Final Report

Detailed Ecological Assessments for the Proposed Development at 750 Craigieburn Road E, Craigieburn, Victoria

Prepared for

Landream

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Ecology and Heritage Partners Pty Ltd

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SUMMARY

Ecology and Heritage Partners Pty Ltd was commissioned by Landream to conduct a detailed ecological assessments of of 750 Craigieburn Road E, Craigieburn, Victoria as part of the proposed industrial development of the site. This assessment was undertaken to identify and characterise the vegetation on-site and determine the presence (or likelihood thereof) of any significant flora and fauna species and/or ecological communities. Impacts to native vegetation, state offsets and targeted survey results will be discussed in the context of this study area.

The ecological assessment, to determine the presence of native vegetation and threatened species, was undertaken between November 2019 and February 2020, with details outlined in the following sections.

Methods

Biodiversity Assessment

A flora and fauna assessment was undertaken on 17 December 2019 to obtain information on terrestrial flora and fauna values within the study area. A habitat hectare assessment was undertaken in conjunction with the flora survey. Vegetation within the study area was assessed according to the habitat hectare methodology, which is described in the Vegetation Quality Assessment Manual.

Matted Flax-lily and Curly Sedge Targeted Surveys

Targeted flora surveys for Matted Flax-lily *Dianella amoena* and Curly Sedge *Caustis recurvata* were undertaken between 20 November 2019 and 23 December 2019. Areas identified as supporting suitable habitat were traversed, with surveys conducted along transect lines approximately five metres apart, or as dictated by the density of existing grasses and weeds. The location of all plants was recorded during the survey with a handheld GPS (accuracy of +/- 5 metres).

Golden Sun Moth Targeted Survey

Targeted surveys for Golden Sun Moth *Synemon plana* were undertaken on 28 November 2019, 9, 17 and 23 December 2019 by Ecologists experienced in the detection and identification of the species. Surveys concentrated on areas identified as supporting native grassland, as well as non-native areas comprising scattered occurrences of Kangaroo Grass *Themeda triandra*

Transects were identified and walked in any potential habitat present within the study area over a minimum of four separate days . Surveys were conducted in accordance with approved methodology identified within the Biodiversity Precinct Planning Kit and according to the Survey Guidelines for the species. Areas of confirmed habitat were identified.

Growling Grass Frog Targeted Survey

Growling Grass Frog *Litoria raniformis* targeted surveys were conducted on two separate occasions along Malcolm Creek a period when the species is known to be active. Call playback and spotlighting occurred at night on the 6 February and 10 February 2020, along Malcolm Creek and the adjoining dam.

Results

Melbourne Strategic Assessment

The northern section of the study area is also within the Biodiversity Conservation Strategy (BCS) area and is subject to the *Environmental Mitigation Levy Act 2019*. Offsets and Habitat Compensation fees associated with the removal of native vegetation, Matted Flax-lily, Golden Sun Moth and Growling Grass Frog habitat within the BCS equate to an estimated $1,017,602.15.

Flora

Patches of low-moderate quality Plains Grassland Ecological Vegetation Class (EVC) were recorded during the field assessment and patches of vegetation within the study area representative of Plains Grassland was consistent with State significant Western (Basalt) Plains Grassland (WBPG) community. Despite systematic targeted surveys within the current study area (during the known flowering period for the species), no Matted Flax-Lilly or Curly Sedge was detected during the targeted surveys.

Fauna

One significant fauna species (Golden Sun Moth) was recorded during the field assessment. Growling Grass Frog was not recorded within the study area and habitat quality for the species was considered poor.

Golden Sun Moth

Targeted surveys for Golden Sun Moth were undertaken and a total of 290 Golden Sun Moths were recorded within the study area. There is 11.53 hectares of suitable Golden Sun Moth habitat within the study area that is not already subject to assessments under the BCS.

Other EPBC Act-listed fauna species

No Growling Grass Frog were recorded within the study area during the targeted surveys.

Legislative Implications

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

Golden Sun Moth was recorded in the study area and the proposed development would impact 11.53 hectares of known habitat for the species.

Given that the project will result in a significant impact on matters of National Environmental Significance under the EPBC Act, a referral to the Commonwealth Minister of the Environment assessment under the Act will be required.

SUMMARY OF APPLICATION REQUIREMENTS

Table S1. Application requirements for a permit to remove native vegetation under the Detailed Assessment Pathway (*Victoria Planning Provisions* Clause 52.17 -3; DELWP 2017a)

No.	Application Requirement	Response
1	Information about the native vegetation to be removed, including: • The assessment pathway and reason for the assessment pathway. • A description of the native vegetation to be removed. • Maps showing the native vegetation and property in context. • The offset requirements that will apply if the native vegetation is approved to be removed.	Within NVR report – Appendix 3
2	Topographic and land information relating to the native vegetation to be removed.	Refer to Section 1 and Figure 1.
3	Recent dated photographs of the native vegetation to be removed.	Refer to Section 3.1 of this report.
4	Details of any other native vegetation that was permitted to be removed on the same property with the same ownership as the native vegetation to be removed, where the removal occurred in the five-year period before the application to remove native vegetation is lodged.	Refer to 3.1
5	An avoidance and minimise statement.	Refer to Section 5.3
6	A copy of any property vegetation plan that applies to the site.	Not applicable.
7	Where the removal of native vegetation is to create defendable space, a written statement explaining why the removal of native vegetation is necessary. This is not required when the creation of defendable space is in conjunction with an application under the Bushfire Management Overlay	Not applicable
8	If the application is under Clause 52.16, a statement that explains how the proposal responds to the Native Vegetation Precinct Plan	Not applicable – the application does not fall under Clause 52.16 covered by a Native Vegetation Precinct Plan
9	An offset statement explaining than an offset that meets the offset requirements for the native vegetation to be removed has been identified and how it will be secured	Are likely to be available for purchase form a third party – see Section 5.3.3
Additional application requirements for applications in the Detailed Assessment Pathway		
10	A site assessment report of the native vegetation to be removed, including: • A habitat hectare assessment of any patches of native vegetation, including the condition, extent (in hectares), Ecological Vegetation Class and bioregional conservation status. • The location, number, circumference (in centimetres measured at 1.3 metres above ground level) and species of any large trees within patches. • The location, number, circumference (in centimetres measured at 1.3 metres above ground level) and species of any scattered trees, and whether each tree is small or large.	Refer to Section 3 and Appendix 1 of this report and the NVR Report – Appendix 3
11	Information about impacts on rare or threatened species habitat, including: • The relevant section of the Habitat importance map for each rare or threatened species requiring a species offset. • For each rare or threatened species that the native vegetation to be removed is habitat for, according to the Habitat importance maps:	Within NVR report – Appendix 3

No.	Application Requirement	Response
	- the species' conservation status - the proportional impact of the removal of native vegetation on the total habitat for that species - whether their habitats are highly localised habitats, dispersed habitats, or important areas of habitat within a dispersed species habitat	
Requirements under the Biodiversity Conservation Strategy		
12	The northern section of the study area is also within the Biodiversity Conservation Strategy (BCS) area and is subject to the Environmental Mitigation Levy Act. Offsets and Habitat Compensation fees associated with the removal of native vegetation, Matted Flax-lily, Golden Sun Moth and Growling Grass Frog habitat within the BCS equate to an estimated $1,017,602.15.	Pay offset amount (levy) to DELWP MSA team before commencing any works within the land parcel. Refer to Section 3.5 of this report.

1 INTRODUCTION

1.1 Background

Ecology and Heritage Partners Pty Ltd was commissioned by Landream to conduct an Detailed Ecological Assessments at 750 Craigieburn Road E, Craigieburn, Victoria (Figure 1).

The purpose of the assessment is to identify the extent and type of remnant native vegetation present within the study area and identify the presence of significant flora and fauna species and/or ecological communities. As well as the identification of habitat for significant flora and fauna species, targeted surveys were also conducted as part of this investigation.

This report presents the results of the ecological assessment and targeted survey and discusses the potential ecological and legislative implications associated with the proposed action. The report also provides recommendations to address or reduce impacts and, where necessary, highlights components that require further investigation.

Additionally, as parts of the study area are also within the Biodiversity Conservation Strategy (BCS) area, Levy payments (offsets) will be required for these areas.

1.2 Objectives

The objectives of the detailed ecological assessment were to:

- Review the relevant flora and fauna databases and available literature;
- Conduct a field assessment to identify flora and fauna values within the study area;
- 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 legislation;
- Undertaken targeted flora and fauna surveys (Growling Grass Frog, Golden Sun Moth, Matted Flax-lily and Curly Sedge);
- Advise whether any additional flora and/or fauna surveys are required prior to works commencing; and,
- Undertake an assessment of the offset requirements under the BCS.

Where areas of remnant vegetation were present, a habitat hectare assessment was completed to quantify the quality and extent of any areas of remnant native vegetation present within the study area.

1.3 Study Area

The study area is located between 750 Craigieburn Road E, Craigieburn, Victoria, approximately 25 kilometres north of Melbourne's CBD (Figure 1).The study area is bound by Craigieburn Road E to the south and is intersected by the Hume Freeway which runs east-west through the centre of the study area.

The landscape generally flat with a mix of remnant native vegetation, grazed land and crosses the Malcolm Creek. Merri Creek makes up the eastern border of the study area and is part of a conservation area under the Biodiversity Conservation Strategy (BCS).

According to the Department of Environment, Land, Water and Planning (DELWP) Native Vegetation Information Management (NVIM) Tool (DELWP 2021a), the study area occurs within the Victorian Volcanic Plain bioregion. It is located within the jurisdiction of the Port Philip and Westernport Catchment Management Authority (CMA) and is within the Hume City 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 DELWP NVIM Tool (DELWP 2021a) and NatureKit (DELWP 2021b) for:
    - Modelled data for location category, remnant vegetation patches, scattered trees and habitat for rare or threatened species; and,
    - The extent of historic and current EVCs.
- EVC benchmarks (DELWP 2021c) for descriptions of EVCs within the relevant bioregion;
- The Victorian Biodiversity Atlas (VBA) for previously documented flora and fauna records within the project locality (DELWP 2020);
- The Commonwealth Department of the Agriculture, Water and the Environment (DAWE) Protected Matters Search Tool (PMST) (DAWE 2020a) for matters of National Environmental Significance (NES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- The VicPlan Online Tool (DELWP 2021d) to ascertain current zoning and environmental overlays in the study area;
- Relevant listings under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act), including the latest Threatened and Protected Lists (DELWP 2019a, 2019b);
- Other relevant environmental legislation and policies as required;
- Aerial photography of the study area; and,
- Previous ecological or other relevant assessments of the study area.

2.2 Field Assessments

2.2.1 Flora Assessment

A flora assessment was undertaken between on 17 December 2020 to obtain information on flora and fauna values within the study area. The study area was walked, with all observed vascular flora and fauna species recorded, any significant records mapped and the overall condition of vegetation and habitats noted. Ecological Vegetation Classes (EVCs) were determined with reference to DELWP pre-1750 and extant EVC mapping and their published descriptions (DELWP 2021c).

Where remnant vegetation was identified a habitat hectare assessment was undertaken following methodology described in the Vegetation Quality Assessment Manual (DSE 2004).

2.2.2 Targeted Surveys

2.2.2.1 Matted Flax-lily *Dianella amoena*

Matted Flax-lily is listed as Endangered under the EPBC Act, threatened under the FFG Act and Endangered on the Advisory List for Threatened Flora in Victoria (DEPI 2014).

Matted Flax-lily is a perennial, tufted, mat-forming lily which can form patches of up to five metres wide. The plant can grow vegetatively, through sending underground rhizomatous roots, which rise above the ground with a tiller of several leaves, spread over a distance from the parent plant.

Plate 1. Matted Flax-lily flowering at a reference site (Ecology and Heritage Partners Pty Ltd 19/02/2018).

The leaves of the Matted Flax-lily are generally glaucous, blue in colour but may be red at the base and usually but not always having small hooks (teeth) along the margins and midrib. The leaves taper to approximately 45 centimetres long depending on site and climatic conditions and are borne on tillers with the leaves arranged alternatively, with several leaves per tiller. Matted Flax-lily generally flowers between November and February but may continue flowering with summer and autumn rains. It has pale blue to violet flowers with bright yellow stamens and berries, which are generally purple in colour. The flowers and berries are born on culms extending to typically 30 centimetres in height but this may alter depending on plant location and season (DSE 2010a).

The Matted Flax-lily generally occurs in grassland and grassy woodland habitats, on well drained to seasonally wet fertile sandy loams to heavy cracking clay soils derived from Silurian or Tertiary sediments, or from volcanic geology (DSE 2010a).

Targeted flora surveys for Matted Flax-lily were undertaken between 20 November 2019 and 23 December 2019 and surveys. The study area was systematically traversed in areas of potential habitat at approximately five-metre linear intervals in accordance with the survey guidelines for Matted Flax-lily outlined in the *Biodiversity Precinct Structure Planning Kit* (DSE 2010b). Although the study area does not occur in a Precinct Structure Plan area to which the guidelines generally apply, they are considered 'best practice' guidelines for conducting Matted Flax-lily Surveys. Targeted surveys were directed to all potential habitat (i.e. native and non-native grasslands including degraded areas, and fence lines). Any Matted Flax-lily plants identified were recorded with a GPS with a five-metre accuracy.

It is recommended that the optimal time to conduct Matted Flax-lily surveys is during the flowering season which generally occurs between late spring to early summer (DSE 2010b).

2.2.3 Fauna Assessment

Fauna assessments were undertaken between 20 November 2019 and 10 February 2020 to obtain information on terrestrial fauna values within the study area. The study area was visually assessed and active searching 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.

2.2.4 Targeted Surveys

2.2.4.1 Growling Grass Frog *Litoria raniformis*

Growling Grass Frog is listed as endangered in Victoria (DELWP 2019a) and vulnerable nationally (DAWE 2020b). It is also listed as a threatened taxon under the EPBC Act and the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act). Overall the species is of national conservation significance.

