

Preliminary Ecological Assessment: Mount Shamrock Quarry, Pakenham, Victoria

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1 Introduction

Ecology and Heritage Partners Pty Ltd was instructed by Umwelt Pty Ltd on behalf of Holcim to undertake a preliminary ecological assessment to gain an initial understanding of the ecological values present within the study area.

This assessment sought to achieve the following objectives:

- Complete a desktop assessment of the ecological values modelled to occur or previously recorded within proximity to the study area;
- Ground-truth the extent of native vegetation, as defined by the State *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017) present within the study area;
- Identify any habitat for flora and fauna species, and ecological communities listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and State *Flora and Fauna Guarantee Act 1988* (FFG Act); and,
- Identify any ecological implications under the *Environment Effects Act 1987* (EE Act).

2 Study Area

The study area is located at 95 Mount Shamrock Road, Pakenham, approximately 64 kilometres south east of Melbourne's CBD (Figure 1). The site covers approximately 13.25 hectares and is bound by the Pakenham Pony Club to the north, agricultural land to the east and the existing quarry operations to the west and south.

According to the Victorian Department of Energy, Environment and Climate Action (DEECA) NatureKit Map (DEECA 2023a), the study area is located within the Highlands – Southern Fall bioregion, Melbourne Water Catchment Management Authority (CMA) and Cardinia Shire municipality.

3 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 2023a) and Native Vegetation Regulation (NVR) Map (DEECA 2023b) 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 2023c) 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 2023d);
- 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 EPBC Act (DCCEEW 2023);
- Relevant listings under the FFG Act, including the latest Threatened (DEECA 2023e) and Protected Lists (DELWP 2019a);
- The online VicPlan Map (Department of Transport and Planning [DTP] 2023) to ascertain current zoning and environmental overlays in the study area;
- Aerial photography of the study area; and,
- Previous vegetation assessments relevant to the study area; including;
 - Holcim Quarry Mt Shamrock – 2022 Rehabilitation Report. Naturelinks Landscape Management Pty Ltd.
 - Holcim Quarry Mt Shamrock – 2021 Rehabilitation Report. Naturelinks Landscape Management Pty Ltd.

4 Site Inspection

A rapid assessment of the study area was undertaken by a qualified ecologist on 11th October 2023. The inspections sought primarily to identify the extent and type of native vegetation present and applicable Ecological Vegetation Class (EVC) present within the study area and to identify potential habitat for species and ecological communities listed under the EPBC Act and FFG Act.

5 Results

5.1 Vegetation

The study area predominately contains areas of planted and direct seeded revegetation, which have been completed over several stages throughout the years of operation of the quarry, with ongoing rehabilitation undertaken by Naturelinks Landscape Management. Most of the revegetation includes Victorian native species, many local to the Pakenham area. Common species observed in the revegetation included a mixture of Messmate Stringybark *Eucalyptus obliqua*, Narrow-leaf Peppermint *Eucalyptus radiata*, Hedge Wattle *Acacia paradoxa*, Blackwood *Acacia melanoxylon*, Bushy Hakea *Hakea decurrens*, Long-leaf Cassinia *Cassinia longifolia*, Spiny-headed Mat-rush *Lomandra longifolia*, and Woolly Tea-tree *Leptospermum lanigerum*.

Areas of remnant native vegetation were observed, primarily in the far north west and central south of the study area. In the far north west, a patch of Shrubby Foothill Forest (EVC 45) was observed, along with several other smaller patches, and a patch of Damp Forest (EVC 29) was observed in the central south (Figure 2). The presence of these EVCs are consistent with the modelled extent (2005) native vegetation mapping (DEECA 2023a).

Shrubby Foothill Forest

Four patches of Shrubby Foothill Forest (SFF) were mapped within the study area (Figure 2). SFF1, SFF2 and SFF4 were all represented by a cluster of wattle, such as Blackwood *Acacia melanoxylon* or Silver Wattle *Acacia dealbata* (Plate 1). These patches were treated as remnant due to a review of the aerial imagery indicating their persistence within the study area, whereas other areas of revegetation showed clearer signs of establishment and were generally present in rows within the study area or contained evidence of past tree guards. The SFF3 patch mapped along the north western boundary contained a canopy of Narrow-leaf Peppermint and Manna Gum *Eucalyptus viminalis* with a low cover of native flora in the understorey. Several of the canopy trees were mature (Plate 2), with a large stag also present.



Plate 1. Cluster of Blackwood forming a patch of Shrubby Foothill Forest (SFF1 on Figure 2) (Ecology and Heritage Partners Pty Ltd 11/10/2023).



Plate 2. Mature Narrow-leaf Peppermint within Shrubby Foothill Forest patch (SFF3 on Figure 2) (Ecology and Heritage Partners Pty Ltd 11/10/2023).

Damp Forest

Two patches of Damp Forest (DF) were mapped within the south eastern portion of the study area. DF1 contained a canopy primarily of Messmate Stringybark, with Wattle *Acacia* sp. scattered throughout. This patch was located on a south facing aspect, which lead to a gully containing a body of water. Several Large Trees were observed. Native flora species observed included Weeping Grass *Microlaena stipoides* var. *stipoides*, Bidgee-widgee *Acaena novae-zelandiae*, Cottony Fireweed *Senecio quadridentatus*, Kangaroo Apple *Solanum aviculare*, Austral Bracken *Pteridium esculentum*, Mother Shield-fern *Polystichum proliferum*, Tall Sword-sedge *Lepidosperma elatius* and two Rough Tree-ferns *Cyathea australis* (Plate 3).

The second patch of Damp Forest was located in the south eastern corner, starting at the small dam. A cluster of Swamp Gum *Eucalyptus ovata* were present around the dam and scattered throughout the canopy within this area (Plate 4). Infill revegetating planting had occurred to fill in the gaps in the canopy, with tree guards present protecting the planted saplings. This area contained several wattles, scattered Tall Sword-sedge and Flecked Flat-sedge *Cyperus gunnii* subsp. *gunnii*, with a lower diversity of flora in the understorey, mainly Bidgee-widgee and Weeping Grass.



Plate 3. Two Rough Tree-ferns observed within Damp Forest patch (DF1 on Figure 2) (Ecology and Heritage Partners Pty Ltd 11/10/2023).



Plate 4. Large Swamp Gums within Damp Forest patch (DF2 on Figure 2) (Ecology and Heritage Partners Pty Ltd 11/10/2023).

5.1.1 Introduced Vegetation

Excluding the areas of revegetation, the study area contained several areas which were dominated by introduced vegetation. This was mainly apparent where no canopy was present, and an understorey of exotic grass, such as Sweet Vernal-grass *Anthoxanthum odoratum*, dominated the ground layer (Plate 5).

Scattered noxious weeds, as defined under the *Catchment and Land Protection Act 1994* (CaLP Act), were present throughout the study area in low cover, including Spear Thistle *Cirsium vulgare*, Blackberry *Rubus fruticosus* (Plate 6) and Variegated Thistle *Silybum marianum*.

Other exotic flora commonly observed included Yorkshire Fog-grass *Holcus lanatus*, Cocksfoot *Dactylis glomerata*, Ribwort *Plantago lanceolata*, Panic Veldt-grass *Ehrharta erecta*, Annual Veldt-grass *Ehrharta longifolia*, Cape Weed *Arctotheca calendula*, Pimpernal *Lysimachia arvensis* and Wild Raddish *Raphanus raphanistrum*.



Plate 5. Open area dominated by exotic grass within the eastern portion of the study area (Ecology and Heritage Partners Pty Ltd 11/10/2023).



