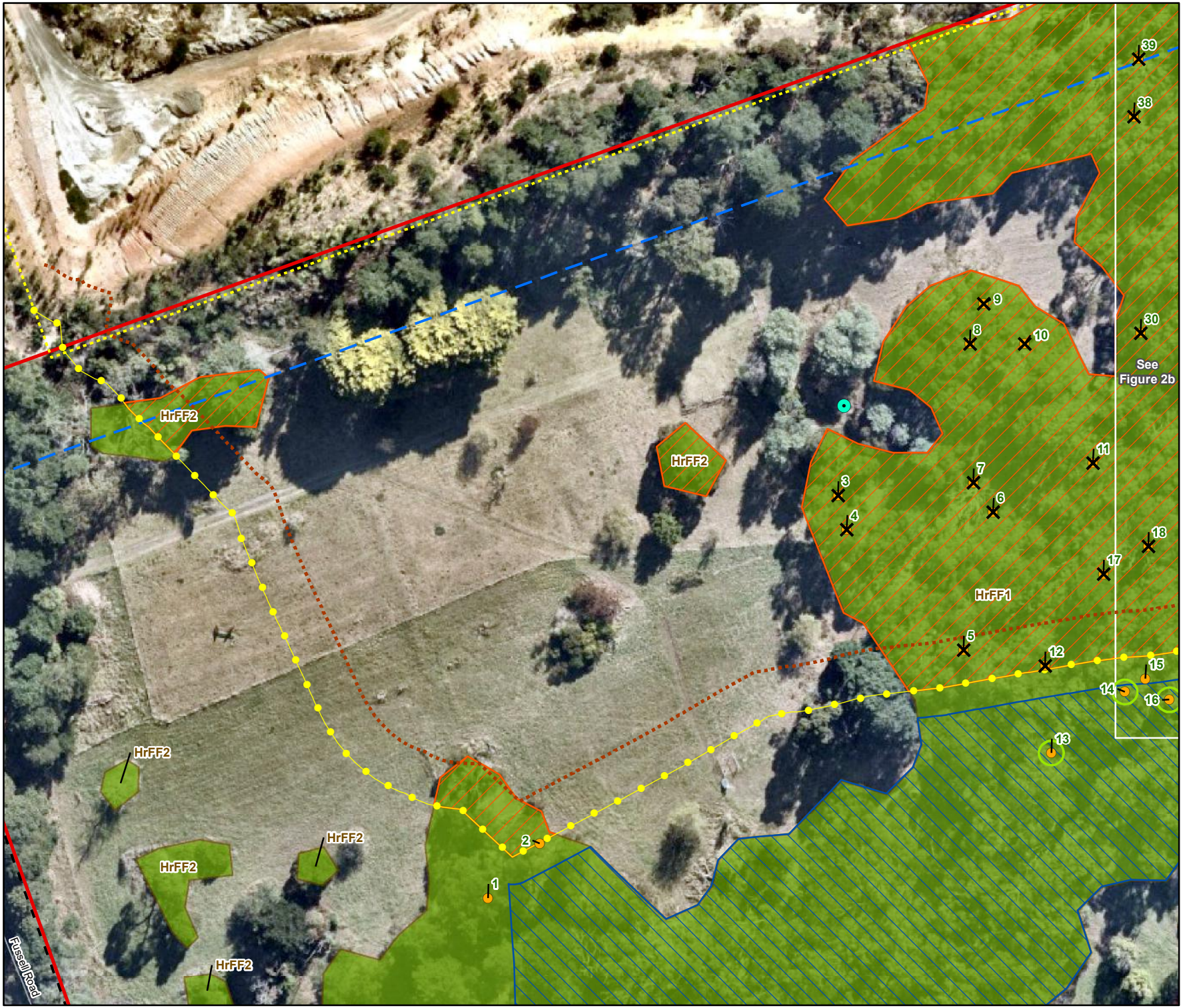
Metres

Map Scale: 1:4,700 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

14500_Fig02_EcolFeat_OV_G20 19/03/2024 psorensen

Aerial source: Nearmap 2022



Legend

- Study Area
- Large Tree in patch
- Pond
- Impacted tree
- Tree for potential offset

Ecological Vegetation Classes

- Herb-rich Foothill Forest (EVC 23)
- Proposed impacted vegetation
- Vegetation for potential offset

Extension proposal limits

- Existing extraction limit
- Property boundary
- Work authority boundary
- Proposed extraction limit (disturbance area)
- Pit crest

Figure 2a

Ecological features

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

N

0 20 40

Metres

Map Scale: 1:1,100 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

14500_Fig02_EcolFeat_MB_G20 19/03/2024 psorensen

Aerial source: Nearmap 2022

Legend

- Study Area
- Large Tree in patch
- Common Bird-orchid
- Common Onion-orchid
- Pond
- Impacted tree
- Tree for potential offset

FFG Act Listed Flora

- Dandenong Wattle (Endangered)

Ecological Vegetation Classes

- Herb-rich Foothill Forest (EVC 23)
- Proposed impacted vegetation
- Vegetation for potential offset

Extension proposal limits

- Existing extraction limit
- Work authority boundary
- Proposed extraction limit (disturbance area)
- Pit crest

Figure 2b

Ecological features

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

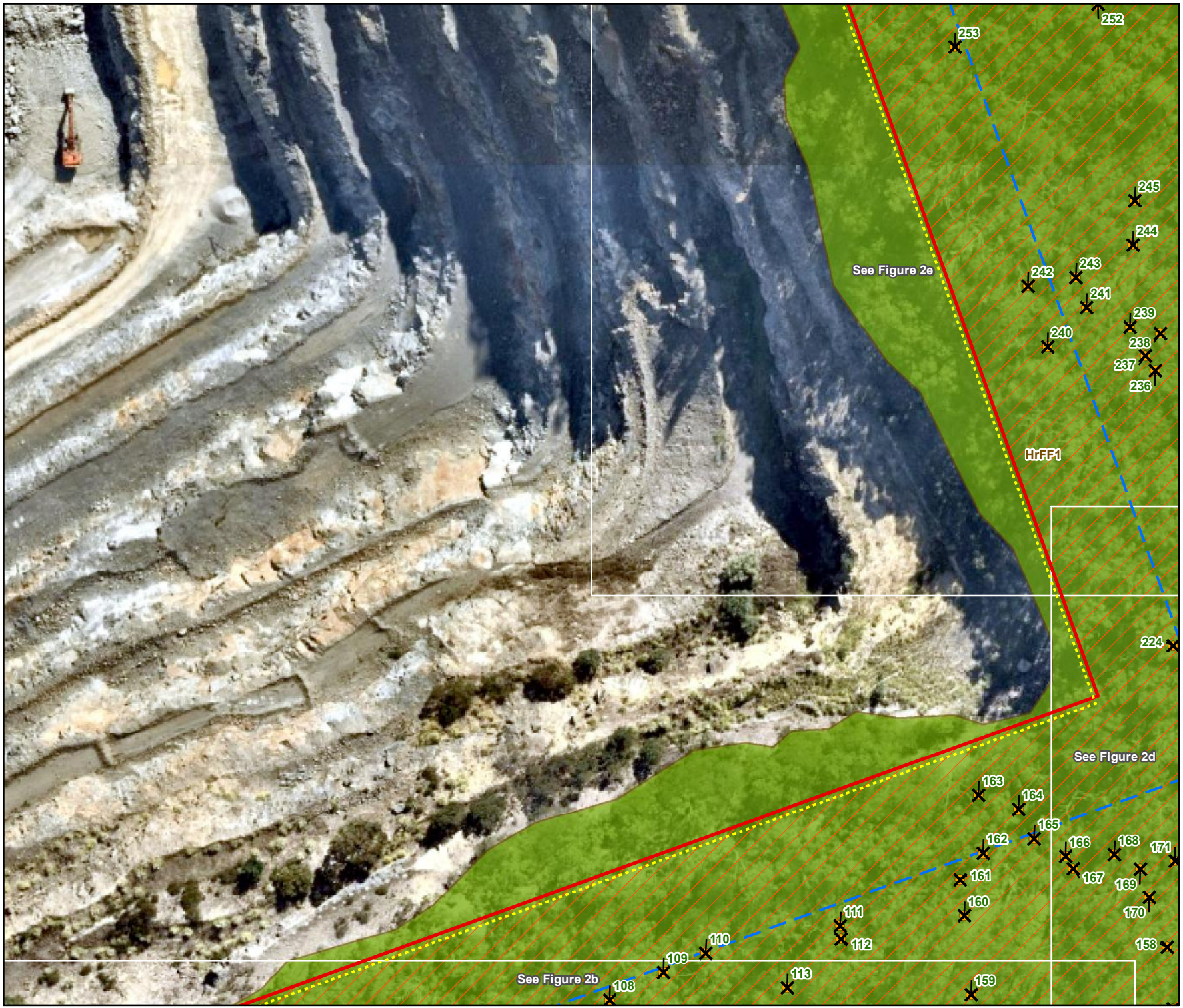
0 15 30
Metres

Map Scale: 1:1,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

14500_Fig02_EcolFeat_MB_G20 19/03/2024 psorensen

Aerial source: Nearmap 2022



Legend

- Study Area
- Large Tree in patch
- Impacted tree

Ecological Vegetation Classes

- Herb-rich Foothill Forest (EVC 23)
- Proposed impacted vegetation

Extension proposal limits

- Existing extraction limit
- Work authority boundary

Figure 2c

Ecological features

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

N

0 15 30

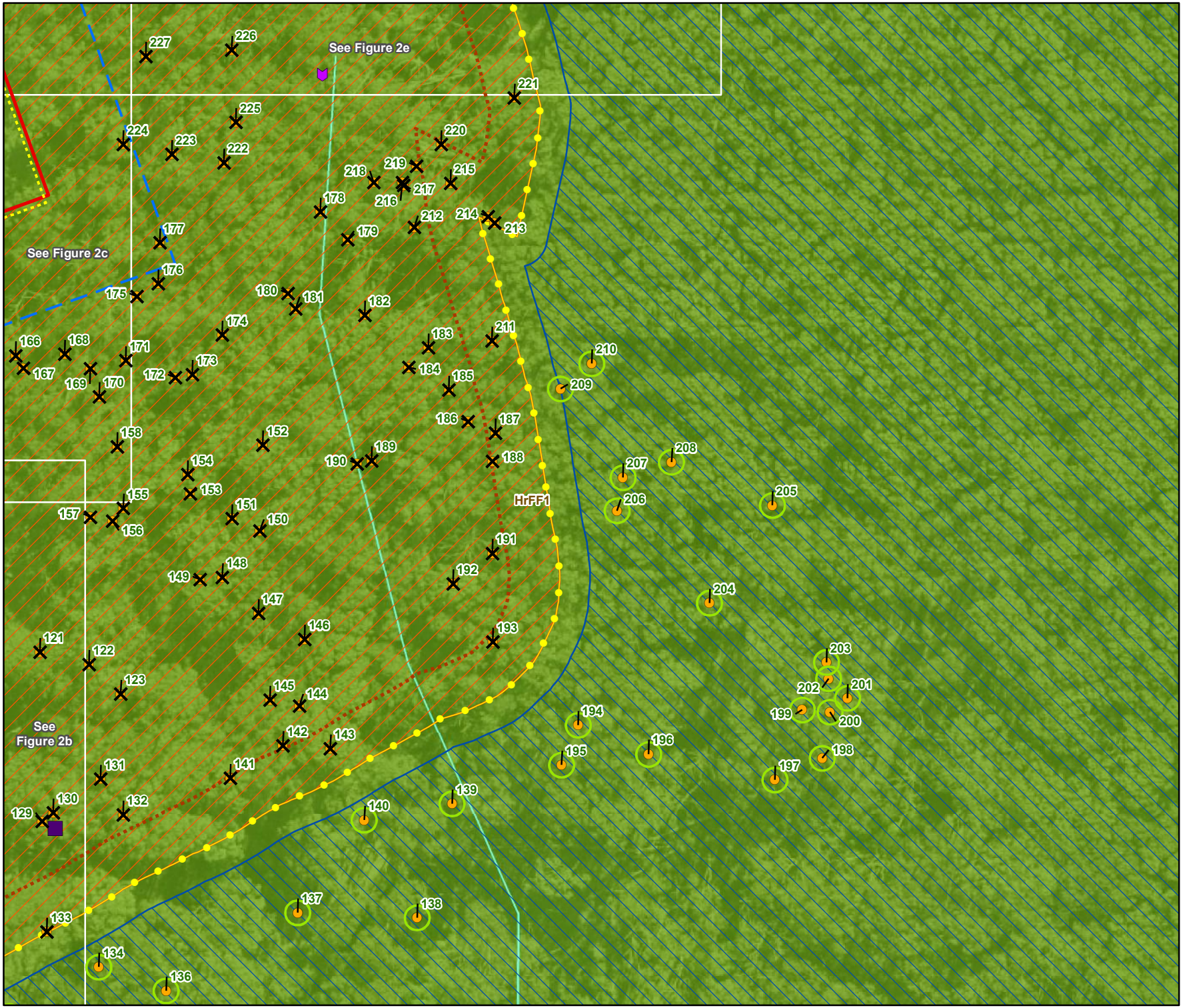
Metres

Map Scale: 1:1,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

14500_Fig02_EcolFeat_MB_G20 19/03/2024 psorensen

Aerial source: Nearmap 2022



Legend

- Study Area
- Large Tree in patch
- Common Onion-orchid
- Impacted tree
- Tree for potential offset

FFG Act Listed Flora

- Sticky Wattle (Vulnerable)

Ecological Vegetation Classes

- Herb-rich Foothill Forest (EVC 23)
- Proposed impacted vegetation
- Vegetation for potential offset

Extension proposal limits

- Existing extraction limit
- Work authority boundary
- Proposed extraction limit (disturbance area)
- Pit crest

Figure 2d

Ecological features

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

0 15 30

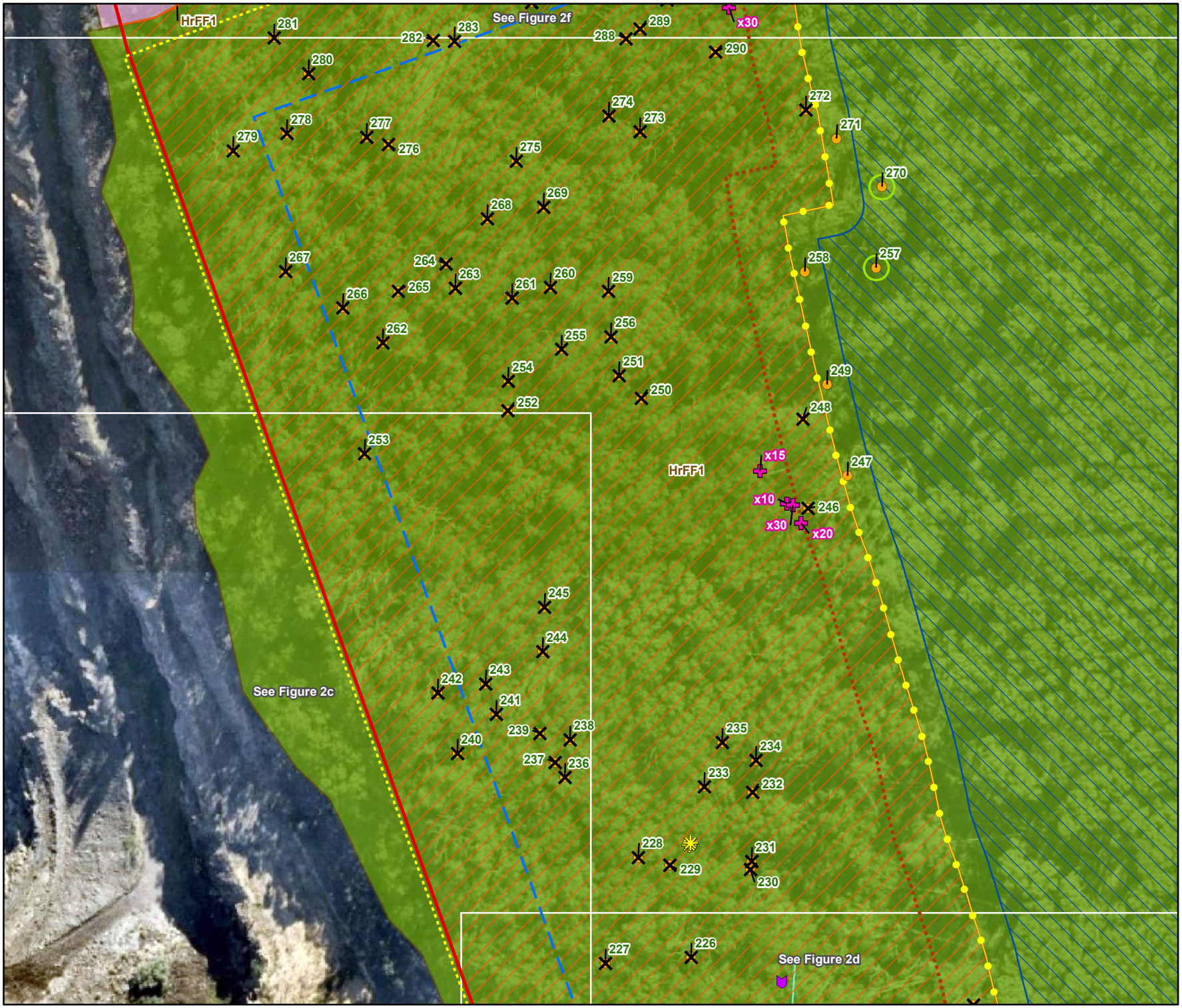
Metres

Map Scale: 1:1,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

14500_Fig02_EcolFeat_MB_G20 19/03/2024 psorensen

Aerial source: Nearmap 2022



Legend

- Study Area
- Large Tree in patch
- Impacted tree
- Tree for potential offset
- Planted vegetation

FFG Act Listed Flora

- Dandenong Wattle (Endangered)
- Mountain Bird-orchid (Vulnerable)
- Sticky Wattle (Vulnerable)

Ecological Vegetation Classes

- Herb-rich Foothill Forest (EVC 23)
- Proposed impacted vegetation
- Vegetation for potential offset

Extension proposal limits

- Existing extraction limit
- Work authority boundary
- Proposed extraction limit (disturbance area)
- Pit crest