Although formerly widely distributed across southern eastern Australia, including Tasmania (Littlejohn 1963, 1982; Hero *et al.* 1991), the species has declined markedly across much of its former range. This has been most evident over the past two decades and in many areas, particularly in south and central Victoria, populations have experienced apparent declines and local extinctions (Mahony 1999; Organ pers. obs.).

Plate 2. Growling Grass Frog (Source: Ecology and Heritage Partners Pty Ltd)

The species is largely associated with permanent or semi-permanent still or slow flowing waterbodies (i.e. streams, lagoons, farm dams and old quarry sites), supporting an extensive cover of emergent, submerged and floating vegetation (Robertson *et al.* 2002; Organ 2003). This species is also known to inhabit temporarily inundated waterbodies for breeding purposes providing they contain water over the breeding season (Organ 2003).

There is sub-optimal habitat for this species occurring along Malcolm Creek, and artificial the artificial dam connected to the creek (Figure 8). Targeted surveys were undertaken on 6 February and 10 February 2020.

2.2.4.2 Golden Sun Moth *Synemon plana*

Golden Sun Moth (GSM) is listed as Vulnerable under the EPBC Act and the FFG Act.

The species typically occurs in native grassland and grassy woodland habitats dominated by greater than 40% cover of wallaby grass *Rytidosperma* spp. (DSE 2004b), but may also inhabit areas dominated by Kangaroo Grass (Endersby and Koehler 2006) and introduced grassland dominated by Chilean Needle-grass and other introduced species (A. Organ pers. obs.).

Male flight is typically low, to about one metre above the ground, fast and can be prolonged, but they are generally not recorded flying more than 100 metres from suitable habitat (Clarke and O'Dwyer 1999). The male of this species generally flies between 10am and 3pm on calm, warm (over 20°C), sunny days.

Plate 3. Golden Sun Moth (Ecology and Heritage Partners Pty Ltd).

Prior to European settlement, the Golden Sun Moth was widespread and relatively continuous throughout its range, inhabiting grassy open woodlands and grassland, although it now mainly inhabits small isolated sites (DSE 2004). The species is threatened by habitat loss, disturbance and fragmentation due to agricultural expansion and urbanisation. Many populations are isolated and fragmented, impeding the ability of the relatively immobile females to recolonise areas, thereby reducing the likelihood of genetic exchange (DSE 2004). Such populations are therefore vulnerable as there is little likelihood of recolonisation in the event of a local extinction.

Most of the study area supports habitat comprising areas of Plains Grassland vegetation. Areas of vegetation outside of Plains Grassland are dominated by non-native flora, predominantly Toowoomba Canary-grass and Serrated Tussock *Nassella neesiana*, neither of which are known to also provide suitable habitat for the threatened Golden Sun Moth.

Surveys for Golden Sun Moth were undertaken in accordance with the recommended survey guidelines detailed in the significant impact guidelines for the species (DEWHA 2009), and the *Biodiversity Precinct Planning Structure Kit* (DSE 2010b).

Targeted surveys for Golden Sun Moth were undertaken on 28 November 2019 and 9, 17 and 23 December 2019 by Zoologists experienced in the detection and identification of the species. Surveys concentrated on areas identified as supporting native grassland, as well as non-native areas comprising scattered occurrences of wallaby grasses (Figure 6).

Areas of suitable habitat were walked by qualified zoologists over at least four separate days during the known flight season (i.e. November to early January). Surveys were undertaken at a time which is considered suitable for detecting the species (i.e. when adult males are flying), and when Golden Sun Moth were recorded fyling at nearby sites. The male of this species generally flies between 11am and 3pm on calm, warm (over 20°C), sunny days.

Surveys were undertaken during weather conditions suitable for detecting the species (i.e. between 10am and 3pm on warm (over 20°C by 10am) days with minimal cloud cover and still conditions), with 10 to 50-metre wide parallel transects surveyed across all areas of suitable habitat.

2.3 Guidelines for the Removal of Native Vegetation (Guidelines)

Under the *Planning and Environment Act 1987* (P&E Act), Clause 52.17 of the Planning Schemes requires a planning permit from the relevant local Council to remove, destroy or lop native vegetation. The assessment process for the clearing of vegetation follows the 'Guidelines for the removal, destruction or lopping of native vegetation' (the Guidelines) (DELWP 2017b). The '*Assessor's handbook – applications to remove, destroy or lop native vegetation'* (Assessor's handbook) (DELWP 2018) provides clarification regarding the application of the Guidelines.

2.3.1 Assessment Pathway

Guidelines manage the impacts on biodiversity from native vegetation removal (DELWP 2017b). The assessment pathway for an application to remove native vegetation reflects its potential impact on biodiversity and is determined from the location and extent of the native vegetation to be removed. The location risk (1, 2 or 3) has been determined for all areas in Victoria and is available on DELWP's Native Vegetation Information Management (NVIM) Tool (DELWP 2021a). Determination of assessment pathway is summarised in Table 1.

Table 1. Assessment pathways for applications to remove native vegetation (DELWP 2017b)

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

Notes: Large trees include trees within a patch or a large scattered tree. The extent of native vegetation is in hectares and includes the extent of any patches and scattered trees proposed to be removed and the extent of 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 2) is assessed using two key parameters: extent (in hectares) and condition. Extent is determined through a field assessment. The condition score Detailed pathway must be assessed through a habitat hectare[1] assessment conducted by a qualified ecologist. The condition score for Basic and Intermediate pathways may be based on either modelled data available on the NVIM Tool (DELWP 2021a), or through a habitat hectare assessment.

[1] A 'habitat hectare' is a unit of measurement which combines the condition and extent of native vegetation.

Table 2. Determination of remnant native vegetation (DELWP 2017b)

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 (15m 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 Offsets

Offsets are required to compensate for any permitted removal of native vegetation. The section of the study area located outside of the BCS will be assessed under the Detailed Assessment Pathway under Clause 52.17.

2.4 Assessment Qualifications and Limitations

Data and information held within the ecological databases and mapping programs reviewed in the desktop assessment (e.g. VBA, PMST, NatureKit etc.) are unlikely to represent all flora and fauna observations within, and surrounding, the study area. It is therefore important to acknowledge that a lack of documented records does not necessarily indicate that a species or community is absent.

Ecological values identified on site are recorded using a hand-held GPS or tablet with an accuracy of +/-5 metres. This level of accuracy is considered adequate 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 targeted surveys for all species listed above were conducted within the peak flowering period and fauna activity periods using the appropriate survey methods.

3 RESULTS

3.1 Vegetation Condition

3.1.1 Remnant Patches

Remnant native vegetation in the study area is representative of Plains Grassland (EVC 132_61). The presence of this EVC is generally consistent with the modelled pre-1750s native vegetation mapping (DELWP 2021a). The remainder of the study area comprises introduced and planted vegetation, present as windrows and exotic grassland.

Plains Grassland

Plains Grassland is located throughout the study area within paddocks and estimated to be in low-moderate condition at the time of assessment. However, due to the study area being grazed by livestock prior to and during the assessment the extent and condition of native grassland patches was difficult to determine. Plains Grassland within the study area was typically dominated by wallaby grass *Rytidosperma* spp. (Plate 4) Other native species include spear grass *Austrostipa* spp., Kangaroo Grass *Themeda triandra*, Slender Bindweed *Convolvulus angustissimus*.

Plate 4. Plains Grassland (PG1) within the study area (Ecology and Heritage Partners Pty Ltd 17/12/2019).

Plate 5. Plains Grassland (PG1) within the study area (Ecology and Heritage Partners Pty Ltd 17/12/2019).

Patches of grassland north of Craigieburn Road was predominantly represented by wallaby grass cover between 25% and 75% (Plate 5) with grassland patches south of Craigieburn Road exhibiting a higher percentage of Kangaroo Grass as a component of the understory strata. Patches of Plains Grassland within the study area were recorded with varying levels of the WoNS listed Artichoke thistle (Plate 6).

Plate 6. Modified Plains Grassland (PG1) within the study area (Ecology and Heritage Partners Pty Ltd 17/12/2019).

Habitat zone PG1 satisfies the condition thresholds that defines the State significant Western (Basalt) Plains Grassland (WBPG) community. Given the effects of grazing pressures observed during the field assessment it is recommended that grazing is halted and additional assessment be undertaken after a period of significant growth of Plains Grassland patches to determine the presence of the nationally significant Natural Temperate Grasslands of the Victorian Volcanic Plain (NTGVVP) ecological community.

3.2 Introduced and Planted Vegetation

3.2.1 Planted Vegetation

Areas of planted windrow dominated by exotic Pine *Pinus spp.* were present adjacent to the internal roads within the study area (Plate 7).

3.2.2 Introduced Vegetation

Areas not supporting remnant native vegetation have a high cover (>80%) of exotic grass species. Scattered native grasses are generally present in these areas, however they did not have the required 25% relative cover to be considered a remnant patch.

Disturbed areas were dominated by environmental weeds such as Toowoomba Canary-grass *Phalaris aquatica*, Rye-grass *Lolium* spp., Large Quaking Grass *Briza maxima* and Brome *Bromus* spp. Weeds of National Significance (WoNS) Serrated Tussock *Nassella trichotoma*, Gorse *Ulex europaeus* and Chilean Needle-Grass *Nassella neesiana* were scattered throughout the study area with several large patches of Gorse also present (Plate 8).

Plate 7. Planted vegetation within the study area (Ecology and Heritage Partners Pty Ltd 17/12/2019).

Plate 8. Introduced Vegetation within the study area (Ecology and Heritage Partners Pty Ltd 17/12/2019).

3.3 Fauna Habitat

3.3.1 Native and Introduced Grasslands

The study area consists of native and introduced grasslands which are used as a foraging resource by common generalist bird species that are tolerant of modified grassland areas. Native fauna observed using this habitat included; Australian Magpie *Cracticus tibicen*, Little Raven *Corvus mellori*, Magpie-lark *Grallina cyanoleuca*, Willie Wagtail *Rhipidura leucophrys* and Nankeen Kestrel *Falco cenchroides*. Introduced species recorded were Common Myna *Acriodtheres tristis* and Common Blackbird *Turdus merula*.

Patches of native grassland occur within the study area and vary in quality and floristic composition. Habitat attributes of the native grassland are suitable for an array of common native fauna, including snakes, lizards, skinks and grassland birds.

Areas of native grassland, particularly those with a high cover of wallaby-grasses *Rytidosperma* spp. and Spear Grasses *Austrostipa* spp., as well as the introduced Chilean Needle Grass *Nassella neesiana* provided habitat for the nationally significant Golden Sun Moth, which was recorded throughout most of the study area. Cracking clay soils were present, particularly within the Plains Grassland EVC and may provide sheltering habitat for a range of reptiles and small mammals.

3.4 Removal of Native Vegetation (the Guidelines)

3.4.1 Vegetation proposed to be Removed

In accordance with the Guidelines (2017b), the assessment pathway for a permit for the removal of native vegetation is determined by the extent of native vegetation and the modelled location category where native vegetation is proposed to be removed (Table 3).

The study area is within Location 2 and 8.099 hectares of native vegetation is proposed to be removed. As such, the permit application falls under the Detailed Assessment pathway.

Table 3. Determination of the assessment pathway under the Guidelines (DELWP 2017a).

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

As the application falls under the Detailed Assessment Pathway, condition scores for vegetation proposed to be removed are based on a habitat hectare assessment (DELWP 2018). Habitat hectare scores and the location, number, circumference and species of scattered trees are provided in Appendix 1.

Table 4. Removal of Native Vegetation (the Guidelines)

Assessment pathway	Detailed
Total Extent	8.099
Remnant Patch (ha)	8.099
Scattered Trees (no.)	0
Large Trees within patches (no.)	0
Location Risk	2

3.4.2 Offset Targets

The offset requirement for the native vegetation removal is 1.628 GHU's for the preferred alignment (Table 5).

A summary of proposed vegetation losses and associated offset requirements is presented in Table 5 and the NVR Report is presented in Appendix 3.

Table 5. Offset targets

General Offsets Required	1.628 GHU's
Specific Offsets Required	0
Large Tree Offsets Required	0
Vicinity (catchment / LGA)	Port Philip and Westernport CMA / Hume City Council
Minimum Strategic Biodiversity Score*	0.461

Note: GHU = General Habitat Units

3.5 Biodiversity Conservation Strategy

The study area is located within the Melbourne Strategic Assessment (MSA) area, and any development is subject to approval conditions in accordance with the Biodiversity Conservation Strategy (BCS) (DEPI 2013a).

The BCS and associated sub-regional species' strategies (DEPI 2013b; 2013c; 2013d; DSE 2009) identify conservation outcomes and offset consolidation strategies for Victoria's native vegetation and Matters of National Environmental Significance (MNES) under the EPBC Act, including mechanisms for how these outcomes will be delivered. The BCS covers Melbourne's four growth corridors within the expanded 2010

Urban Growth Boundary, as well as 28 precincts under the 2005 Urban Growth Boundary, except where a planning scheme amendment to introduce a Precinct Structure Plan has been approved prior to 1 March 2012.

To facilitate the planning approvals process for Melbourne's growth areas, the Victorian Government has introduced the 'Time Stamping' project (DSE 2009). This project captures, and 'time stamps' native vegetation information within Melbourne's urban growth areas. This data can then be used to calculate native vegetation offsets for future development, and to prepare Native Vegetation Precinct Plans (NVPPs) for these areas.

Classes of actions associated with urban development in most of the land in Melbourne's growth corridors have been approved under Section 146B of the EPBC Act by the Commonwealth Environment Minister (Minister). The approval was made in relation to the western, north-western and northern growth corridors on 5 September 2013.

The study area is located within the northern growth corridor. The Commonwealth approvals are subject to conditions, which included the former Habitat Compensation Obligations (HCO) and the restriction of urban development in identified conservation areas.