Plate 6. Blackberry observed within a patch of Damp Forest within the study area (Ecology and Heritage Partners Pty Ltd 11/10/2023).

5.2 Fauna habitat

Fauna habitat within the study area is represented by three main forms, woodland, open grassland and waterbodies.

Woodland

The primary habitat type within the study area is woodland, represented by either the more mature remnant areas of forest vegetation or the revegetation areas. The remnant areas often contained several mature eucalypt trees, offering hollows and high roosting opportunities for arboreal and avifauna, including birds, bats and possums. The remnant areas generally contained a sparser, more open understorey than the revegetation areas, with the exemption of the revegetation area along the eastern boundary, which was also relatively open. A number of Bare-nosed Wombat *Vombatus ursinus* burrows were observed within the woodland areas, with their locations incidentally mapped (Figure 2). Fauna observed using this habitat, either through direct observation or presence of scats and dreys, included Australian Raven *Corvus coronoides*, Grey Butcherbird *Cracticus torquatus*, Short-beaked Echidna *Tachyglossus aculeatus*, Grey Fantail *Rhipidura albiscapa*, Common Ring-tail Possum *Pseudocheirus peregrinus*, Eastern Rosella *Platycercus eximius*, Crimson Rosella *Platycercus elegans*, Striated Thornbill *Acanthiza lineata*, Common Brush-tailed Possum *Trichosurus vulpecula*, Australian Magpie *Gymnorhina tibicen* and Grey Currawong *Strepera versicolor*.

Waterbodies

Two waterbodies were observed within the study area, one small dam located along the eastern boundary, and a larger waterbody located in a gully within the Damp Forest patch (Plate 7; Plate 8) (Figure 2). Both were holding water at the time of the assessment.

The small dam was located below a closed canopy of eucalypt and acacia species, and had several logs and branches protruding into the water. Structural vegetation was present in the understorey, providing shelter for fauna when accessing the dam. Fauna observed using this habitat included a flock of Yellow-tailed Black Cockatoo *Calyptorhynchus funereus*, Crimson Rosellas, Eastern Rosellas and Red Wattlebird *Anthochaera*

carunculata. No fauna were observed directly using the larger waterbody, however it is likely to provide habitat for frogs.



Plate 7. Small dam located within Damp Forest (DF2) patch (Ecology and Heritage Partners Pty Ltd 11/10/2023).



Plate 8. Large waterbody located within Damp Forest (DF1) patch (Ecology and Heritage Partners Pty Ltd 11/10/2023).

Open Grassland

Areas of open grassland where a canopy was lacking was present in the north eastern portion of the study area. This area contained the occasional recruiting eucalypt or wattle, and contained an understorey dominated by exotic grass. A mob of Eastern Grey Kangaroo *Macropus giganteus* were observed grazing within this area, along with common birds such as Australian Magpie, Crimson Rosella and Welcome Swallow *Hirundo neoxena*. Diggings and scats from European Rabbit *Oryctolagus cuniculus* were common.

6 Significant Ecological Values

6.1 Flora Species

No nationally or State significant flora species were observed or likely to occur within the study area. The results of the desktop assessment and rapid site inspection did not identify any habitat values present for significant flora, with much of the understorey been subject to historical disturbance and subsequent revegetation associated with the quarry operations. Most significant flora species records previously recorded within the local area are restricted to the RJ Chambers Flora and Fauna Reserve located north, and the Beaconsfield Nature Conservation Reserve located west of the study area (Figure 3).

6.2 Fauna Species

Several nationally significant fauna species have previously been recorded in the local area (Figure 4). Of these, 13 have the potential to use habitat within the study area, based on the presence of suitable habitat values and/or high number of records in the local area as identified through the desktop assessment. Each of these species is discussed below in Table 1, including a description of their preferred habitat, and the likelihood that these species would use and rely on habitat within the study area based on the habitat attributes present.

Table 1. Summary of nationally significant (listed under the EPBC Act) fauna that have the potential to use habitat within the study area

Scientific Name	Common Name	Habitat Requirement	Likelihood within study area	Further requirements
Critically Endangered*				
<i>Lathamus discolor</i>	Swift Parrot	Feeds on flowering eucalyptus in forests and woodlands, and roost in trees. Breeds in Tasmania and is largely occurs throughout western, central and north eastern Victoria where the species typically overwinters (i.e. in Box-ironbark Forests).	Foraging and roosting habitat is present in the wooded areas of the study area, although likely to rely on larger patches of woodland in the local area and throughout its core over-wintering range.	None required.
<i>Lichenostomus melanops cassidix</i>	Helmeted Honeyeater	Streamside woodland / forest vegetation with a dense understorey. Known population within Yellingbo Nature Conservation Reserve, located 18 kilometres north of the study area. Species generally associated with Mountain Swamp Gum <i>Eucalyptus camphora</i> .	Low likelihood due to open nature of the understorey vegetation, lack of riparian vegetation and lack of Mountain Swamp Gum.	None required.
Endangered*				
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	Occurs in taller mountain forests over summer, moving to lower altitude open woodlands in winter. Suitable foraging habitat present. Nest is tree hollows.	Observed within the study area by Naturelinks in 2022 and previous years (Naturelinks 2022), and suitable foraging habitat observed. May nest in any hollows present within the study area.	Surveys recommended.
<i>Isoodon obesulus obesulus</i>	Southern Brown Bandicoot	Occurs in a variety of habitats, including heathy open forests or areas with a dense understorey, including native and exotic vegetation. Vegetation structure is considered a more important factor than flora species composition.	Low likelihood due to general open understorey structure and lack of records in the local area.	None required.
<i>Melanodryas cucullata</i>	Hooded Robin	Occurs in open woodlands often dominated by eucalyptus or acacia. Roost in trees and nest in stumps, tree hollows or crevices.	The canopy within the study area is largely dominated by eucalyptus and acacia. However, limited records in the local area as the species is largely restricted north of the Great Divided Range (drier woodland and forest habitats).	None required.

Scientific Name	Common Name	Habitat Requirement	Likelihood within study area	Further requirements
<i>Petauroides volans</i>	Southern Greater Glider	Arboreal species that occurs in tall eucalypt forests. Shelters in tree hollows, with the presence of tree hollows often a requirement for the species to occur. Feeds on eucalyptus leaves, buds and flowers.	Most of the canopy within the study area is immature. Few large trees were observed within the Damp Forest and Shrubby Foothill Forest patches, that may contain hollows, although not observed during the rapid site assessment. Past records located 6.5 kilometres north of the study area.	None required.
Vulnerable*				
<i>Climacteris picumnus</i>	Brown Treecreeper	Open forest and woodlands with a low cover of shrubs and a grassy understorey, foraging for food along trees. Nests generally in tree hollows. Generally occurs in drier woodland and forest habitats north of the Great Divided Range.	Suitable habitat present, although limited past records in the local area.	None required.
<i>Galaxiella pusilla</i>	Dwarf Galaxias	Occurs in shallow, slow-flowing water where aquatic vegetation is present.	Both waterbodies within the study area are not connected to any streams and no records within proximity to the study area.	None required.
<i>Hirundapus caudacutus</i>	White-throated Needletail	Predominately aerial species, tending to fly over woodlands / treed areas. Occasionally roosts in forests and woodlands. Does not breed in Australia.	Unlikely to rely on habitat within the study area for foraging or breeding purposes (primarily forages aerially and breeds in Asia).	None required.
<i>Litoria raniformis</i>	Growling Grass Frog	Occurs within still to slow-flowing waterbodies with emergent aquatic vegetation and minimal canopy cover.	Limited suitable habitat and nearest population is located five kilometres south, with no habitat connectivity to the study area. The smaller dam had a high canopy cover, and the larger water body had a moderate canopy cover and limited suitable vegetation.	None required.
<i>Neophema chrysostoma</i>	Blue-winged Parrot	Breed in Tasmania and southern Victoria and migrate up the east coast over winter. Often associated with open pasture and saltmarsh, and roost in nearby trees.	When the species is in Victoria, it is generally within near coastal areas. May stop over the study area on occasion and roost in the canopy vegetation. Potential to breed in tree hollows within the study area.	Surveys recommended.
<i>Petaurus australis</i>	Yellow-bellied Glider	Occurs in eucalypt woodlands, preferring old growth forest that contain	Limited suitable habitat within the study area, as the canopy is generally young with limited	None required.

