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FINAL REPORT:

Biodiversity Assessment for Precinct Areas 1062 and 1098, Beveridge, Victoria

PREPARED FOR:

Growth Areas Authority
July 2012

Ecology and Heritage Partners Pty Ltd

HEAD OFFICE: 420 Victoria Street, Brunswick VIC 3056 MELBOURNE: PO Box 298, Brunswick VIC 3056 GEELONG: PO Box 8048 Newtown VIC 3220

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- The Department of Sustainability and Environment for providing Time-stamped Native Vegetation Data, and for the use of data available on the Victorian Biodiversity Atlas, Flora Information System and Atlas of Victoria Wildlife.
- The landowners who permitted access, and discussed details of their properties.

Cover Photo: River Red-gum in Paddock in the Lockerbie Property (taken by Anna O'Brien, Ecology and Heritage Partners Pty Ltd).

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Project manager	Anna O'Brien, Botanist
Report author(s)	Anna O'Brien, Botanist Andrea Canzano, Zoologist Aaron Organ, Director / Principal Ecologist
Report reviewer	Stuart Cooney, Senior Zoologist
Other EHP Staff	Laura Maddox, Botanist Cristina Del Borrello, Research Assistant
Mapping	Amanda Feetham
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EXECUTIVE SUMMARY

Introduction

Ecology and Heritage Partners Pty Ltd was commissioned by the Growth Areas Authority (GAA) to undertake a biodiversity assessment as part of the 2011/12 GAA Biodiversity Mapping Project, at Areas 1062 (Beveridge Central) and 1098 (Lockerbie North) (the Precincts) in the urban fringe, north of Melbourne (Figure ES1). The precinct is located in Beveridge, approximately 60 kilometres north of the Melbourne CBD, Victoria, and consists of around 165 small properties in the existing Beveridge Township and west of the Hume Freeway and two larger farming properties in the south: "Lockerbie", and east, "Baldi Property", of the Precincts (Figure ES2).

This report summarises the time-stamped native vegetation data provided by the Department of Sustainability and Environment (DSE) and outlines findings from the general flora and fauna assessment, and targeted flora surveys undertaken in the Lockerbie North and Beveridge Central Precincts where access was approved (Figure ES2).

The purpose of the biodiversity assessment was to provide a detailed account of the ecological values across the Precincts. This information will be incorporated into the GAA's Precinct Structure Planning (PSP) process (i.e. the development of a Native Vegetation Precinct Plan (NVPP)).

Methods

The following resources and databases were reviewed over the duration of the project:

- DSE time-stamped native vegetation data for Melbourne's Urban Growth Area;
- Ecological reports relevant to the precinct;
- The Victorian Biodiversity Atlas, Atlas of Victorian Wildlife and Flora Information System databases.
- Department of Sustainability and Environment Biodiversity Interactive Maps showing historic and current Ecological Vegetation Classes (EVCs).
- Museum of Victoria Butterfly Database;
- Sites of Biological Significance (BioSites);
- Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) Protected Matters Search Tool providing matters of National Environmental Significance (e.g. listed taxa and ecological communities, Ramsar wetlands) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- Planning Schemes Online providing the current zone and overlays; and
- Relevant legislation and policies.

The extent and intensity of the proposed methodology was developed in liaison with the GAA and DSE.

Site assessments were undertaken where access was approved. Biodiversity assessment methods followed the methodology stipulated within the 'Biodiversity Assessment Template for 2011-2012 GAA Biodiversity Mapping', and included the following:

- *General flora survey*: Sites were assessed on foot and all vascular plants were recorded within each property.

- *Indigenous Tree Assessment:* The location and size of each scattered trees and large old trees situated in habitat zones were recorded.

- *Targeted flora survey*: Targeted flora surveys were undertaken in Spring 2011 and Summer 2011/12 for Matted Flax-lily *Dianella amoena*, Curly Sedge *Carex tasmanica*, Clover Glycine *Glycine latrobeana*, Slender Tick Trefoil *Desmodium varians*, Small Scurf Pea *Cullen parvum*, Tough Scurf Pea *Cullen tenax*, Austral Toadflax *Thesium austral*, Narrow Plantain *Plantago gaudichaudiana*, Sunshine Diuris *Diuris fragrantissima*, Adamson's Blown-grass *Lachnagrostis adamsonii*, Basalt Peppercress *Lepidium hyssopifolium*, Swamp Fireweed *Senecio psilocarpus*, Swamp Everlasting *Xerochrysum palustre*, River Swamp Wallaby Grass *Amphibromus fluitans*, Plump Swamp Wallaby-grass *Amphibromus pithogastrus*, Small-flower Wallaby-grass *Austrodanthonia monticola*, Veined Spear-grass *Austrostipa rudis* subsp. *rudis*, Large-flower Crane's-bill *Geranium sp. 1*, Pale-flower Crane's-bill *Geranium* sp. 3, Pale Swamp Everlasting *Helichrysum aff. Rutidolepis (Lowland Swamps)*, Perennial Blown-grass *Lachnagrostis perennis spp.* Agg, Purple Blown-grass *Lachnagrostis punicea* subsp. *Punicea* and Basalt Tussock Grass *Poa labillardeirei* var. (Volcanic Plains).

- *General fauna survey*: All fauna observed and/or heard were recorded, while the presence of a particular species within the Precincts was also confirmed through indirect evidence such as feathers, scats, scratchings and/or nests. Assessors used binoculars to scan for birds, mammals in hollows, and basking reptiles. Hard rubbish, woody debris and rocks were lifted to locate small ground-dwelling fauna including reptiles and frogs.

- *Habitat Assessment*: An assessment of different habitat types throughout the Precincts included waterbodies, trees (including the presence or absence of hollows), drainage lines and remnant grassland. The level of ground cover, vegetation composition and structure within these areas was also recorded.

- *Incidental records*: All incidental observation of significant flora and fauna species observed were recorded with hand-held PDAs.

This report does not identify or map threatened floristic communities, including *Natural Temperate Grassland of the Victorian Volcanic Plain* (NTGVVP). The presence, mapping

and requirements for nationally significant vegetation communities within PSP areas are currently being negotiated between DSE and SEWPaC.

Results

Flora

A total of 273 flora species (112 indigenous, 161 exotic) were recorded during the site assessments. The Precincts were highly modified and dominated by exotic vegetation. They have largely been cleared of remnant native vegetation for agricultural purposes, although modified native grassland, wetlands and scattered trees are present in undulated areas and across rocky areas which have not been cropped.

DSE time-stamped data indicates that five native vegetation types are present in the precinct: Plains Grassland (EVC 132), Plains Grassy Wetland (EVC 125), Stony Knoll Shrubland (EVC 649), Swamp Scrub (EVC 53) and Creekline Tussock Grassland (EVC 654). One state significant vegetation community, Western Basalt Plains Grassland (WBPG), occurs in the Beveridge Central PSP in patches of Plains Grassland.

One nationally significant flora species, Matted Flax-lily, was recorded during the targeted flora surveys.

Habitat hectare assessment

A desktop habitat hectare assessment was completed using DSE time-stamped native vegetation data. Time-stamped data provides location and habitat hectare information for patches of native vegetation deemed present in Melbourne's Urban Growth Boundary (UGB). It has been collated using previous site assessments that have been undertaken across some of the UGB, and modelled native vegetation data for areas that have not undergone any prior assessments. In some instances, the use of modelled data does not provide an entirely accurate assessment of the native vegetation present onsite.

Table ES.2 outlines the total habitat hectares present within the Precincts according to DSE time-stamped data, and the potential Net Gain Offset requirements if this native vegetation was removed or disturbed. There were no large old trees in patches recorded during the site assessments, however a number of scattered indigenous trees were identified outside of DSE time-stamped native vegetation.

Due to the endangered status of the EVCs identified in the study area, remnant patches of vegetation in the study area are considered of at least 'High' conservation significance. Four patches of Plains Grassy Wetland, one patch of Plains Grassland and one patch of Creekline Tusoock Grassland were of Very High Conservation Significance due to their high vegetation quality score. Patches of native vegetation that were not surveyed for threatened species as part of this assessment (due to lack of approved access) are assumed as High conservation significance. The conservation significance of these patches may change if targeted surveys are undertaken in them in the future.

Table ES.1. Habitat Hectares and Preliminary Net Gain Offset Summary

Native Vegetation Present	Habitat Hectares	Total Net Gain Requirement	
		High Con Sig	Very High Con Sig
High Conservation Significance Plains Grassland	1.32	1.98	-
Very High Conservation Significance Plains Grassland	0.01	-	0.02
High Conservation Significance Plains Grassy Wetland	1.24	1.86	-
Very High Conservation Significance Plains Grassland	0.64	-	1.28
High Conservation Significance Stony Knoll Shrubland	3.51	5.27	-
High Conservation Significance Swamp Scrub	0.55	0.83	-
High Conservation Significance Creekline Tussock Grassland	0.02	0.03	-
Very High Conservation Significance Creekline Tussock Grassland	-	-	-
Total	**7.29**	**9.96**	**1.3**

A total of 16 scattered indigenous trees were recorded outside of remnant vegetation patches, consisting of one VLOT, seven LOTs, one stag, five MOTs and two STs. The total Net Gain Offset implications for these scattered trees are:

- Protect 5 VLOTs, 28 LOTs and 10 MOTs, and recruit 407 new plants.

  Or

- Recruit 1,457 new plants.