Figure 2e

Ecological features

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

N

0 15 30

Metres

Map Scale: 1:1,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

14500_Fig02_EcolFeat_MB_G20 19/03/2024 psorensen

Aerial source: Nearmap 2022

Legend

- Study Area
- Large Tree in patch
- Common Bird-orchid
- Impacted tree
- Tree for potential offset
- Planted vegetation

FFG Act Listed Flora

- Mountain Bird-orchid (Vulnerable)

Ecological Vegetation Classes

- Herb-rich Foothill Forest (EVC 23)
- Proposed impacted vegetation
- Vegetation for potential offset

Extension proposal limits

- Existing extraction limit
- Property boundary
- Work authority boundary
- Proposed extraction limit (disturbance area)
- Pit crest

Figure 2f

Ecological features

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

N

0 20 40

Metres

Map Scale: 1:1,200 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

14500_Fig02_EcolFeat_MB_G20 19/03/2024 psorensen

Aerial source: Nearmap 2022

Legend

- Study Area
- Wine-lipped Spider-orchid

Significant flora

- Annual Fireweed
- Bristly Shield-fern
- Dandenong Wattle
- Floodplain Fireweed
- Forest Sedge
- Giant Honey-myrtle
- Green Leek-orchid
- Macromitrium
- Mountain Bird-orchid
- Pinkwood
- Powelltown Correa
- Red-tip Greenhood
- Slender Pink-fingers
- Spotted Gum
- Spurred Helmet-orchid
- Sticky Wattle
- Swamp Everlasting
- Veined Spear-grass

Figure 3

Previously documented significant flora within 5km of the study area

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

N

0 1 2

Kilometres

Map Scale: 1:40,000 @ A3
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

Legend

- Study Area

Significant fauna

- Australasian Shoveler
- Barking Owl
- Blue-billed Duck
- Broad-toothed Rat
- Brown Treecreeper
- Eastern Bent-winged Bat
- Eastern Great Egret
- Foothill Burrowing Crayfish
- Gang-gang Cockatoo
- Grey Goshawk
- Grey-headed Flying-fox
- Growling Grass Frog
- Hardhead
- Helmeted Honeyeater
- Lace Monitor
- Little Eagle
- Little Egret
- Narracan Corrugated Mussel
- Pilotbird
- Platypus
- Powerful Owl
- Regent Honeyeater
- Sooty Owl
- Southern Brown Bandicoot
- Southern Greater Glider
- Southern Toadlet
- Speckled Warbler
- Square-tailed Kite
- Superb Parrot
- Swift Parrot
- Tubercle Burrowing Crayfish
- White-bellied Sea-Eagle
- White-throated Needletail
- Yellow-bellied Glider

Figure 4

Previously documented significant fauna within 5km of the study area

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

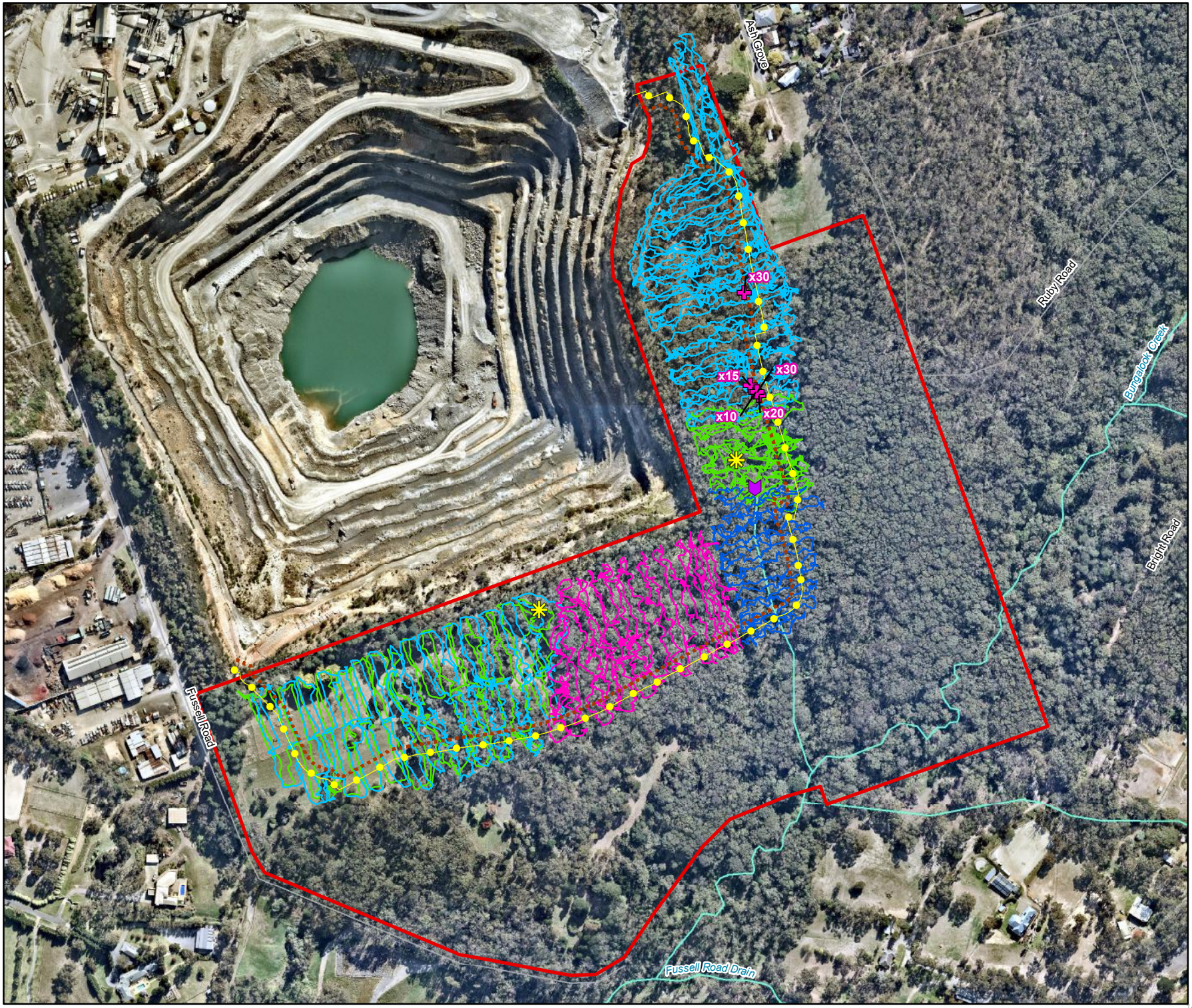
N

0 1 2

Kilometres

Map Scale: 1:40,000 @ A3
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners



Legend

- Study Area
- Proposed extraction limit (disturbance area)
- Pit crest

FFG Act Listed Flora

- Dandenong Wattle (Endangered)
- Mountain Bird-orchid (Vulnerable)
- Sticky Wattle (Vulnerable)

White Star-bush survey tracks

- Survey date: 19/10/2023
- Survey date: 20/10/2023
- Survey date: 31/10/2023
- Survey date: 1/11/2023

Figure 5 Overview

White Star-bush and other flora species' Targeted Survey

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

N

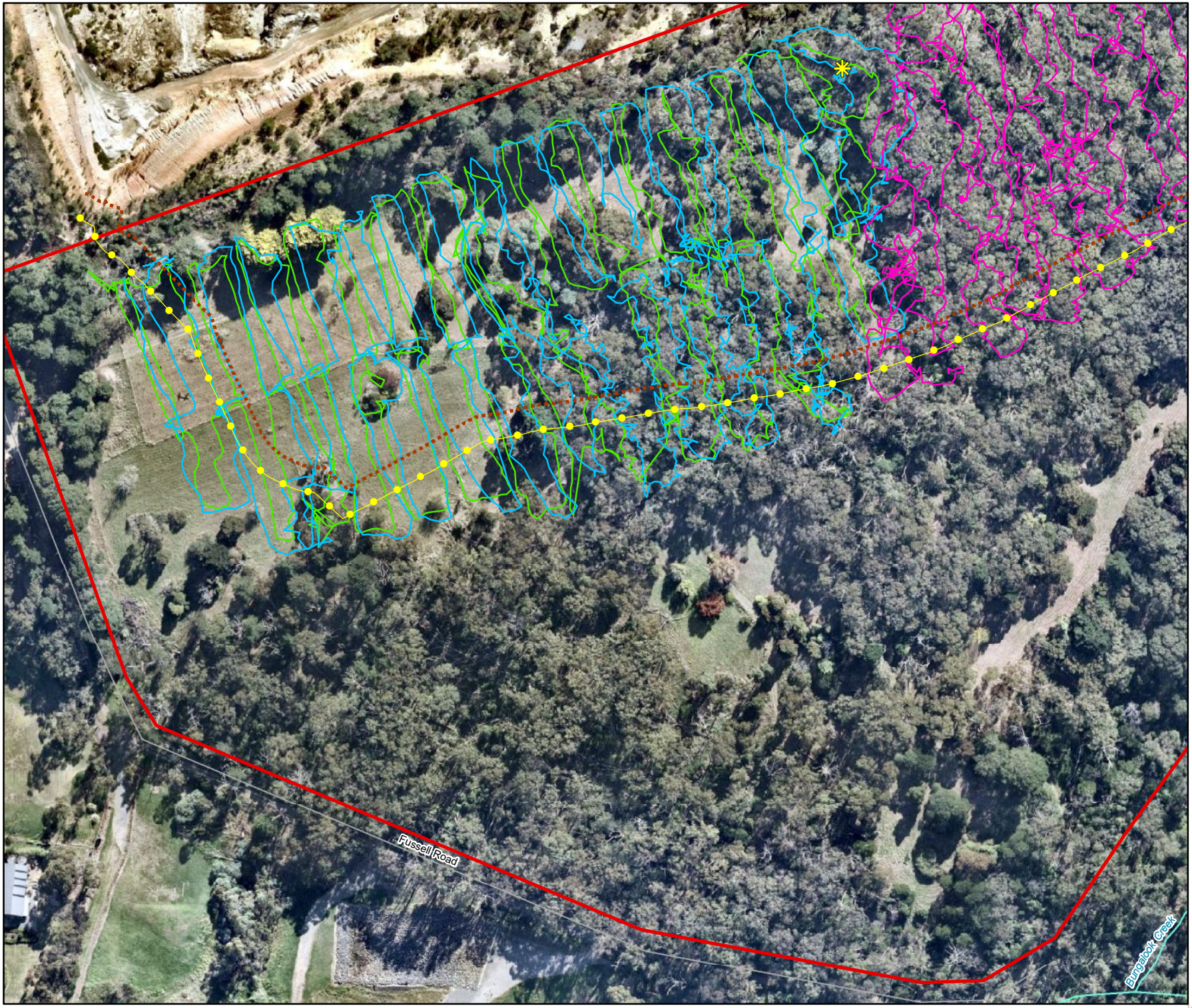
0 75 150

Metres

Map Scale: 1:5,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

Aerial source: Nearmap 2022



Legend

- Study Area
- Proposed extraction limit (disturbance area)
- Pit crest

FFG Act Listed Flora

- Dandenong Wattle (Endangered)

White Star-bush survey tracks

- Survey date: 19/10/2023
- Survey date: 20/10/2023
- Survey date: 1/11/2023

Figure 5a

White Star-bush and other flora species' Targeted Survey

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

N

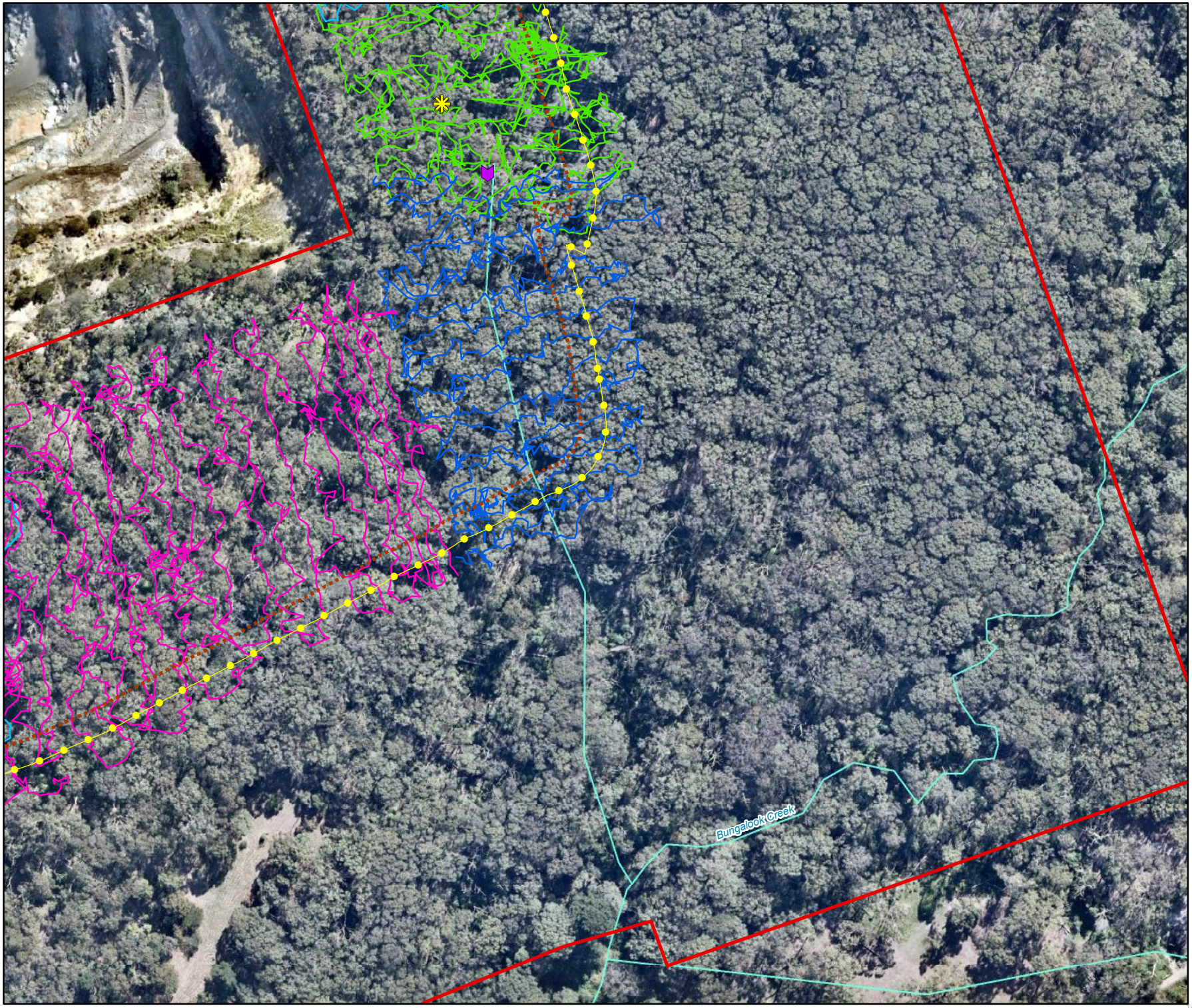
0 30 60

Metres

Map Scale: 1:2,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

Aerial source: Nearmap 2022



Legend

- Study Area
- Proposed extraction limit (disturbance area)
- Pit crest

FFG Act Listed Flora

- Dandenong Wattle (Endangered)
- Sticky Wattle (Vulnerable)

White Star-bush survey tracks

- Survey date: 19/10/2023
- Survey date: 20/10/2023
- Survey date: 31/10/2023
- Survey date: 1/11/2023

Figure 5b

White Star-bush and other flora species' Targeted Survey

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

N

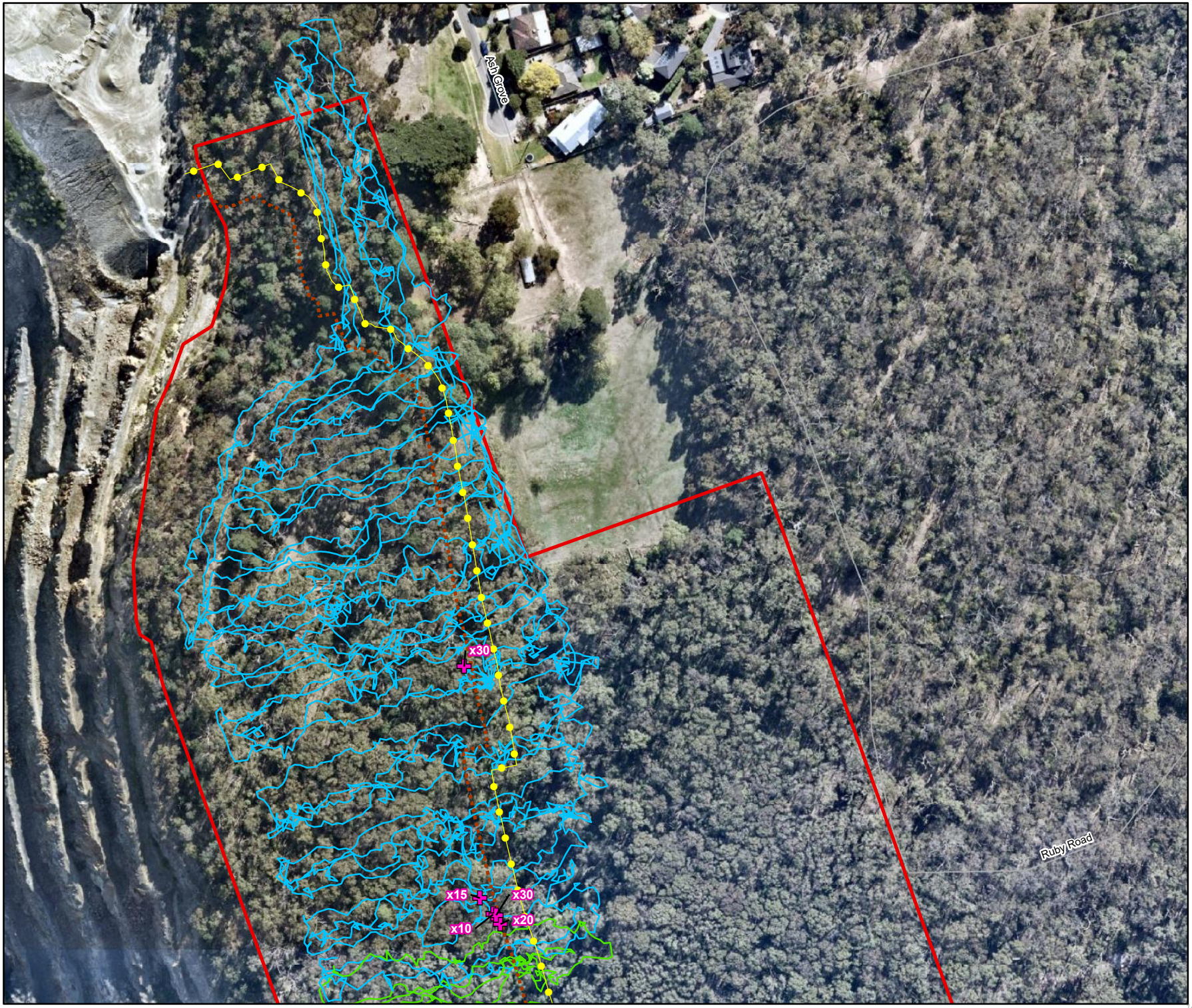
0 30 60

Metres

Map Scale: 1:2,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

Aerial source: Nearmap 2022



Legend

- Study Area
- Proposed extraction limit (disturbance area)
- Pit crest

FFG Act Listed Flora

- Mountain Bird-orchid (Vulnerable)