Scientific Name	Common Name	Habitat Requirement	Likelihood within study area	Further requirements
		large old hollow-bearing trees. Generally associated with habitat that contains a range of eucalypt species.	large trees and small patch size.	
<i>Pycnoptilus floccosus</i>	Pilotbird	Occurs in woodlands with dense understoreys, where they forage in the understorey amongst leaf litter.	Minimal suitable habitat due to relatively open understorey and no past records within proximity to the study area.	None required.

*Listing status under the EPBC Act.

State Significant Fauna

Habitat for several State significant fauna was observed within the study area, including; Powerful Owl *Ninox strenua*, Sooty Owl *Tyto tenebricosa* and Southern Toadlet *Pseudophryne dendyi*. The general lack of large, hollow-bearing trees within the study area reduces the likelihood that owls would rely on the habitat for breeding purposes but may forage within the woodland areas. Mitigation measures are recommended prior to the removal of any large trees, to ensure impacts are minimised to fauna that may use this habitat.

Southern Toadlet occur in damp habitats that are inundated during late autumn and winter (ephemeral depressions and waterbodies), often where logs or leaf litter are present. The remnant vegetation within the study area contained areas of suitable habitat, albeit relatively low quality.

6.3 Ecological Communities

Two nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DCCEE 2023):

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

The vegetation within the study area did not meet the condition thresholds that define any national or State-significant communities due to the absence of key indicator species, the low diversity of native flora and high cover of exotic vegetation. The vegetation modelled to occur and observed within the study area was not representative of a grassland, and no canopy species or significant characteristics of the White Box – Yellow Box – Blakely’s Red Gum Grassy Woodland and Derived Native Grassland ecological community were present.

7 Legislation and Policy

7.1 Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

Habitat for two nationally significant fauna species was observed within the study area, including Gang-gang Cockatoo and Blue-winged Parrot.

No significant flora species or ecological communities were observed or likely to occur within the study area. No further surveys recommended for significant flora or ecological communities.

Implications

Targeted surveys are recommended for Gang-gang Cockatoo and Blue-winged Parrot.

7.2 Flora and Fauna Guarantee Act 1988 (Victoria)

No flora species or ecological communities listed as Threatened under the FFG Act were recorded within the study area during the rapid site assessment. Several protected flora species were recorded, including Cottony Fireweed, Rough-tree-fern, Mother-shield Fern, Long-leaf Cassinia *Cassinia longifolia*, Common Cassinia *Cassinia aculeata*, and Everlasting *Ozothamnus* spp.

In addition, a population of two orchid species, Slender Sun-orchid *Thelymitra pauciflora* and Common Onion-orchid *Microtis unifolia* have previously been observed within the study area (Naturelinks 2022). Both of these species are listed as protected under the FFG Act.

Habitat for three State significant fauna species, Powerful Owl, Sooty Owl and Southern Toadlet, was observed within the study area.

Implications

As the study area is privately owned, an FFG Act permit for the removal of protected flora is not required.

Targeted surveys are recommended for Southern Toadlet, Powerful Owl and Sooty Owl, to understand their presence and use of habitat within the study area and inform the overall ecological values present within the study area, to enable informed mitigation measures to be undertaken.

7.3 Environmental Effects Act 1978 (Victoria)

The *Environment Effects Act 1978* (EE Act) provides for assessments of proposed actions that are capable of exerting a significant impact on the environment and requires the preparation of an Environment Effects Statement (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 to the Victorian Minister for Planning. The potential project impacts have been considered against these referral criteria (Table 2).

Table 2. Referral criteria under the EE Act (DSE 2006).

Referral criteria	Potential Impacts
<p style="text-align: center;">Individual potential environment effects</p> <p style="text-align: center;">Individual types of potential effects on the environment that might be of regional or State significance, and therefore warrant referral of a project, are:</p>	

Referral criteria	Potential Impacts
<p>Potential clearing of 10 hectares or more of native vegetation from an area that:</p> <ul style="list-style-type: none"> • is of an EVC identified as endangered by DEECA 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 	<p>No.</p> <p>An estimated extent of up to 3.509 hectares of native vegetation patches may be impacted by the project.</p> <p>The Bioregional Conservation Status (BCS) of both Shrubby Foothill Forest and Damp Forest is classified as ‘Least Concern’.</p>
<p>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</p>	<p>Unlikely.</p> <p>No threatened flora species were observed within the Project Area during the site assessment, and none are considered likely to occur based on the available habitat within the study area and the proximity of previous records.</p> <p>The Project Area may provide potential habitat for 13 threatened fauna species (Table 1). Of these, targeted surveys are recommended for Blue-winged Parrot, Gang-gang Cockatoo, Southern Toadlet, Powerful Owl and Sooty Owl. If the species are found to be present in the study area, then the proposed action will impact on potential foraging and breeding habitat. However, the loss of up to 3.509 hectares of native vegetation is highly unlikely to lead to the long-term loss of a significant proportion (1-5%) of any of the species’ habitat or their populations.</p>
<p>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’</p>	<p>No.</p> <p>The Project Area is not listed under the Ramsar Convention or in ‘A Dictionary of Important Wetlands in Australia’.</p>
<p>Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long time</p>	<p>No.</p> <p>The project will not directly impact on any watercourses. The two dams present in the Project Area are likely to be decommissioned as part of the proposed quarry expansion, however both are isolated from other water sources. Consequently, the impacts to aquatic environments are considered localised and relatively minor.</p> <p>No estuarine or marine ecosystems are present in the site.</p>
<p>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</p>	<p>Unknown.</p> <p>Outside the scope of this report.</p>
<p>Potential greenhouse gas emissions exceeding 200,000 tonnes of carbon dioxide equivalent per annum, directly attributable to the operation of the facility</p>	<p>Unknown.</p> <p>Outside the scope of this report.</p>
<p>A combination of potential environmental effects</p> <p>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:</p>	
<p>Potential clearing of 10 hectares or more of native vegetation, unless authorised under an approved Forest Management Act or Fire Protection Plan</p>	<p>No.</p> <p>The current impact footprint proposes to remove an estimated maximum of 3.509 hectares of native vegetation patches.</p>