Fauna

Overall, there were 55 species recorded during the current survey. Of these, there were five mammals (one native and four introduced), 44 birds (39 native, 5 introduced), four native reptiles and two native amphibians (Appendix 3.1).

No significant fauna species were recorded within the Precincts at the time of assessment. (Figure ES6). It provides low/moderate quality habitats for Golden Sun Moth, Striped Legless Lizard and moderate to high quality habitat for Growling Grass Frog. However, targeted surveys for these species were beyond the scope of the current assessment. It is understood that these have been undertaken through sub-regional surveys. Targeted Golden Sun Moth surveys will be required to satisfy the prescriptions in the Strategic Impact Assessment Report (Figure ES7).

The Precincts support seven broad habitat types: native grasslands, ephemeral drainage line, modified woodland and scattered remnant trees, planted native and introduced trees, artificial waterbodies, introduced pasture grass and crops, and rocky outcrops/stony knolls.

Discussion

A summary of legislative considerations is provided in Section 4 of this report. Additional surveys for significant vegetation communities, including NTGVVP, may be required to confirm the significance of native vegetation deemed present in the precinct and implications for their removal or disturbance under the *Strategic Impact Assessment Report* (SIAR).

According to the Prescriptions for Matted Flax-lily under SIAR, removal and/or disturbance of the Matted Flax-lily plant recorded in the "Baldi" property may be permitted by DSE as the native vegetation in which the plant has been recorded contains >25 per cent high threat perennial grasses. If clearing of high contribution habitat is permitted, a suitable offset must be found and secured prior to the development approval and a Matted Flax-lily translocation plan must be prepared to the satisfaction of DSE.

A permit to 'take' native vegetation under the *Flora and Fauna Guarantee Act 1988* (FFG Act) will be required for the removal of protected species located on public land.

Targeted Golden Sun Moth surveys are required to confirm the presence or absence of the moth within the study area. Detailed Conservation Management Plans may be required in accordance with the sub regional strategies for EPBC Act listed species (e.g. Golden Sun Moth and Growling Grass Frog), and a detailed Striped Legless Lizard Salvage and Translocation Plan is recommended to be prepared to the satisfaction of DSE.

The potential impacts, mitigation measures and opportunities to enhance the ecological values have been provided in Section 5. These will be achieved principally through protection and enhancement of native vegetation, allowing the regeneration of native vegetation, revegetation and weed control

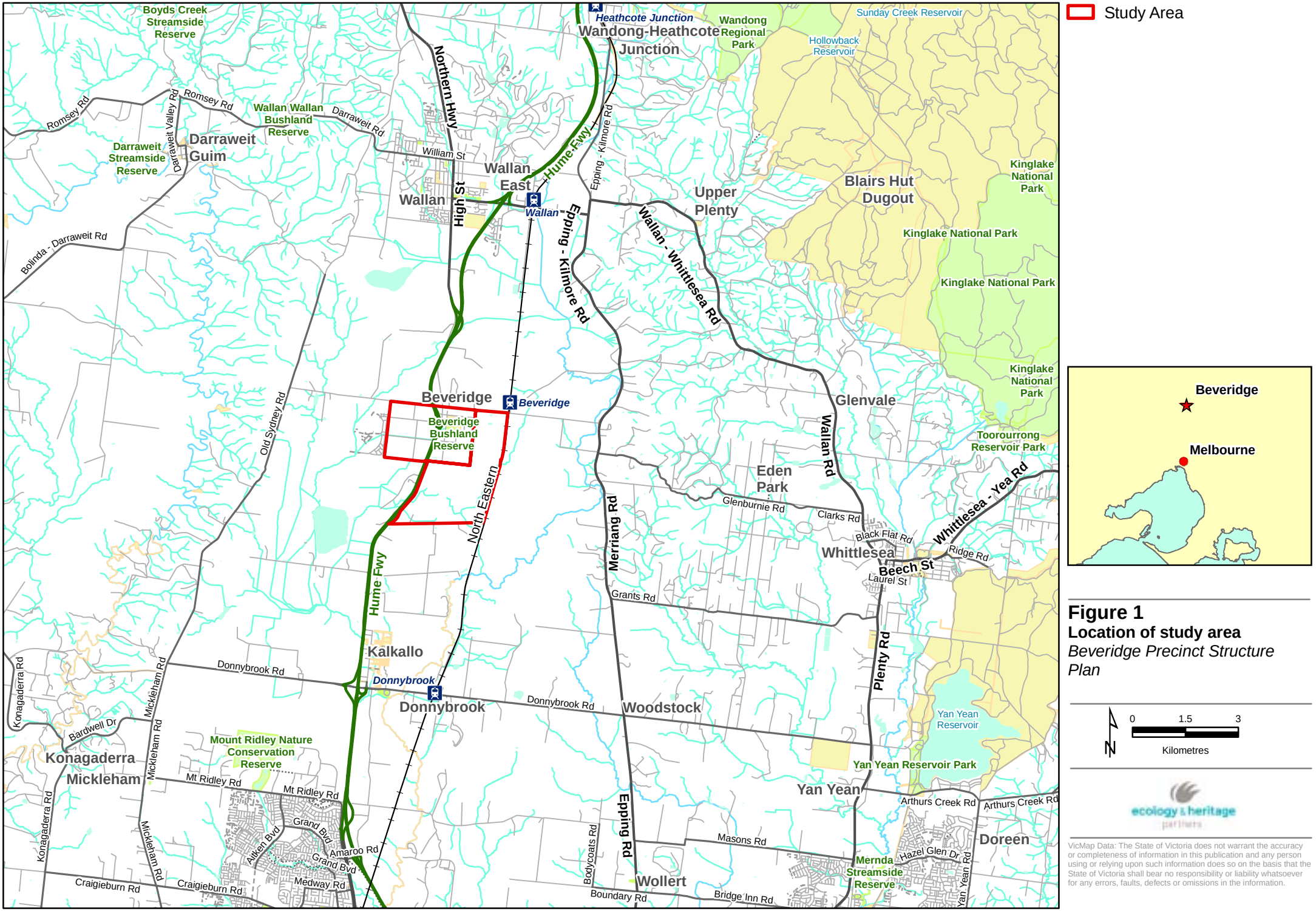

Figure 1
Location of study area
Beveridge Precinct Structure Plan

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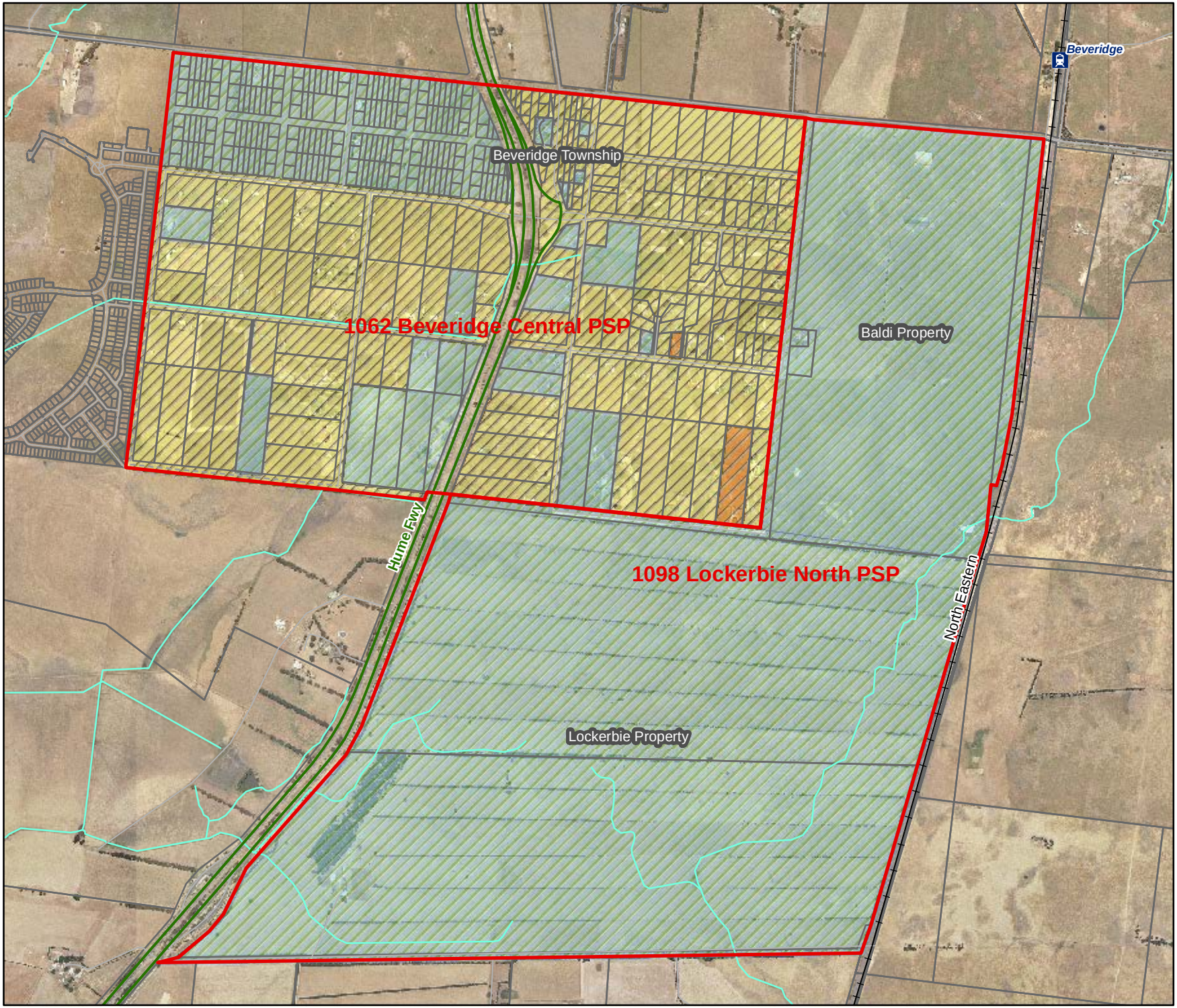