3.6 Melbourne Strategic Assessment (Environment Mitigation Levy) Act 2020

The Melbourne Strategic Assessment (Environment Mitigation Levy) Act 2020 (MSA Act) established a Victorian legislative framework for the existing Melbourne Strategic Assessment (MSA) program. It imposes a levy to fund mitigation measures for impacts on biodiversity caused by the development of Melbourne's growth corridors.

The environmental mitigation levies, as set out in the MSA Act, replaces the Biodiversity Conservation Strategy Habitat Compensation Obligations (HCO) fee system. The conservation outcomes that the MSA program has committed to deliver do not change.

The liability to pay an MSA Levy is triggered when a levy event occurs within the levy area. The only levy events are the:

- Issue of a Statement of Compliance for a plan of subdivision (i.e. subdivision of land),
- The certification of a plan of subdivision submitted under section 35 of the *Subdivision Act 1998*,
- Application for a building permit for the construction of a building,
- Approval of a work plan under the Mineral Resources (Sustainable Development) Act 1990,
- Approval of a variation of a work plan under the Mineral Resources (Sustainable Development) Act 1990,
- Construction of utility infrastructure on Crown land,
- Construction of a road on Crown land (MSA 2020).

Any relevant event, undertaken in the levy area, will trigger a levy liability. The liability is triggered regardless of who undertakes the activity.

The northern section of the study area is within the Biodiversity Conservation Strategy (BCS) area. In this case the Environmental Mitigation Levy Act is applicable, which requires the payment of Levy amounts for habitat removal (Figure 3; Table 6).

3.6.1 Habitat Compensation (Levy amounts)

Levy amounts associated with the removal of native vegetation and fauna habitat under the BCS are calculated with the following considerations (current as at 1 July 2021). Levy amounts are no longer subject to GST:

Native vegetation (DEPI 2013a):

- Offsets for patches of native vegetation will be based on the extent of Time Stamping data, with all native vegetation considered to be Very High conservation significance.
- Clearance of native vegetation will invoke an offset fee $136,688.00 per hectare cleared.

Matted Flax-lily (DEPI 2013a):

- All native vegetation patches within the northern growth area and the Outer Metropolitan Ring Transport Corridor will invoke a compensatory habitat fee of $11,625.00 per hectare cleared to cover the cost of securing and managing conservation reserves for Matted Flax-lily. This is additional to the abovementioned offset for clearance of native vegetation.

Golden Sun Moth (DEPI 2013b):

- All habitat within the northern, north-western and western growth areas and the Outer Metropolitan Ring Transport Corridor (native and non-native grassland and woodlands) and excluding any areas identified as Growling Grass Frog habitat will be deemed to be "confirmed habitat". However only non-native habitat will invoke a compensatory habitat fee as fees for native habitat have been built into the price of native vegetation offsets. All non-native habitat cleared will invoke a compensatory habitat fee of $12,773.00 per hectare cleared.

Growling Grass Frog (DEPI 2013c):

- All land within the northern, north-western, western and south-eastern growth areas and the Outer Metropolitan Ring Transport Corridor mapped as Category 1 or 2 habitat will invoke a compensatory habitat fee of $8,257.00 per hectare cleared to cover the cost of establishing and managing the Growling Grass Frog corridors as set out in the Sub-regional Species Strategy.

Scattered Trees (DEPI 2013a):

- All large old trees and scattered trees not mapped as native vegetation will invoke a compensatory fee of $18,999 per tree cleared.

In accordance with the Commonwealth approval conditions of the BCS made on 11 September 2014, there are no further assessments required to comply with the existing approval provided the relevant Levy amounts relating to the sections of the study area that fall within the BCS are met.

3.6.2 Levy amounts applicable to the study area

Under the BCS a total Habitat compensation Obligations fee of approximately $1,017,602.15 will apply to the study area. This comprises:

- $601,700.58 for the removal of 4.402 hectares of native vegetation;

- $51,173.25 for the removal of 4.402 hectares of Matted Flax-lily;
- $10,499.41 for the removal of 0.822 hectares of Golden Sun Moth habitat;
- $107,241.92 for the removal of 12.988 hectares of Growling Grass Frog habitat; and,
- $246,987.00 for the removal of 13 scattered trees.

A summary of the Habitat compensation fees associated with removal of flora and fauna habitat within the study area are summarised in Table 6.

Table 6. Habitat Compensation Obligations for the proposed development within the BCS.

Habitat Compensation Fees Applicable to the Study Area			
	Costs under BCS per hectare	Total (hectares/number)	Offset cost
Native Vegetation	$136,688.00	4.402	$601,700.58
Matted Flax-lily	$11,625.00	4.402	$51,173.25
Golden Sun Moth	$12,773.00	0.822	$10,499.41
Growling Grass Frog	$8,257.00	12.988	$107,241.92
Scattered Tree	$18,999.00	13	$246,987.00
TOTAL			**$1,017,602.15**

Landream will be responsible for meeting all Levy amounts across the entire land parcel. Levies are payable to DELWP prior to removal of vegetation or habitats.

3.6.3 Environment Mitigation Levy

On 16 October 2019, the Melbourne Strategic Assessment (Environment Mitigation Levy) Bill 2019 was introduced to the Victorian Parliament. The Bill provides for a legislative framework to support the collection of the Environment Mitigation Levy that is expected to be in effect by 1 July 2020. This is in accordance with the Melbourne Strategic Assessment (MSA) Report and the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

3.7 Significance Assessment

3.7.1 Flora

One FFG listed flora species (Slender Bindweed *Convolvulus angustissimus subsp. omnigracilis*) was recorded within the study area during the field assessment.

The VBA contains records of six nationally significant and 45 State significant flora species previously recorded within 10 kilometres of the study area (DELWP 2020) (Appendix 1.2; Figure 4). The PMST nominated an additional 12 nationally significant species which have not been previously recorded but have the potential to occur in the locality (DAWE 2020a). Most records are confined to existing conservation reserves and creek lines within the local area, including recent (post- 2010) records for the nationally significant Matted Flax-lily *Dianella amoena* (Figure 4). There is one record (2004) of Matted Flax-lily within the study area. Targeted surveys did not locate this individual.

Of these species, there is potential habitat within the study area for one flora species of national significance (Matted Flax-lily) (Table 7) and eight species of State significance (Elongate Woodruff *Asperula charophyton,* Curly Sedge *Carex tasmanica,* Australia Crane's-bill *Geranium solanderi var. solanderi s.s.,* Large-flower Crane's Bill *Geranium sp. 1,* Pale-flower Crane's-bill *Geranium sp. 3,* Purple Blown-grass *Lachnagrostis punicea subsp. punicea,* Basalt Tussock-grass *Poa labillardierei var. (Volcanic Plains),* Black Roly-poly *Sclerolaena muricata var. muricata*).

Table 7. Nationally significant flora species with the potential to occur within the study area.

Common Name	Scientific Name	Habitat
National Significance		
Matted Flax-lily	*Dianella amoena*	There are 175 records of Matted Flax-lily recorded in the VBA within 10 kilometres of the study area. There is suitable habitat within Plains Grassland EVCs found across the study area, however no individuals were identified during the targeted surveys.

3.7.2 Targeted Survey Results

Targeted flora surveys were undertaken for Matted Flax-lily and Curly Sedge. No individuals were recorded within the study area.

3.7.3 Fauna

The VBA contains records of 12 nationally significant, 30 State significant and 13 regionally significant fauna species previously recorded within 10 kilometres of the study area (DELWP 2020) (Appendix 2; Figure 5). The PMST nominated an additional 13 nationally significant species which have not been previously recorded but have the potential to occur in the locality (DAWE 2020a). Of these species, there is suitable habitat within the study area for multiple fauna species including national and state significant species.

All areas surveyed within the study area (including areas with a high cover of wallaby grass), provide known habitat for the nationally significant Golden Sun Moth. There is potential habitat for Growling Grass Frog within the study area however targeted surveys did not identify the species along Malcolm Creek.

Additional state significant species which may use the study area include Tussock Skink *Pseudemoia pagenstecheri.* A range of State significant birds [e.g. Australasian Shoveler *Anas rhynchotis* Blue-billed Duck

Oxyura australis, Eastern Great Egret *Ardea modesta* and Freckled Duck *Stictonetta naevosa*] may also infrequently visit the study area to forage or when moving to areas of more suitable habitat.

All other significant fauna species are considered to have a low likelihood or unlikely to occur within the study area (Appendix 2).

Table 8. Nationally significant fauna species with the potential to occur within the study area.

Common Name	Scientific Name	Habitat
National Significance		
Growling Grass Frog	*Litoria raniformis*	There are 275 records of Growling Grass Frog within 10 kilometres of the study area, according to the VBA (2018d). Sub-optimal habitat along the Malcolm Creek occurs in the study area, however targeted surveys did not identify any individuals (Figure 8).
Golden Sun Moth	*Synemon plana*	There were observations 290 Golden Sun Moth within the study area recorded by Ecology and Heritage Partners. A total of 11.53 hectares of suitable habitat proposed to be impacted by the potential development (Figure 7).

3.7.4 Targeted Survey Results

Targeted surveys were undertaken for Golden Sun Moth between 28 November and 23 December 2019. Results relating to the Golden Sun Moth targeted surveys are detailed in Section 3.6.7.

Targeted surveys for Growling Grass Frog were undertaken on 6 February and 10 February 2020 to determine species presence within the study area, and any implications under relevant legislation (i.e. EPBC Act). No Growling Grass Frog were identified within the study area.

3.7.5 Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoEE 2017):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia; and,
- Natural Temperate Grassland of the Victorian Volcanic Plain
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains
- White Box-Yellow Box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Vegetation within the study area representative of Plains Grassland was consistent with State significant Western (Basalt) Plains Grassland (WBPG), an open grassland vegetation present on poorly-drained heavy clay soils within the basalt plains of western Victoria. The vegetation is characteristically dominated by perennial native grasses, with very few eucalypts and shrubs.

Several patches of Plains Grassland within the study area are likely to meet the condition thresholds that define the nationally significant vegetation community, Natural Temperate Grassland of the Victorian Volcanic Plain. However, the presence of this community could not be accurately determined / confirmed at the time of the assessment due to recent grazing activities.

3.7.6 Flora

Although the targeted surveys were undertaken during the known flowering period when the species were known to be flowering within the locality, neither Matted Flax-lily or Curly Sedge were identified within the study area. One other significant flora species (Slender Bindweed *Convolvulus angustissimus subsp. omnigracilis*) was detected within the study area during the surveys

3.7.7 Fauna

Targeted surveys for Golden Sun Moth were undertaken and a total of 290 individuals were recorded within the study area (Table 9, Figure 6).

Table 9. Golden Sun Moth survey results

Date	Survey times	Temperature (°C) *	Wind (km/hr) Direction *	Cloud cover (%)	Days since rain *	No. GSM
28/11/2019	13:05 – 13:30	22.3	11 S	5	2	86
9/12/2019	10:20 – 11:20	30.3	10 N	25	7	109
17/12/2019	13:10 – 14:45	27.6	10 ESE	0	2	94
23/12/2019	12:30 – 14:00	20.1	13 SSE	15	7	1

Note. *Bureau of Meteorology (BOM) weather for Melbourne Airport, Victoria (Station 086282 – November & December 2019), Australian Government, ACT

Growling Grass Frog (Malcolm Creek) targeted surveys were also undertaken in February 2020. A summary of the survey results and weather data is provided in Table 10 and the survey locations presented in Figure 8.

Table 10. Growling Grass Frog survey results

Date	Survey times	Ambient Temperature (°C) *	Wind (km/hr) Direction *	Cloud cover (%)	Number of GGF	Other species
06/02/2020	21:00 - 22.30	16	9 WNW	40	0	No observations
10/02/2020	21:00 - 22.30	18	Calm	70	0	No observations

Note. * Bureau of Meteorology (BOM) weather for Melbourne Airport, Victoria (Station 086282 – February 2020), Australian Government, ACT

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 (i.e. project, development, undertaking, activity, or series of activities) that are likely to have a significant impact on matters of national environmental significance (NES), or on Commonwealth land. An action, unless otherwise exempt, requires approval from the Commonwealth Environment Minister if it is considered likely to have an impact on any matters of National Environmental Significance (NES).

For species listed under the EPBC Act, a 'significant impact' is defined as an impact which is important, notable, or of consequence, having regard to its context or intensity (DoE 2013). If an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is affected, and upon the intensity, duration, magnitude and geographic extent of the impacts. Importantly, for a 'significant impact' to be 'likely', it is not necessary for a significant impact to have a greater than 50% chance of happening; it is sufficient if a significant impact on the environment is a real or not remote chance or possibility (DoE 2013).

4.1.1 Flora

No Matted Flax-lily or Curly Sedge were recorded within the study area despite surveys conducted during the appropriate season for these species. According to the significant impact criteria for critically endangered ecological communities (DoE 2013), an action is likely to be significant where there is a real chance or possibility that it will reduce the extent of the ecological community.

4.1.2 Fauna

Targeted surveys for Golden Sun Moth were undertaken in the Summer 2019 flying season and a total of 290 Golden Sun Moth were recorded within the study area (Table 9, Figure 6). This comprised 11.53 hectares of GSM suitable habitat proposed within the study area. According to the significant impact criteria for critically endangered ecological communities (DoE 2013), an action is likely to be significant where there is a real chance or possibility that it will impact >0.5 hectares of contiguous habitat greater than 10 hectares.

Targeted surveys (February 2020) in potential habitat within the study area did not record Growling Grass Frog (Figure 8).

4.1.3 Implications

Given that matters of NES (i.e. Golden Sun Moth) will be significantly impacted by the proposed works, an EPBC Act referral will be submitted to the Commonwealth Minister of the Environment and Energy for the proposed impacts to matters of NES.

4.2 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' listed and/or protected flora species, listed vegetation communities and listed fish species in areas of public land (i.e. within road

reserves, drainage lines and public reserves). 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.

There is suitable habitat within the study area for several species listed or protected under the FFG Act. However, these areas are within private property, as such a permit under the FFG Act is not required.