Referral criteria	Potential Impacts
<p>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 <i>National Parks Act 1975</i></p>	<p>No.</p> <p>The Project Area is not within or adjoining a National Park.</p> <p>The Environmental Significance Overlay – Schedule 1 (ESO1) covers the study area. A planning permit from Cardinia Shire Council will be required to remove any native vegetation under ESO1, and a detailed site assessment will be conducted to address the relevant (ecological) application requirements.</p> <p>However, much of the vegetation proposed to be removed contains areas of planted vegetation. The impact to native vegetation (3.509 ha) is not likely to have an extensive or major effect on regionally important landscape values.</p>
<p>Matters listed under the FFG Act:</p> <ul style="list-style-type: none"> • 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. 	<p>Unlikely.</p> <p>No flora species or ecological communities listed as Threatened under the FFG Act were recorded within the Project Area. Eight protected species were observed in low numbers during the rapid site assessment and previous surveys (Ecology and Heritage Partners 2023; Naturelinks 2022).</p> <p>The site may provide potential habitat for three State significant fauna species: Powerful Owl, Sooty Owl, and Southern Toadlet. Targeted surveys for all three species have been recommended. However, it is considered unlikely that the study area provides critical habitat for the species, or supports an important population.</p> <p>There is no suitable habitat within the study area for migratory birds.</p>
<p>Potential extensive or major effects on land stability, acid sulphate soils or highly erodible soils over the short or long term</p>	<p>Unknown.</p> <p>Outside the scope of this report.</p>
<p>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</p>	<p>Unknown.</p> <p>Outside the scope of this report.</p>
<p>Potential extensive or major effects on social or economic well-being due to direct or indirect displacement of non-residential land use activities</p>	<p>Unknown.</p> <p>Outside the scope of this report.</p>
<p>Potential for extensive displacement of residences or severance or residential access to community resources due to infrastructure development</p>	<p>Unknown.</p> <p>Outside the scope of this report.</p>
<p>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</p>	<p>Unknown.</p> <p>Outside the scope of this report.</p>
<p>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</p>	<p>Unknown.</p> <p>Outside the scope of this report.</p>
<p>Potential extensive or major effects on Aboriginal cultural heritage</p>	<p>Unknown.</p> <p>Outside the scope of this report.</p>
<p>Potential extensive or major effects on cultural heritage places listed on the Heritage Register of the Archaeological Inventory under the <i>Heritage Act 1995</i>.</p>	<p>Unknown.</p> <p>Outside the scope of this report.</p>

Implications

The criteria for an EES referral are outlined in the *Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978*. Based on the nature of the project and the localised extent of proposed impacts, from an ecological perspective, it is unlikely that an EES will be triggered based on ecological impacts alone as:

- None of the thresholds relating to any of the individual ecological criteria are likely to be exceeded; and,
- None of the thresholds relating to the combination of ecological criteria are likely to be exceeded.

7.4 Mineral Resources (Sustainable Development) Act 1990 (Victoria)

The proposal to expand the quarry requires a work plan variation to be developed and submitted to DEECA for approval. The proponent must address “*all necessary planning consents and approvals*” including Victoria’s native vegetation policy (DPI 2009).

The work plan variation is required to include a rehabilitation plan that outlines:

- Proposed land uses for the affected land after it has been rehabilitated;
- Post-quarrying landform(s) that will support the proposed land use(s);
- Key characteristics of the post-quarrying landform(s), having regard to the proposed post-quarrying land use(s);
- An outline of the practicality and achievability of the rehabilitated landform, including what resources will be required and their availability;
- An explanation of the activities involved in forming (e.g. blasting, dozing) the landform(s); and,
- Demonstration that the landform design considers threatening events such as fire, flood and drought.

7.4.1 Native Vegetation Removal (the Guidelines [DELWP 2017])

The study area is within Location 1, with 3.5 hectares of native vegetation broadly mapped within the study area. A native vegetation removal scenario was undertaken to determine the potential impact and offset implications, based on the entire removal of the estimated extent of native vegetation. The scenario relied on the modelled condition score for the Shrubby Foothill Forest and Damp Forest EVCs. Areas of planted vegetation were excluded from the impact assessment, as this vegetation falls under the *Planted vegetation* exemption in the table of exemptions listed in clause 52.17-7 of the Cardinia Planning Scheme.

The native vegetation removal scenario identified that the native vegetation removal is likely to fall within the Detailed Assessment Pathway, due to the extent of native vegetation removal and removal of Large Trees (i.e. greater than 0.5 hectares of native vegetation proposed to be removed, which includes several Large Trees) (Appendix 1).

The offset requirement for native vegetation removal is estimated to be around 2.60 General Habitat Units and include an estimate of 20 to 30 Large Trees. Based on a review of the Native Vegetation Credit Register (DEECA 2023f), there are seven offset sites within the Melbourne Water CMA and/or Cardinia Shire that currently meet the estimated offset requirement.

7.5 **Planning and Environment Act 1987 (Victoria)**

Environmental Significance Overlay (ESO1) covers the study area. The objective of ESO1 is to protect the hills located in the northern region of the shire, through the protection of vegetation, biolinks and ensuring that buildings and works do not have an adverse impact on the environmental or visual amenity values of the landscape.

A permit is required to remove any vegetation within an area covered by an ESO. The table of exemptions in clause 42.01-3 lists planted vegetation. Large portions of the study area contain planted vegetation within revegetated areas, which would be exempt from requiring a permit under the ESO1. Remaining areas of remnant native vegetation are not exempt, and therefore require a permit for removal.

The application requirements under the ESO1 list several items pertaining to ecology, which will be included in the detailed site assessment to inform the planning application. These include:

- Location of any hollow bearing trees;
- Location of existing vegetation and vegetation proposed to be removed;
- Description of the EVCs recorded and the extent of Large Trees to be removed; and,
- An avoid and minimise statement.

Implications

A permit is required to remove, destroy, or lop native vegetation, including dead native vegetation under clause 52.17. This does not apply:

- If the exemption table to Clause 52.17-7 specifically states that a permit is not required.
- The table to Clause 52.17-7 provides that the requirement to obtain a planning permit does not apply to:

‘Native vegetation that is to be removed, destroyed or lopped to the minimum extent necessary to enable the carrying out of extractive industry in accordance with a work plan approved under the Mineral Resources (Sustainable Development) Act 1990 and authorised by a work authority under that Act.’

Whilst Holcim does not hold an approved Work Plan for the quarry extension at this time, it will hold an approved Work Plan when it comes to remove the vegetation. On the basis that the Work Plan is approved, no planning permit under clause 52.17 will be required.

Environmental Significance Overlay – Schedule 1 Northern Hills

ESO1 (Clause 42.01) states a permit is required to carry out works, and to remove, destroy or lop any vegetation, including dead vegetation. However, Clause 42.01-3 Table of Exemptions, states that requirement to obtain a permit for vegetation removal does not apply to:

‘Vegetation that is to be removed, destroyed or lopped to the minimum extent necessary to enable the carrying out of extractive industry in accordance with a work plan approved under the Mineral Resources (Sustainable Development) Act 1990 and authorised by a work authority granted under that Act.’

Whilst Holcim does not hold an approved Work Plan for the quarry extension at this time, it will hold an approved Work Plan when it comes to remove the vegetation. On the basis that the Work Plan is approved, no planning permit under clause 42.01 will be required.