White Star-bush survey tracks

- Survey date: 19/10/2023
- Survey date: 20/10/2023

Figure 5c

White Star-bush and other flora species' Targeted Survey

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

N

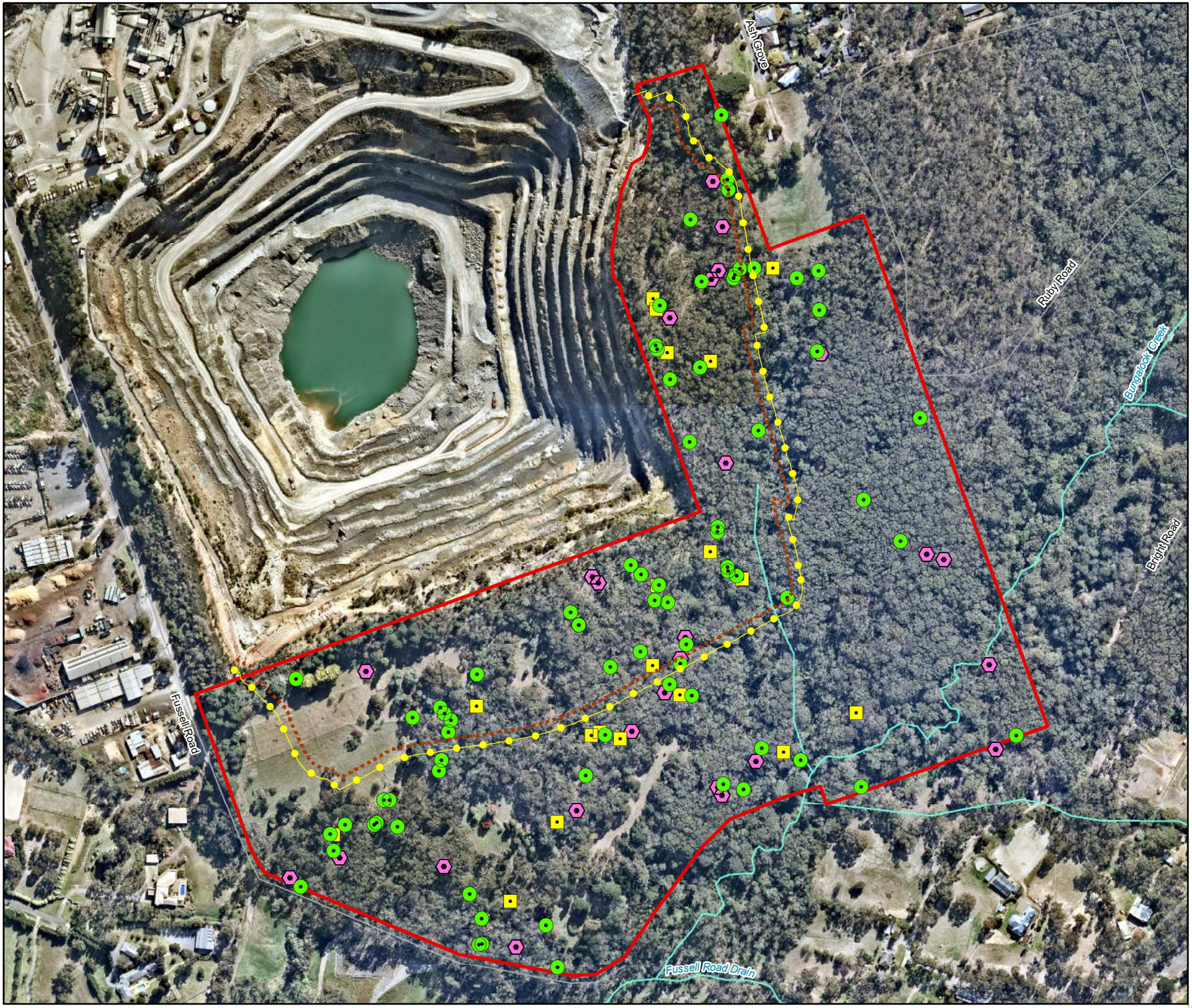
0 30 60

Metres

Map Scale: 1:2,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

Aerial source: Nearmap 2022



Legend

- Study Area
- Proposed extraction limit (disturbance area)
- Pit crest

Hollow Size

- Small hollow (<30cm)
- Large hollow (30cm and greater)
- Small and large hollows

Figure 6 Overview

Gang-gang Cockatoo Targeted Survey

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

N

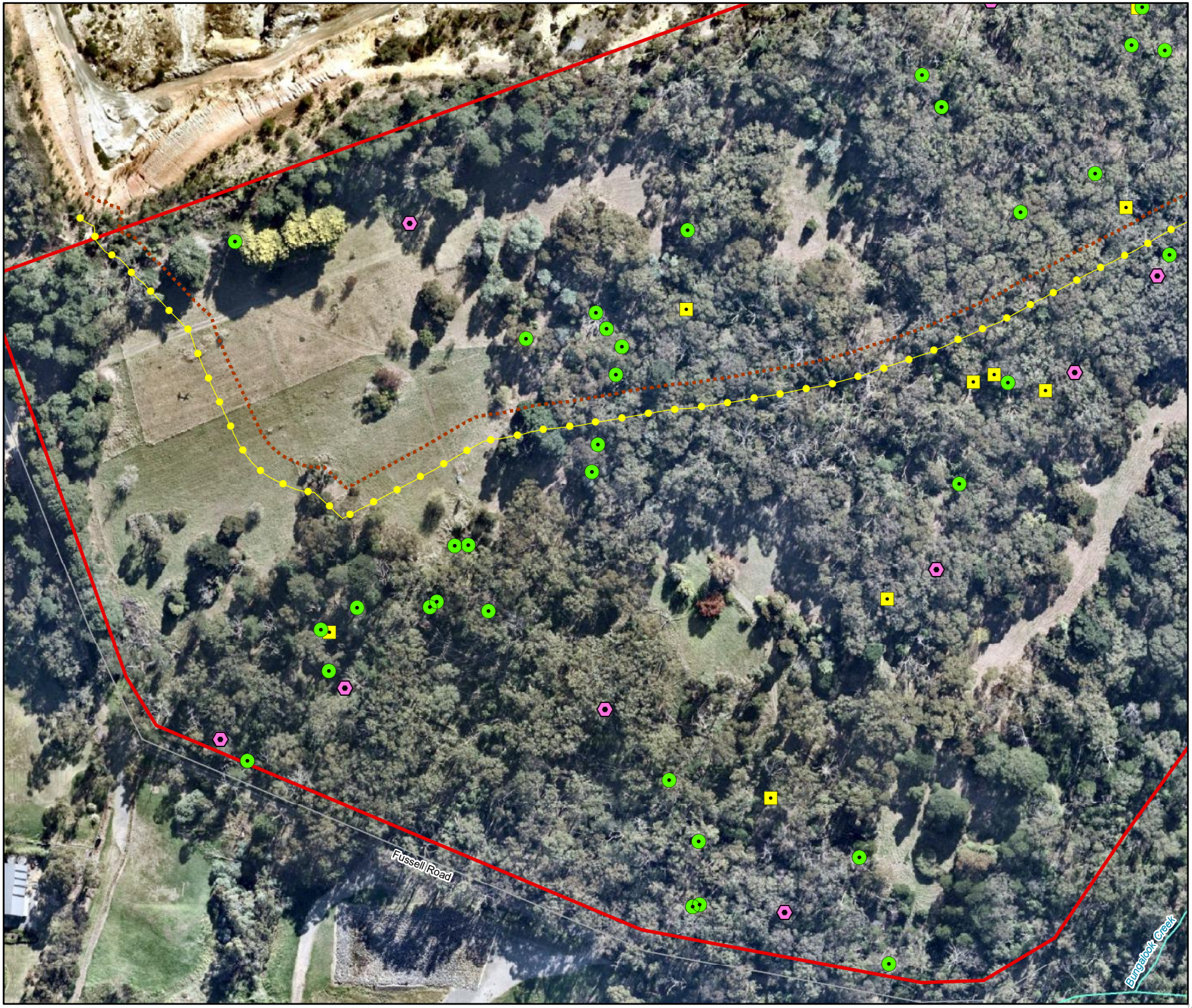
0 75 150

Metres

Map Scale: 1:5,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

Aerial source: Nearmap 2022



Legend

- Study Area
- Proposed extraction limit (disturbance area)
- Pit crest

Hollow Size

- Small hollow (<30cm)
- Large hollow (30cm and greater)
- Small and large hollows

Figure 6a

Gang-gang Cockatoo Targeted Survey

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

0 30 60

Metres

Map Scale: 1:2,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

14500_Fig06_GGCSurvResults_MB_G20 19/03/2024 psorensen

Aerial source: Nearmap 2022

Legend

- Study Area
- Proposed extraction limit (disturbance area)
- Pit crest

Hollow Size

- Small hollow (<30cm)
- Large hollow (30cm and greater)
- Small and large hollows

Figure 6b

Gang-gang Cockatoo Targeted Survey

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

N

0 30 60

Metres

Map Scale: 1:2,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

Aerial source: Nearmap 2022

Legend

- Study Area
- Proposed extraction limit (disturbance area)
- Pit crest

Hollow Size

- Small hollow (<30cm)
- Large hollow (30cm and greater)
- Small and large hollows

Figure 6c

Gang-gang Cockatoo Targeted Survey

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

N

0 30 60

Metres

Map Scale: 1:2,000 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

14500_Fig06_GGCSurvResults_MB_G20 19/03/2024 psorensen

Aerial source: Nearmap 2022

Legend

- Study Area
- Proposed extraction limit (disturbance area)
- Pit crest

Survey tracks

- Transect 1, Survey 1 - 7/02/2022
- Transect 1, Survey 2 - 8/02/2022
- Transect 2, Survey 1 - 9/05/2022
- Transect 2, Survey 2 - 10/05/2022
- Transect 3, Survey 1 - 9/05/2022
- Transect 3, Survey 2 - 10/05/2022

Observer locations

- 07/02/2022
- 08/02/2022
- 09/05/2022
- 10/05/2022

Observations

- Brushtail Possum
- Eastern Barn Owl
- Ringtail Possum
- Sugar Glider

Figure 7

Southern Greater GliderTargeted Survey

Preliminary Flora and Fauna Impact Assessment for Montrose Quarry, Montrose

N

0 75 150

Metres

Map Scale: 1:5,300 @ A4
Coordinate System: GDA2020 MGA Zone 55

ecology & heritage partners

14500_Fig07_SGGSurveyRes_G20 19/03/2024 psorensen

Aerial source: Nearmap 2022

APPENDIX 1 FLORA

Appendix 1.1 Flora Results

Legend:

L Listed as threatened under the FFG Act (DEECA 2023b);
I Protected under the FFG Act (DELWP 2019a);
***** Listed as a noxious weed under the CaLP Act;
w Weed of National Significance;
Planted Victorian and non-Victorian species.

Table A1.1. Flora within the study area.

Scientific Name	Common Name	Notes
INDIGENOUS SPECIES		
Acacia dealbata	Silver Wattle	
Acacia howittii	Sticky Wattle	**L I**
Acacia melanoxylon	Blackwood	
Acacia strictophylla	Dandenong Wattle	**L I**
Acaena novae-zelandiae	Bidgee-widgee	
Acrotriche serrulata	Honey-pots	
Adiantum aethiopicum	Common Maidenhair	**I**
Amyema pendula	Drooping Mistletoe	
Austrostipa pubinodis	Tall Spear-grass	
Austrostipa rudis	Veined Spear-grass	
Blechnum cartilagineum	Gristle Fern	**I**
Brunonia australis	Blue Pincushion	
Bursaria spinosa	Sweet Bursaria	
Calochlaena dubia	Common Ground-fern	**I**
Cassinia aculeata	Common Cassinia	
Chiloglottis jeanesii	Mountain Bird-orchid	**L I**
Chiloglottis valida	Common Bird-orchid	**I**
Clematis aristata	Mountain Clematis	
Coprosma quadrifida	Prickly Currant-bush	
Coronidium scorpioides s.s.	Button Everlasting	**I**
Correa reflexa	Common Correa	**I**
Dianella tasmanica	Tasman Flax-lily	

Scientific Name	Common Name	Notes
Dichondra repens	Kidney-weed	
Eleocharis sphacelata	Tall Spike-sedge	
Eragrostis brownii	Common Love-grass	
Eucalyptus goniocalyx s.l.	Bundy	
Eucalyptus macrorhyncha	Red Stringybark	
Eucalyptus obliqua	Messmate Stringybark	
Eucalyptus radiata s.l.	Narrow-leaf Peppermint	
Eucalyptus viminalis	Manna Gum	
Exocarpos cupressiformis	Cherry Ballart	
Gahnia radula	Thatch Saw-sedge	
Glycine clandestina	Twining Glycine	
Gonocarpus tetragynus	Common Raspwort	
Goodenia lanata	Trailing Goodenia	
Goodenia ovata	Hop Goodenia	
Hakea ulicina	Furze Hakea	
Juncus amabilis	Hollow Rush	
Juncus pallidus	Pale Rush	
Kunzea ericoides	Burgan	
Lepidosperma laterale var. *laterale*	Variable Sword-sedge	
Leptospermum continentale	Prickly Tea-tree	
Lomandra filiformis subsp. *filiformis*	Wattle Mat-rush	
Lomandra longifolia subsp. *exilis*	Cluster-headed Mat-rush	
Microlaena stipoides var. *stipoides*	Weeping Grass	
Microtis unifolia	Common Onion-orchid	I
Olearia lirata	Snowy Daisy-bush	I
Oxalis exilis	Shady Wood-sorrel	
Pandorea pandorana subsp. *pandorana*	Wonga Vine	
Poa ensiformis	Sword Tussock-grass	
Pteridium esculentum	Austral Bracken	
Pultenaea scabra	Rough Bush-pea	
Rumex bidens	Mud Dock	
Rytidosperma caespitosum	Common Wallaby-grass	
Rytidosperma pallidum	Silvertop Wallaby-grass	
Senecio glomeratus	Annual Fireweed	
Senecio quadridentatus	Cotton Fireweed	I

Scientific Name	Common Name	Notes
Stylidium graminifolium s.l.	Grass Triggerplant	I
Tetrarrhena juncea	Forest Wire-grass	
Themeda triandra	Kangaroo Grass	
Viola hederacea sensu Entwisle (1996)	Ivy-leaf Violet	
Wahlenbergia stricta subsp. *stricta*	Tall Bluebell	
NON-INDIGENOUS OR INTRODUCED SPECIES		
Acacia elata	Cedar Wattle	
Acer palmatum	Japanese Maple	
Acer pseudoplatanus	Sycamore Maple	
Acetosella vulgaris	Sheep Sorrel	
Agapanthus praecox subsp. *orientalis*	Agapanthus	
Aira elegantissima	Delicate Hair-grass	
Ajuga reptans	Common Bugle	
Anagallis arvensis	Scarlet Pimpernel	
Anthoxanthum odoratum	Sweet Vernal-grass	
Arbutus unedo	Irish Strawberry Tree	
Asparagus asparagoides	Bridal Creeper	* w
Asparagus scandens	Asparagus Fern	* w
Avena barbata	Bearded Oat	
Briza maxima	Large Quaking-grass	
Briza minor	Lesser Quaking-grass	
Bromus catharticus	Prairie Grass	
Callistemon viminalis	Weeping Bottlebrush	#
Camellia sasanqua	Sasanqua Camellia	
Canola X *napus*	Canola	
Centaurium erythraea	Common Centaury	
Chrysanthemoides monilifera	Boneseed	* w
Cirsium vulgare	Spear Thistle	*
Citrus X *limon*	Lemon	
Citrus X *paradisi*	Grapefruit	
Conyza bonariensis	Flaxleaf Fleabane	
Cortaderia selloana	Pampas Grass	
Cotinus coggygria	Smoke Bush	
Cynodon dactylon	Couch	
Cyperus eragrostis	Drain Flat-sedge	

Scientific Name	Common Name	Notes
Dactylis glomerata	Cocksfoot	
Ehrharta erecta var. *erecta*	Panic Veldt-grass	
Eucalyptus globulus subsp. *globulus*	Southern Blue Gum	#
Ficus carica	Fig	
Galium aparine	Cleavers	
Genista linifolia	Flax-leaf Broom	* w
Hedera helix	English Ivy	
Helminthotheca echioides	Ox-tongue	
Hesperocyparis macrocarpa	Monterey Cypress	
Holcus lanatus	Yorkshire Fog	
Hypochaeris radicata	Flatweed	
Ilex aquifolium	English Holly	
Kniphofia uvaria	Red-hot Poker	
Lactuca serriola	Prickly Lettuce	
Liquidambar styraciflua	Liquidamber	
Lolium perenne	Perennial Rye-grass	
Lotus uliginosus	Greater Bird's-foot Trefoil	
Malus pumila	Apple	
Mentha X *piperita*	Peppermint	
Myosotis sylvatica	Wood Forget-me-not	
Nephrolepis cordifolia	Fishbone Fern	#
Paspalum dilatatum	Paspalum	
Phytolacca octandra	Red-ink Weed	
Pinus radiata	Radiata Pine	
Pittosporum undulatum	Sweet Pittosporum	
Plantago lanceolata	Ribwort	
Pleioblastus spp.	Bamboo	
Populus alba	White Poplar	
Prunus cerasifera	Cherry Plum	
Prunus cerasifera 'Nigra'	Purple-leaf Cherry-plum	
Quercus robur	English Oak	
Ranunculus repens	Creeping Buttercup	
Rhododendron spp.	Rhododendron	
Rosa rubiginosa	Sweet Briar	*
Rubus fruticosus spp. agg.	Blackberry	* w

Scientific Name	Common Name	Notes
Rumex conglomeratus	Clustered Dock	
Sisyrinchium iridifolium	Striped Rush-leaf	
Sonchus asper s.l.	Rough Sow-thistle	
Sonchus oleraceus	Common Sow-thistle	
Syzygium smithii	Lilly Pilly	#
Taxus baccata	English Yew	
Tragopogon porrifolius subsp. *porrifolius*	Salsify	
Trifolium repens var. *repens*	White Clover	
Viburnum tinus	Laurestinus	
Vinca major	Blue Periwinkle	
Vinca major 'Variegata'	Variegated Greater Periwinkle	
Watsonia meriana var. *bulbillifera*	Bulbil Watsonia	*
Zantedeschia aethiopica	White Arum-lily	

Appendix 1.2 Habitat Hectare Assessment

Table A1.2. Habitat Hectare Assessment Table.