Legend

- Study Area
- Access Denied
- Areas Assessed
- Access Unattainable

Figure 2

Access Information

Beveridge Precinct Structure Plan

N

0 312.5 625

Metres

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Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

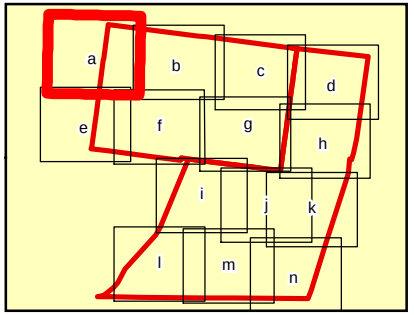

Figure 3a

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
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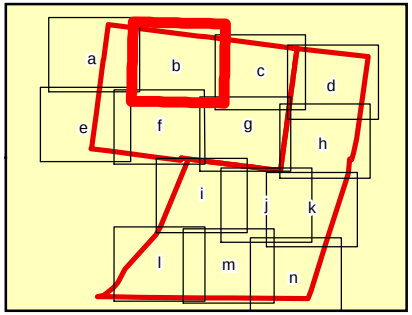


Figure 3b

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

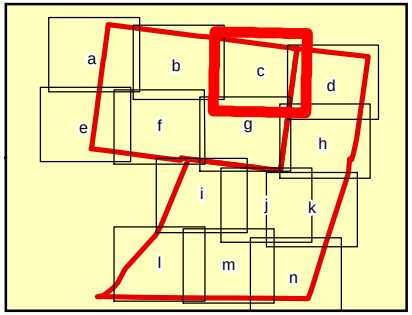


Figure 3c

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

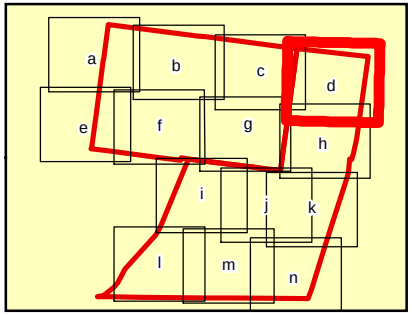


Figure 3d

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

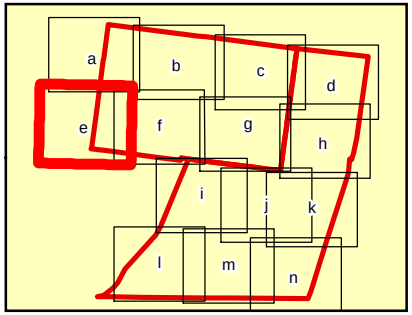


Figure 3e

Ecological Features within the Study Area

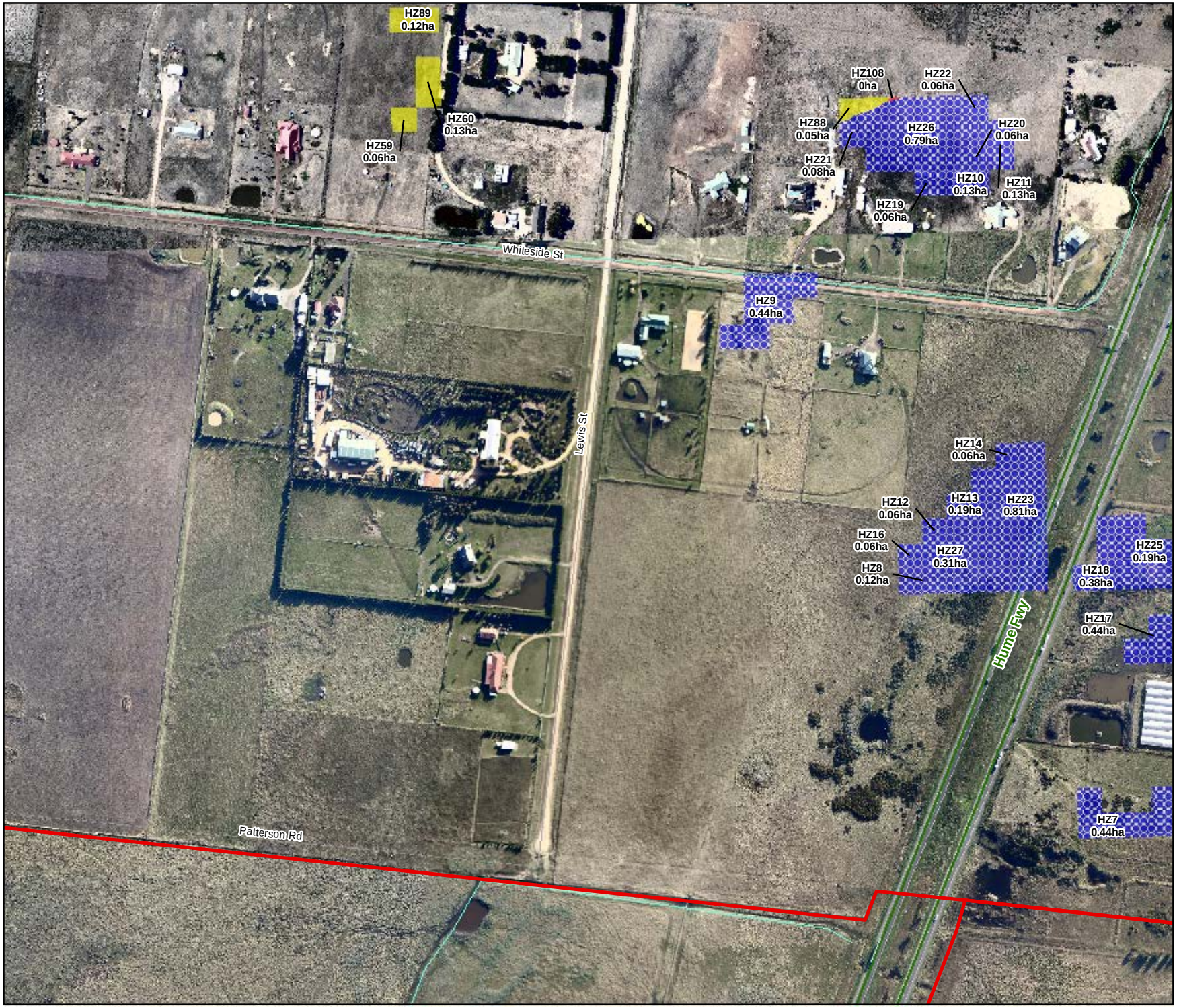
Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners



Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

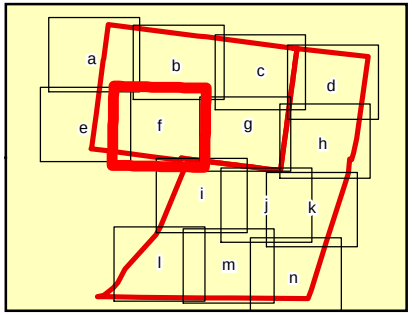


Figure 3f

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
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Ev = Eucalyptus viminalis

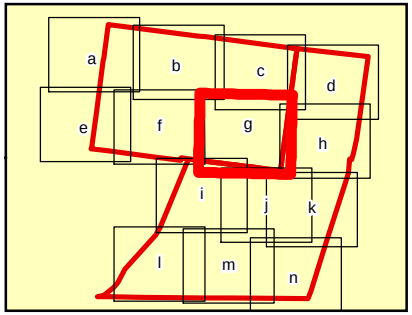

Figure 3g

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

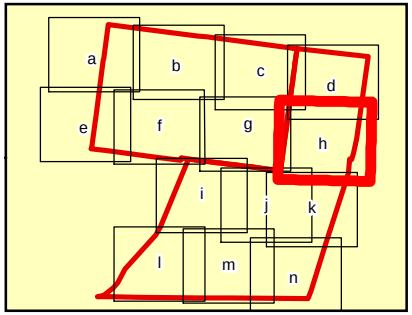

Figure 3h

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

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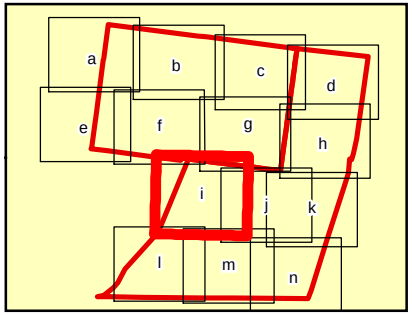