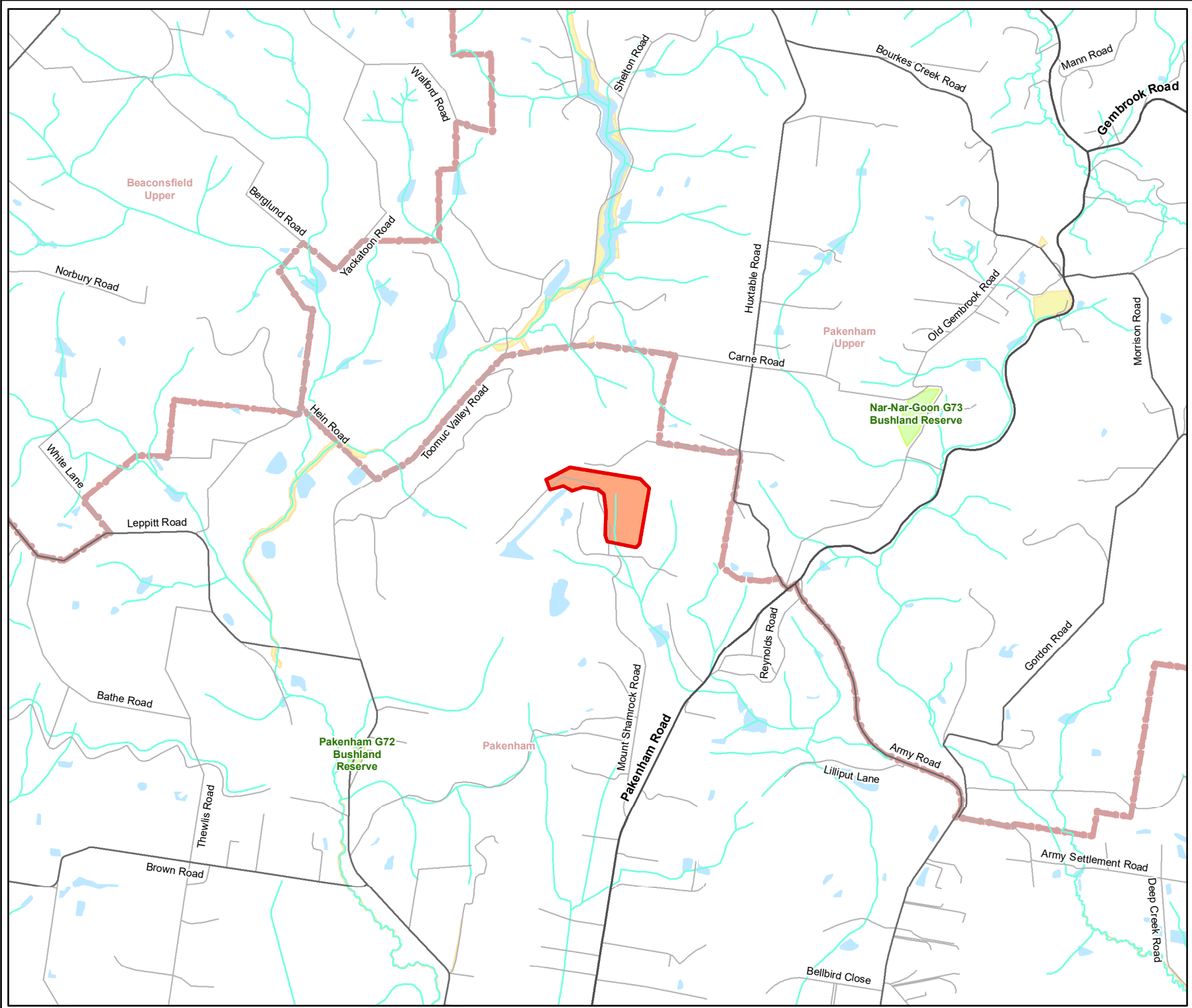
8 Recommendations

The following items are recommended to mitigate impacts on the ecological values observed within the study area, or likely to occur based on the presence of suitable habitat:

- Undertake targeted surveys for Gang-gang Cockatoo, Blue-winged Parrot, Southern Toadlet, Powerful Owl and Sooty Owl in April/May;
- Map and assess all Large Trees for the presence of hollows, including hollow size and evidence of use;
- Coordinate any future vegetation removal to avoid the key breeding season for fauna likely to occur within the study area;
- Complete detailed mapping of native vegetation within the study area; and,
- Review opportunities to avoid and/or minimise impacts to native vegetation and fauna habitat within the study area.

References

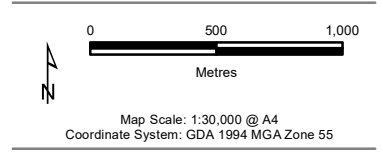
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- Legend**
- Study Area
 - Major Road
 - Collector Road
 - Minor Road
 - Minor Watercourse
 - Permanent Waterbody
 - Parks and Reserves
 - Crown Land
 - Localities



Figure 1
Location of the study area
Ecological Impact Assessment for the Mt Shamrock Quarry Extension, Mt Shamrock Road, Pakenham



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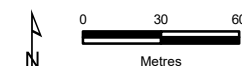
17386 Fig01_StudyArea 17/10/2023 dvaladares



- Legend**
- Study Area
 - Current Wetlands
 - Property Boundaries
 - Wombat Burrows
 - Waterbody
 - Planted vegetation
- Ecological Vegetation Classes**
- Damp Forest (EVC 29)
 - Shrubby Foothill Forest (EVC 45)



Figure 2
Ecological features
Ecological Impact Assessment for the Mt. Dandenong Quarry Extension, 10/11 Shamrock Road, Pakenham