Vegetation Zone		HrFF1	HrFF2	SGF1
Bioregion		Highlands – Southern Fall	Highlands – Southern Fall	Highlands – Southern Fall
EVC / Tree		Herb-rich Foothill Forest	Herb-rich Foothill Forest	Shrubby Gully Forest
EVC Number		23	23	938
EVC Conservation Status		Least Concern	Least Concern	
Patch Condition	Large Old Trees /10	9	0	9
	Canopy Cover /5	4	0	4
	Under storey /25	20	5	20
	Lack of Weeds /15	9	0	9
	Recruitment /10	6	0	3
	Organic Matter /5	5	4	5
	Logs /5	5	0	5
	Treeless EVC Multiplier	1.00	1.00	1.00
	Subtotal =	58.00	9.00	55.00
Landscape Value /25		14	4	14
Habitat Points /100		72	13	69
Habitat Score		0.72	0.13	0.69

Note: HrFF = Herb-rich Foothill Forest; SGF = Shrubby Gully Forest.

Appendix 1.3 Large Trees in Patches Impacted by the Impact Footprint

Table A1.3. Scattered Trees and Large Trees in Patches.

Tree # (Figure 2)	Species Name	Common Name	DBH (cm)	Size Class	Scattered / Parch
1	*Eucalyptus goniocalyx*	Bundy	90	Large	Patch
2	*Eucalyptus goniocalyx*	Bundy	70	Large	Patch
3	*Eucalyptus goniocalyx*	Bundy	90	Large	Patch
4	*Eucalyptus goniocalyx*	Bundy	80	Large	Patch
5	*Eucalyptus obliqua*	Messmate Stringybark	87	Large	Patch
6	*Eucalyptus goniocalyx*	Bundy	88	Large	Patch
7	*Eucalyptus* spp.	Dead stag	74	Large	Patch
8	*Eucalyptus goniocalyx*	Bundy	130	Large	Patch
9	*Eucalyptus goniocalyx*	Bundy	91	Large	Patch
10	*Eucalyptus goniocalyx*	Bundy	78	Large	Patch
11	*Eucalyptus goniocalyx*	Bundy	73	Large	Patch
12	*Eucalyptus goniocalyx*	Bundy	78	Large	Patch
13	*Eucalyptus goniocalyx*	Bundy	95	Large	Patch
14	*Eucalyptus obliqua*	Messmate Stringybark	81	Large	Patch
15	*Eucalyptus obliqua*	Messmate Stringybark	73	Large	Patch
16	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
17	*Eucalyptus macrorhyncha*	Red Stringybark	97	Large	Patch
18	*Eucalyptus macrorhyncha*	Red Stringybark	75	Large	Patch
19	*Eucalyptus obliqua*	Messmate Stringybark	76	Large	Patch
20	*Eucalyptus macrorhyncha*	Red Stringybark	74	Large	Patch
21	*Eucalyptus macrorhyncha*	Red Stringybark	71	Large	Patch
22	*Eucalyptus* spp.	Dead stag	80	Large	Patch
23	*Eucalyptus macrorhyncha*	Red Stringybark	81	Large	Patch
24	*Eucalyptus macrorhyncha*	Red Stringybark	71	Large	Patch
25	*Eucalyptus goniocalyx*	Bundy	70	Large	Patch
26	*Eucalyptus goniocalyx*	Bundy	78	Large	Patch
27	*Eucalyptus macrorhyncha*	Red Stringybark	88	Large	Patch
28	*Eucalyptus* spp.	Dead stag	85	Large	Patch
29	*Eucalyptus goniocalyx*	Bundy	91	Large	Patch
30	*Eucalyptus goniocalyx*	Bundy	74	Large	Patch
31	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
32	*Eucalyptus obliqua*	Messmate Stringybark	117	Large	Patch
33	*Eucalyptus obliqua*	Messmate Stringybark	77	Large	Patch
34	*Eucalyptus obliqua*	Messmate Stringybark	71	Large	Patch
35	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
36	*Eucalyptus obliqua*	Messmate Stringybark	97	Large	Patch
37	*Eucalyptus obliqua*	Messmate Stringybark	88	Large	Patch
38	*Eucalyptus obliqua*	Messmate Stringybark	74	Large	Patch

Tree # (Figure 2)	Species Name	Common Name	DBH (cm)	Size Class	Scattered / Parch
39	*Eucalyptus obliqua*	Messmate Stringybark	130	Large	Patch
40	*Eucalyptus* spp.	Dead stag	120	Large	Patch
41	*Eucalyptus macrorhyncha*	Red Stringybark	85	Large	Patch
42	*Eucalyptus macrorhyncha*	Red Stringybark	70	Large	Patch
43	*Eucalyptus macrorhyncha*	Red Stringybark	77	Large	Patch
44	*Eucalyptus* spp.	Dead stag	102	Large	Patch
45	*Eucalyptus macrorhyncha*	Red Stringybark	83	Large	Patch
46	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
47	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
48	*Eucalyptus obliqua*	Messmate Stringybark	85	Large	Patch
49	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
50	*Eucalyptus obliqua*	Messmate Stringybark	72	Large	Patch
51	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
52	*Eucalyptus obliqua*	Messmate Stringybark	86	Large	Patch
53	*Eucalyptus obliqua*	Messmate Stringybark	77	Large	Patch
54	*Eucalyptus obliqua*	Messmate Stringybark	74	Large	Patch
55	*Eucalyptus obliqua*	Messmate Stringybark	79	Large	Patch
56	*Eucalyptus obliqua*	Messmate Stringybark	72	Large	Patch
57	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
58	*Eucalyptus obliqua*	Messmate Stringybark	77	Large	Patch
59	*Eucalyptus obliqua*	Messmate Stringybark	73	Large	Patch
60	*Eucalyptus obliqua*	Messmate Stringybark	76	Large	Patch
61	*Eucalyptus obliqua*	Messmate Stringybark	72	Large	Patch
62	*Eucalyptus obliqua*	Messmate Stringybark	76	Large	Patch
63	*Eucalyptus obliqua*	Messmate Stringybark	76	Large	Patch
64	*Eucalyptus obliqua*	Messmate Stringybark	88	Large	Patch
65	*Eucalyptus obliqua*	Messmate Stringybark	81	Large	Patch
66	*Eucalyptus obliqua*	Messmate Stringybark	76	Large	Patch
67	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
68	*Eucalyptus obliqua*	Messmate Stringybark	72	Large	Patch
69	*Eucalyptus obliqua*	Messmate Stringybark	72	Large	Patch
70	*Eucalyptus obliqua*	Messmate Stringybark	68	Large	Patch
71	*Eucalyptus obliqua*	Messmate Stringybark	79	Large	Patch
72	*Eucalyptus obliqua*	Messmate Stringybark	92	Large	Patch
73	*Eucalyptus obliqua*	Messmate Stringybark	76	Large	Patch
74	*Eucalyptus obliqua*	Messmate Stringybark	105	Large	Patch
75	*Eucalyptus obliqua*	Messmate Stringybark	98	Large	Patch
76	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
77	*Eucalyptus obliqua*	Messmate Stringybark	86	Large	Patch
78	*Eucalyptus obliqua*	Messmate Stringybark	87	Large	Patch
79	*Eucalyptus obliqua*	Messmate Stringybark	83	Large	Patch

Tree # (Figure 2)	Species Name	Common Name	DBH (cm)	Size Class	Scattered / Parch
80	*Eucalyptus obliqua*	Messmate Stringybark	114	Large	Patch
81	*Eucalyptus obliqua*	Messmate Stringybark	90	Large	Patch
82	*Eucalyptus obliqua*	Messmate Stringybark	74	Large	Patch
83	*Eucalyptus obliqua*	Messmate Stringybark	87	Large	Patch
84	*Eucalyptus obliqua*	Messmate Stringybark	71	Large	Patch
85	*Eucalyptus obliqua*	Messmate Stringybark	91	Large	Patch
86	*Eucalyptus obliqua*	Messmate Stringybark	77	Large	Patch
87	*Eucalyptus obliqua*	Messmate Stringybark	118	Large	Patch
88	*Eucalyptus obliqua*	Messmate Stringybark	87	Large	Patch
89	*Eucalyptus obliqua*	Messmate Stringybark	130	Large	Patch
90	*Eucalyptus obliqua*	Messmate Stringybark	71	Large	Patch
91	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
92	*Eucalyptus obliqua*	Messmate Stringybark	132	Large	Patch
93	*Eucalyptus obliqua*	Messmate Stringybark	124	Large	Patch
94	*Eucalyptus obliqua*	Messmate Stringybark	82	Large	Patch
95	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
96	*Eucalyptus obliqua*	Messmate Stringybark	74	Large	Patch
97	*Eucalyptus obliqua*	Messmate Stringybark	85	Large	Patch
98	*Eucalyptus obliqua*	Messmate Stringybark	81	Large	Patch
99	*Eucalyptus obliqua*	Messmate Stringybark	86	Large	Patch
100	*Eucalyptus obliqua*	Messmate Stringybark	79	Large	Patch
101	*Eucalyptus obliqua*	Messmate Stringybark	76	Large	Patch
102	*Eucalyptus obliqua*	Messmate Stringybark	122	Large	Patch
103	*Eucalyptus obliqua*	Messmate Stringybark	102	Large	Patch
104	*Eucalyptus obliqua*	Messmate Stringybark	88	Large	Patch
105	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
106	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
107	*Eucalyptus obliqua*	Messmate Stringybark	82	Large	Patch
108	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
109	*Eucalyptus obliqua*	Messmate Stringybark	89	Large	Patch
110	*Eucalyptus obliqua*	Messmate Stringybark	77	Large	Patch
111	*Eucalyptus obliqua*	Messmate Stringybark	84	Large	Patch
112	*Eucalyptus obliqua*	Messmate Stringybark	88	Large	Patch
113	*Eucalyptus obliqua*	Messmate Stringybark	119	Large	Patch
114	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
115	*Eucalyptus obliqua*	Messmate Stringybark	84	Large	Patch
116	*Eucalyptus obliqua*	Messmate Stringybark	74	Large	Patch
117	*Eucalyptus obliqua*	Messmate Stringybark	71	Large	Patch
118	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
119	*Eucalyptus obliqua*	Messmate Stringybark	77	Large	Patch
120	*Eucalyptus obliqua*	Messmate Stringybark	110	Large	Patch

Tree # (Figure 2)	Species Name	Common Name	DBH (cm)	Size Class	Scattered / Parch
121	*Eucalyptus obliqua*	Messmate Stringybark	99	Large	Patch
122	*Eucalyptus obliqua*	Messmate Stringybark	92	Large	Patch
123	*Eucalyptus obliqua*	Messmate Stringybark	95	Large	Patch
124	*Eucalyptus obliqua*	Messmate Stringybark	94	Large	Patch
125	*Eucalyptus obliqua*	Messmate Stringybark	84	Large	Patch
126	*Eucalyptus obliqua*	Messmate Stringybark	114	Large	Patch
127	*Eucalyptus obliqua*	Messmate Stringybark	81	Large	Patch
128	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
129	*Eucalyptus obliqua*	Messmate Stringybark	88	Large	Patch
130	*Eucalyptus obliqua*	Messmate Stringybark	103	Large	Patch
131	*Eucalyptus obliqua*	Messmate Stringybark	80	Large	Patch
132	*Eucalyptus obliqua*	Messmate Stringybark	115	Large	Patch
133	*Eucalyptus obliqua*	Messmate Stringybark	82	Large	Patch
134	*Eucalyptus obliqua*	Messmate Stringybark	101	Large	Patch
135	*Eucalyptus obliqua*	Messmate Stringybark	80	Large	Patch
136	*Eucalyptus obliqua*	Messmate Stringybark	76	Large	Patch
137	*Eucalyptus obliqua*	Messmate Stringybark	80	Large	Patch
138	*Eucalyptus obliqua*	Messmate Stringybark	130	Large	Patch
139	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
140	*Eucalyptus obliqua*	Messmate Stringybark	87	Large	Patch
141	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
142	*Eucalyptus obliqua*	Messmate Stringybark	74	Large	Patch
143	*Eucalyptus obliqua*	Messmate Stringybark	109	Large	Patch
144	*Eucalyptus obliqua*	Messmate Stringybark	70	Large	Patch
145	*Eucalyptus obliqua*	Messmate Stringybark	72	Large	Patch
146	*Eucalyptus obliqua*	Messmate Stringybark	95	Large	Patch
147	*Eucalyptus obliqua*	Messmate Stringybark	90	Large	Patch
148	*Eucalyptus obliqua*	Messmate Stringybark	81	Large	Patch
149	*Eucalyptus obliqua*	Messmate Stringybark	73	Large	Patch
150	*Eucalyptus obliqua*	Messmate Stringybark	80	Large	Patch
151	*Eucalyptus obliqua*	Messmate Stringybark	92	Large	Patch
152	*Eucalyptus obliqua*	Messmate Stringybark	94	Large	Patch
153	*Eucalyptus obliqua*	Messmate Stringybark	70	Large	Patch
154	*Eucalyptus obliqua*	Messmate Stringybark	74	Large	Patch
155	*Eucalyptus obliqua*	Messmate Stringybark	73	Large	Patch
156	*Eucalyptus obliqua*	Messmate Stringybark	102	Large	Patch
157	*Eucalyptus obliqua*	Messmate Stringybark	105	Large	Patch
158	*Eucalyptus obliqua*	Messmate Stringybark	72	Large	Patch
159	*Eucalyptus obliqua*	Messmate Stringybark	74	Large	Patch
160	*Eucalyptus obliqua*	Messmate Stringybark	70	Large	Patch
161	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch

Tree # (Figure 2)	Species Name	Common Name	DBH (cm)	Size Class	Scattered / Parch
162	*Eucalyptus obliqua*	Messmate Stringybark	104	Large	Patch
163	*Eucalyptus macrorhyncha*	Red Stringybark	70	Large	Patch
164	*Eucalyptus* spp.	Dead stag	80	Large	Patch
165	*Eucalyptus obliqua*	Messmate Stringybark	79	Large	Patch
166	*Eucalyptus obliqua*	Messmate Stringybark	85	Large	Patch
167	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
168	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
169	*Eucalyptus* spp.	Dead stag	85	Large	Patch
170	*Eucalyptus obliqua*	Messmate Stringybark	92	Large	Patch
171	*Eucalyptus* spp.	Dead stag	82	Large	Patch
172	*Eucalyptus obliqua*	Messmate Stringybark	72	Large	Patch
173	*Eucalyptus obliqua*	Messmate Stringybark	71	Large	Patch
174	*Eucalyptus obliqua*	Messmate Stringybark	80	Large	Patch
175	*Eucalyptus obliqua*	Messmate Stringybark	89	Large	Patch
176	*Eucalyptus obliqua*	Messmate Stringybark	86	Large	Patch
177	*Eucalyptus obliqua*	Messmate Stringybark	85	Large	Patch
178	*Eucalyptus obliqua*	Messmate Stringybark	70	Large	Patch
179	*Eucalyptus obliqua*	Messmate Stringybark	82	Large	Patch
180	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
181	*Eucalyptus obliqua*	Messmate Stringybark	99	Large	Patch
182	*Eucalyptus obliqua*	Messmate Stringybark	72	Large	Patch
183	*Eucalyptus obliqua*	Messmate Stringybark	102	Large	Patch
184	*Eucalyptus obliqua*	Messmate Stringybark	77	Large	Patch
185	*Eucalyptus obliqua*	Messmate Stringybark	81	Large	Patch
186	*Eucalyptus obliqua*	Messmate Stringybark	85	Large	Patch
187	*Eucalyptus obliqua*	Messmate Stringybark	81	Large	Patch
188	*Eucalyptus obliqua*	Messmate Stringybark	79	Large	Patch
189	*Eucalyptus obliqua*	Messmate Stringybark	85	Large	Patch
190	*Eucalyptus obliqua*	Messmate Stringybark	85	Large	Patch
191	*Eucalyptus* spp.	Dead stag	74	Large	Patch
192	*Eucalyptus obliqua*	Messmate Stringybark	70	Large	Patch
193	*Eucalyptus obliqua*	Messmate Stringybark	70	Large	Patch
194	*Eucalyptus obliqua*	Messmate Stringybark	71	Large	Patch
195	*Eucalyptus obliqua*	Messmate Stringybark	89	Large	Patch
196	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
197	*Eucalyptus obliqua*	Messmate Stringybark	99	Large	Patch
198	*Eucalyptus obliqua*	Messmate Stringybark	73	Large	Patch
199	*Eucalyptus obliqua*	Messmate Stringybark	80	Large	Patch
200	*Eucalyptus obliqua*	Messmate Stringybark	112	Large	Patch
201	*Eucalyptus obliqua*	Messmate Stringybark	81	Large	Patch
202	*Eucalyptus macrorhyncha*	Red Stringybark	76	Large	Patch