4.3 Planning and Environment Act 1987 (Victoria)

The Planning and Environment Act 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 require a planning permit from the relevant local Council to remove, destroy or lop native vegetation on a site of more than 0.4 hectares, unless an exemption under clause 52.17-7 of the Victorian Planning Schemes applies or a subdivision is proposed with lots less than 0.4 hectares[2]. Local planning schemes may contain other provisions in relation to the removal of native vegetation (Section 4.3.1).

4.3.1 Local Planning Schemes

The study area is located within the Hume City Council municipality. The following zoning and overlays apply (DELWP 2021d, 2018f):

- Industrial Zone – Schedule 3 (IN3Z)
- Urban Growth Zone (UGZ)
- Bushfire Prone Area
- Environmental Significance Overlay – Schedule 2 (ESO2)
- Environmental Significance Overlay – Schedule 10 (ESO10)

4.3.2 Implications

Environmental Significance Overlay – Schedule 2 (ESO2)

The ESO2 of the Hume City Council Planning Scheme aims to protect and conserve the Merri Creek and to discourage inappropriate use and development. This overlay applies to the all areas of the study area that are adjacent to Merri Creek. No application requirements are specified for this ESO.

Environmental Significance Overlay – Schedule 10 (ESO10)

The ESO10 of the Hume City Council Planning Scheme aims to prevent a decline in the extent and quality of native vegetation and native fauna habitat of the Victorian Volcanic Plain.

Application Requirements:

- A description of any proposed disturbance of surface soil or rocks associated with the proposal.

[2] In accordance with the Victorian Civil and Administrative Tribunal's (VCAT) decision Villawood v Greater Bendigo CC (2005) VCAT 2703 (20 December 2005) all native vegetation is considered lost where proposed lots are less than 0.4 hectares in area and must be offset at the time of subdivision.

- The total extent of vegetation on the property and the extent of native vegetation proposed to be removed, lopped or destroyed.
- A description of the steps that have been taken to avoid and minimise the removal of native vegetation including the practicality of alternative options which do not require removal of the native vegetation.
- A flora and fauna assessment of the land prepared by a suitably qualified and experienced person to the satisfaction of the responsible authority. The assessment must include:
    - A flora and fauna survey
    - A habitat hectare assessment
    - Identification of the vegetation and habitat significance of the property
    - A description of the effect of the proposed development in relation to other areas of native vegetation or native fauna habitat, including any proposed conservation reserves, streams and waterways
- A land and environmental management plan prepared by a suitably qualified person identifying as appropriate:
    - Any proposals for revegetation, including proposed species, and ground stabilisation;
    - How any vegetation removal will be offset (an offset plan), in accordance with Victoria's Guidelines for the removal, destruction or lopping of native vegetation (DELWP 2017);
    - Weed management, including species to be targeted and proposed management techniques, and;
    - Pest animal management, including species to be targeted and proposed management techniques

4.3.2.1 Relevant Exemptions

Planted vegetation in the study area native to Victoria is exempt from planning permit requirements under Clause 52.17-7 (Table of Exemptions) as it is planted on private land for amenity purposes (DELWP 2018).

4.3.3 Requirements

The study area is within Location 2 and 8.099 hectares of native vegetation is proposed to be removed. As such, the permit application falls under the Detailed Assessment pathway.

A Planning Permit from Hume City Council is required to remove, destroy or lop any native vegetation. In this instance, the application will be referred to DELWP as the application is within the Detailed Assessment Pathway.

Matters of National Environmental Significance were recorded in the study area during the initial biodiversity assessment and targeted surveys. A referral to the Commonwealth Environment Minister is therefore required as part of the proposed development.

4.4 Wildlife Act 1975 and Wildlife Regulations 2013 (Victoria)

The *Wildlife Act 1975* (and associated Wildlife Regulations 2013) is the primary legislation in Victoria providing for protection and management of 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 P&E Act. 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.

4.5 Catchment and Land Protection Act 1994 (Victoria)

The *Catchment and Land Protection Act 1994* (CaLP Act) contains provisions relating to catchment planning, land management, noxious weeds and pest animals. Landowners are responsible for the control of any infestation of noxious weeds and pest fauna species to minimise their spread and impact on ecological values.

Weeds listed as noxious under the CaLP Act were recorded during the assessment (Chilean Needle-grass, Serrated Tussock and Gorse). A Weed Management Plan and a pest fauna eradication plan may be required.

4.6 Melbourne Strategic Assessment

In accordance with the Commonwealth approval conditions of the BCS made on 5 September 2013, provided the relevant MSA Levies relating to the project area are met and the action is in accordance with the BCS, typically, there are no further assessments required (i.e. native vegetation surveys, or targeted surveys for significant species) to comply with this existing approval or further approvals under the BCS.

The levies for the study area have been calculated based on an updated cost model for the delivery of mitigation measures required by the Commonwealth approval and associated conditions.

4.6.1 Implications

Development within the MSA program area is subject to Habitat Compensation Obligation fees in accordance with the BCS. A breakdown of the Levy fees for the study area is provided above (Table 6) and total $1,017,602.15.

5 IMPACT AND MITIGATION MEASURES

5.1 Likely and Potential Impacts

The study area is within Location 2 and 8.099 hectares of native vegetation is proposed to be removed. As such, the permit application falls under the Detailed Assessment pathway.

A Planning Permit from Hume City Council is required to remove, destroy or lop any native vegetation. In this instance, the application will be referred to DELWP as the application is within the Detailed Assessment Pathway. State offset requirements are detailed in Section 3.4.

Matters of National Environmental Significance were recorded in the study area during the biodiversity assessment and targeted surveys. A referral to the Commonwealth Environment Minister is therefore required as part of the proposed development.

5.2 Best Practice Mitigation Measures

Recommended measures to mitigate impacts upon terrestrial and aquatic values present within the study area may 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 within wetlands 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. Habitat Zones (areas of sensitivity) should be included as a mapping overlay on any construction plans;
- Removal of any habitat trees or shrubs (particularly hollow-bearing trees) should be undertaken between February and September to avoid the breeding season for most of 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;
- Where possible, construction stockpiles, machinery, roads, and other infrastructure should be placed away from areas supporting native vegetation and/or wetlands;
- Ensure that best practice sedimentation and pollution control measures are undertaken in accordance with Environment Protection Authority guidelines (EPA 1991; EPA 1996; 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.

In addition to these measures, the following documents should be prepared and implemented prior to any construction activities:

- Construction Environmental Management Plan (CEMP). The CEMP should include specific species/vegetation conservation strategies, daily monitoring, sedimentation management, site specific rehabilitation plans, weed and pathogen management measures, etc.;
- Significant Species Offset Management Plan. This will need to be prepared as part of the EPBC Act approvals for the project.
- An Offset Strategy under the Guidelines (DELWP 2017b)

5.3 Avoid and Minimise Impacts

5.3.1 Avoid and Minimise Statement

Under the Guidelines (DELWP 2017b), the three-step approach (avoid, minimise, offset) is the key policy in relation to the removal of native vegetation to achieve no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation. Efforts to avoid the removal of, and minimise the impacts on, native vegetation should be commensurate with the biodiversity and other values of the native vegetation and focused on areas of native vegetation that have the most value. Areas of native vegetation to be retained must be able to maintain the same values in the future and should not be degraded over time by a proposed use or development associated with the removal.

The feasibility of retaining land north of Malcolm Creek is currently being investigated with Hume City Council and DELWP. Areas north of the creek are modelled to contain patches of native vegetation and Golden Sun Moth habitat.

5.3.2 Offset Strategy

To meet the state offset requirements, the proponent may elect to secure offsets on-site, as "first party" offsets or to protect equivalent native vegetation elsewhere as "third-party" offsets.

The applicant has state offset requirements for 1.628 General Habitat Units within the study area. Native vegetation offsets will be required from the Port Phillip and Westernport CMA / Moorabool Shire Council and Melton City Council as part of the Planning Permit Application (Clause 52.17 of the Planning Schemes).

5.3.3 Offset Estimate

General Offsets Required	1.628 General HUs
Large Trees	0
Vicinity (catchment / LGA)	Port Phillip and Westernport CMA
Minimum Strategic Biodiversity Value*	0.461

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 11. Further requirements associated with development of the study area

Relevant Legislation	Implications	Further Action
Environment Protection and Biodiversity Conservation Act 1999	Matters of National Environmental Significance were recorded in the study area during the field surveys. A referral to the Commonwealth Environment Minister is therefore required as part of the proposed development	Prepare and submit an EPBC Act referral.
Flora and Fauna Guarantee Act 1988	There is suitable habitat within the study area for several species listed or protected under the FFG Act. However, these areas are within private property, as such a permit under the FFG Act is not required.	No further action required.
Planning and Environment Act 1987	The study area is within Location 2 and 8.099 hectares of native vegetation is proposed to be removed. As such, the permit application falls under the Detailed Assessment pathway. A Planning Permit from Hume City Council is required to remove, destroy or lop any native vegetation. In this instance, the application will be referred to DELWP as the application is within the Detailed Assessment Pathway. The northern section of the property is partially covered by a Bushfire Management Overlay.	Prepare and submit a Planning Permit application.
Catchment and Land Protection Act 1994	Several weed species listed under the CaLP Act were recorded within the study area. To meet requirements under the CaLP Act, listed noxious weeds should be appropriately controlled throughout the study area.	Planning Permit conditions are likely to include a requirement for a Weed Management Plan.
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.
Melbourne Strategic Assessment Area (MSA)	The study area falls partially within the Environmental Mitigation Levy Act area and the Biodiversity Conservation Strategy. Levy amounts apply for the removal of native vegetation (4.402 hectares), 13 scattered trees, Matted Flax-lily (4.402 hectares), Golden Sun Moth habitat (0.822 hectares) and Growling Grass Frog habitat (12.988 hectares).	Pay Levy amount fees totalling approximately **$1,017,602.15.**

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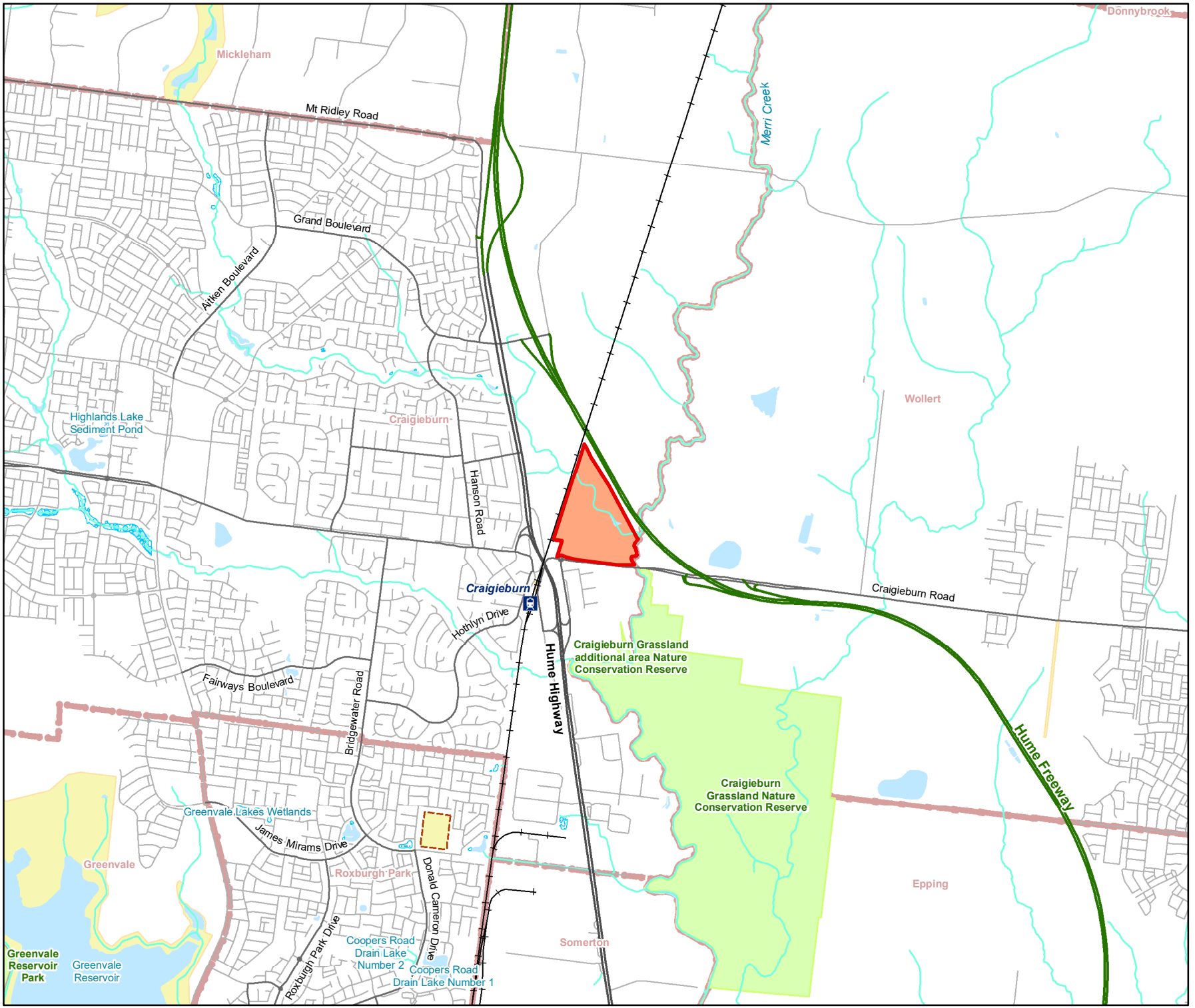
FIGURES



Legend

- Study Area
- Railway
- Freeway
- Major Road
- Collector Road
- Minor Road
- Minor Watercourse
- Permanent Waterbody
- Land Subject to Inundation
- Wetland/Swamp
- Parks and Reserves
- Commonwealth Land
- Crown Land
- Localities