Figure 3i

Ecological Features within the Study Area

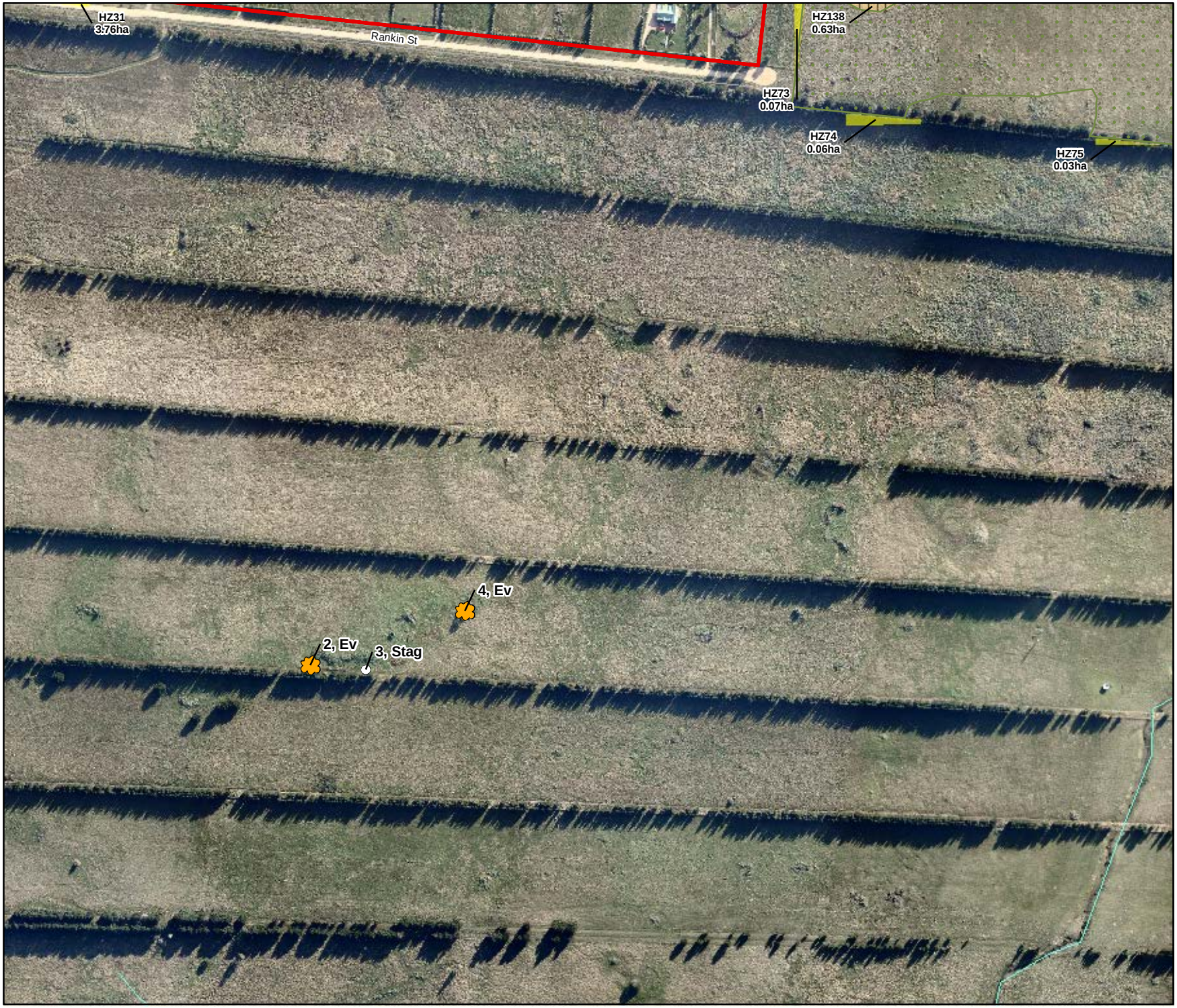
Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners



Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

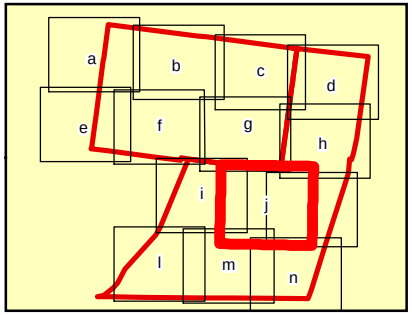


Figure 3j

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

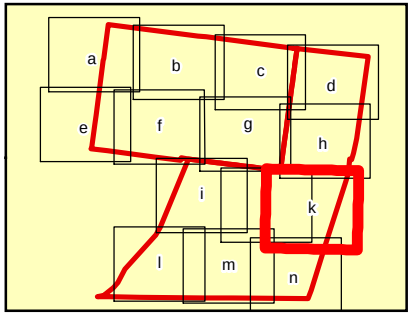


Figure 3k

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

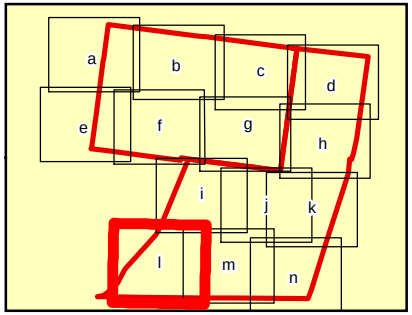


Figure 3l

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

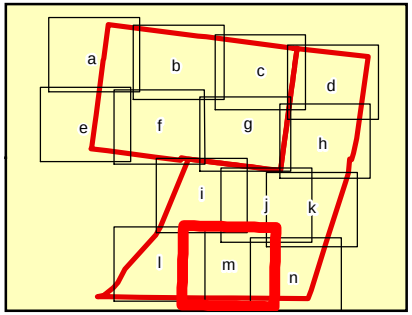


Figure 3m

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

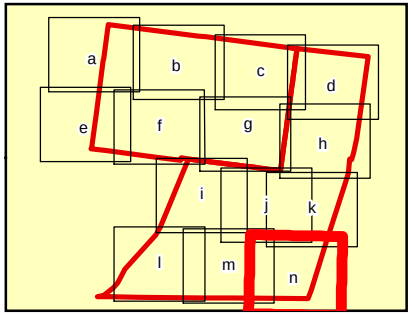


Figure 3n

Ecological Features within the Study Area

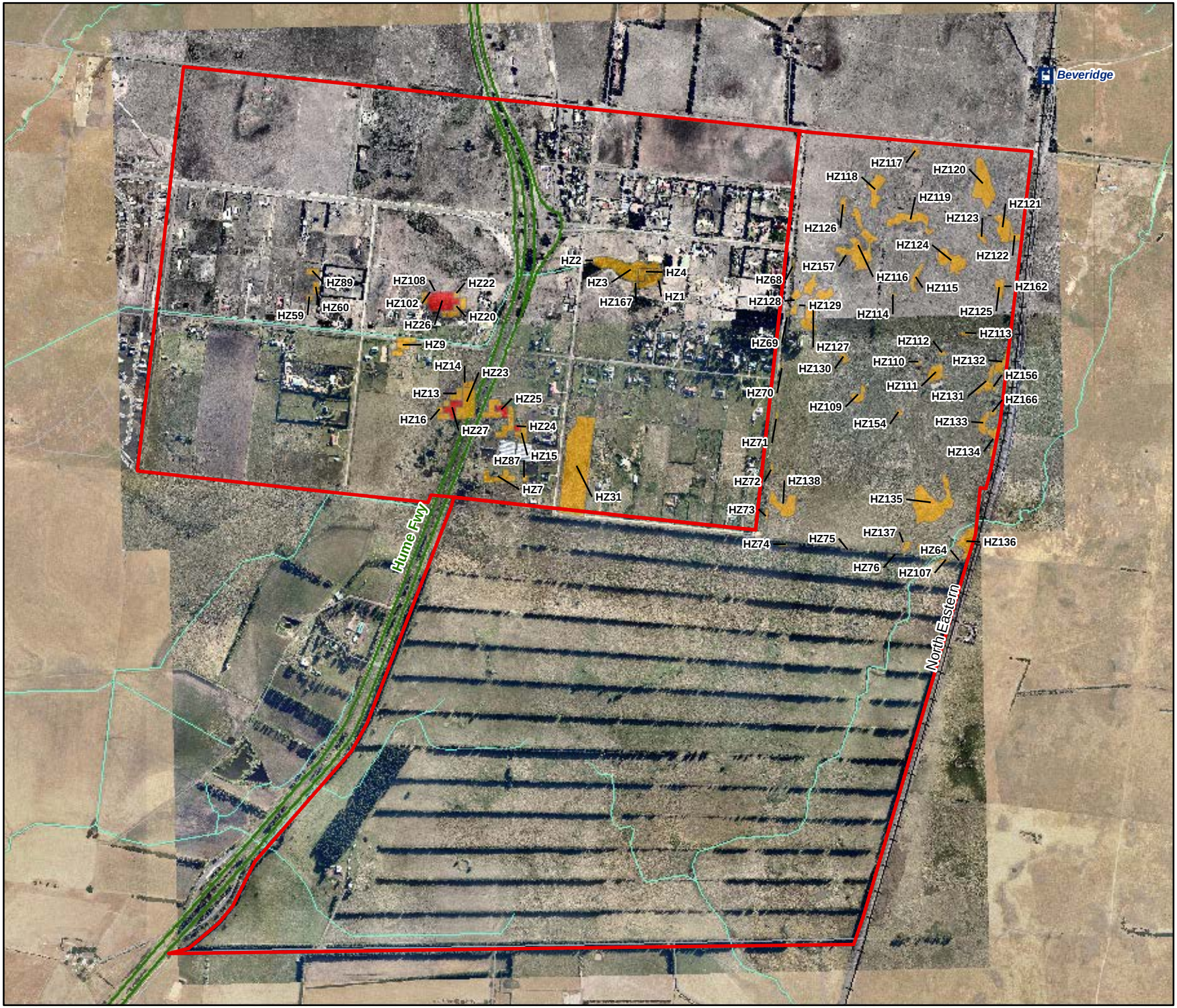
Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners