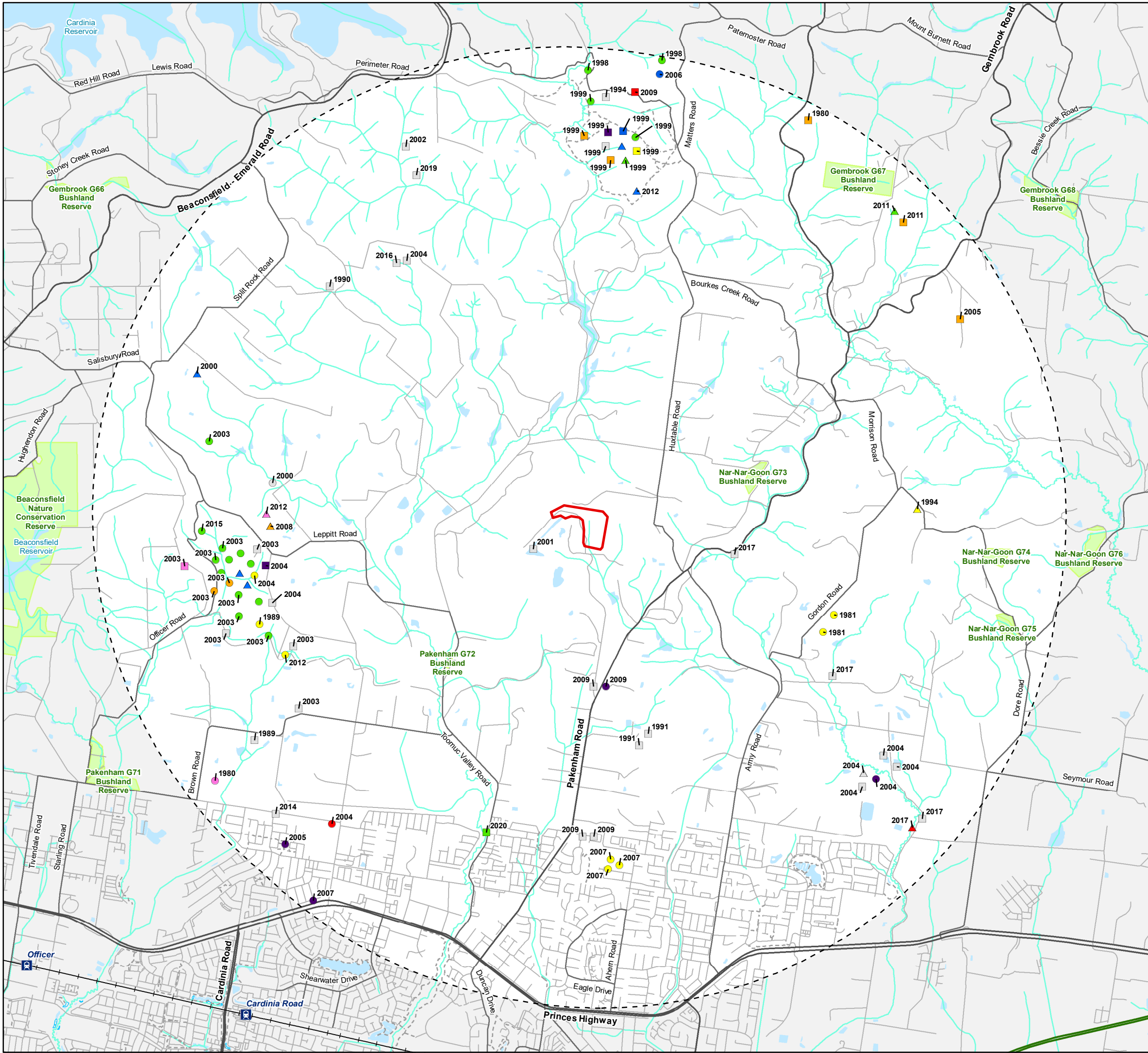


Map Scale: 1:2,900 @ A4
 Coordinate System: GDA 1994 MGA Zone 55



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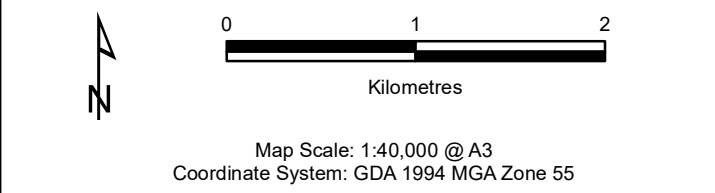
17386 Fig02_EcoFeat 17/10/2023 dvaldareis



- Legend**
- Study Area
- Significant flora**
- | | |
|------------------------------|-----------------------------|
| ○ Angahook Pink-fingers | ■ Mountain Bird-orchid |
| ● Austral Crane's-bill | ■ Mugga |
| ● Clover Glycine | ■ Powelltown Correa |
| ● Cobra Greenhood | ■ Red-tip Greenhood |
| ● Dandenong Wattle | ■ Slender Pink-fingers |
| ● Floodplain Fireweed | △ Southern Blue-gum |
| ● Forest Sedge | ▲ Spotted Gum |
| ● Giant Honey-myrtle | ▲ Spurred Helmet-orchid |
| ■ Green Scentbark | ▲ Swamp Bush-pea |
| ■ Large-leaf Cinnamon-wattle | ▲ Victorian Flat-pea |
| ■ Long Pink-bells | ▲ Wine-lipped Spider-orchid |
| | ▲ Winter Sun-orchid |



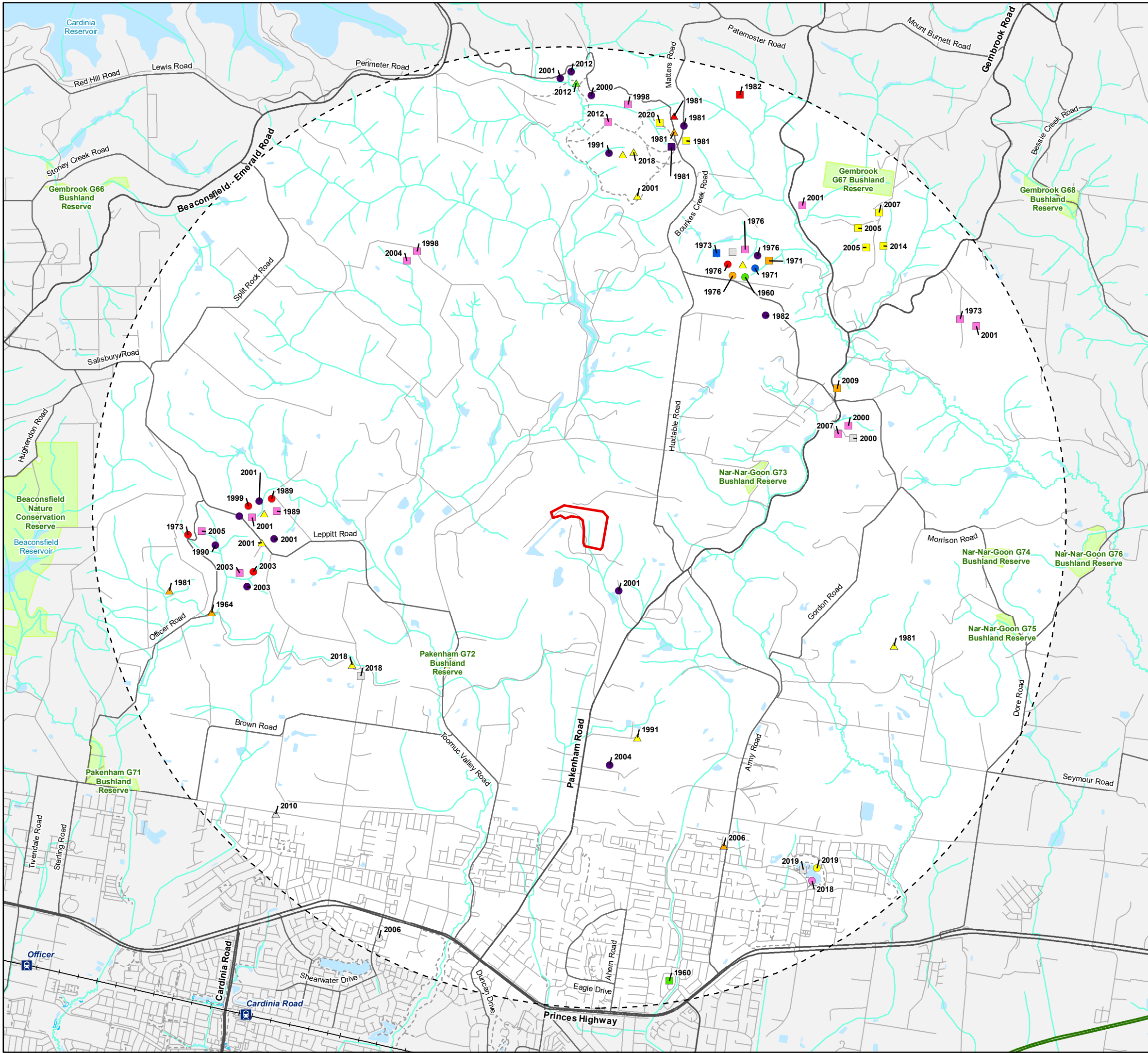
Figure 3
Previously documented significant flora within 5km of the study area
Ecological Impact Assessment for the Mt Shamrock Quarry Extension, Mt Shamrock Road, Pakenham



Victorian Biodiversity Atlas (VBA) // Sourced from: 'VBA_FLORA25', 'VBA_FLORA100', 'VBA_FAUNA25' and 'VBA_FAUNA100'. Updated September 2023 © The State of Victoria, Department of Energy, Environment and Climate Action. Records prior to 1949 not shown.