Figure 1

Location of the study area

Ecological surveys for the proposed development along Craigieburn Road East, Craigieburn

N

0 500 1,000

Metres

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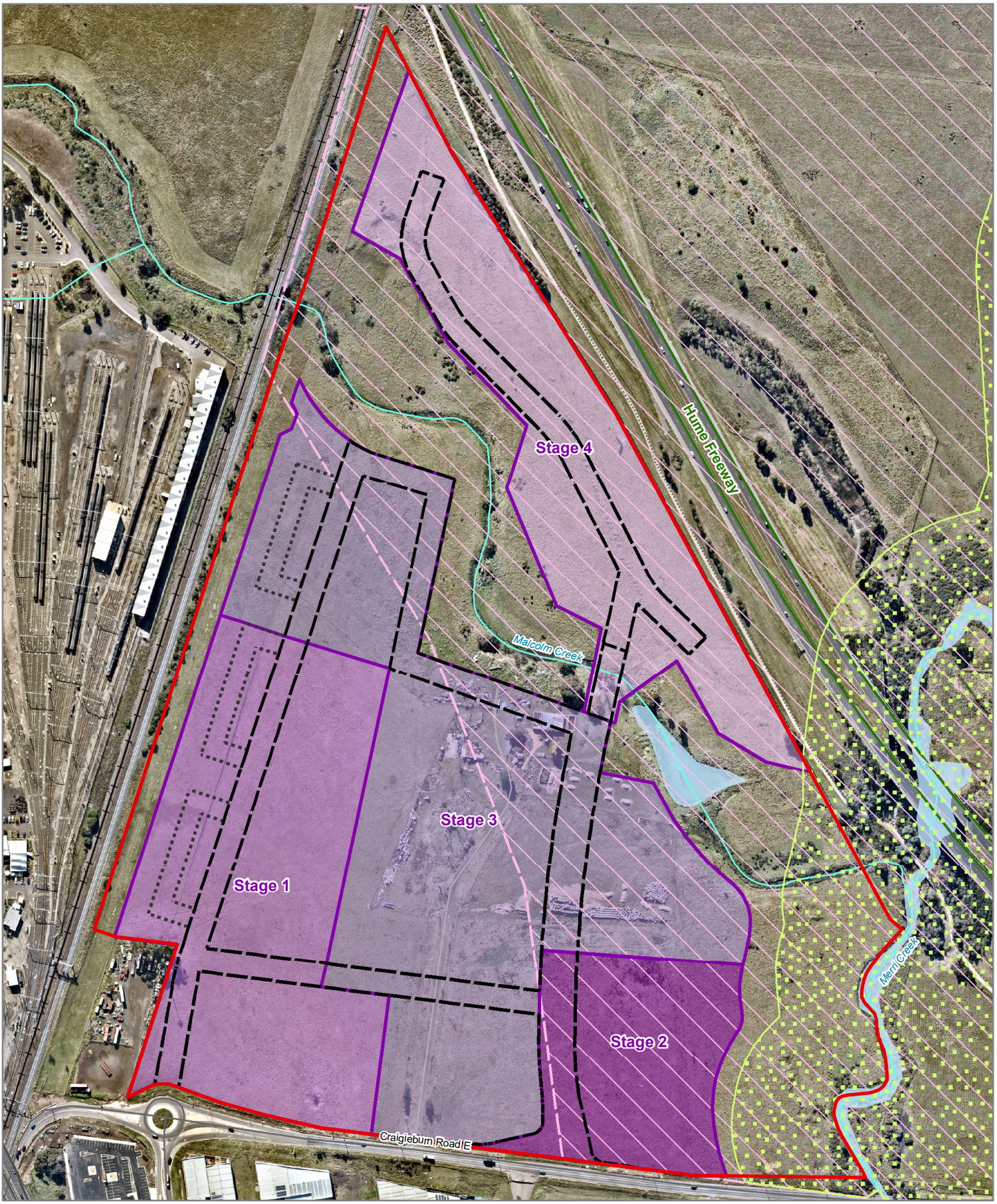

Figure 2

Ecological features

Ecological surveys for the proposed development along Craigieburn Road East, Craigieburn

Legend

- Study Area
- MSA BCS Extent
- BCS Conservation Area
- Stage boundary
- Main loop road
- Access road

N

0 45 90

Metres

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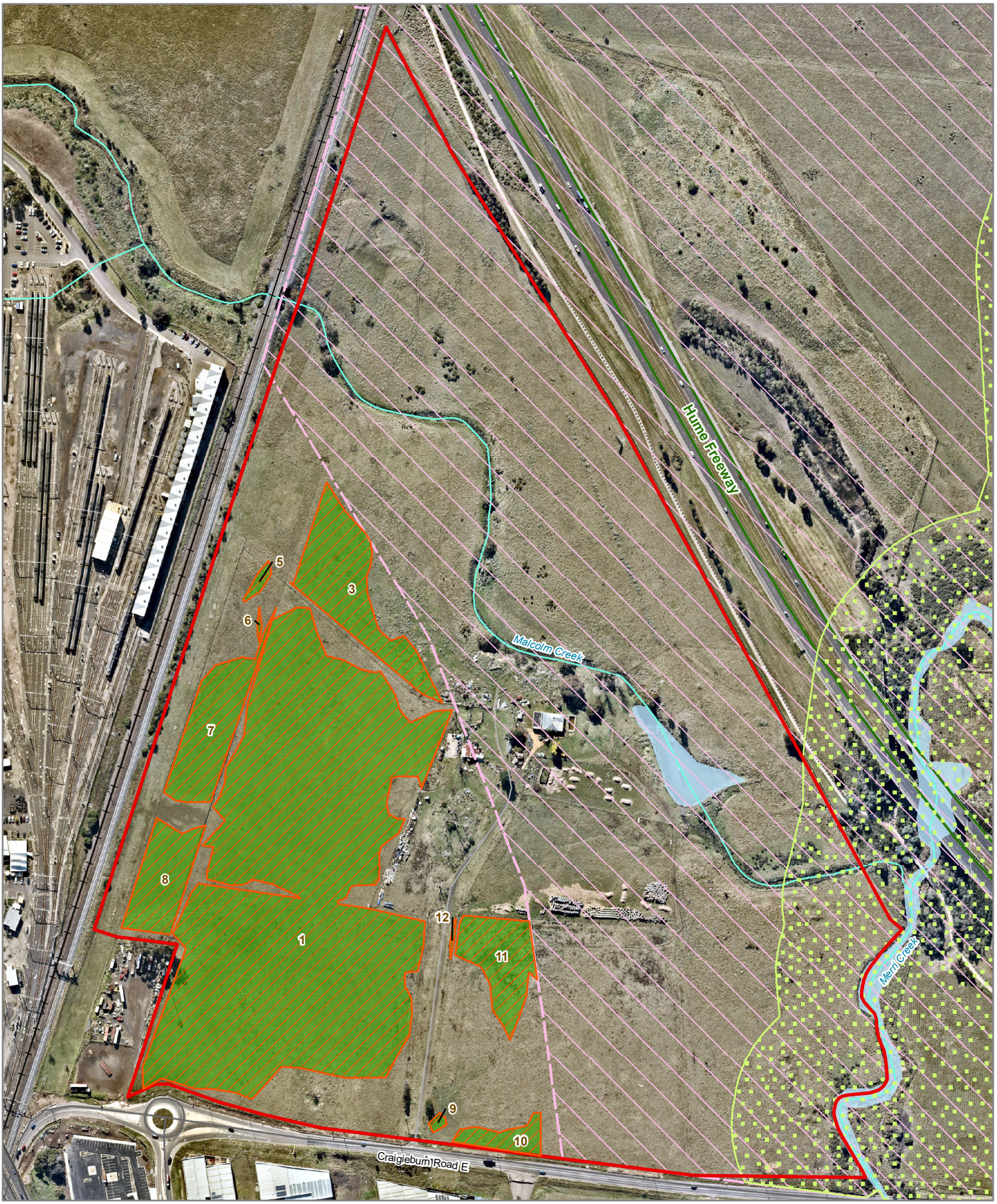

Figure 3

Ecological features

Ecological surveys for the proposed development along Craigieburn Road East, Craigieburn

Legend

- Study Area
- MSA BCS Extent
- BCS Conservation Area

Ecological Vegetation Class

- Plains Grassland (EVC 132)
- Impacted vegetation

N

0 45 90

Metres

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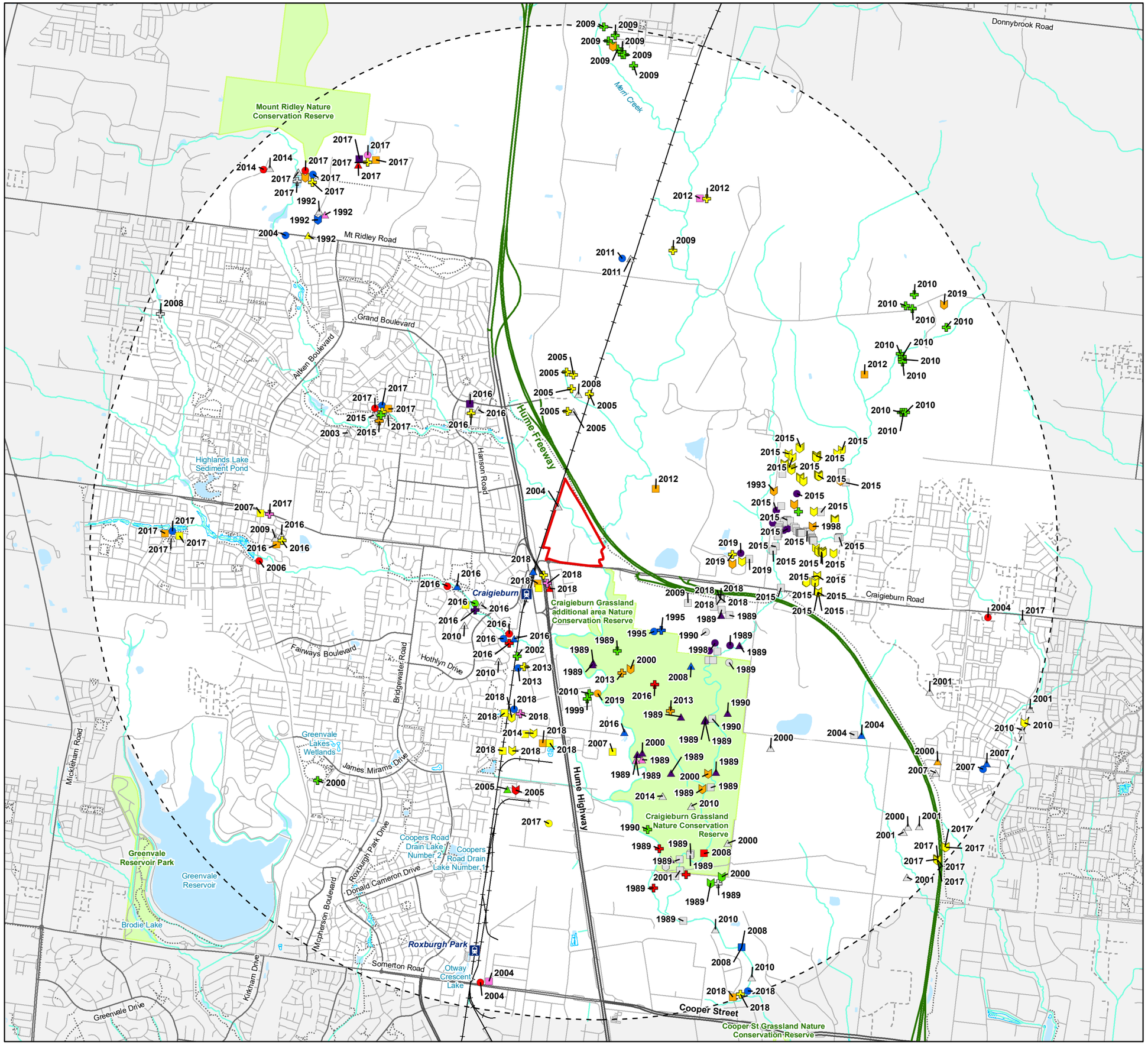

Legend

Study Area

Significant flora

- Adamson's Blown-grass
- Austral Crane's-bill
- Austral Tobacco
- Basalt Peppercress
- Basalt Podolepis
- Basalt Tussock-grass
- Bog Gum
- Brackish Plains Buttercup
- Curly Sedge
- Elongate Woodruff
- Fragrant Saltbush
- Giant Honey-myrtle
- Glandular Blanket-fern
- Inland Sickle-fern
- Large-flower Crane's-bill
- Large-fruit Yellow-gum
- Matted Flax-lily
- Mugga
- Oval Wedge-fern
- Pale Grass-lily
- Pale Swamp Everlasting
- Pale-flower Crane's-bill
- Plump Swamp Wallaby-grass
- Purple Blown-grass
- River Swamp Wallaby-grass
- Rosemary Grevillea
- Rye Beetle-grass
- Slender Bindweed
- Slender Tick-trefoil
- Small Milkwort
- Spotted Gum
- Sticky Wattle
- Studley Park Gum
- Swamp Everlasting
- Tough Scurf-pea
- Western Golden-tip
- Winged Water-starwort
- Yellow Star

Figure 4

Previously documented significant flora within 5km of the study area

Ecological surveys for the proposed development along Craigieburn Road East, Craigieburn

N

0 1 2

Kilometres

ecology & heritage partners

Victorian Biodiversity Atlas (VBA) // Sourced from: 'VBA_FLORA25', 'VBA_FLORA100', 'VBA_FAUNA25' and 'VBA_FAUNA100', Updated March 2021 © The State of Victoria, Department of Environment, Land, Water and Planning. Records prior to 1949 not shown.