Legend

- Study Area
- High Conservation Significance
- Very High Conservation Significance

Figure 4

Conservation Significance

Beveridge Precinct Structure Plan

N

0 340 680

Metres

ecology & heritage partners

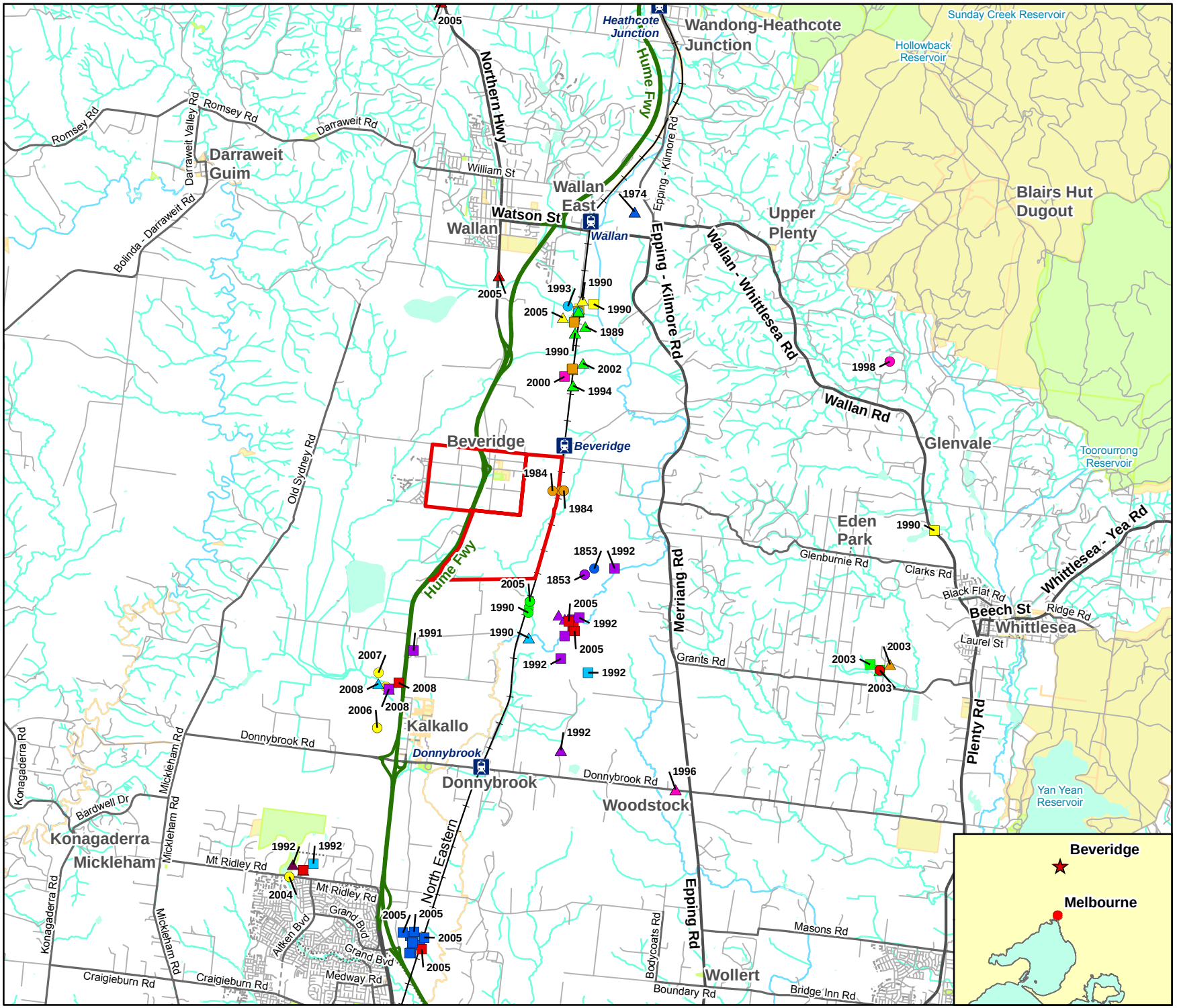
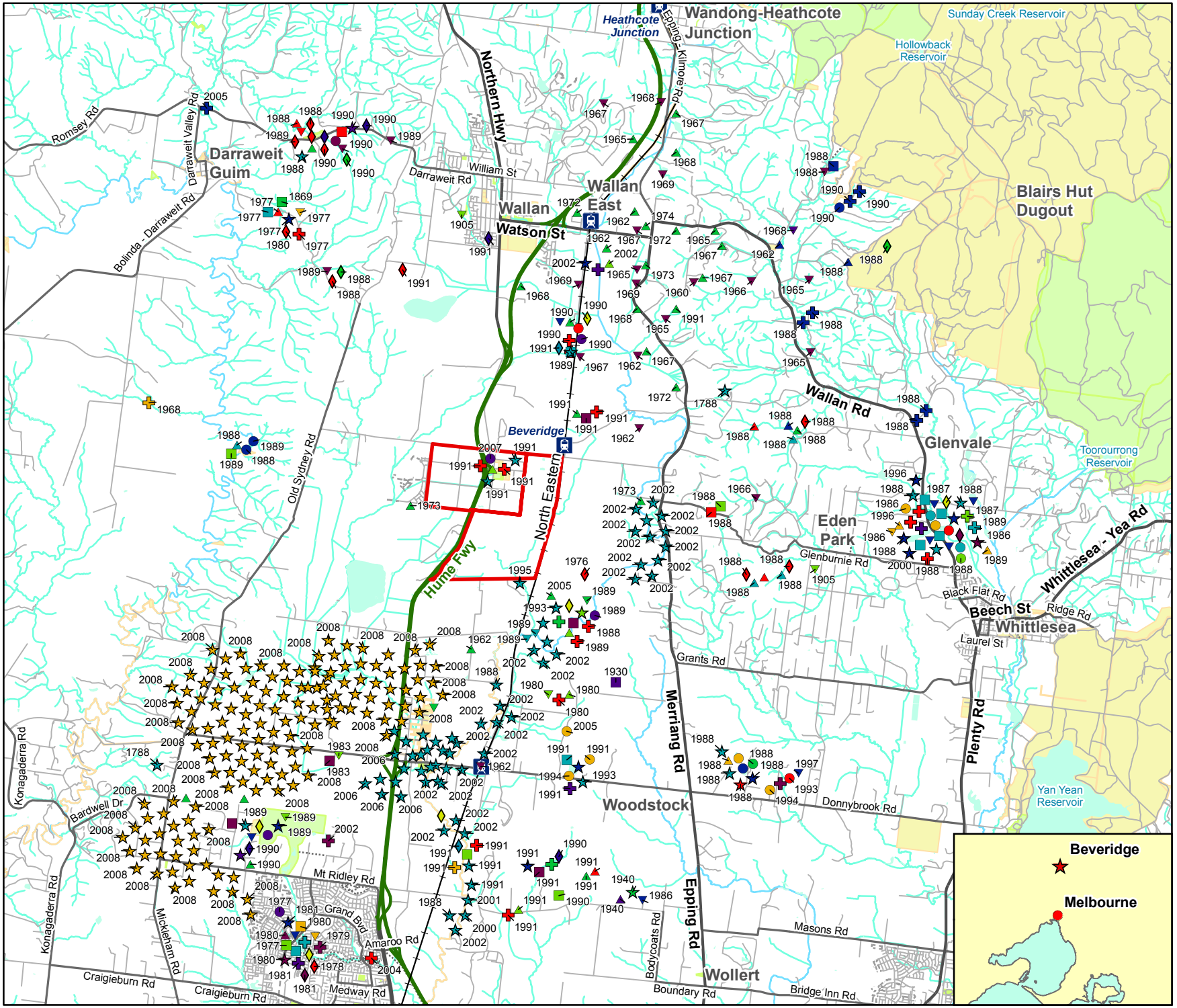


Figure 5

Previously documented significant flora within 10km of the study area

Beveridge Precinct Structure

ecology & heritage partners



Study Area

Significant Fauna

- Australasian Bittern
- Australasian Shoveler
- Australian Painted Snipe
- Azure Kingfisher
- Baillon's Crake
- Barking Owl
- Black Falcon
- Black-chinned Honeyeater
- Black-eared Cuckoo
- Blue-billed Duck
- Brown Quail
- Brown Toadlet
- Brown Treecreeper (south-eastern ssp.)
- Brush-tailed Phascogale
- Bush Stone-curlew
- Caspian Tern
- Common Dunnart
- Common Sandpiper
- Diamond Firetail
- Eastern Bettong
- Eastern Great Egret
- Eastern Horseshoe Bat
- Eastern Quoll
- Fat-tailed Dunnart
- Freckled Duck
- Golden Sun Moth
- Grassland Earless Dragon
- Grey-crowned Babbler
- Growling Grass Frog
- Hardhead
- Hooded Robin
- Intermediate Egret
- Latham's Snipe
- Lewin's Rail
- Little Bittern
- Little Button-quail
- Little Egret
- Mountain Galaxias
- Musk Duck
- Nankeen Night Heron
- Painted Honeyeater
- Pied Cormorant
- Plains-wanderer
- Red-chested Button-quail
- River Blackfish
- Royal Spoonbill
- Southern Brown Bandicoot
- Southern Toadlet
- Speckled Warbler
- Spotted Harrier
- Spotted Quail-thrush
- Striped Legless Lizard
- Swift Parrot
- Whiskered Tern

Figure 6

Previously documented significant fauna within 10km of the study area

Beveridge Precinct Structure

0 1.5 3

Kilometres

ecology & heritage partners

Legend

Study Area

Potential Fauna Habitat

- Growling Grass Frog
- Latham's Snipe
- Striped Legless Lizard
- Golden Sun Moth

Figure 7

Potential Fauna Habitat

Beveridge Precinct Structure Plan

N

0 325 650

Metres

ecology & heritage partners

1 INTRODUCTION

1.1 Background

Ecology and Heritage Partners Pty Ltd was commissioned by the Growth Areas Authority (GAA) to undertake a biodiversity assessment as part of the 2011/12 GAA Biodiversity Mapping Project, at Areas 1062 and 1098 of the Beveridge Precinct Structure Plan (PSP) area, north of Melbourne (Figure 1). The purpose of this report is to identify biodiversity values within the Precinct and to inform the planning process.