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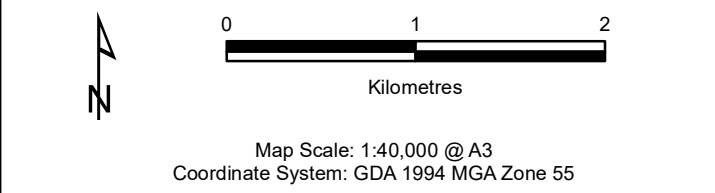
17386_Fig03_SigFlora_12/10/2023_dvaladras



- Legend**
- Study Area
- Significant fauna**
- Australian Little Bittern
 - Barking Owl
 - Black Falcon
 - Blue-billed Duck
 - Blue-winged Parrot
 - Chestnut-rumped Heathwren
 - Eastern Great Egret
 - Gang-gang Cockatoo
 - Hardhead
 - Helmeted Honeyeater
 - Hooded Robin
 - Lace Monitor
 - Murray Cod
 - Pilotbird
 - Powerful Owl
 - Sooty Owl
 - ▲ Southern Brown Bandicoot
 - ▲ Southern Greater Glider
 - ▲ Southern Toadlet
 - ▲ White-throated Needletail
 - ▲ Yellow-bellied Glider



Figure 4
Previously documented significant fauna within 5km of the study area
Ecological Impact Assessment for the Mt Shamrock Quarry Extension, Mt Shamrock Road, Pakenham



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17386_Fig04_SigFauna_12/10/2023_dvaladares

Appendix 1 – EnSym Scenario Report

Scenario test – native vegetation removal

This report provides offset requirements for internal testing of different proposals to remove native vegetation. **This report DOES NOT support an application to remove, destroy or lop native vegetation under Clause 52.16 or 52.17 of planning schemes in Victoria.** A report must be obtained from the Department of Environment, Land, Water and Planning (DELWP).

Date of issue: 17/10/2023

Time of issue: 2:18 pm

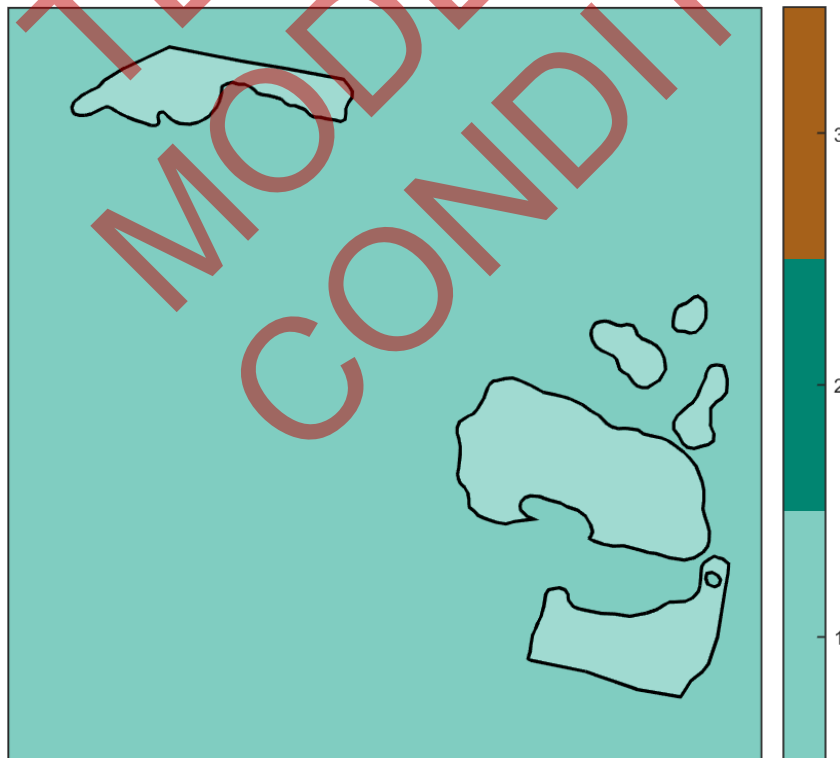
Report ID: Scenario Testing

Project ID	EHP17386_Pakenham_VG94
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Assessment pathway

Assessment pathway	Detailed Assessment Pathway
Extent including past and proposed	3.509 ha
Extent of past removal	0.000 ha
Extent of proposed removal	3.509 ha
No. Large trees proposed to be removed	0
Location category of proposed removal	Location 1 The native vegetation is not in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map), sensitive wetland or coastal area. Removal of less than 0.5 hectares in this location will not have a significant impact on any habitat for a rare or threatened species

1. Location map



Scenario test – native vegetation removal

Offset requirements if a permit is granted

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

General offset amount¹	2.540 general habitat units
Vicinity	Port Phillip and Westernport Catchment Management Authority (CMA) or Cardinia Shire Council
Minimum strategic biodiversity value score ²	0.413
Large trees	0 large trees

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

Appendix 1 includes information about the native vegetation to be removed

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

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

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

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

Scenario test – native vegetation removal

Next steps

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

This report DOES NOT support an application to remove, destroy or lop native vegetation under Clause 52.16 or 52.17 of planning schemes in Victoria.

If you wish to remove the mapped native vegetation you must submit the related shapefiles to the Department of Environment, Land, Water and Planning (DELWP) for processing, by email to ensymnvrtool.support@delwp.vic.gov.au. DELWP will provide a *Native vegetation removal report* that is required to meet the permit application requirements in accordance with *Guidelines for the removal, destruction or lopping of native vegetation* (Guidelines).

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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:

$$\text{Species habitat units} = \text{extent} \times \text{condition} \times \text{species landscape factor} \times 2, \text{ where the species landscape factor} = 0.5 + (\text{habitat importance score}/2)$$

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:

$$\text{General habitat units} = \text{extent} \times \text{condition} \times \text{general landscape factor} \times 1.5, \text{ where the general landscape factor} = 0.5 + (\text{strategic biodiversity value score}/2)$$

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	Modelled Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
1-A	Patch	hsf_0029	Least Concern	0	no	0.641	0.832	0.832	0.607		0.644	General
2-A	Patch	hsf_0029	Least Concern	0	no	0.707	1.635	1.635	0.568		1.359	General
3-B	Patch	hsf_0045	Least Concern	0	no	0.440	0.695	0.695	0.360		0.312	General
4-B	Patch	hsf_0045	Least Concern	0	no	0.631	0.052	0.052	0.360		0.034	General
5-B	Patch	hsf_0045	Least Concern	0	no	0.687	0.163	0.163	0.368		0.115	General
6-B	Patch	hsf_0045	Least Concern	0	no	0.579	0.132	0.132	0.360		0.078	General

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

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

Species common name	Species scientific name	Species number	Conservation status	Group	Habitat impacted	% habitat value affected
White Star-bush	<i>Asterolasia asteriscophora</i> subsp. <i>albiflora</i>	505647	Endangered	Dispersed	Habitat importance map	0.0043
Dandenong Wattle	<i>Acacia stictophylla</i>	505140	Rare	Dispersed	Habitat importance map	0.0031
Wine-lipped Spider-orchid	<i>Caladenia oenochila</i>	503694	Vulnerable	Dispersed	Habitat importance map	0.0030
Strzelecki Gum	<i>Eucalyptus strzeleckii</i>	504558	Vulnerable	Dispersed	Habitat importance map	0.0023
Swamp Bush-pea	<i>Pultenaea weindorferi</i>	502881	Rare	Dispersed	Habitat importance map	0.0013
Long Pink-bells	<i>Tetradlea stenocarpa</i>	503354	Rare	Dispersed	Habitat importance map	0.0012
Powelltown Correa	<i>Correa reflexa</i> var. <i>lobata</i>	505404	Rare	Dispersed	Habitat importance map	0.0012
Mountain Bird-orchid	<i>Chiloglottis jeansii</i>	504499	Rare	Dispersed	Habitat importance map	0.0008
Green Scentbark	<i>Eucalyptus fulgens</i>	505175	Rare	Dispersed	Habitat importance map	0.0007
Spurred Helmet-orchid	<i>Corybas aconitiflorus</i>	500835	Rare	Dispersed	Habitat importance map	0.0006
Green-striped Greenhood	<i>Pterostylis chlorogramma</i>	504728	Vulnerable	Dispersed	Habitat importance map	0.0006
Rough Daisy-bush	<i>Olearia asterotricha</i>	502300	Rare	Dispersed	Habitat importance map	0.0006
Large-leaf Cinnamon-wattle	<i>Acacia leprosa</i> var. <i>uninervia</i>	505141	Rare	Dispersed	Habitat importance map	0.0004
Cobra Greenhood	<i>Pterostylis grandiflora</i>	502798	Rare	Dispersed	Habitat importance map	0.0003
Wiry Bossiaea	<i>Bossiaea cordigera</i>	500435	Rare	Dispersed	Habitat importance map	0.0003
Lacy Wedge-fern	<i>Lindsaea microphylla</i>	502015	Rare	Dispersed	Habitat importance map	0.0003
Tufted Club-sedge	<i>Isolepis wakefieldiana</i>	501789	Rare	Dispersed	Habitat importance map	0.0003
Forest Phebalium	<i>Phebalium squamulosum</i> subsp. <i>squamulosum</i>	504817	Rare	Dispersed	Habitat importance map	0.0003
Southern Toadlet	<i>Pseudophryne semimarmorata</i>	13125	Vulnerable	Dispersed	Habitat importance map	0.0002