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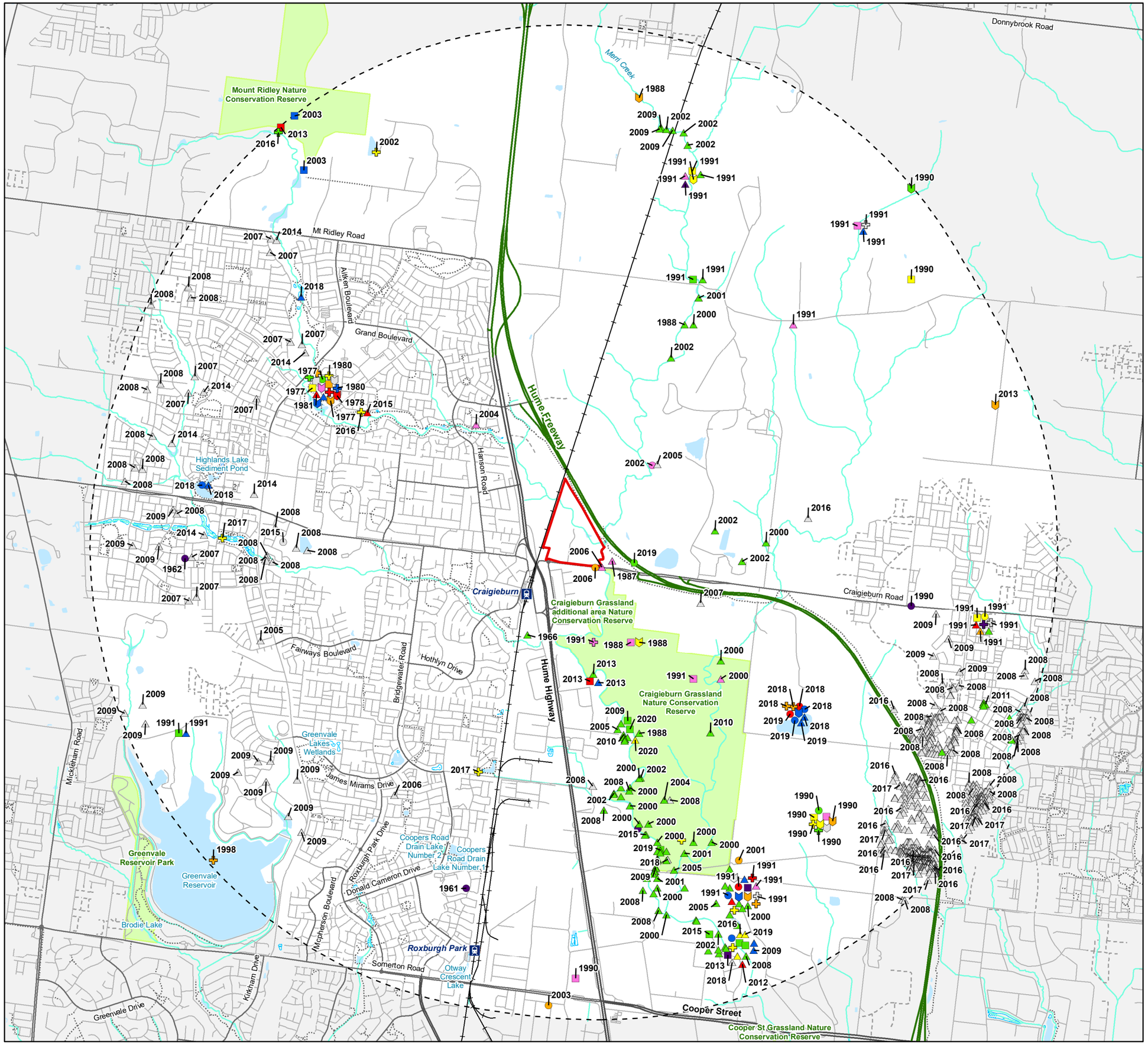

Legend

Study Area

Significant fauna

- Amethyst Hairstreak Butterfly
- Australasian Shoveler
- Baillon's Crake
- Barking Owl
- Black Falcon
- Blue-billed Duck
- Brolga
- Brown Toadlet
- Caspian Tern
- Common Bent-wing Bat (eastern ssp.)
- Common Sandpiper
- Diamond Firetail
- Eastern Snake-necked Turtle
- Emu
- Fat-tailed Dunnart
- Freckled Duck
- Golden Sun Moth
- Great Egret
- Grey Goshawk
- Grey-headed Flying-fox
- Growling Grass Frog
- Hardhead
- Latham's Snipe
- Lewin's Rail
- Little Button-quail
- Little Egret
- Musk Duck
- Nankeen Night-Heron
- Pied Cormorant
- Plumed Egret
- Red-chested Button-quail
- Regent Honeyeater
- Royal Spoonbill
- Speckled Warbler
- Spotted Harrier
- Striped Legless Lizard
- Swift Parrot
- Whiskered Tern
- White-throated Needletail

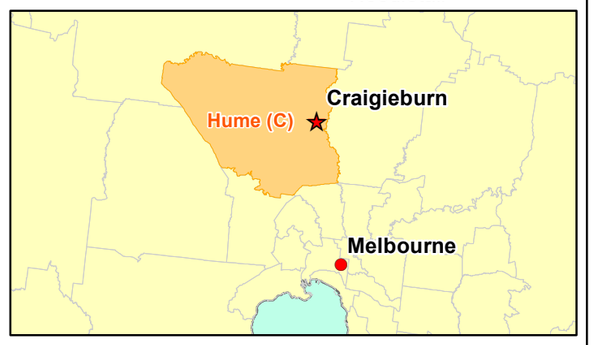

Figure 5

Previously documented significant fauna within 5km of the study area

Ecological surveys for the proposed development along Craigieburn Road East, Craigieburn

N

0 1 2

Kilometres

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Victorian Biodiversity Atlas (VBA) // Sourced from: 'VBA_FLORA25', 'VBA_FLORA100', 'VBA_FAUNA25' and 'VBA_FAUNA100', Updated March 2021 © The State of Victoria, Department of Environment, Land, Water and Planning. Records prior to 1949 not shown.

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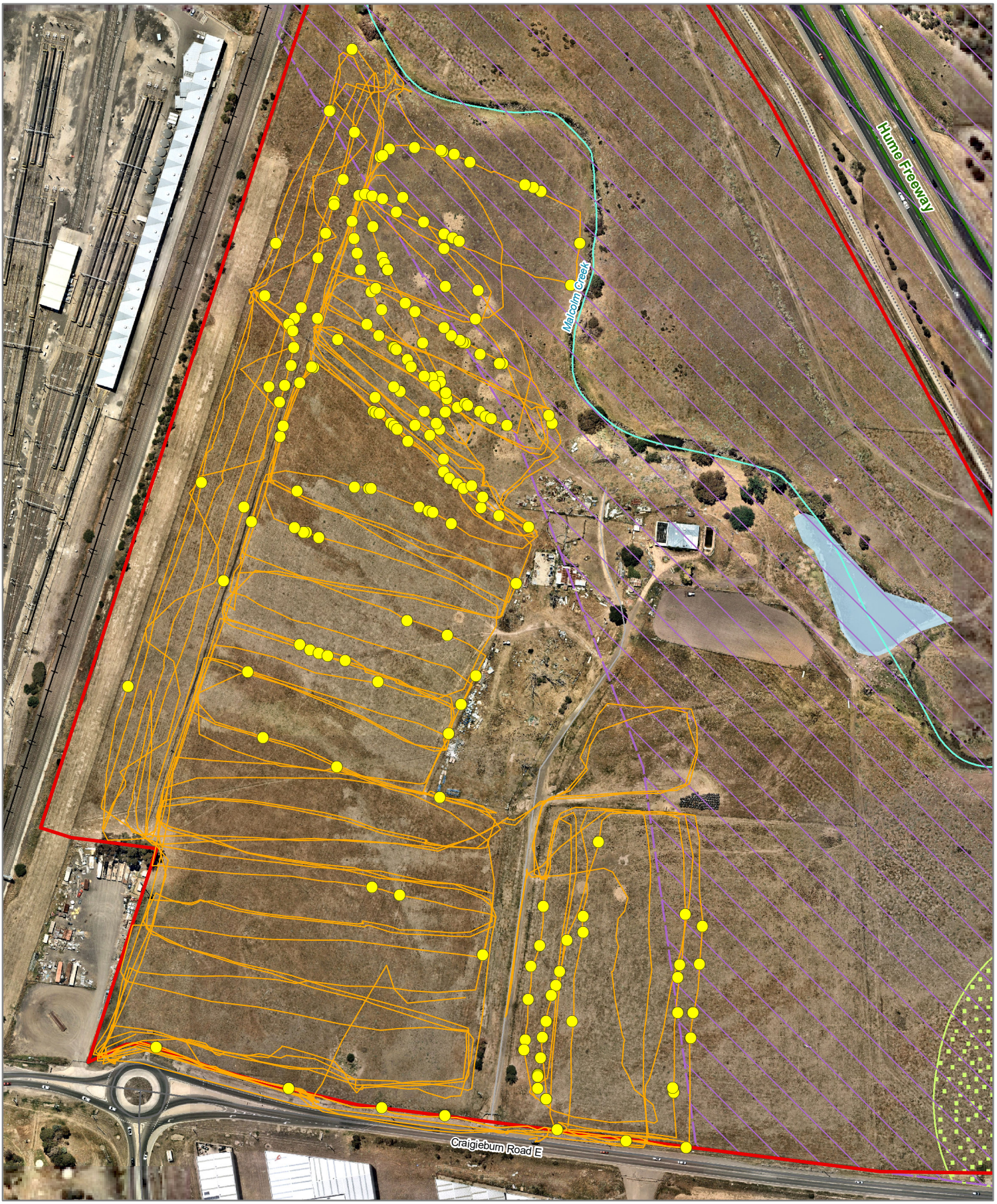


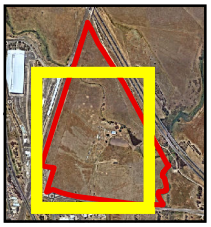
Figure 6

Golden Sun Moth, Matted Flax-lily and Curly Sedge Survey Results

Ecological surveys for the proposed development along Craigieburn Road East, Craigieburn

Legend

- Study Area
- BCS Extent
- BCS Conservation Area
- Golden Sun Moth, Matted Flax-lily and Curly Sedge survey transects
- Golden Sun Moth records



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Metres

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13029_Fig06_Results_P 18/08/2021 psorensen

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Aerial source: Nearmap 2020 / aerial date 2019

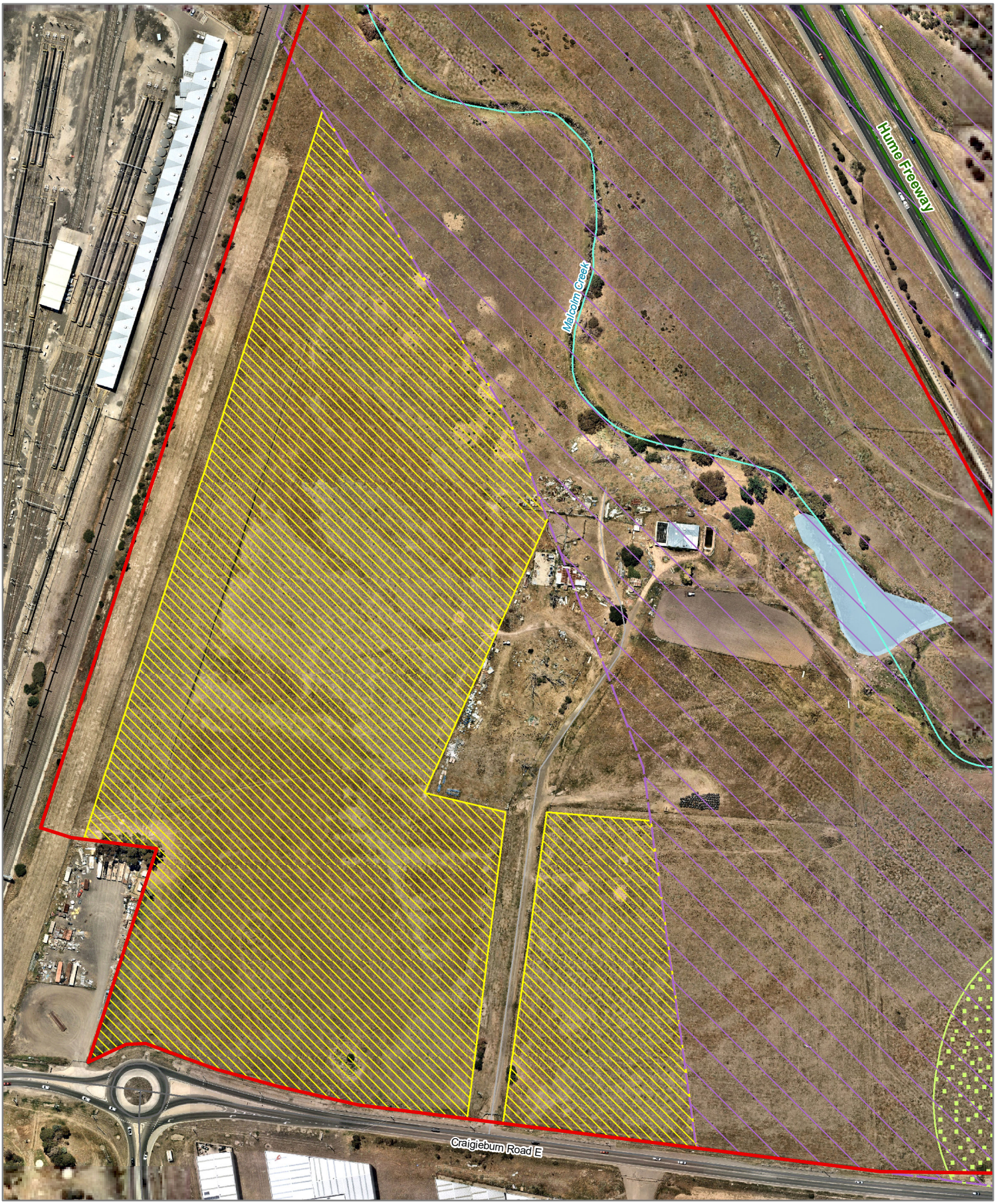
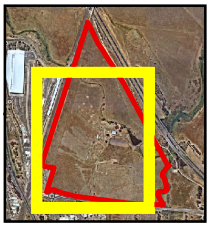


Figure 7
Golden Sun Moth habitat within the study area
Ecological surveys for the proposed development along Craigieburn Road East, Craigieburn

Legend

- Study Area
- BCS Extent
- BCS Conservation Area
- Golden Sun Moth habitat



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13029_Fig07_GSM_Hab_P 18/08/2021 psorensen

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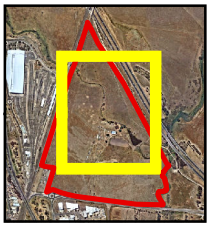
Aerial source: Nearmap 2020 / aerial date 2019

Figure 8
Growling Grass Frog survey results
Ecological surveys for the proposed development along Craigieburn Road East, Craigieburn

Legend

- Study Area
- BCS Extent
- BCS Conservation Area
- Call playback locations



N

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Metres

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13029_Fig08_GGF_Results_P 18/08/2021 psorensen

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Aerial source: Nearmap 2020 / aerial date 2019

APPENDIX 1 – FLORA

Appendix 1.1 – Flora Results

Legend:

v/r Listed as vulnerable/rare in Victoria under the Advisory List of Rare or Threatened Plants in Victoria (DEPI 2014);

***** Listed as a noxious weed under the CaLP Act;

w Weed of National Significance;

- Not applicable

Table A2.1. Flora recorded within the study area.