Tree # (Figure 2)	Species Name	Common Name	DBH (cm)	Size Class	Scattered / Parch
203	*Eucalyptus obliqua*	Messmate Stringybark	74	Large	Patch
204	*Eucalyptus obliqua*	Messmate Stringybark	92	Large	Patch
205	*Eucalyptus obliqua*	Messmate Stringybark	85	Large	Patch
206	*Eucalyptus obliqua*	Messmate Stringybark	88	Large	Patch
207	*Eucalyptus obliqua*	Messmate Stringybark	86	Large	Patch
208	*Eucalyptus obliqua*	Messmate Stringybark	138	Large	Patch
209	*Eucalyptus obliqua*	Messmate Stringybark	101	Large	Patch
210	*Eucalyptus obliqua*	Messmate Stringybark	76	Large	Patch
211	*Eucalyptus obliqua*	Messmate Stringybark	90	Large	Patch
212	*Eucalyptus obliqua*	Messmate Stringybark	73	Large	Patch
213	*Eucalyptus obliqua*	Messmate Stringybark	82	Large	Patch
214	*Eucalyptus obliqua*	Messmate Stringybark	115	Large	Patch
215	*Eucalyptus obliqua*	Messmate Stringybark	74	Large	Patch
216	*Eucalyptus obliqua*	Messmate Stringybark	71	Large	Patch
217	*Eucalyptus obliqua*	Messmate Stringybark	71	Large	Patch
218	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
219	*Eucalyptus obliqua*	Messmate Stringybark	72	Large	Patch
220	*Eucalyptus obliqua*	Messmate Stringybark	73	Large	Patch
221	*Eucalyptus obliqua*	Messmate Stringybark	80	Large	Patch
222	*Eucalyptus obliqua*	Messmate Stringybark	160	Large	Patch
223	*Eucalyptus obliqua*	Messmate Stringybark	70	Large	Patch
224	*Eucalyptus obliqua*	Messmate Stringybark	90	Large	Patch
225	*Eucalyptus obliqua*	Messmate Stringybark	110	Large	Patch
226	*Eucalyptus obliqua*	Messmate Stringybark	105	Large	Patch
227	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
228	*Eucalyptus obliqua*	Messmate Stringybark	88	Large	Patch
229	*Eucalyptus obliqua*	Messmate Stringybark	71	Large	Patch
230	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
231	*Eucalyptus obliqua*	Messmate Stringybark	85	Large	Patch
232	*Eucalyptus obliqua*	Messmate Stringybark	118	Large	Patch
233	*Eucalyptus obliqua*	Messmate Stringybark	74	Large	Patch
234	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
235	*Eucalyptus obliqua*	Messmate Stringybark	70	Large	Patch
236	*Eucalyptus obliqua*	Messmate Stringybark	83	Large	Patch
237	*Eucalyptus obliqua*	Messmate Stringybark	86	Large	Patch
238	*Eucalyptus obliqua*	Messmate Stringybark	93	Large	Patch
239	*Eucalyptus obliqua*	Messmate Stringybark	74	Large	Patch
240	*Eucalyptus obliqua*	Messmate Stringybark	70	Large	Patch
241	*Eucalyptus obliqua*	Messmate Stringybark	80	Large	Patch
242	*Eucalyptus goniocalyx*	Bundy	110	Large	Patch
243	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch

Tree # (Figure 2)	Species Name	Common Name	DBH (cm)	Size Class	Scattered / Parch
244	*Eucalyptus obliqua*	Messmate Stringybark	90	Large	Patch
245	*Eucalyptus obliqua*	Messmate Stringybark	73	Large	Patch
246	*Eucalyptus obliqua*	Messmate Stringybark	88	Large	Patch
247	*Eucalyptus obliqua*	Messmate Stringybark	72	Large	Patch
248	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
249	*Eucalyptus obliqua*	Messmate Stringybark	72	Large	Patch
250	*Eucalyptus obliqua*	Messmate Stringybark	83	Large	Patch
251	*Eucalyptus obliqua*	Messmate Stringybark	71	Large	Patch
252	*Eucalyptus obliqua*	Messmate Stringybark	89	Large	Patch
253	*Eucalyptus obliqua*	Messmate Stringybark	90	Large	Patch
254	*Eucalyptus obliqua*	Messmate Stringybark	93	Large	Patch
255	*Eucalyptus obliqua*	Messmate Stringybark	98	Large	Patch
256	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
257	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
258	*Eucalyptus obliqua*	Messmate Stringybark	87	Large	Patch
259	*Eucalyptus obliqua*	Messmate Stringybark	70	Large	Patch
260	*Eucalyptus obliqua*	Messmate Stringybark	72	Large	Patch
261	*Eucalyptus obliqua*	Messmate Stringybark	74	Large	Patch
262	*Eucalyptus obliqua*	Messmate Stringybark	90	Large	Patch
263	*Eucalyptus obliqua*	Messmate Stringybark	76	Large	Patch
264	*Eucalyptus obliqua*	Messmate Stringybark	80	Large	Patch
265	*Eucalyptus obliqua*	Messmate Stringybark	72	Large	Patch
266	*Eucalyptus obliqua*	Messmate Stringybark	92	Large	Patch
267	*Eucalyptus macrorhyncha*	Red Stringybark	80	Large	Patch
268	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
269	*Eucalyptus obliqua*	Messmate Stringybark	95	Large	Patch
270	*Eucalyptus obliqua*	Messmate Stringybark	74	Large	Patch
271	*Eucalyptus obliqua*	Messmate Stringybark	71	Large	Patch
272	*Eucalyptus obliqua*	Messmate Stringybark	72	Large	Patch
273	*Eucalyptus obliqua*	Messmate Stringybark	160	Large	Patch
274	*Eucalyptus obliqua*	Messmate Stringybark	71	Large	Patch
275	*Eucalyptus obliqua*	Messmate Stringybark	74	Large	Patch
276	*Eucalyptus obliqua*	Messmate Stringybark	92	Large	Patch
277	*Eucalyptus obliqua*	Messmate Stringybark	89	Large	Patch
278	*Eucalyptus obliqua*	Messmate Stringybark	83	Large	Patch
279	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
280	*Eucalyptus* spp.	Dead stag	80	Large	Patch
281	*Eucalyptus goniocalyx*	Bundy	80	Large	Patch
282	*Eucalyptus obliqua*	Messmate Stringybark	70	Large	Patch
283	*Eucalyptus obliqua*	Messmate Stringybark	80	Large	Patch
284	*Eucalyptus obliqua*	Messmate Stringybark	90	Large	Patch

Tree # (Figure 2)	Species Name	Common Name	DBH (cm)	Size Class	Scattered / Parch
285	*Eucalyptus* spp.	Dead stag	70	Large	Patch
286	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
287	*Eucalyptus obliqua*	Messmate Stringybark	120	Large	Patch
288	*Eucalyptus obliqua*	Messmate Stringybark	88	Large	Patch
289	*Eucalyptus obliqua*	Messmate Stringybark	73	Large	Patch
290	*Eucalyptus obliqua*	Messmate Stringybark	95	Large	Patch
291	*Eucalyptus obliqua*	Messmate Stringybark	130	Large	Patch
292	*Eucalyptus* spp.	Dead stag	130	Large	Patch
293	*Eucalyptus macrorhyncha*	Red Stringybark	75	Large	Patch
294	*Eucalyptus macrorhyncha*	Red Stringybark	80	Large	Patch
295	*Eucalyptus* spp.	Dead stag	120	Large	Patch
296	*Eucalyptus obliqua*	Messmate Stringybark	75	Large	Patch
297	*Eucalyptus obliqua*	Messmate Stringybark	72	Large	Patch
298	*Eucalyptus macrorhyncha*	Red Stringybark	90	Large	Patch
299	*Eucalyptus macrorhyncha*	Red Stringybark	120	Large	Patch
300	*Eucalyptus* spp.	Dead stag	77	Large	Patch
301	*Eucalyptus* spp.	Dead stag	78	Large	Patch
302	*Eucalyptus* spp.	Dead stag	81	Large	Patch
303	*Eucalyptus obliqua*	Messmate Stringybark	78	Large	Patch
304	*Eucalyptus obliqua*	Messmate Stringybark	94	Large	Patch
305	*Eucalyptus obliqua*	Messmate Stringybark	103	Large	Patch
306	*Eucalyptus obliqua*	Messmate Stringybark	86	Large	Patch
307	*Eucalyptus macrorhyncha*	Red Stringybark	90	Large	Patch
308	*Eucalyptus obliqua*	Messmate Stringybark	94	Large	Patch
309	*Eucalyptus goniocalyx*	Bundy	77	Large	Patch
310	*Eucalyptus* spp.	Dead stag	77	Large	Patch
311	*Eucalyptus* spp.	Dead stag	73	Large	Patch
312	*Eucalyptus obliqua*	Messmate Stringybark	117	Large	Patch
313	*Eucalyptus obliqua*	Messmate Stringybark	89	Large	Patch
314	*Eucalyptus obliqua*	Messmate Stringybark	115	Large	Patch
415	*Eucalyptus obliqua*	Messmate Stringybark	91	Large	Patch
316	*Eucalyptus obliqpa*	Messmate Stringybark	102	Large	Patch
317	*Eucalyptus obliqua*	Messmate Stringybark	83	Large	Patch
318	*Eucalyptus* spp.	Dead stag	91	Large	Patch
319	*Eucalyptus obliqua*	Messmate Stringybark	74	Large	Patch
320	*Eucalyptus obliqua*	Messmate Stringybark	85	Large	Patch
321	*Eucalyptus obliqua*	Messmate Stringybark	125	Large	Patch
322	*Eucalyptus obliqua*	Messmate Stringybark	123	Large	Patch
323	*Eucalyptus* spp.	Dead stag	93	Large	Patch

Appendix 1.4 Significant Flora Species

Significant flora within 10 kilometres of the study area is provided in the Table A1.4.3 at the end of this section, with Tables A1.4.1 and A1.4.2 below providing the background context for the values in Table 1.4.3.

Table A1.4.1 Conservation status of each species for each Act. The values in this table correspond to Columns 5 and 6 in Table A1.4.3.

EPBC (*Environment Protection and Biodiversity Conservation Act 1999*):		FFG (*Flora and Fauna Guarantee Act 1988*):	
EX	Extinct	EX	Extinct
CR	Critically endangered	CR	Critically endangered
EN	Endangered	EN	Endangered
VU	Vulnerable	VU	Vulnerable
#	Listed on the Protected Matters Search Tool		

Table A1.4.2 Likelihood of occurrence rankings: Habitat characteristics assessment of significant flora species previously recorded within 10 kilometres of the study area, or that may potentially occur within the study area to determine their likelihood of occurrence. The values in this table correspond to Column 7 in Table A1.4.3.

1	Known Occurrence	• Recorded within the study area recently (i.e. within ten years).
2	High Likelihood	• Previous records of the species in the local vicinity; and/or, • The study area contains areas of high-quality habitat.
3	Moderate Likelihood	• Limited previous records of the species in the local vicinity; and/or • The study area contains poor or limited habitat.
4	Low Likelihood	• Poor or limited habitat for the species, however other evidence (such as lack of records or environmental factors) indicates there is a very low likelihood of presence.
5	Unlikely	• No suitable habitat and/or outside the species range.

Table A1.4.3 Significant flora recorded within 10 kilometres of the study area.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
NATIONAL SIGNIFICANCE							
Acacia glandulicarpa	Hairy-pod Wattle	1	2009	VU	en	5	No suitable habitat
Amphibromus fluitans #	River Swamp Wallaby-grass	-	-	VU	-	4	Potential habitat along creek line, however no VBA records within 10 kilometres
Asterolasia asteriscophora subsp. *albiflora*	White Star-bush	14	2019	CR	cr	2	Several previous records in the vicinity and suitable habitat, however not recorded during the targeted survey
Caladenia concolor #	Crimson Spider-orchid	-	-	VU	en	4	Potential habitat, however at outer extent of distribution.
Caladenia sp. aff. *venusta*	Kilsyth South Spider-orchid	3	2004	CR	cr	4	Potential habitat, however know to currently only exist in a small reserve near Kilsyth South
Dianella amoena	Matted Flax-lily	4	2016	EN	cr	4	Limited habitat
Eucalyptus crenulata #	Silver Gum	-	-	EN	en	5	Outside species natural range
Eucalyptus strzeleckii #	Strzelecki Gum	-	-	VU	cr	5	Outside species natural range

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
Euphrasia collina subsp. *muelleri*	Purple Eyebright	2	1905	EN	en	5	Outside species known range and last record was over 100 years ago
Glycine latrobeana	Clover Glycine	1	1980	VU	vu	4	Potential habitat, however the one record within 10 kilometres was 44 years ago
Lepidium aschersonii #	Spiny Peppercress	-	-	VU	en	5	Outside species natural range
Pomaderris vacciniifolia #	Round-leaf Pomaderris	-	-	CR	cr	4	Potential habitat, however largely confined to upper reaches of Yarra, Plenty and Yea Rivers
Prasophyllum colemaniae #	Lilac Leek-orchid	-	-	VU	-	4	Potential habitat, however no VBA records within 10 kilometres
Prasophyllum frenchii	Maroon Leek-orchid	5	1990	EN	en	4	Potential habitat, however limited VBA records within 10 kilometres
Prasophyllum spicatum #	Dense Leek-orchid	-	-	VU	cr	4	Potential habitat, however no VBA records within 10 kilometres
Pterostylis chlorogramma #	Green-striped Greenhood	-	-	VU	en	4	Potential habitat, however no VBA records within 10 kilometres
Pterostylis cucullata #	Leafy Greenhood	-	-	VU	-	4	Potential habitat along creek line, however no VBA records within 10 kilometres

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
Senecio macrocarpus #	Large-fruit Fireweed	-	-	VU	cr	5	No suitable habitat
Senecio psilocarpus #	Swamp Fireweed	-	-	VU	-	5	No suitable habitat
Thelymitra orientalis #	Hoary Sun-orchid	-	-	CR	cr	5	No suitable habitat
Thesium australe #	Austral Toadflax	-	-	VU	en	4	Potential habitat, however no VBA records within 10 kilometres
Xerochrysum palustre	Swamp Everlasting	6	2018	VU	cr	5	No suitable habitat
STATE SIGNIFICANCE							
Abrodictyum caudatum	Jungle Bristle-fern	2	2015	-	en	4	Potential habitat on trees along creek line
Acacia boormanii	Snowy River Wattle	3	2011	-	en	5	Outside species natural range
Acacia decora	Western Silver Wattle	4	2011	-	en	5	Outside species natural range
Acacia howittii	Sticky Wattle	7	2020	-	vu	1	One plant observed within the study area during the biodiversity assessment. No further individuals recorded during the targeted survey
Acacia sporadica	Pale Hickory-wattle	1	2003	-	cr	5	Outside species natural range

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
Acacia stictophylla	Dandenong Wattle	56	2023	-	en	1	One plant observed within the study area during the biodiversity assessment. One additional individual was recorded during the targeted survey
Acacia williamsonii	Whirrakee Wattle	1	2009	-	vu	5	Outside species natural range
Austrostipa rudis subsp. *australis*	Veined Spear-grass	9	2017	-	en	3	Several previous records in the vicinity and suitable habitat, however no individuals were recorded during the targeted survey
Beyeria lanceolata	Pinkwood	8	2017	-	en	4	Several previous records further east of the study area. Mostly found in East Gippsland
Billardiera scandens s.s.	Velvet Apple-berry	17	2009	-	en	3	Several previous records in the vicinity and suitable habitat, however no individuals were recorded during the targeted survey
Botrychium australe	Austral Moonwort	2	1909	-	cr	4	Potential habitat, however last VBA record was over 100 years ago
Burnettia cuneata	Lizard Orchid	1	1921	-	en	4	Potential habitat, however last VBA record was over 100 years ago

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
Caladenia flavovirens	Christmas Spider-orchid	8	1980	-	cr	4	Potential habitat, however VBA records at least 44 years old
Caladenia fragrantissima	Scented Spider-orchid	1	1949	-	cr	5	No suitable habitat
Caladenia oenochila	Wine-lipped Spider-orchid	24	2021	-	cr	3	Several previous records in the vicinity and suitable habitat, however no individuals were recorded during the targeted survey
Caladenia vulgaris	Slender Pink-fingers	2	1998	-	vu	4	Limited habitat suitability.
Carex alsophila	Forest Sedge	6	2010	-	en	4	Potential habitat along creek line, however limited VBA records
Chiloglottis jeanesii	Mountain Bird-orchid	26	2018	-	vu	1	Several previous records in the vicinity and suitable habitat. Approximately 105 individuals were recorded during the flora targeted survey
Correa reflexa var. *lobata*	Powelltown Correa	12	2022	-	en	4	Potential habitat, however slightly outside known range
Corybas aconitiflorus	Spurred Helmet-orchid	3	2006	-	en	4	Potential habitat, however limited VBA records
Corybas grumulus	Mountain Helmet-orchid	4	2017	-	en	4	Potential habitat, however limited VBA records

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
Corymbia maculata	Spotted Gum	15	2019	-	vu	5	Outside species natural range
Craspedia canens	Grey Billy-buttons	8	1973	-	cr	5	No suitable habitat
Cyathea cunninghamii	Slender Tree-fern	31	2013	-	cr	3	Several previous records in the vicinity and potential habitat along creek line
Distichophyllum crispulum	Crisped Mitre-moss	1	1984	-	en	4	Potential habitat, however the one record within 10 kilometres was 40 years ago
Diuris behrii	Golden Cowslips	2	1943	-	en	5	No suitable habitat
Diuris punctata var. *punctata*	Purple Diuris	1	1924	-	en	5	No suitable habitat
Diuris X palachila	Broad-lip Diuris	1	1915	-	en	4	Potential habitat, however last VBA record was over 100 years ago
Eucalyptus fulgens	Green Scentbark	7	2015	-	en	4	Outside species natural range
Eucalyptus globulus subsp. *globulus*	Southern Blue-gum	3	2017	-	en	4	Some previous records in the vicinity and potential habitat
Eucalyptus yarraensis	Yarra Gum	32	2022	-	cr	4	Several previous records in the vicinity and suitable habitat, although more likely found in more woodland settings
Euphrasia collina subsp. *trichocalycina*	Purple Eyebright	1	1924	-	vu	4	Potential habitat, however last VBA record was 100 years ago