This report summarises DSE time-stamped native vegetation data provided for the entire Precinct areas and outlines findings from the general flora and fauna assessment and targeted flora surveys undertaken across the majority of the Precincts where property access was approved (Figure 2).

A desktop habitat hectare assessment and preliminary Net Gain analysis was completed using DSE time-stamped data. Significant limitations occur as a result of the use of DSE time-stamped native vegetation data in the place of onsite habitat hectare assessments. These limitations are more pronounced in areas where only computer modelled data was available.

This report discusses the implications and requirements under Commonwealth, State, and local legislation and polices, and makes recommendations for significant fauna surveys required. This report does not identify or map threatened floristic communities, including *Natural Temperate Grassland of the Victorian Volcanic Plain* (NTGVVP). Potential impacts and mitigation measures are proposed to avoid or minimise impacts to local ecological values and adhere to legislative requirements.

1.2 Objectives

The objectives of the general flora and fauna survey, and habitat hectare assessment were to:

- Map and review native vegetation, and associated habitat hectare information, as identified by DSE time-stamped native vegetation data;
- Identify, assess and map significant flora, fauna and habitat within the precinct and the level of conservation significance for any species or habitat recorded;
- Identify, assess and map scattered trees or large old trees in native vegetation patches recorded in the DSE time-stamped data;
- Calculate and summarise the total habitat hectares identified in the precinct area by DSE time-stamped data and provide a preliminary Net Gain analysis;
- Collect data at a sufficient detail and standard to enable the development of a PSP and Native Vegetation Precinct Structure Plan (NVPP);
- Provide advice on any works or management measures that may reduce adverse impacts of the development on species known or likely to occur in the precinct; and,

- Ensure that development of the precinct complies with legislative requirements regarding the protection of indigenous flora and fauna species and communities.

1.3 Precincts and Assessment Area

Areas 1062 and 1098 (the Precincts) are located in Beveridge, approximately 60 kilometres north of the Melbourne CBD, Victoria (Figure 1). The Hume Freeway cuts through the middle of the precincts running north-south. The Precincts cover around 1000 hectares and consists of multiple small properties in the existing Beveridge Township and west of the Hume Freeway and two larger farming properties in the south, "Lockerbie", and east, "Baldi Property", of the Precinct (Figure 2).

It is bound to the west by private farmland, by Cameron's Lane and Beveridge Road to the north, the rail reserve to the east, private farmland to the south west of the Hume Freeway and by Donovan's Lane to the south east of the Hume Freeway.

The majority of properties within the Precincts are privately owned, however there is some public land owned by the Mitchell Shire Council in the existing township zone, which includes the local school and church, and Spring Street Swamp. The Precincts have largely been cleared for agricultural purposes, with areas of remnant native vegetation limited to rocky and wet areas within farmland or on smaller properties that have not been cropped or cleared for residential housing and gardens. Remnant native vegetation onsite comprises modified examples of Plains Grassland, Plains Grassy Wetland, Plains Grassy Woodland and Swamp Scrub.

Not all properties were accessed as part of the general and targeted surveys. This was due to either the landholder not getting in contact or the landholder denying access. Properties that were accessed and assessed as part of the Beveridge Biodiversity Assessment are shown below (Figure 2).

According to the Department of Sustainability and Environment's (DSE's) Biodiversity Interactive Map (DSE 2011a) the precincts fall within the Victorian Volcanic Plain bioregion. The Victorian Volcanic Plain bioregion extends from Port Phillip Bay in the east, to Dartmoor in the west, extending north to the southern slopes of the Great Dividing Range.

The Precincts lies within the boundaries of the Port Phillip and Westernport Catchment Management Authority (CMA).

The Precincts contains one BioSite, Spring Street Swamp, and has several other BioSites in the near vicinity (Table 1) (DSE 2011a). BioSites in and near the precinct include habitat and significant species of national and regional significance (Table 1).

Table 1. BioSites located within the vicinity of the precinct.

Biosite No.	Name	Size (hectares)	Location	Significance	Attributes
5046	Spring St Swamp	19.97	Beveridge Township Zone, in Precinct	Regional	Contains Low Rises Woodland and (Dry) Sub-alpine Shrubland, and records of Growling Grass Frog *Litoria raniformis*, the Brown Quail *Coturnix ypsilophora* and Victorian Club-sedge *Isolepis victoriensis*.
3556	Beveridge Rail Reserve (GrassPPKI001)	3.79	In rail reserve on eastern boundary of Precinct	Regional	Previously contained native grassland that has since been damaged.
5130	Beveridge Rail Reserve - Camoola Swamp	200	Immediately north-west of Precinct	National	Contains the last extensive and intact area of native grassland remaining along the north-eastern (Melbourne to Sydney) railway, north-east of Melbourne. Includes Low Rises Woodlands and species records for Matted Flax-lily *Dianella amoena*, Swamp Fireweed *Senecio psilocarpus*, Small Scurf-pea *Cullen parv*um, Latham's Snipe *Gallinago hardwickii* and Bibron's Toadlet *Pseudophryne bibronii*.
5052	Merri Creek - Kalkallo	368.78	Along the eastern boundary of the Precinct	Regional	Contains Low Rises Woodland and Growling Grass Frog.
3610	Bald Hill (Merri Creek) (Grass PPWH001)	1199.48	Approx. 300m east of the eastern boundary of the Precinct	National	Contains Low Rises Woodland, Black Falcon *Falco subniger,* Curly Sedge *Carex tasmanica*, and Slender Tick-foil *Desmodium varians*.
n/a	Wallan East Rail Reserve (Grass PPKI002)	n/a	Approx. 2km north of Precinct	State	Contains (Dry) Sub-alpine Shrubland.
4854	Hernes Swamp	393.88	Approx. 2.5km north of Precinct area	National	Contains Low Rises Woodland, Growling Grass Frog, Striped Legless Lizard *Delma impar*, Black Falcon, Yam Daisy *Microseris sp.1* and Swamp Fireweed *Senecio psilocarpus.*

2 METHODS

2.1 Nomenclature

Common and scientific names of vascular plants follow the Flora Information System (FIS) (FIS 2011) and the Census of Vascular Plants of Victoria (Walsh and Stajsic 2007). Vegetation community names follow the DSE EVC Benchmarks (DSE 2011b).

Terrestrial and vertebrate fauna (mammals, birds, reptiles, amphibians and fish) follow the Victorian Biodiversity Atlas (VBA 2010) and the Atlas of Victorian Wildlife (AVW) (AVW 2009).

2.2 Literature and Database Review

2.2.1 DSE Time-stamped Native Vegetation Data

Time-stamped native vegetation data for the Beveridge PSP areas has been provided by the DSE. DSE time-stamped data contains GIS location and habitat hectare information for patches of native vegetation considered present within Melbourne's Urban Growth Boundary (UGB). On the advice of DSE, the provision of this data negates the requirement to undertake onsite habitat hectare assessments.

The time-stamped data has been developed using native vegetation and habitat hectare results from previous site assessments undertaken in the UGB and DSE modelled native vegetation data in areas where existing assessment data is not available. For example, DSE time-stamped data for the "Baldi" Property was collated from a previous assessment undertaken by Brett Lane and Associates (2011), whereas time-stamped data for the Beveridge Central Precinct and the Lockerbie property has been collated using DSE modelled native vegetation data only. The limitations of DSE modelled native vegetation data are discussed further in Section 2.4 and as part of the results.

2.2.2 Other Resources and Database Searches

The following additional resources and databases were reviewed over the duration of the project:

- Known ecological reports relevant to the precinct;
- The VBA (2010), AVW (2009) and FIS (2009) databases;
- Victorian Aquatic Fish Database and 'DSE verified unpublished aquatic records';
- The DSE's Biodiversity Interactive Maps showing historic and current EVCs (DSE 20110a);
- Museum of Victoria Butterfly Database (MOV 2011);

- Sites of Biological Significance (BioSites) (DSE 2011);
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) Protected Matters Search Tool which identifies matters of national environmental significance (e.g. listed flora and fauna species and ecological communities, Ramsar wetlands) protected under the EPBC Act (DSEWPC 2011);
- Planning Schemes Online providing the current zone and overlays (DPCD 2011); and
- Relevant legislation and policies.

Liaison was undertaken with the GAA and DSE to confirm the extent and intensity of the proposed methodology.