Scientific Name	Common Name	Conservation Status/Notes
INDIGENOUS SPECIES		
Austrostipa bigeniculata	Kneed Spear-grass	-
Austrostipa scabra	Rough Spear-grass	-
Austrostipa spp.	Spear Grass	-
Convolvulus angustissimus subsp. omnigracilis	Slender Bindweed	-
Juncus filicaulis	Thread Rush	-
Lomandra filiformis	Wattle Mat-rush	-
Rytidosperma caespitosum	Common Wallaby-grass	-
Rytidosperma spp.	Wallaby Grass	-
Themeda triandra	Kangaroo Grass	-
NON-INDIGENOUS OR INTRODUCED SPECIES		
Avena spp.	Oat	-
Brassica spp.	Turnip	-
Briza maxima	Large Quaking-grass	-
Bromus spp.	Brome	-
Cirsium vulgare	Spear Thistle	*
Cynara cardunculus subsp. flavescens	Artichoke Thistle	*
Echium plantagineum	Paterson's Curse	*
Lolium spp.	Rye Grass	-
Nassella neesiana	Chilean Needle-grass	W*
Nassella trichotoma	Serrated Tussock	W*
Pinus spp.	Pine	-

Scientific Name	Common Name	Conservation Status/Notes
Rosa rubiginosa	Sweet Briar	*
Scolymus hispanicus	Golden Thistle	*
Ulex europaeus	Gorse	**W***

Appendix 1.2 – Significant Flora

Table A1.2 Significant flora recorded within 10 kilometres of the study area

Key:

EPBC	*Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
FFG	*Flora and Fauna Guarantee Act 1988* (FFG Act)
DEPI	Advisory List of Threatened Flora in Victoria (DEPI 2014)

EX	Extinct	X	Extinct
CR	Critically endangered	e	Endangered
EN	Endangered	v	Vulnerable
VU	Vulnerable	r	Rare
K	Poorly Known (Briggs and Leigh 1996)	k	Poorly Known
#	Records identified from EPBC Act Protected Matters Search Tool.	L	Listed
*	Records identified from the FIS		

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 a 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.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DEPI	Likely occurrence in study area
NATIONAL SIGNIFICANCE							
Amphibromus fluitans	River Swamp Wallaby-grass	4	2008	VU	-	-	5
Dianella amoena	Matted Flax-lily	175	2015	EN	-	r	2 (not detected)
Diuris basaltica	Small Golden Moths	1	1902	EN	-	v	4
Dodonaea procumbens #	Trailing Hop-bush	-	-	VU	-	k	5
Glycine latrobeana #	Clover Glycine	-	-	VU	-	e	4
Lachnagrostis adamsonii	Adamson's Blown-grass	3	1990	EN	-	r	5
Lepidium hyssopifolium s.s.	Basalt Peppercress	1	1977	EN	-	e	5
Leucochrysum albicans var. *tricolor #*	Hoary Sunray	-	-	EN	-	k	4
Pimelea spinescens subsp. *Spinescens #*	Spiny Rice-flower	-	-	CR	-	r	4
Pomaderris vacciniifolia #	Round-leaf Pomaderris	-	-	CR	L	e	5
Prasophyllum frenchii #	Maroon Leek-orchid	-	-	EN	-	k	5
Pterostylis chlorogramma #	Green-striped Greenhood	-	-	VU	L	e	5
Pterostylis cucullata #	Leafy Greenhood	-	-	VU	-	r	5
Rutidosis leptorhynchoides #	Button Wrinklewort	-	-	EN	-	k	4
Senecio macrocarpus #	Large-headed Fireweed	-	-	VU	-	r	4
Senecio psilocarpus #	Swamp Fireweed	-	-	VU	-	k	5
Thelymitra matthewsii #	Spiral Sun-orchid	-	-	VU	-	k	5
Xerochrysum palustre #	Swamp Everlasting	1	2005	VU	-	r	5
STATE SIGNIFICANCE							
Amphibromus pithogastrus	Plump Swamp Wallaby-grass	7	1992	-	-	v	5
Asperula charophyton	Elongate Woodruff	1	2008	-	L	v	3

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DEPI	Likely occurrence in study area
Caesia parviflora var. *vittata*	Pale Grass-lily	1	1992	-	L	v	4
Callitriche umbonata	Winged Water-starwort	5	2012	-	L	e	5
Cardamine tenuifolia	Slender Bitter-cress	1	2005	-	L	e	5
Carex blakei	Alpine Sedge	1	1980	-	-	v	5
Carex chlorantha	Green-top Sedge	1	2001	-	L	v	4
Carex tasmanica	Curly Sedge	19	2009	-	L	v	3
Comesperma polygaloides	Small Milkwort	1	1995	-	L	e	5
Convolvulus angustissimus subsp. *omnigracilis*	Slender Bindweed	26	2015	-	L	e	1
Coronidium gunnianum	Pale Swamp Everlasting	65	2014	-	L	v	4
Corymbia maculata	Spotted Gum	5	2016	-	L	e	5
Cullen parvum	Small Scurf-pea	1	2011	-	-	e	4
Cullen tenax	Tough Scurf-pea	13	2015	-	L	e	4
Desmodium varians	Slender Tick-trefoil	79	2015	-	L	e	4
Dianella callicarpa	Swamp Flax-lily	1	2002	-	L	e	5
Dianella sp. aff. *longifolia* (Benambra)	Arching Flax-lily	24	2016	-	L	e	4
Diuris punctata	Purple Diuris	1	1900	-	L	e	4
Eragrostis trachycarpa	Rough-grain Love-grass	2	1996	-	-	k	5
Eucalyptus X studleyensis	Studley Park Gum	2	2006	-	-	k	5
Eucalyptus yarraensis	Yarra Gum	2	1996	-	-	r	5
Geranium solanderi var. *solanderi* s.s.	Austral Crane's-bill	11	2013	-	-	P	3
Geranium sp. 1	Large-flower Crane's-bill	10	2016	-	-	r	3
Geranium sp. 3	Pale-flower Crane's-bill	11	2012	-	-	k	3

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DEPI	Likely occurrence in study area
Goodia medicaginea	Western Golden-tip	4	2010	-	L	v	5
Grevillea rosmarinifolia	Rosemary Grevillea	4	2015	-	L	v	5
Lachnagrostis punicea subsp. *punicea*	Purple Blown-grass	21	2015	-	-	k	3
Lachnagrostis rudis subsp. *rudis*	Rough Blown-grass	1	1977	-	-	v	5
Leionema bilobum subsp. *bilobum*	Truncate Leionema	1	2006	-	-	v	5
Lindsaea trichomanoides	Oval Wedge-fern	1	2000	-	L	e	5
Melaleuca armillaris subsp. *armillaris*	Giant Honey-myrtle	7	2014	-	L	e	5
Microseris scapigera s.s.	Plains Yam-daisy	10	2010	-	-	k	5
Nicotiana suaveolens	Austral Tobacco	2	1901	-	-	r	5
Paspalidium flavidum	Yellow Watercrown Grass	2	2008	-	-	v	5
Pauridia vaginata var. *brevistigmata*	Yellow Star	2	1992	-	L	v	5
Pellaea calidirupium	Inland Sickle-fern	1	2008	-	-	r	5
Pleurosorus subglandulosus	Glandular Blanket-fern	2	2008	-	-	e	5
Poa labillardierei var. (Volcanic Plains)	Basalt Tussock-grass	19	2015	-	-	r	3
Podolepis linearifolia	Basalt Podolepis	2	2004	-	-	v	4
Pterostylis cucullata subsp. *cucullata*	Leafy Greenhood	1	1770	-	L	e	5
Ranunculus diminutus	Brackish Plains Buttercup	3	1998	-	-	r	5
Rhagodia parabolica	Fragrant Saltbush	2	2012	-	-	r	4
Rytidosperma aff. caespitosum (South-west swamps)	Porphyry Wallaby-grass	1	2000	-	-	P	4
Sclerolaena muricata var. *muricata*	Black Roly-poly	1	2016	-	-	r	3
Tripogon loliiformis	Rye Beetle-grass	11	2015	-	-	r	4

Data source: Victorian Biodiversity Atlas (DELWP 2020); Protected Matters Search Tool (DAWE 2020a). **Taxonomic order:** Alphabetical.

Table A2.3. Habitat Hectares results for remnant vegetation recorded within the study area, including the alternative (northern) alignment.

Vegetation Zone		PG1
Bioregion		VVP
EVC / Tree		Plains Grassland (Lighter Soils)
EVC Number		132_62
EVC Conservation Status		Endangered
Patch Condition	Large Trees /10	na
	Canopy Cover /5	na
	Under storey /25	5
	Lack of Weeds /15	2
	Recruitment /10	3
	Organic Matter /5	2
	Logs /5	na
	Treeless EVC Multiplier	1.36
	Subtotal =	16.32
Landscape Value /25		1
Habitat Points /100		17
Habitat Score		0.17

APPENDIX 2 – FAUNA

Table A2.1. Significant fauna within 5 kilometres of the study area.

Habitat characteristics of significant fauna species previously recorded within 10 kilometres of the study area, or that may potentially occur within the study area were assessed to determine their likelihood of occurrence. The likelihood of occurrence rankings for each of the threatened species are:

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 (VBA 2011); 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 (DSE 2011b); 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.

EPBC	*Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
FFG	*Flora and Fauna Guarantee Act 1988* (FFG Act)
DSE	Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2013); Advisory List of Threatened Invertebrate Fauna in Victoria (DSE 2009)
NAP	National Action Plan (Cogger *et al.* 1993; Duncan *et al.* 1999; Garnet and Crowley 2000; Lee 1995; Maxwell *et al.* 1996; Sands and New 2002; Tyler 1997)

EX	Extinct
RX	Regionally extinct
WX	Extinct in the wild
CR	Critically endangered
EN	Endangered
VU	Vulnerable
RA	Rare
NT	Near threatened
CD	Conservation dependent
LC	least concern
DD	Data deficient (insufficiently or poorly known
L	Listed as threatened under FFG Act
I	Invalid or ineligible for listing under the FFG Act
#	Listed on the Protected Matters Search Tool
*	Additional information from the Victorian Fauna Database

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	Likelihood of Occurrence
NATIONAL SIGNIFICANCE							
Australasian Bittern	*Botaurus poiciloptilus*	1993	1	EN	L	EN	4
Australian Grayling #	*Prototroctes maraena*	-	-	VU	L	VU	4
Australian Painted Snipe #	*Rostratula australis*	-	-	EN	L	CR	4
Curlew Sandpiper #	*Calidris ferruginea*	-	-	CR	L	EN	4
Dwarf Galaxias #	*Galaxiella pusilla*	-	-	VU	L	EN	4
Eastern Barred Bandicoot #	*Perameles gunnii*	2003	12	EN	L	WX	4
Eastern Curlew #	*Numenius madagascariensis*	-	-	CR	L	VU	4
Eastern Quoll #	*Dasyurus viverrinus*	-	4	EN	L	RX	4
Golden Sun Moth	*Synemon plana*	2017	4072	VU	L	CR	1
Grassland Earless Dragon	*Tympanocryptis pinguicolla*	1988	1	EN	L	CR	4
Greater Glider #	*Petauroides volans*	-	-	VU	L	VU	4
Grey-headed Flying-fox	*Pteropus poliocephalus*	2016	6	VU	L	VU	4
Growling Grass Frog	*Litoria raniformis*	2017	275	VU	L	EN	3
Hooded Plover #	*Thinornis rubricollis rubricollis*	-	-	VU	L	VU	4
Macquarie Perch	*Macquaria australasica*	1970	2	EN	L	EN	4
Murray Cod #	*Maccullochella peelii*	-	-	VU	L	VU	4
Painted Honeyeater #	*Grantiella picta*	-	-	VU	L	VU	4
Plains-wanderer	*Pedionomus torquatus*	1991	8	CR	L	CR	4
Regent Honeyeater	*Anthochaera phrygia*	1986	1	CR	L	CR	4
Spot-tailed Quoll #	*Dasyurus maculatus maculatus*	-	2	EN	L	EN	4
Striped Legless Lizard	*Delma impar*	1991	4	VU	L	EN	4