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
Gentianella polysperes	Early Forest-gentian	3	1922	-	en	4	Potential habitat, however last VBA record was over 100 years ago
Geranium solanderi var. *solanderi s.s.*	Austral Crane's-bill	1	1897	-	en	4	Potential habitat along creek line, however last VBA record was over 100 years ago
Glossostigma cleistanthum	Small-flower Mud-mat	2	2009	-	en	5	Outside species natural range
Grevillea parvula	Genoa Grevillea	1	2000	-	en	5	Outside species natural range
Isolepis wakefieldiana	Tufted Club-sedge	1	1907	-	en	5	Potential habitat, however last VBA record was over 100 years ago
Lastreopsis hispida	Bristly Shield-fern	5	2000	-	en	4	Potential habitat along creek line, however limited VBA records
Levenhookia sonderi	Slender Stylewort	1	1948	-	en	5	No suitable habitat
Macromitrium longirostre	Macromitrium	1	1950	-	cr	5	No suitable habitat
Melaleuca armillaris subsp. *armillaris*	Giant Honey-myrtle	11	2019	-	en	5	Outside species natural range
Orthrosanthus multiflorus	Morning Flag	2	2007	-	en	5	Outside species natural range
Platylobium infecundum	Famine Flat-pea	2	2014	-	cr	4	Potential habitat, however limited VBA records

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
Platylobium reflexum	Victorian Flat-pea	2	1945	-	en	4	Potential habitat, however last VBA record was 79 years ago
Prasophyllum lindleyanum	Green Leek-orchid	9	2007	-	en	4	Potential habitat, however limited VBA records
Pteris epaleata	Netted Brake	13	2000	-	en	3	Several previous records in the vicinity and suitable habitat along creek line, however no individuals were recorded during the targeted survey
Pterostylis clivosa	Red-tip Greenhood	2	2006	-	en	4	Potential habitat, however limited VBA records
Pterostylis grandiflora	Cobra Greenhood	3	1980	-	en	4	Potential habitat, however limited VBA records
Pterostylis X ingens	Sharp Greenhood	3	1946	-	vu	4	Potential habitat along the creek line, however last VBA record was 78 years ago
Pultenaea weindorferi	Swamp Bush-pea	24	2013	-	en	4	Potential habitat along creek line, however only one specimen previously recorded in the Dandenong Ranges
Ripogonum album	White Supplejack	1	2003	-	en	4	Potential habitat, however just outside known species range
Senecio campylocarpus	Floodplain Fireweed	4	2015	-	en	5	Outside species natural range

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
Senecio glomeratus subsp. *longifructus*	Annual Fireweed	1	2017	-	vu	4	Potential habitat along creek line, however limited VBA records
Thismia rodwayi	Fairy Lanterns	3	2000	-	en	4	Potential habitat along creek line, however limited VBA records
Tmesipteris ovata	Oval Fork-fern	1	1853	-	en	4	Potential habitat along creek line, however only one specimen previously recorded in the Dandenong Ranges in 1853
Tmesipteris parva	Small Fork-fern	5	2015	-	en	4	Potential habitat, however just outside known species range

Data source: Victorian Biodiversity Atlas (DEECA 2023a); Protected Matters Search Tool (DCCEEW 2024).

APPENDIX 2 FAUNA

Appendix 2.1 Fauna Results

Table A2.1. Fauna observed or evidence of their presence within the study area. All are native apart from the Wild Pig.

Scientific Name	Common Name	Notes
BIRDS		
Acanthiza lineata	Striated Thornbill	
Acanthiza pusilla	Brown Thornbill	
Anthochaera carunculata	Red Wattlebird	
Cacatua galerita	Sulphur-crested Cockatoo	
Callocephalon fimbriatum	Gang-gang Cockatoo	Feather only
Colluricincla harmonica	Grey Shrike-thrush	
Cormobates leucophaeus	White-throated Treecreeper	
Cracticus torquatus	Grey Butcherbird	
Dacelo novaeguineae	Laughing Kookaburra	
Daphoenositta chrysoptera	Varied Sittella	
Eopsaltria australis	Eastern Yellow Robin	With fledglings
Hieraaetus morphnoides	Little Eagle	
Lichenostomus chrysops	Yellow-faced Honeyeater	
Malurus cyaneus	Superb Fairy-wren	
Manorina melanophrys	Bell Miner	
Melithreptus lunatus	White-naped Honeyeater	
Pachycephala pectoralis	Golden Whistler	
Pachycephala rufiventris	Rufous Whistler	
Pardalotus punctatus	Spotted Pardalote	
Platycercus elegans	Crimson Rosella	
Rhipidura albiscarpa	Grey Fantail	
Sericornis frontalis	White-browed Scrubwren	
Trichoglossus haematodus	Rainbow Lorikeet	
Zosterops lateralis	Silvereye	
OTHER		
Heteronympha merope	Common Brown Butterfly	
Lampropholis guichenoti	Common Garden Skink	
Macropus giganteus	Eastern Grey Kangaroo	
Pieris rapae	Cabbage White Butterfly	
Sus scrofa	Wild Pig	Scats only. Believed to belong to a wild pig

Appendix 2.2 Significant Fauna Species

Significant fauna within 10 kilometres of the study area is provided in the Table A2.2.3 at the end of this section, with Tables A2.2.1 and A2.2.2 below providing the background context for the values in Table 2.1.3.

Table A2.2.1 Conservation status of each species for each Act/Plan. The values in this table correspond to Columns 5 to 7 in Table A2.2.3.

EPBC (*Environment Protection and Biodiversity Conservation Act 1999*):		FFG (*Flora and Fauna Guarantee Act 1988*):	
EX	Extinct	EX	Extinct
CR	Critically endangered	CR	Critically endangered
EN	Endangered	EN	Endangered
VU	Vulnerable	VU	Vulnerable
CD	Conservation dependent	CD	Conservation dependent
#	Listed on the Protected Matters Search Tool		

Table A2.2.2 Likelihood of occurrence rankings: Habitat characteristics assessment of significant fauna species previously recorded within 10 kilometres of the study area, or that may potentially occur within the study area to determine their likelihood of occurrence. The values in this table correspond to Column 7 in Table A2.2.3.

1	High Likelihood	• Known resident in the study area based on site observations, database records, or expert advice; and/or, • Recent records (i.e. within five years) of the species in the local area (DELWP 2022d); and/or, • The study area contains the species' preferred habitat.
2	Moderate Likelihood	• The species is likely to visit the study area regularly (i.e. at least seasonally); and/or, • Previous records of the species in the local area (DELWP 2022d); and/or, • The study area contains some characteristics of the species' preferred habitat.
3	Low Likelihood	• The species is likely to visit the study area occasionally or opportunistically whilst en route to more suitable sites; and/or, • There are only limited or historical records of the species in the local area (i.e. more than 20 years old); and/or, • The study area contains few or no characteristics of the species' preferred habitat.
4	Unlikely	• No previous records of the species in the local area; and/or, • The species may fly over the study area when moving between areas of more suitable habitat; and/or, • Out of the species' range; and/or, • No suitable habitat present.

Table A2.2.3 Significant fauna recorded within 10 kilometres of the study area.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
NATIONAL SIGNIFICANCE							
Antechinus minimus maritimus #	Swamp Antechinus	-	-	VU	vu	4	There are no previous records in the local vicinity
Anthochaera phrygia	Regent Honeyeater	19	2000	CR	cr	3	May visit site on occasion
Aphelocephala leucopsis #	Southern Whiteface	-	-	VU	-	4	Located at outer extent of distribution and no records within 10 kilometres of the study area
Aprasia parapulchella #	Pink-tailed Worm-lizard	-	-	VU	en	4	No suitable habitat
Botaurus poiciloptilus	Australasian Bittern	1	1988	EN	cr	4	No suitable habitat
Calidris acuminata #	Sharp-tailed Sandpiper	-	-	VU	-	4	No suitable habitat
Calidris ferruginea #	Curlew Sandpiper	-	-	CR	cr	4	No suitable habitat
Callocephalon fimbriatum	Gang-gang Cockatoo	158	2020	EN	en	1	Numerous records in the local vicinity up to 2020 and a feather found during the site assessment, however not recorded during the targeted survey
Climacteris picumnus	Brown Treecreeper	11	2018	VU	-	4	Outside species natural range
Dasyurus maculatus maculatus	Spot-tailed Quoll	2	1980	EN	en	4	Suitable habitat, however, records are at least 44 years old
Dasyurus viverrinus	Eastern Quoll	1	1880	EN	en-x	4	Outside species natural range

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
Delma impar #	Striped Legless Lizard	-	-	VU	en	4	Outside species natural range
Falco hypoleucos #	Grey Falcon	-	-	VU	vu	4	No suitable habitat
Galaxiella pusilla #	Eastern Dwarf Galaxias	-	-	EN	en	4	No suitable habitat
Gallinago hardwickii #	Latham's Snipe	-	-	VU	-	4	No suitable habitat
Grantiella picta #	Painted Honeyeater	-	-	VU	vu	4	Outside species natural range
Hirundapus caudacutus	White-throated Needletail	71	2019	VU	vu	3	Numerous records in the local vicinity up to 2019; however isn't generally a resident of the type of habitat and is a migratory bird that is largely aerial
Isoodon obesulus obesulus	Southern Brown Bandicoot	12	2018	EN	en	3	Potential habitat, however this species prefers more open vegetation that follows fire events
Lathamus discolor	Swift Parrot	6	1976	CR	cr	4	Suitable habitat, however records are at least 48 years old
Lichenostomus melanops cassidix	Helmeted Honeyeater	3	1994	CR	cr	4	Potential habitat, however few records, with the most recent being 30 years old
Liopholis montana #	Mountain Skink	-	-	EN	en	4	Outside species natural range
Lissolepis coventryi	Swamp Skink	6	2001	EN	en	4	No suitable habitat

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
Litoria raniformis	Growling Grass Frog	7	1990	VU	vu	4	No suitable habitat
Maccullochella macquariensis	Trout Cod	1	1970	EN	en	4	No suitable habitat
Maccullochella peelii	Murray Cod	1	1970	VU	en	4	No suitable habitat
Macquaria australasica	Macquarie Perch	2	1920	EN	en	4	No suitable habitat
Mastacomys fuscus mordicus	Broad-toothed Rat	28	1994	EN	vu	4	While there are several previous records, these are at least 30 years old
Melanodryas cucullata cucullata #	South-eastern Hooded Robin	-	-	EN	vu	4	No suitable habitat
Nannoperca obscura #	Yarra Pygmy Perch	-	-	EN	vu	4	No suitable habitat
Neophema chrysostoma	Blue-winged Parrot	14	2020	VU	-	3	Potential habitat, however prefers grasslands and grassy woodland near wetlands
Numenius madagascariensis #	Eastern Curlew	-	-	CR	cr	4	No suitable habitat
Paralucia pyrodiscus lucida #	Eltham Copper Butterfly	-	-	EN	en	4	Outside species natural range
Pedionomus torquatus #	Plains-wanderer	-	-	CR	cr	4	No suitable habitat
Petauroides volans	Southern Greater Glider	55	2022	EN	en	2	Numerous records in the local vicinity up to 2022 and there is suitable habitat, however not recorded during the targeted survey
Petaurus australis	Yellow-bellied Glider	39	2021	VU	vu	3	Potential habitat, however no records within 10 kilometres

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
Polytelis swainsonii	Superb Parrot	1	2005	VU	en	4	No suitable habitat
Potorous tridactylus trisulcatus #	Long-nosed Potoroo	-	-	VU	vu	4	Outside species natural range
Prototroctes maraena	Australian Grayling	1	1979	VU	en	4	No suitable habitat
Pseudomys fumeus #	Smoky Mouse	-	-	EN	en	4	Outside species natural range
Pseudomys novaehollandiae #	New Holland Mouse	-	-	VU	en	4	No suitable habitat
Pteropus poliocephalus	Grey-headed Flying-fox	14	2021	VU	vu	3	Several records in the local vicinity up to 2021 and potential for this species to forage intermittently, however the closest camp is 20 kilometres south in Doveton
Pycnoptilus floccosus	Pilotbird	34	2001	VU	vu	3	Potential habitat, however most recent record was 23 years ago
Rostratula australis #	Australian Painted Snipe	-	-	EN	cr	4	No suitable habitat
Stagonopleura guttata	Diamond Firetail	2	1914	VU	vu	4	No suitable habitat
Synemon plana #	Golden Sun Moth	-	-	VU	vu	4	No suitable habitat
Tringa nebularia #	Common Greenshank	-	-	EN	en	4	No suitable habitat
STATE SIGNIFICANCE							
Accipiter novaehollandiae	Grey Goshawk	15	2022	-	en	3	Potential habitat and recent records, however prefers wet forests for nesting

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
Acrodipsas myrmecophila	Small Ant Blue Butterfly	3	1942	-	en	4	Last VBA record was 82 years ago
Anseranas semipalmata	Magpie Goose	1	1994	-	vu	4	No suitable habitat
Ardea alba modesta	Eastern Great Egret	53	2019	-	vu	4	No suitable habitat
Austrogammarus australis	Dandenong Freshwater Amphipod	53	2021	-	cr	3	Marginally suitable habitat along creek line and several recent records, however outside impact area
Austrogammarus haasei	Sherbrooke Amphipod	11	2011	-	en	3	Marginally suitable habitat along creek line and several recent records, however outside impact area
Aythya australis	Hardhead	95	2019	-	vu	4	No suitable habitat
Biziura lobata	Musk Duck	16	2019	-	vu	4	No suitable habitat
Burhinus grallarius	Bush Stone-curlew	1	1962	-	cr	4	Very old record
Calamanthus pyrrhopygius	Chestnut-rumped Heathwren	3	2002	-	vu	4	No suitable habitat
Chelodina expansa	Broad-shelled Turtle	1	2012	-	en	4	No suitable habitat
Egretta garzetta	Little Egret	3	2019	-	en	4	No suitable habitat
Emydura macquarii	Murray River Turtle	4	2016	-	cr	4	No suitable habitat
Engaeus tuberculatus	Tubercle Burrowing Crayfish	25	2022	-	en	3	Marginally suitable habitat along creek line and several recent records, however outside impact area

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
Engaeus urostrictus	Dandenong Burrowing Crayfish	33	2021	-	cr	3	Marginally suitable habitat along creek line and several recent records, however outside impact area
Engaeus victoriensis	Foothill Burrowing Crayfish	15	2011	-	en	3	Marginally suitable habitat along creek line and several recent records, however outside impact area
Falco subniger	Black Falcon	3	2018	-	cr	4	No suitable habitat
Haliaeetus leucogaster	White-bellied Sea-Eagle	7	2018	-	en	4	No suitable habitat
Hieraaetus morphnoides	Little Eagle	15	2020	-	vu	3	Several records in the area, but not preferred habitat
Hydroprogne caspia	Caspian Tern	2	2000	-	vu	4	No suitable habitat
*Hyridella (*Hyridella*) depressa*	Depressed Mussel	1	1994	-	en	4	No suitable habitat
Hyridella narracanensis	Narracan Corrugated Mussel	7	2015	-	en	4	No suitable habitat
Ixobrychus dubius	Australian Little Bittern	1	1894	-	en	4	No suitable habitat
Lophoictinia isura	Square-tailed Kite	3	2018	-	vu	3	Suitable habitat, however limited records
Miniopterus orianae oceanensis	Eastern Bent-winged Bat	2	1974	-	cr	3	No suitable habitat
Ninox connivens	Barking Owl	3	2000	-	cr	2	May visit site on occasion
Ninox strenua	Powerful Owl	246	2022	-	vu	1	Recent records within the study area and numerous records in the local vicinity
Ornithorhynchus anatinus	Platypus	122	2021	-	vu	4	No suitable habitat
Oxyura australis	Blue-billed Duck	80	2022	-	vu	4	No suitable habitat

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
Pasma tasmanica	Two-spotted Grass-skipper Butterfly	36	1949	-	en	4	Several records, however last record was 75 years ago
Phascogale tapoatafa	Brush-tailed Phascogale	1	2017	-	vu	3	Suitable habitat, however one record only
Plectrotarsus gravenhorstii	Caddisfly	1	1943	-	en	4	Only one old record from 81 years ago
Pomatostomus temporalis	Grey-crowned Babbler	4	1931	-	vu	4	No suitable habitat and the most recent record was 93 years ago
Pseudemoia rawlinsoni	Glossy Grass Skink	5	2015	-	en	4	No suitable habitat
Pseudophryne bibronii	Brown Toadlet	1	1943	-	en	4	No suitable habitat
Pseudophryne semimarmorata	Southern Toadlet	7	1988	-	en	3	Suitable habitat along creek line, however this is outside the extraction limit boundary
Pyrrholaemus sagittatus	Speckled Warbler	22	2000	-	en	2	Suitable habitat, as it prefers dry sclerophyll forests
Spatula rhynchotis	Australasian Shoveler	50	2019	-	vu	4	No suitable habitat
Stictonetta naevosa	Freckled Duck	6	2019	-	en	4	No suitable habitat
Synoicus chinensis	King Quail	1	1981	-	en	4	Only one old record from 43 years ago
Temognatha sanguinipennis	Jewel Beetle	1	1970	-	en	4	Only one old record from 54 years ago

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area	Rationale for likelihood of occurrence within the extraction limit boundary
Trapezites luteus luteus	Yellow Ochre Butterfly	28	1953	-	en	4	Several records, however the most recent record was 71 years ago
Tyto tenebricosa	Sooty Owl	51	2021	-	en	2	Numerous records in the local vicinity up to 2021 and there is moderate habitat along the creek line
Varanus varius	Lace Monitor	23	2022	-	en	2	Numerous records in the local vicinity up to 2022 and there is suitable habitat

Data source: Victorian Biodiversity Atlas (DEECA 2023a); Protected Matters Search Tool (DCCEEW 2024).

APPENDIX 3 NATIVE VEGETATION REMOVAL (NVR) 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: **20/03/2024**
Time of issue: **3:09 pm**

Report ID: EHP_2024_041

Project ID	EHP14500_Montrose_19032024_VG94

Assessment pathway

Assessment pathway	**Detailed Assessment Pathway**
Extent including past and proposed	8.779 ha
Extent of past removal	0.000 ha
Extent of proposed removal	8.779 ha
No. Large trees proposed to be removed	262
Location category of proposed removal	Location 2 The native vegetation is in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map). Removal of less than 0.5 hectares of native vegetation in this location will not have a significant impact on any habitat for a rare or threatened species.