The significance assessment criteria developed by Ecology and Heritage Partners Pty Ltd of taxa and vegetation communities are presented in Appendix 1.

2.3 Field Surveys

General flora and fauna assessments were undertaken by a qualified botanist and zoologist.

2.3.1 General flora survey

Flora surveys were undertaken in the Precinct on 21, 22, 26 and 28 September 2011, and 23 and 24 November 2011. All properties for which access was provided were assessed on foot (Figure 2). Records of all vascular plants were recorded within each property.

2.3.2 Tree Assessment

DSE time-stamped data does not provide information relating to the presence and size of canopy trees in the study. An assessment of each canopy tree species was undertaken during the general and targeted flora surveys on 21, 22, 26 and 28 September 2011, 23 and 24 November 2011, 19 and 21 December 2011, and 30 and 31 January 2012.

Plains Grassy Woodland is the only vegetation type recorded within or in close proximity to the study area with a benchmark tree canopy layer. Table 2 illustrates the tree size classes for canopy trees for Plains Grassy Woodland, based on their Diameter at Breast (1.3m) Height (DBH).

Table 2. Tree size classes for trees indicative of the Plains Grassy Woodland EVC Benchmark.

Bioregion	EVC (number)	Species	Very Large Old Tree (DBH cm)	Large Old Tree (DBH cm)	Medium Old Tree (DBH cm)	Small Tree (DBH cm)
Victorian Volcanic Plain	Plains Grassy Woodland (55_61)	*Eucalyptus* spp.	>120	80 - 120	60 - 80	20 - 60

2.3.3 Targeted flora surveys

Targeted flora surveys were undertaken in all areas of native vegetation as indicated by DSE time-stamped vegetation data. The targeted surveys were completed on 23 and 24 November 2011, 19 and 21 December 2011, and 30 and 31 January 2012. The following species were targeted during these surveys:

- Matted Flax-lily *Dianella amoena*;
- Curly Sedge *Carex tasmanica*;
- Clover Glycine *Glycine latrobeana*;
- Slender Tick Trefoil *Desmodium varians*;
- Small Scurf Pea *Cullen parvum*;
- Tough Scurf Pea *Cullen tenax*;
- Austral Toadflax *Thesium australe*;
- Narrow Plantain *Plantago gaudichaudiana*;
- Adamson's Blown-grass *Lachnagrostis adamsonii*
- Basalt Peppercress *Lepidium hyssopifolium*;
- Swamp Fireweed *Senecio psilocarpus;*
- Swamp Everlasting *Xerochrysum palustre*;
- Pale Swamp Everlasting *Helichrysum* aff. *rutidolepis* (Lowland Swamps);
- Sunshine Diuris *Diuris fragrantissima*;
- River Swamp Wallaby Grass *Amphibromus fluitans*;
- Swollen Swamp Wallaby Grass *Amphibromus pithogastrus*;
- Small-flower Wallaby-grass *Austrodanthonia monticola*;
- Veined Spear-grass *Austrostipa rudis* subsp. *rudis*;
- Large-flower Crane's-bill *Geranium* sp. 1;
- Pale-flower Crane's-bill *Geranium* sp. 3;
- Perennial Blown-grass *Lachnagrostis perennis* spp. agg;
- Purple Blown-grass *Lachnagrostis punicea* subsp. *punicea*; and
- Basalt Tussock Grass *Poa labillardeirei* var. (Volcanic Plains).

The target flora species have been determined based on the available habitat in the study area and according to the *Biodiversity Precinct Structure Planning Kit* (DSE 2010c). The findings of the targeted flora surveys will influence the conservation significance of vegetation recorded in the study area.

2.3.4 General fauna survey

General fauna assessments, including habitat assessments were undertaken throughout the flora assessment period on 21, 22, 26 and 28 September 2011, and 30 January, 2012. Weather conditions over this period were varied, ranging from mild, to hot and sunny, to cool and overcast. All fauna observed and/or heard were recorded, while the presence of a particular species within the precinct was also confirmed through indirect evidence such as feathers, scats, scratchings and/or nests.

Assessors used binoculars to scan for birds, mammals in hollows, and basking reptiles. Hard rubbish, woody debris and rocks were lifted to locate small ground-dwelling fauna including reptiles and frogs.

An assessment of different habitat types throughout the Precincts included waterbodies, trees (including the presence or absence of hollows), drainage lines and remnant grassland. The level of ground cover, vegetation composition and structure within these areas was also recorded.

2.3.5 Incidental flora and fauna surveys

Several site assessments were undertaken within the Precincts over the duration of the project. Throughout this period, flora and fauna records were maintained by all assessors. A consolidated list of all flora and fauna species recorded during the project area provided below (Appendices 2 and 3, respectively).

2.4 Assessment Qualifications and Limitations

The objectives of the assessment were to document flora and fauna species that occur, or may occur, within the Precincts. Targeted surveys were undertaken for significant flora species that have the potential to occur in the study area.

As with any assessment, a greater amount of time on the site would increase the likelihood of recording additional flora and fauna species. The short duration of the survey meant that migratory, transitory or uncommon fauna species may have been absent from habitats at the time of the present field assessments.

Flora surveys were undertaken during September, November, December and January at a time considered appropriate to undertake general flora assessments and targeted surveys for the majority of plant species. However, some flora species (e.g. orchids), may not have been visible at the time of the assessment.

Habitat hectare assessments were not undertaken as part of the current project, as DSE time-stamped native vegetation data was provided. This data contains information relating to the location of native vegetation patches deemed present and their habitat scores. It uses results from previous habitat hectare assessments undertaken in Melbourne's UGB. Where no assessment have been undertaken previously, DSE modelled native vegetation and habitat hectare data has been used.

Based on observations during the site assessments, there are inaccuracies in the DSE time-stamped data. In particular, three patches of NTGVVP identified onsite are not indicated as grassland patches in the time-stamped data. Numerous other patches of native vegetation identified in the Beveridge Central Precinct and in the Lockerbie Property were also not indicated in the time-stamped data. These included 47 patches of grassland vegetation, 14 wetland patches and two woodland patches.

Not all properties were accessed as part of the general and targeted surveys. This was due to either the landholder not getting in contact or the landholder denying access.

3 RESULTS

3.1 Literature review

DSE Time-stamped Native Vegetation Data

Time-stamped native vegetation data for the Beveridge PSP areas has been provided by the DSE. DSE time-stamped data contains habitat hectare assessment information for native vegetation considered present within Melbourne's UGB. Figure 3 illustrates patches of native vegetation considered present in the study area according to the DSE time-stamped data. The habitat hectare assessment information associated with these patches is outlined in Table A4.1.1.

3.2 Flora

3.2.1 General Flora Survey

Flora Species Recorded

273 flora species (112 indigenous, 161 exotic) were recorded in total within the Beveridge Central (1068) and Lockerbie North (1092) Precincts (Appendix 2.1): 99 species (36 indigenous, 63 exotic) being recorded in Beveridge Central and 174 species (76 indigenous, 98 exotic) recorded in Lockerbie North. Both Precinct areas were highly modified and dominated by exotic vegetation. They have largely been cleared of remnant native vegetation for agricultural purposes, although modified native grassland and wetlands are present across rocky areas which have not been cropped.

Indigenous species recorded within Beveridge Central included one tree species, Swamp Gum *Eucalyptus ovata,* a variety of herbs, including *Geranium* spp., Common Everlasting *Chrysocephalum apiculatum,* Sheep's Burr *Acaena echinata*, Common Woodruff *Asperula conferta,* Blue Devil *Eryngium ovinum*, Fireweed *Senecio* spp., Slender Speedwell *Veronica gracilis*, and grasses, such as Wallaby Grass *Austrodanthonia* spp., Tussock Grass *Poa* spp., Rough Spear-grass *Austrostipa scabra* subsp. *falcata*, Kangaroo Grass *Themeda triandra*, Rushes *Juncus* spp., Fen Sedge *Carex gaudichaudiana* and Narrow-leaf Cumbungi *Typha domingensis.*

Indigenous species recorded within the Lockerbie North Precinct included tree species, Swamp Gum *Eucalyptus ovata*, Manna Gum *Eucalyptus viminalis*, River Red-gum *Eucalyptus camaldulensis*, one shrub species, Tree Violet *Melicytus dentatus*, herbs, including Small Loosestrife *Lythrum hyssopifolia*, Variable Willow-herb Epilobium billardierianum, Blue Devil *Eryngium ovinum, Geranium* spp. and Mud Dock *Rumex bidens,* and grasses, such as Wallaby Grass *Austrodanthonia spp*., Tussock Grass *Poa* spp., Supple Spear-grass *Austrostipa mollis*, Weeping Grass *Microleana stipoides* var. *Stipoides*, Kangaroo Grass

Themeda triandra, Rushes *Juncus* spp., Common Spike-sedge *Eleocharis acuta* and Common Wheat-grass *Elymus scaber* var. *scaber*.

Both Precincts comprised similar exotic grass and herbaceous species, including Toowoomba Canary-grass *Phalaris aquatic*, Browntop Bent *Agrostis capillaris*, Cocksfoot *Dactylis glomerata*, Barley Grass *Hordeum* spp., Rye-grass *Lolium* spp., Yorkshire Fog *Holcus lanatus*, Ox-tongue *Helminthotheca echioides*, Cape Weed *Arctotheca calendula*, Spear Thistle *Cirsium vulgare*, Artichoke Thistle *Cynara cardunculus*, Clover *Trifolium spp*., Ribwort *Plantago lanceolata*, Sheep Sorrel *Acetosella vulgaris* and Onion Grass *Romulea rosea*. In addition, Beveridge Central contained a greater number of declared noxious weeds, including Blackberry *Rubus fruticosus* spp. agg., Blue Periwinkle *Vinca major*, Sweet Briar *Rosa rubiginosa*, Gorse *Ulex europaeus*, Montpellier Broom *Genista monspessulana* and Paterson's Curse *Echium plantagineum*. Lockerbie North also contained a variety of planted non-indigenous Gum Trees *Eucalyptus* spp.