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	Likelihood of Occurrence
Superb Parrot	*Polytelis swainsonii*	1940	2	VU	L	EN	4
Swift Parrot	*Lathamus discolor*	2000	6	CR	L	EN	4
White-throated Needletail	*Hirundapus caudacutus*	2014	9	-	-	VU	4
STATE SIGNIFICANCE							
Australasian Shoveler	*Anas rhynchotis*	2005	15	-	-	VU	3
Baillon's Crake	*Porzana pusilla palustris*	2006	7	-	L	VU	3
Barking Owl	*Ninox connivens connivens*	1988	3	-	L	EN	4
Bearded Dragon	*Pogona barbata*	1990	2	-	-	VU	4
Black Falcon	*Falco subniger*	1989	4	-	-	VU	4
Blue-billed Duck	*Oxyura australis*	2000	5	-	L	EN	3
Brolga	*Grus rubicunda*	2002	3	-	L	VU	4
Brown Toadlet	*Pseudophryne bibronii*	2005	33	-	L	EN	4
Brown Treecreeper (south-eastern ssp.)	*Climacteris picumnus victoriae*	1990	1	-	-	NT	4
Bush Stone-curlew	*Burhinus grallarius*	1940	4	-	L	EN	4
Caspian Tern	*Hydroprogne caspia*	2007	3	-	L	NT	4
Common Bent-wing Bat (eastern ssp.)	*Miniopterus schreibersii oceanensis*	2013	3	-	L	VU	4
Common Sandpiper	*Actitis hypoleucos*	1980	1	-	-	VU	4
Diamond Firetail	*Stagonopleura guttata*	1991	8	-	L	NT	4
Eastern Great Egret	*Ardea modesta*	2012	20	-	L	VU	3
Freckled Duck	*Stictonetta naevosa*	2013	5	-	L	EN	3
Grey Goshawk	*Accipiter novaehollandiae novaehollandiae*	1986	1	-	L	VU	4
Grey-crowned Babbler	*Pomatostomus temporalis temporalis*	1940	2	-	L	EN	4

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	Likelihood of Occurrence
Hardhead	*Aythya australis*	2013	34	-	-	VU	4
Hooded Robin	*Melanodryas cucullata cucullata*	1990	1	-	L	NT	4
Intermediate Egret	*Ardea intermedia*	1980	1	-	L	EN	4
Lewin's Rail	*Lewinia pectoralis pectoralis*	1991	2	-	L	VU	4
Little Egret	*Egretta garzetta nigripes*	1991	5	-	L	EN	4
Masked Owl	*Tyto novaehollandiae novaehollandiae*	1991	1	-	L	EN	4
Murray Short-necked Turtle	*Emydura macquarii*	1993	1	-	-	VU	4
Musk Duck	*Biziura lobata*	2000	25	-	-	VU	3
Red-chested Button-quail	*Turnix pyrrhothorax*	1991	5	-	L	VU	4
Southern Toadlet	*Pseudophryne semimarmorata*	1962	6	-	-	VU	4
Speckled Warbler	*Chthonicola sagittatus*	1990	6	-	L	VU	4
Tussock Skink	*Pseudemoia pagenstecheri*	2016	35	-	-	VU	3
REGIONAL SIGNIFICANCE							
Azure Kingfisher	*Alcedo azurea*	1988	1	-	-	NT	4
Black-eared Cuckoo	*Chrysococcyx osculans*	2000	3	-	-	NT	4
Emu	*Dromaius novaehollandiae*	2014	3	-	-	NT	4
Fat-tailed Dunnart	*Sminthopsis crassicaudata*	1998	13	-	-	NT	4
Golden Perch	*Macquaria ambigua*	1990	2	-	-	NT	4
Latham's Snipe	*Gallinago hardwickii*	2006	16	-	-	NT	4
Little Button-quail	*Turnix velox*	2001	5	-	-	NT	4
Nankeen Night Heron	*Nycticorax caledonicus hillii*	2010	12	-	-	NT	3
Pied Cormorant	*Phalacrocorax varius*	2016	7	-	-	NT	3

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	Likelihood of Occurrence
Royal Spoonbill	*Platalea regia*	2017	10	-	-	NT	3
Spotted Harrier	*Circus assimilis*	2013	13	-	-	NT	3
Whiskered Tern	*Chlidonias hybridus javanicus*	1991	5	-	-	NT	4
White-winged Black Tern	*Chlidonias leucopterus*	2014	1	-	-	NT	3

Data source: Victorian Biodiversity Atlas (DELWP 2020); Protected Matters Search Tool (DAWE 2020a).

Taxonomic order: Mammals (Strahan 1995 *in* Menkhorst and Knight 2004); Birds (Christidis and Boles, 2008); Reptiles and Amphibians (Cogger et al. 1983 *in* Cogger 1996); Fish (Nelson 1994).

APPENDIX 3 – NATIVE VEGETATION REMOVAL 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: **11/02/2020**
Time of issue: **11:01 am**

Report ID: Scenario Testing

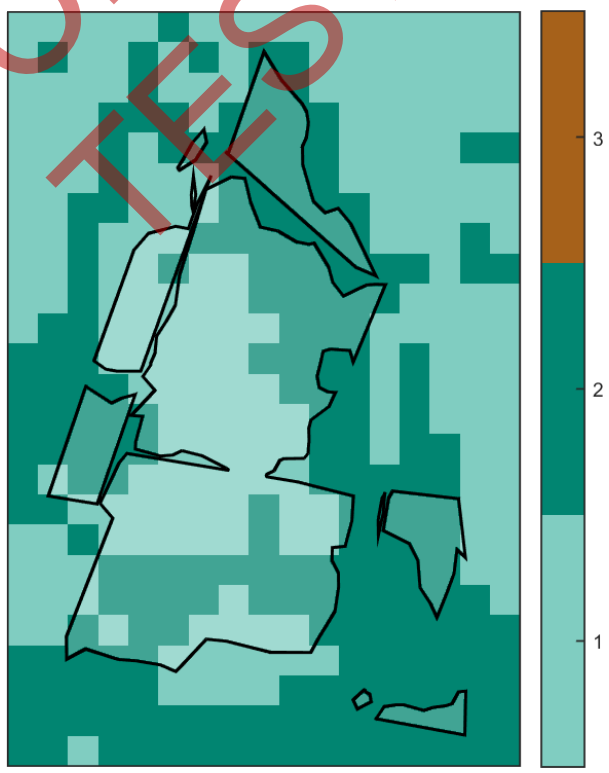
Project ID	EHP13029_Craigieburn_VG94

Assessment pathway

Assessment pathway	**Detailed Assessment Pathway**
Extent including past and proposed	8.099 ha
Extent of past removal	0.000 ha
Extent of proposed removal	8.099 ha
No. Large trees proposed to be removed	0
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.

SCENARIO TESTING

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 amount[1]	1.628 general habitat units
Vicinity	Port Phillip and Westernport Catchment Management Authority (CMA) or Hume City Council
Minimum strategic biodiversity value score[2]	0.461
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:

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.

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Native vegetation to be removed

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	**Type**	**BioEVC**	**BioEVC conservation status**	**Large tree(s)**	**Partial removal**	**Condition score**	**Polygon Extent**	**Extent without overlap**	**SBV score**	**HI score**	**Habitat units**	**Offset type**
1-A	Patch	vvp_0132_61	Endangered	0	no	0.170	5.999	5.999	0.569		1.200	General
2-A	Patch	vvp_0132_61	Endangered	0	no	0.170	0.661	0.661	0.654		0.139	General
3-A	Patch	vvp_0132_61	Endangered	0	no	0.170	0.028	0.028	0.620		0.006	General
4-A	Patch	vvp_0132_61	Endangered	0	no	0.170	0.006	0.006	0.585		0.001	General
5-A	Patch	vvp_0132_61	Endangered	0	no	0.170	0.492	0.492	0.560		0.098	General
6-A	Patch	vvp_0132_61	Endangered	0	no	0.170	0.371	0.371	0.540		0.073	General
7-A	Patch	vvp_0132_61	Endangered	0	no	0.170	0.014	0.014	0.600		0.003	General
8-A	Patch	vvp_0132_61	Endangered	0	no	0.170	0.131	0.131	0.600		0.027	General
9-A	Patch	vvp_0132_61	Endangered	0	no	0.170	0.390	0.390	0.600		0.079	General
10-A	Patch	vvp_0132_61	Endangered	0	no	0.170	0.007	0.007	0.600		0.001	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
Curly Sedge	*Carex tasmanica*	500650	Vulnerable	Dispersed	Habitat importance map	0.0015
Large-headed Fireweed	*Senecio macrocarpus*	503116	Endangered	Dispersed	Habitat importance map	0.0005
Yellow Watercrown Grass	*Paspalidium flavidum*	507820	Endangered	Dispersed	Habitat importance map	0.0005
Large-flower Crane's-bill	*Geranium sp. 1*	505342	Endangered	Dispersed	Habitat importance map	0.0004
Plump Swamp Wallaby-grass	*Amphibromus pithogastrus*	503624	Endangered	Dispersed	Habitat importance map	0.0004
Brackish Plains Buttercup	*Ranunculus diminutus*	504314	Rare	Dispersed	Habitat importance map	0.0004
Small Scurf-pea	*Cullen parvum*	502773	Endangered	Dispersed	Habitat importance map	0.0003
Growling Grass Frog	*Litoria raniformis*	13207	Endangered	Dispersed	Habitat importance map	0.0002
Plains Yam-daisy	*Microseris scapigera s.s.*	504657	Vulnerable	Dispersed	Habitat importance map	0.0002
Tough Scurf-pea	*Cullen tenax*	502776	Endangered	Dispersed	Habitat importance map	0.0002
Matted Flax-lily	*Dianella amoena*	505084	Endangered	Dispersed	Habitat importance map	0.0002
Pale-flower Crane's-bill	*Geranium sp. 3*	505344	Rare	Dispersed	Habitat importance map	0.0002
Rye Beetle-grass	*Tripogon loliiformis*	503455	Rare	Dispersed	Habitat importance map	0.0002
Western Golden-tip	*Goodia medicaginea*	501518	Rare	Dispersed	Habitat importance map	0.0002
Purple Blown-grass	*Lachnagrostis punicea subsp. punicea*	504206	Rare	Dispersed	Habitat importance map	0.0002
Swamp Fireweed	*Senecio psilocarpus*	504659	Vulnerable	Dispersed	Habitat importance map	0.0002
Arching Flax-lily	*Dianella sp. aff. longifolia (Benambra)*	505560	Vulnerable	Dispersed	Habitat importance map	0.0002
Pale Swamp Everlasting	*Coronidium gunnianum*	504655	Vulnerable	Dispersed	Habitat importance map	0.0002
Rosemary Grevillea	*Grevillea rosmarinifolia subsp. rosmarinifolia*	504066	Rare	Dispersed	Habitat importance map	0.0001

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Golden Sun Moth	*Synemon plana*	15021	Critically endangered	Dispersed	Habitat importance map	0.0001
Small Milkwort	*Comesperma polygaloides*	500798	Vulnerable	Dispersed	Habitat importance map	0.0001
Austral Crane's-bill	*Geranium solanderi var. solanderi s.s.*	505337	Vulnerable	Dispersed	Habitat importance map	0.0001
Bearded Dragon	*Pogona barbata*	12177	Vulnerable	Dispersed	Habitat importance map	0.0001
Clover Glycine	*Glycine latrobeana*	501456	Vulnerable	Dispersed	Habitat importance map	0.0001
Black Falcon	*Falco subniger*	10238	Vulnerable	Dispersed	Habitat importance map	0.0000
Grassland Earless Dragon	*Tympanocryptis pinguicolla*	12922	Critically endangered	Dispersed	Habitat importance map	0.0000
Lewin's Rail	*Lewinia pectoralis pectoralis*	10045	Vulnerable	Dispersed	Habitat importance map	0.0000
Hardhead	*Aythya australis*	10215	Vulnerable	Dispersed	Habitat importance map	0.0000
Australasian Shoveler	*Anas rhynchotis*	10212	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.

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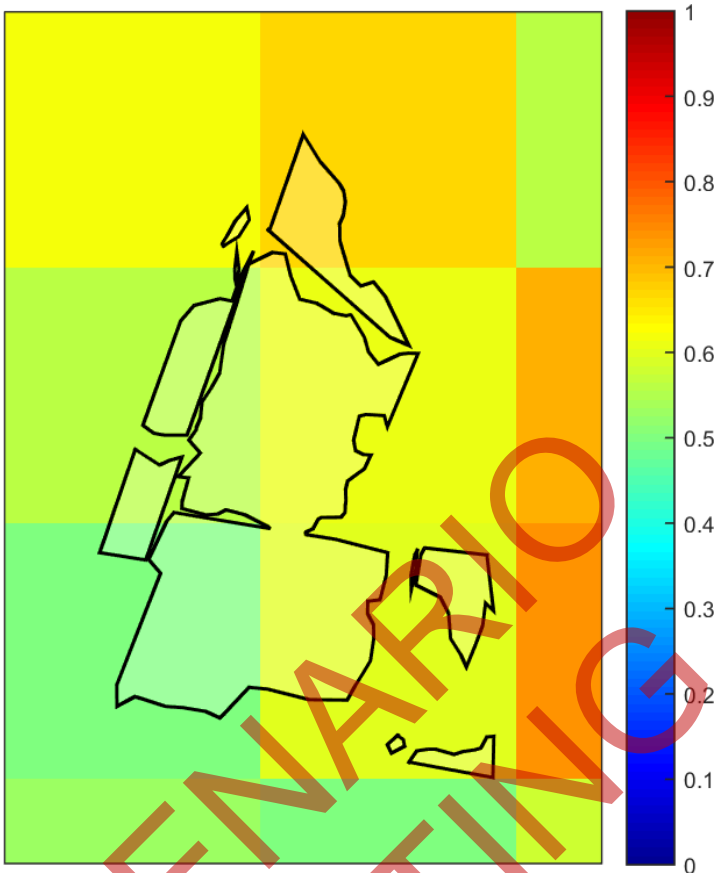
Appendix 3 – Images of mapped native vegetation

2. Strategic biodiversity values map



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