1. Location map

Offset requirements if a permit is granted

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

Species offset amount[1]	10.910 species units of habitat for Swamp Bush-pea, *Pultenaea weindorferi* 10.910 species units of habitat for Wine-lipped Spider-orchid, *Caladenia oenochila* 10.910 species units of habitat for Dandenong Wattle, *Acacia stictophylla*
Large trees	262 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 species offset amount(s) required is the sum of all species habitat units in Appendix 1.

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-B	Patch	hsf_0023	Least Concern	0	no	0.130	0.030	0.030	0.539	0.607	0.006	502881 Swamp Bush-pea *Pultenaea weindorferi*
										0.607	0.006	503694 Wine-lipped Spider-orchid *Caladenia oenochila*
										0.607	0.006	505140 Dandenong Wattle *Acacia stictophylla*
2-B	Patch	hsf_0023	Least Concern	0	no	0.130	0.015	0.015	0.610	0.596	0.003	502881 Swamp Bush-pea *Pultenaea weindorferi*
										0.596	0.003	503694 Wine-lipped Spider-orchid *Caladenia oenochila*
										0.596	0.003	505140 Dandenong Wattle *Acacia stictophylla*
3-A	Patch	hsf_0023	Least Concern	1	no	0.720	0.002	0.002	0.730	0.710	0.003	502881 Swamp Bush-pea *Pultenaea weindorferi*
										0.710	0.003	503694 Wine-lipped Spider-orchid *Caladenia oenochila*
										0.710	0.003	505140 Dandenong Wattle *Acacia stictophylla*
4-A	Patch	hsf_0023	Least Concern	0	no	0.720	0.027	0.027	0.610	0.690	0.033	502881 Swamp Bush-pea *Pultenaea weindorferi*

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
										0.690	0.033	503694 Wine-lipped Spider-orchid *Caladenia oenochila*
										0.690	0.033	505140 Dandenong Wattle *Acacia stictophylla*
5-A	Patch	hsf_0023	Least Concern	261	no	0.720	8.705	8.705	0.661	0.734	10.865	502881 Swamp Bush-pea *Pultenaea weindorferi*
										0.734	10.865	503694 Wine-lipped Spider-orchid *Caladenia oenochila*
										0.734	10.865	505140 Dandenong Wattle *Acacia stictophylla*

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
Wine-lipped Spider-orchid	*Caladenia oenochila*	503694	Vulnerable	Dispersed	Habitat importance map	0.0102
Dandenong Wattle	*Acacia stictophylla*	505140	Rare	Dispersed	Habitat importance map ; special site	0.0100
Swamp Bush-pea	*Pultenaea weindorferi*	502881	Rare	Dispersed	Habitat importance map	0.0076
Green Scentbark	*Eucalyptus fulgens*	505175	Rare	Dispersed	Habitat importance map	0.0024
Spurred Helmet-orchid	*Corybas aconitiflorus*	500835	Rare	Dispersed	Habitat importance map	0.0021
Large-leaf Cinnamon-wattle	*Acacia leprosa var. uninervia*	505141	Rare	Dispersed	Habitat importance map	0.0013
Velvet Apple-berry	*Billardiera scandens s.s.*	504290	Rare	Dispersed	Habitat importance map	0.0006
Slender Pink-fingers	*Caladenia vulgaris*	504449	Rare	Dispersed	Habitat importance map	0.0006
Grey Goshawk	*Accipiter novaehollandiae novaehollandiae*	10220	Vulnerable	Dispersed	Habitat importance map	0.0006
Masked Owl	*Tyto novaehollandiae novaehollandiae*	10250	Endangered	Dispersed	Habitat importance map	0.0003
Lace Monitor	*Varanus varius*	12283	Endangered	Dispersed	Habitat importance map	0.0003
Powerful Owl	*Ninox strenua*	10248	Vulnerable	Dispersed	Habitat importance map	0.0003
Sooty Owl	*Tyto tenebricosa tenebricosa*	10253	Vulnerable	Dispersed	Habitat importance map	0.0002
Greater Glider	*Petauroides volans*	11133	Vulnerable	Dispersed	Habitat importance map	0.0002
White-throated Needletail	*Hirundapus caudacutus*	10334	Vulnerable	Dispersed	Habitat importance map	0.0002
Spot-tailed Quoll	*Dasyurus maculatus maculatus*	11008	Endangered	Dispersed	Habitat importance map	0.0001
Chestnut-rumped Heathwren	*Calamanthus pyrrhopygius*	10498	Vulnerable	Dispersed	Habitat importance map	0.0001
Southern Toadlet	*Pseudophryne semimarmorata*	13125	Vulnerable	Dispersed	Habitat importance map	0.0001

Square-tailed Kite	*Lophoictinia isura*	10230	Vulnerable	Dispersed	Habitat importance map	0.0000
Tremont Bundy	*Eucalyptus aff. goniocalyx (Dandenong Ranges)*	507008	Vulnerable	Dispersed	Habitat importance map	0.0000
Black Falcon	*Falco subniger*	10238	Vulnerable	Dispersed	Habitat importance map	0.0000

Habitat group

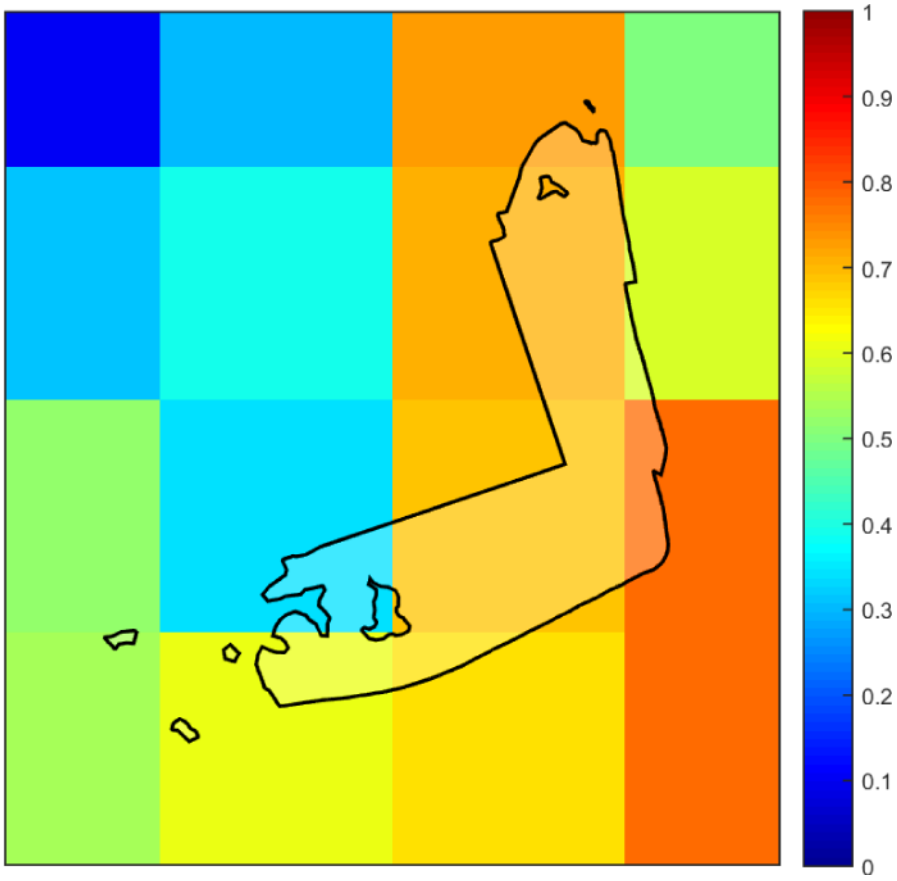
- Highly localised habitat means there is 2000 hectares or less mapped habitat for the species
- Dispersed habitat means there is more than 2000 hectares of mapped habitat for the species

Habitat impacted

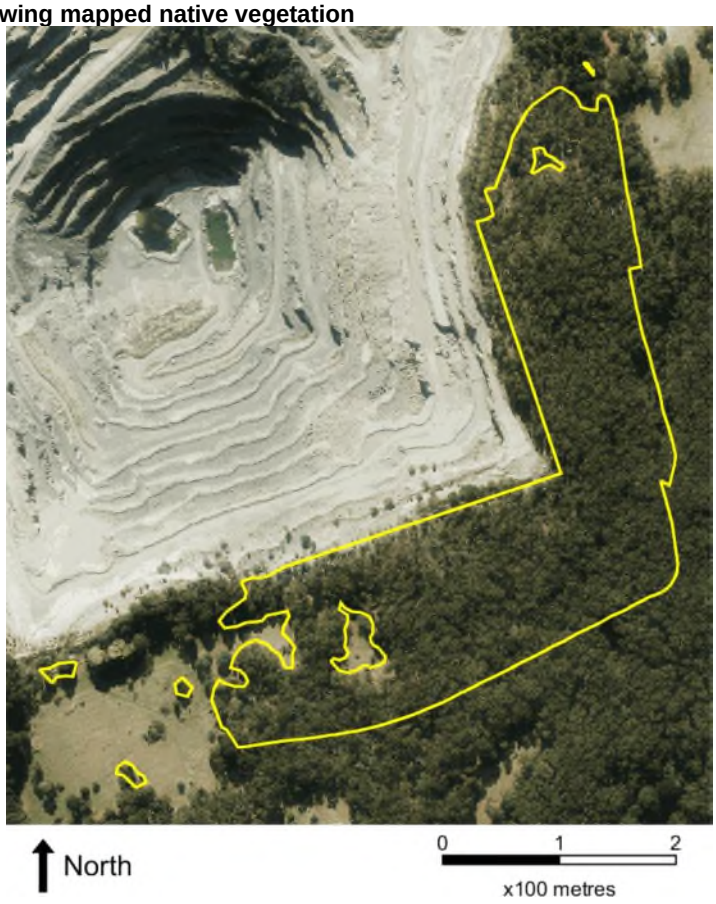
- Habitat importance maps are the maps defined in the Guidelines that include all the mapped habitat for a rare or threatened species
- Top ranking maps are the maps defined in the Guidelines that depict the important areas of a dispersed species habitat, developed from the highest habitat importance 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

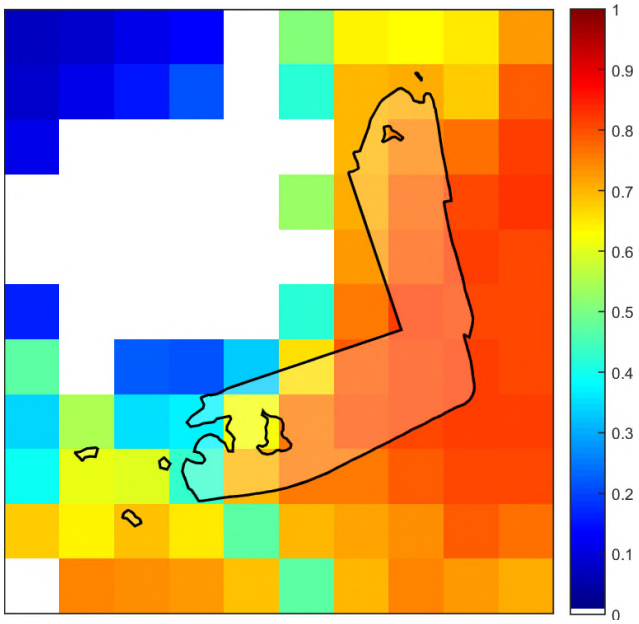


4. Map of the property in context

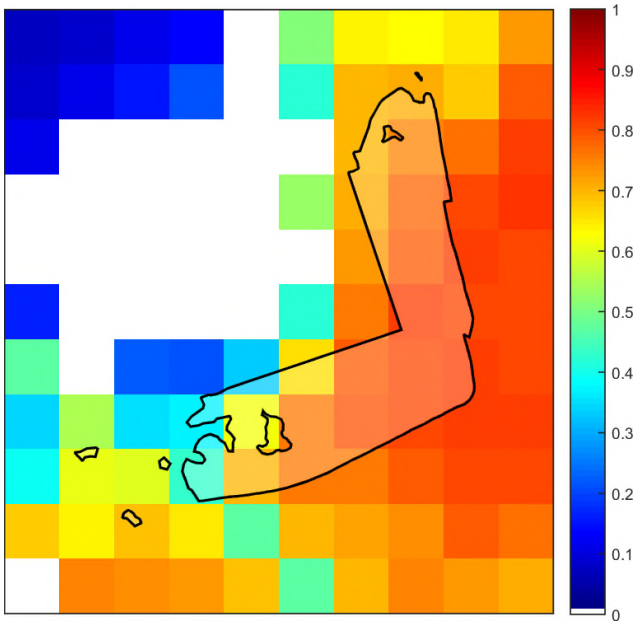
Yellow boundaries denote areas of proposed native vegetation removal.

4. Habitat importance maps

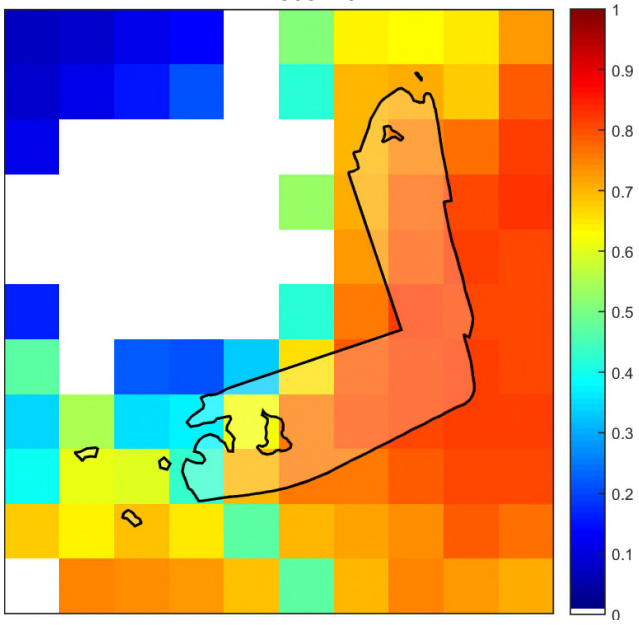
Swamp Bush-pea
Pultenaea weindorferi
502881



Wine-lipped Spider-orchid
Caladenia oenochila
503694



Dandenong Wattle
Acacia stictophylla
505140



APPENDIX 4 AVAILABLE NATIVE VEGETATION CREDITS

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: 21/03/2024 04:03 **Report ID: 23389**

What was searched for?

Species offset

Common Name (*Scientific name*)		Species habitat units
Swamp Bush-pea *(Pultenaea weindorferi)*		10.91
Wine-lipped Spider-orchid *(Caladenia oenochila)*		10.91
Dandenong Wattle *(Acacia stictophylla)*		10.91
with number of large trees	262	

Details of available native vegetation credits on 21 March 2024 04:03

These sites meet all your requirements for species offsets.

Credit Site ID	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
BBA-0678	2601	Melbourne Water	Nillumbik Shire	No	Yes	No	VegLink

Species common name	Species scientific name	SHU
Swamp Bush-pea	Pultenaea weindorferi	44.037
Wine-lipped Spider-orchid	Caladenia oenochila	44.911
Dandenong Wattle	Acacia stictophylla	44.897

These sites meet some of your requirements for species offsets, you may be able to meet all your requirements across multiple sites.

Credit Site ID	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
VC_TFN-09554_01	397	North Central	Macedon Ranges Shire	Yes	Yes	No	Bio Offsets

Species common name	Species scientific name	SHU
Swamp Bush-pea	Pultenaea weindorferi	14.416

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

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

There are no potential sites listed in the Native Vegetation Credit Register that meet your offset requirements.

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

Next steps

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

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

Broker contact details

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

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

APPENDIX 5 NATIVE VEGETATION OFFSET REPORT

Native vegetation offset report

Information included in this report is based on spatial data provided to DELWP. The proposal has not been assessed to confirm eligibility or gain

This report provides information about a potential native vegetation offset site in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation*. The information in this report is based on spatial information and the gain score provided by the landholder (or their representative). Any changes to this input information will change the habitat units of gain reflected in this report and it must be reissued.

Date of issue: **20/03/2024** **DELWP ref: EHP_2024_043**
Time of issue: **3:36 pm**

Project ID	EHP14500_MontroseOS_19032024_VG94

Extent of proposed offset site

Total extent	16.214 ha
Patches	16.214 ha
Revegetation	0.000 ha
Scattered tree(s)	0.000 ha

Habitat units of gain for the proposed offset site

The offset site has the following total general and species habitat units. These units can be used to satisfy a **single permit condition** or if the offset site is established as a **first party offset site**.

Total habitat units and attributes used for a single permit (once off use)	
Number of large tree(s)	48 large trees are protected at the offset site
General habitat units	3.299 general habitat units Port Phillip And Westernport CMA, Yarra Ranges Shire Council 0.695 Strategic biodiversity value
Species habitat units	3.250 species habitat units for Grey-headed Flying-fox, *Pteropus poliocephalus* 3.891 species habitat units for Australian Grayling, *Prototroctes maraena* 3.415 species habitat units for Spurred Helmet-orchid, *Corybas aconitiflorus* 3.415 species habitat units for Swamp Bush-pea, *Pultenaea weindorferi* 3.415 species habitat units for Wine-lipped Spider-orchid, *Caladenia oenochila* 3.415 species habitat units for Dandenong Wattle, *Acacia stictophylla* 3.415 species habitat units for Green Scentbark, *Eucalyptus fulgens*

Habitat units of gain per zone of the proposed offset site

This table provides the habitat units of gain per zone of the offset site. Trading and allocation of units within the **Native Vegetation Credit Register** takes place at the zone.

The species-general offset test is done to determine which species the proposed offset site provides habitat for. The threshold is set at 0.0025 per cent of the mapped habitat value for a species. When the threshold is met or exceeded, species habitat units are generated. If required species habitat units can be generated for all other species mapped at the site. Multiple species units will be generated if the threshold is exceeded for multiple species.