Velvet Apple-berry	<i>Billardiera scandens s.s.</i>	504290	Rare	Dispersed	Habitat importance map	0.0002
Grey Goshawk	<i>Accipiter novaehollandiae novaehollandiae</i>	10220	Vulnerable	Dispersed	Habitat importance map	0.0002
Masked Owl	<i>Tyto novaehollandiae novaehollandiae</i>	10250	Endangered	Dispersed	Habitat importance map	0.0001
Brickmaker's Sedge	<i>Gahnia grandis</i>	501390	Vulnerable	Dispersed	Habitat importance map	0.0001
Tremont Bundy	<i>Eucalyptus aff. goniocalyx (Dandenong Ranges)</i>	507008	Vulnerable	Dispersed	Habitat importance map	0.0001
Powerful Owl	<i>Ninox strenua</i>	10248	Vulnerable	Dispersed	Habitat importance map	0.0001
Lace Monitor	<i>Varanus varius</i>	12283	Endangered	Dispersed	Habitat importance map	0.0001
Winter Sun-orchid	<i>Thelymitra hiemalis</i>	505006	Endangered	Dispersed	Habitat importance map	0.0001
White-throated Needletail	<i>Hirundapus caudacutus</i>	10334	Vulnerable	Dispersed	Habitat importance map	0.0001
Greater Glider	<i>Petauroides volans</i>	11133	Vulnerable	Dispersed	Habitat importance map	0.0000
Clover Glycine	<i>Glycine latrobeana</i>	501456	Vulnerable	Dispersed	Habitat importance map	0.0000
Swamp Fireweed	<i>Senecio psilocarpus</i>	504659	Vulnerable	Dispersed	Habitat importance map	0.0000
Sooty Owl	<i>Tyto tenebricosa tenebricosa</i>	10253	Vulnerable	Dispersed	Habitat importance map	0.0000
Small Fork-fern	<i>Tmesipteris parva</i>	503405	Rare	Dispersed	Habitat importance map	0.0000
Parsley Xanthosia	<i>Xanthosia leiophylla</i>	504562	Rare	Dispersed	Habitat importance map	0.0000
Spot-tailed Quoll	<i>Dasyurus maculatus maculatus</i>	11008	Endangered	Dispersed	Habitat importance map	0.0000
Oval Fork-fern	<i>Tmesipteris ovata</i>	503404	Rare	Dispersed	Habitat importance map	0.0000

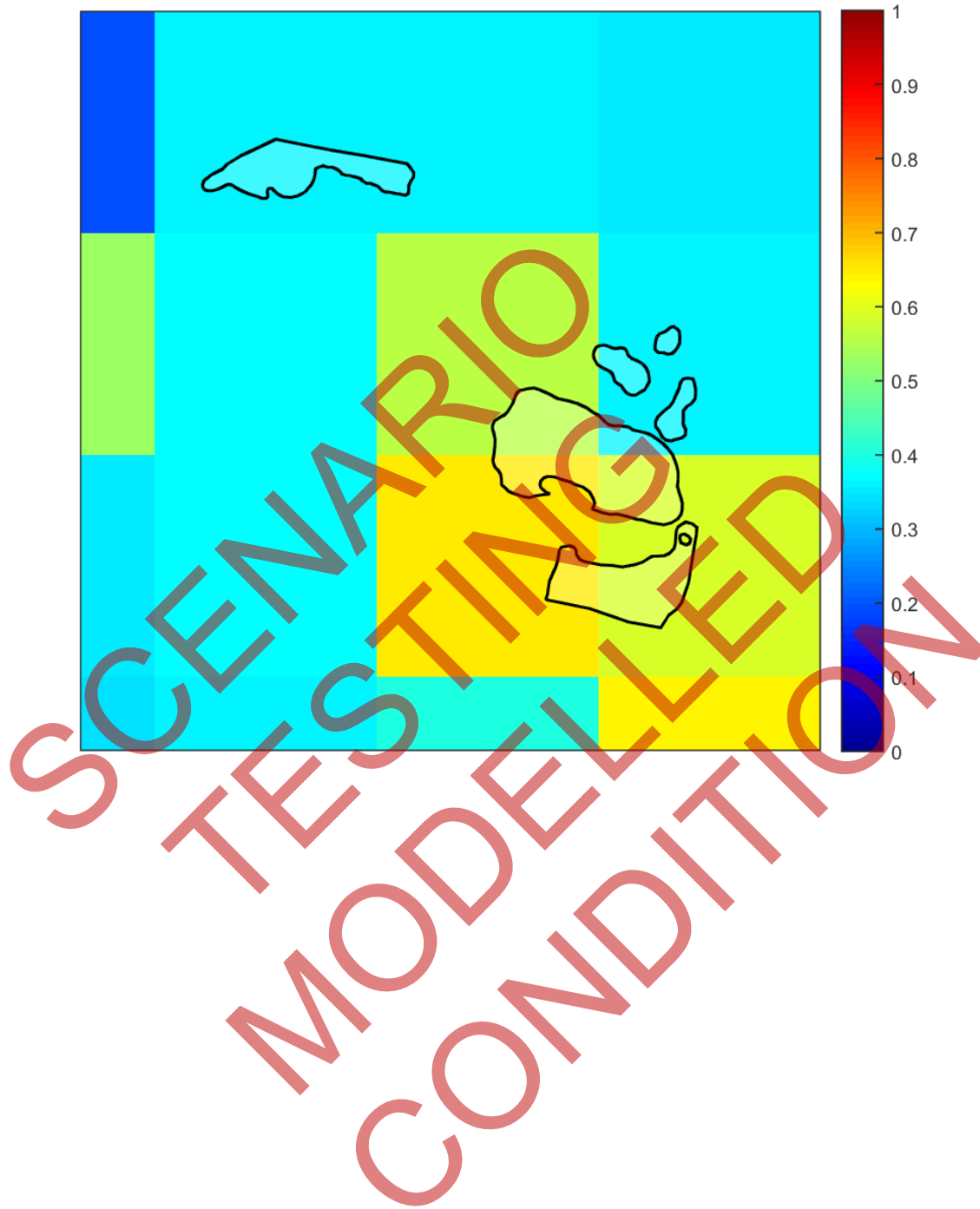
Habitat group

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

Habitat impacted

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

Appendix 3 – Images of mapped native vegetation
2. Strategic biodiversity values map



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