The species habitat units for each species in a zone is calculated by the following equation in accordance with the Guidelines:

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

The general habitat units in a zone is calculated by the following equation in accordance with the Guidelines:

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

Species and general habitat units are alternates and the use or sale of one type of unit will affect the number of other types of units remaining.

Information provided by or on behalf of the applicant				**Information calculated by EnSym**					
Zone	Type	Gain score	Large tree	Polygon extent	Extent without overlap	SBV	HIS	Habitat units	Attributes
1-C	Patch	0.240	0	1.669	1.669	0.778		0.356 general habitat units	Port Phillip And Westernport ; Yarra Ranges Shire
							0.683	0.337 species habitat units	11280 Grey-headed Flying-fox, *Pteropus poliocephalus*
							1.000	0.401 species habitat units	4686 Australian Grayling, *Prototroctes maraena*
							0.793	0.359 species habitat units	500835 Spurred Helmet-orchid, *Corybas aconitiflorus*
							0.793	0.359 species habitat units	502881 Swamp Bush-pea, *Pultenaea weindorferi*
							0.793	0.359 species habitat units	503694 Wine-lipped Spider-orchid, *Caladenia oenochila*

							0.793	0.359 species habitat units	505140 Dandenong Wattle, *Acacia stictophylla*
							0.793	0.359 species habitat units	505175 Green Scentbark, *Eucalyptus fulgens*
2-A	Patch	0.240	48	14.193	14.193	0.685		2.870 general habitat units	Port Phillip And Westernport ; Yarra Ranges Shire
							0.669	2.842 species habitat units	11280 Grey-headed Flying-fox, *Pteropus poliocephalus*
							1.000	3.406 species habitat units	4686 Australian Grayling, *Prototroctes maraena*
							0.750	2.981 species habitat units	500835 Spurred Helmet-orchid, *Corybas aconitiflorus*
							0.750	2.981 species habitat units	502881 Swamp Bush-pea, *Pultenaea weindorferi*
							0.750	2.981 species habitat units	503694 Wine-lipped Spider-orchid, *Caladenia oenochila*
							0.750	2.981 species habitat units	505140 Dandenong Wattle, *Acacia stictophylla*
							0.750	2.981 species habitat units	505175 Green Scentbark, *Eucalyptus fulgens*
3-A	Patch	0.240	0	0.331	0.331	0.711		0.068 general habitat units	Port Phillip And Westernport ; Yarra Ranges Shire
							0.680	0.067 species habitat units	11280 Grey-headed Flying-fox, *Pteropus poliocephalus*
							1.000	0.079 species habitat units	4686 Australian Grayling, *Prototroctes maraena*
							0.792	0.071 species habitat units	500835 Spurred Helmet-orchid, *Corybas aconitiflorus*
							0.792	0.071 species habitat units	502881 Swamp Bush-pea, *Pultenaea weindorferi*
							0.792	0.071 species habitat units	503694 Wine-lipped Spider-orchid, *Caladenia oenochila*

							0.792	0.071 species habitat units	505140 Dandenong Wattle, *Acacia stictophylla*
							0.792	0.071 species habitat units	505175 Green Scentbark, *Eucalyptus fulgens*
4-B	Patch	0.240	0	0.021	0.021	0.717		0.004 general habitat units	Port Phillip And Westernport ; Yarra Ranges Shire
							0.600	0.004 species habitat units	11280 Grey-headed Flying-fox, *Pteropus poliocephalus*
							1.000	0.005 species habitat units	4686 Australian Grayling, *Prototroctes maraena*
							0.470	0.004 species habitat units	500835 Spurred Helmet-orchid, *Corybas aconitiflorus*
							0.470	0.004 species habitat units	502881 Swamp Bush-pea, *Pultenaea weindorferi*
							0.470	0.004 species habitat units	503694 Wine-lipped Spider-orchid, *Caladenia oenochila*
							0.470	0.004 species habitat units	505140 Dandenong Wattle, *Acacia stictophylla*
							0.470	0.004 species habitat units	505175 Green Scentbark, *Eucalyptus fulgens*

Next steps

Offset sites must meet eligibility criteria as outlined in the *Guidelines for the removal, destruction or lopping of native vegetation* and the *Native vegetation gain scoring manual, version 2* available on the DELWP website, and any other relevant requirements. Eligible offset sites that are intended to be banked or sold as credits must be registered on the Native Vegetation Credit Register (NVCR). A gain scoring assessment must be done before any offset can be registered on the NVCR. All proposed offset sites must be secured by a relevant security agreement that includes an offset management plan.

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

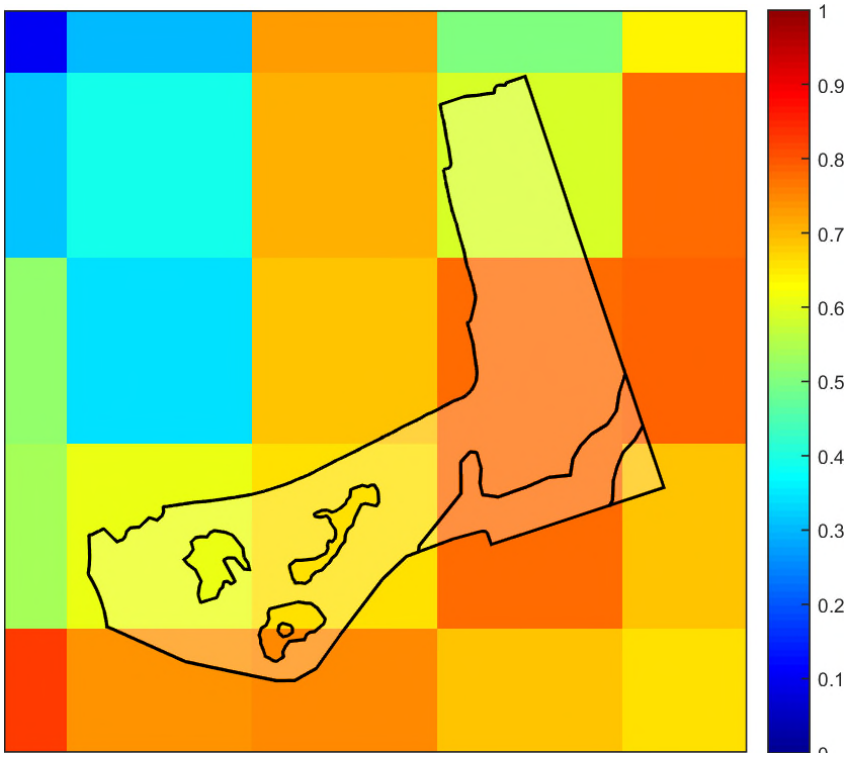
For more information contact the DELWP Customer Service Centre 136 186

www.delwp.vic.gov.au

Appendix 1 – Images of marked native vegetation

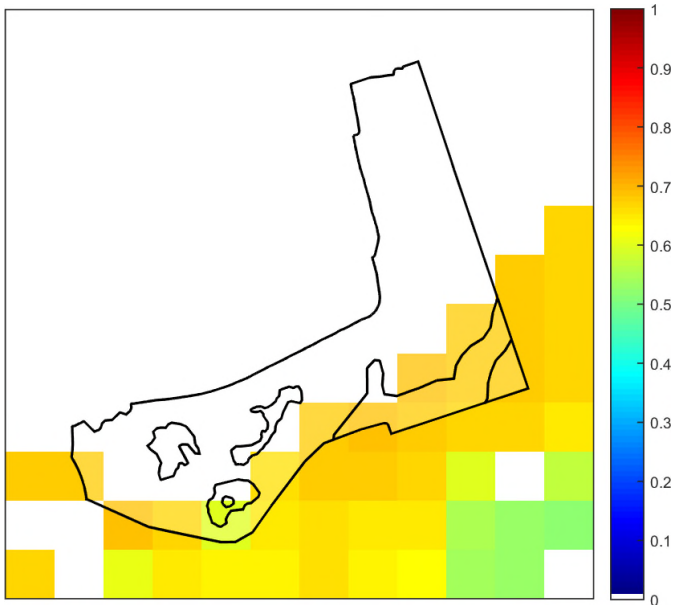
1. Aerial photograph showing marked native vegetation

2. Strategic biodiversity value map

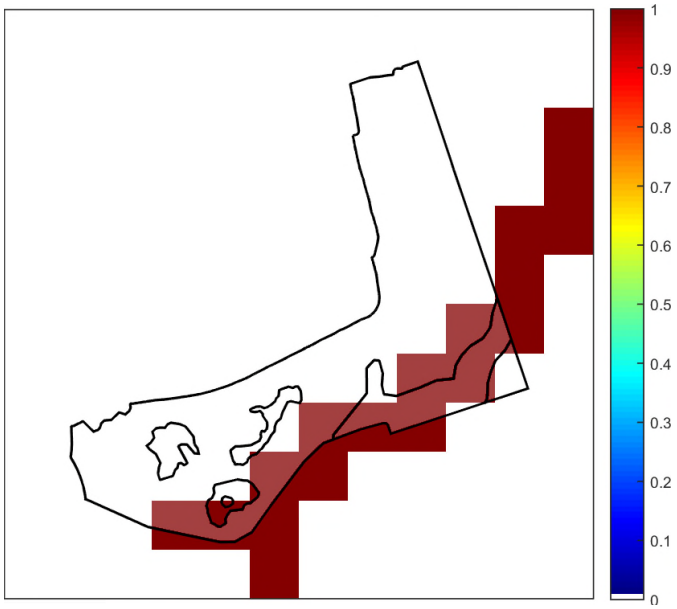


3. Habitat importance maps

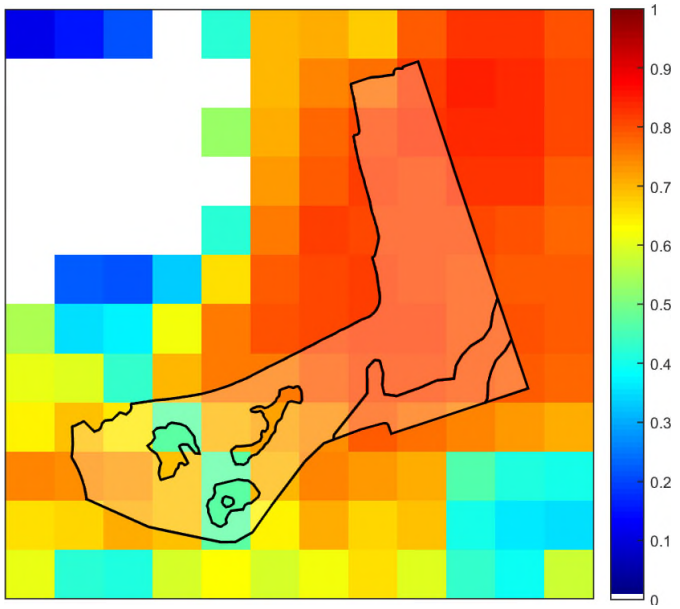
Grey-headed Flying-fox
Pteropus poliocephalus
11280



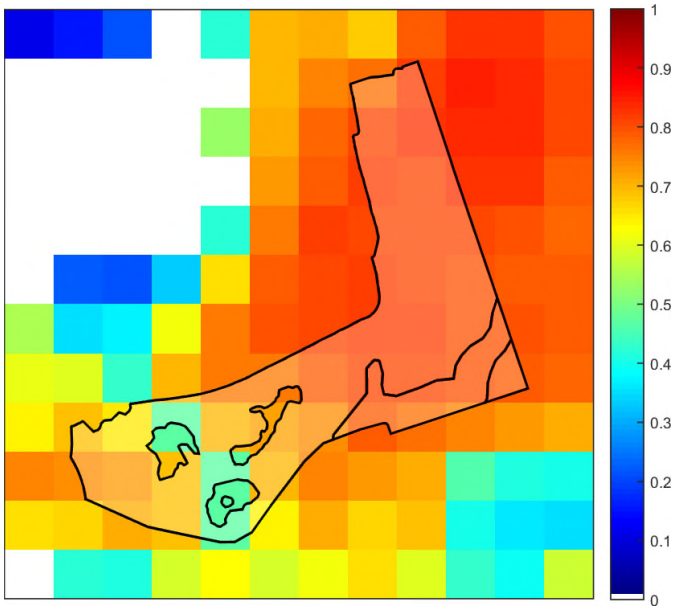
Australian Grayling
Prototroctes maraena
4686



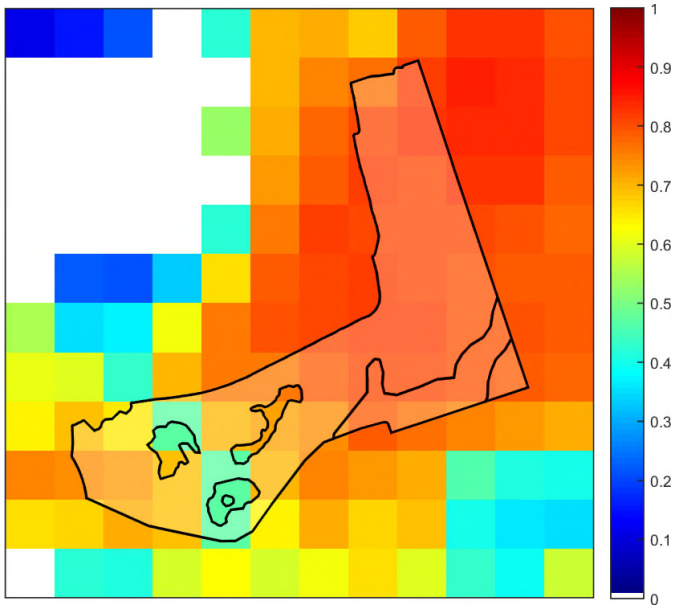
Spurred Helmet-orchid
Corybas aconitiflorus
500835



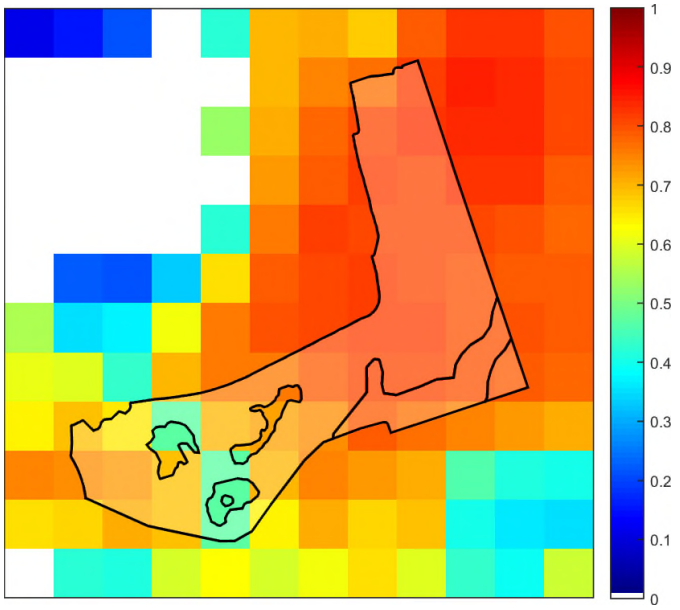
Swamp Bush-pea
Pultenaea weindorferi
502881



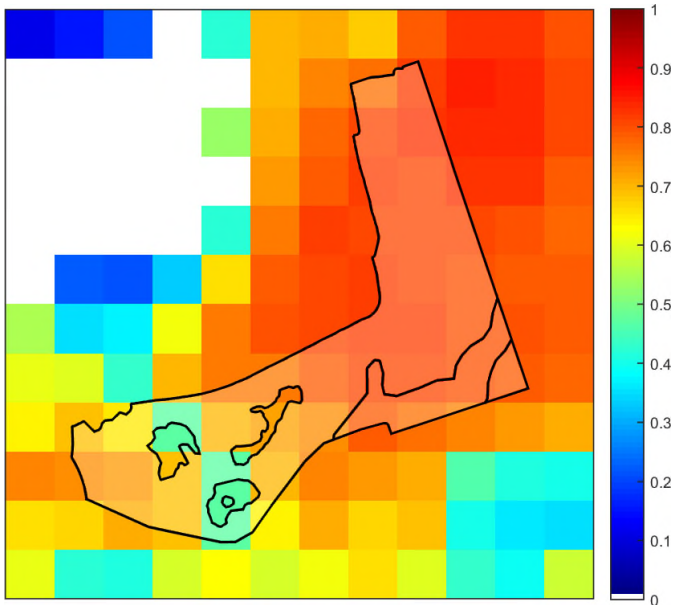
Wine-lipped Spider-orchid
Caladenia oenochila
503694



Dandenong Wattle
Acacia stictophylla
505140



Green Scentbark
Eucalyptus fulgens
505175



GLOSSARY

Alternate offset types

Offset types within a zone are alternates. The use of one offset type will result in the proportional reduction of all other offset types within the zone. Refer to *Native vegetation offset sites* fact sheet available on the DELWP website for more information.

Gain score

This is the site-assessed gain score for the native vegetation based on the agreed management and security commitments. Each zone in the proposed offset site is assigned a gain score according to the gain scoring assessment. The score is divided by 100 to give a number between 0 and 1.

General habitat units of gain

The general habitat units quantify the overall contribution that the protection and management of native vegetation at the offset site makes to Victoria's biodiversity. The general habitat units are calculated as follows:

$$\textbf{General habitat units} = \textbf{extent} \times \textbf{gain score} \times \textbf{general landscape factor}$$

General landscape factor

The general landscape factor is the adjusted strategic biodiversity value (SBV) score. The SBV score is adjusted so that site-based biodiversity information has more influence on the number of units.

General offset attributes

The attributes of a general offset includes the location (Catchment Management Authority and Municipal District), strategic biodiversity value score and the number of large trees protected.

Offset type

There are two types of offsets, general offsets and species offsets. All offset sites include general offsets. Sites that are mapped as habitat for rare or threatened species can also include species offsets for the mapped species.

Species offset attributes

The attributes of a species offset is the mapped habitat for the species and the number of large trees protected.

Species habitat units of gain

The species habitat units quantify the overall contribution that the protection and management of native vegetation at an offset site makes to the habitat of the relevant rare or threatened species. Species habitat units are calculated for each species in the zone where the result of the threshold test is greater than 0.0025 per cent. Species units are calcualted as follows:

$$\textbf{Species habitat units}_{\textbf{species x}} = \textbf{extent} \times \textbf{gain score} \times \textbf{species landscape factor}_{\textbf{species x}}$$