A consolidated list of all of flora species recorded during the general flora surveys within the Precincts is provided in Appendix 2.

3.2.2 Significant flora species and communities

One Site of Biological Significance, Spring Street Swamp, is located within the Beveridge Central Precinct area (figure 8). This site contains records of the nationally endangered Growling Grass Frog *Litoria raniformis*, and the near threatened Brown Quail *Coturnix ypsilophora* (DSE 2007a).

Several other biosites are also located immediately adjacent to or within close proximity to the Precincts (figure 8). These include the Beveridge Rail Reserve, Merri Creek, Camoola Swamp, Bald Hill, Wallan East Rail Reserve and Hernes Swamp. These sites comprise significant native vegetation communities, including native grasslands, Low Rises Woodland and (Dry) Sub-alpine Shrubland, provide important natural connectivity through the landscape, and contain numerous records of nationally and state significant flora and fauna species, including Matted Flax-lily *Dianella amoena*, Curly Sedge *Carex tasmanica*, Swamp Fireweed *Senecio psilocarpus*, Small Scurf-pea *Cullen parvum*, Tough Scurf-pea *Cullen tenax*, Striped Legless Lizard *Delma impar*, Growling Grass Frog, Brown Quail, Latham's Snipe *Gallinago hardwickii*, Bibron's Toadlet *Pseudophryne bibronii* and Black Falcon *Falco subniger*.

National

One nationally significant flora species, Matted Flax-lily, was recorded during the targeted flora surveys (Figure 3). One species also listed as endangered, Basalt Peppercress *Lepidium hyssopifolium*, has been recorded previously in the "Baldi" Property. Six other nationally significant flora species have previously been recorded from within the local area (FIS 2011), and four additional nationally significant flora species are listed as potentially occurring within a 10 kilometre radius of the precinct (DSEWPC 2011) (Appendix 2.2) (Figure 5).

State

One state significant flora species, Matted Flax-lily, listed as Endangered under the Flora and Fauna Guarantee (FFG) Act were recorded during the targeted flora surveys. There have been 25 other state significant flora species previously recorded from within the local area (FIS 2011) (Appendix 2.2.).

Regional and Local

21 regionally significant flora species were recorded within the precinct during the assessment. All other indigenous species are considered to be of local significance, due to the depletion of native vegetation in the local area (Appendix 2.1).

Significant Communities

This report does not identify or map nationally threatened floristic communities, including NTGVVP. The presence, mapping and requirements for nationally significant vegetation communities within PSP areas are currently being negotiated between DSE and SEWPaC.

One state significant vegetation community, Western Basalt Plains Grassland (WBPG), occurs in the precinct in patches of Plains Grassland.

Plains Grassland (EVC 132_61) Plains Grassy Wetland (EVC 125), Stony Knoll Shrubland (EVC 649), Swamp Scrub (EVC 52) and Creekline Tussock Grassland (EVC 654) have been identified as present as part of DSE time-stamped vegetation data and are all listed as Endangered within the Victorian Volcanic (DSE 2011b). The conservation significance of patches of these vegetation types is at least High due to their endangered status.

3.2.3 Best or remaining 50% habitat for rare and threatened flora species

One species of national significance, Matted Flax-lily, was recorded during the site assessment. No other national or state significant flora or fauna species were recorded. Based on the current surveys and literature review, there is habitat present for three nationally significant flora species: Matted Flax-lily, Basalt Peppercress and Curly Sedge; and 10 state significant species. The habitat assessment for significant species is provided below (Table 3) (DSE 2007b). Information on whether the study area provides either the 'best 50%' or 'remaining 50%' habitat for significant species is provided (Table 4).

Table 3. *Habitat assessment for significant species.*

Step	Description	Outcome
A	Is the species, or has the species been recorded as resident on site> OR if the species is not 'resident' has it been recorded regularly (e.g. annually) n-site?	Yes – go to B No – go to D
B	Is it possible to discriminate between the importance of different populations of the species? For example, can numbers be reasonably estimated and is there available knowledge on what are typical population sizes?	Yes – go to C No – go to E
C	Does the site contain a population that is above average size or importance for the bioregion?	Yes – Best 50% of habitat No – remaining 50% of habitat
D	Does the habitat on site clearly meet one or more of the habitat requirements of the species? Is it reasonable to expect that the species is present or would make significant use of the site in the medium term (i.e. within the next 10 years)?	Yes to both – go to F No to either – no further consideration required for that species
E	Has some form of habitat modelling been undertaken for the species in the bioregion?	Yes – use this information to determine Best 50% of habitat or Remaining 50% of habitat No – go to F
F	Does the site represent above-average condition and landscape context for the relevant EVC or habitat type in the bioregion?	Yes – best 50% of habitat No – Remaining 50% of habitat

Table 4. *Habitat assessment for significant species within properties accessed for the precinct.*

Potential Habitat (Remnant Patch No)	Significant Species or Species' with the Highest Likelihood of Occurrence[1]	Steps Followed	Best or Remaining 50% of Habitat for the Species?	Notes	Conservation Significance Rating Prior to Evaluation	Conservation Significance Rating after Evaluation
Hz 135	Matted Flax-lily	A - Yes, B – Yes, C - No	Remaining 50% of Habitat	Only one plant recorded	High	High
Hz 31-128, 130-134, 136-156, 162-166	Matted Flax-lily	A - No, D – Yes, F - No	Remaining 50% of Habitat	Below average condition	High	High
Hz 31-128, 130-134, 136-156, 162-166	Basalt Peppercress	A - No, D – Yes, F - No	Remaining 50% of Habitat	Below average condition	High	High
Hz 7-27, 129,157	Curly Sedge	A - No, D – Yes, F - No	Remaining 50% of Habitat	Below average condition	High	High

Note: The assessment is undertaken on the species of the highest significance (national) and with the highest likelihood of occurrence.

A Matted Flax-lily plant was recorded in one patch of Stony Knoll Shrubland (Hz 135). Being only one plant within below-average condition native vegetation, the plant could not be considered as an important population for the region. Hence, following steps A, B and C, vegetation within Hz 135 is considered to be the Remaining 50% habitat for Matted Flax-lily. No other threatened species were recorded during the targeted flora surveys.

Other areas of Stony Knoll Shrubland, Plains Grassland, Creekline Tussock Grassland and fence lines may also provide potential habitat for Matted Flax-lily and Basalt Peppercress plants. Areas of Plains Grassy Wetland may also provide habitat for Curly Sedge.

The available habitat for these species is however not considered to be in above average condition. As such, following steps A to F in table 6 above, these patches of native vegetation are considered to be the Remaining 50% habitat for Matted Flax-lily, Basalt Peppercress and Curly Sedge.

3.3 Ecological Vegetation Classes

The DSE bioregional pre-1750 EVC mapping shows that the precinct was once covered by Plains Grassland and Plains Grassy Woodland (EVC 55_61). 2005 EVC extent mapping (DSE 2011a) shows only isolated occurrences of these EVCs within the precinct.

DSE time-stamped native vegetation data provided for the Beveridge Precinct areas records the following vegetation types as present in the study area: Plains Grassland (EVC 132_61) Plains Grassy Wetland (EVC 125), Stony Knoll Shrubland (EVC 649), Swamp Scrub (EVC 52) and Creekline Tussock Grassland (EVC 654). These vegetation types are all endangered within the Victorian Volcanic Plain bioregion (DSE 2011b).

3.3.1 Predominantly Exotic Vegetation

The study area has a long history of disturbance primarily through grazing by livestock, though the lack of surface rock in many areas and the prevalence of pasture species (i.e. Toowoomba Canary-grass *Phalaris aquatica*) indicates that much of the study area has also previously been cultivated.

Due to this long history of disturbance, the majority of the study area is dominated by Predominantly Introduced Vegetation (PIV). These areas are dominated by common introduced pasture species such as Toowoomba Canary-grass, Brown-top Bent, Cocksfoot, and Cape Weed along with common agricultural and environmental weeds such as Saffron Thistle, Artichoke Thistle, Ox-tongue, and Ribwort. These areas are in poor condition as they support a high number of introduced grasses and weeds, many of which are highly invasive.

3.3.2 Heavier soils Plains Grassland (EVC 132_62)

Plains Grassland is treeless vegetation, mostly less than one metre tall, dominated by largely graminoid and herb life forms but may have originally contained scattered woody plants (DSE 2011a). DSE mapping (DSE 2011b) shows that historically, this EVC would have occurred in smaller areas in the north and along the eastern boundary of the study area. According to DSE time-stamped data, modified patches of Plains Grassland are present in the Beveridge Central Precinct and the "Baldi" Property.

3.3.3 Plains Grassy Wetland (EVC 125)

This EVC comprises a wetland dominated by grasses and small sedges and herbs, which is typically species-rich on the outer verges but is usually species-poor in the wetter central areas. Usually treeless, but in some instances can include sparse River Red-gums or Swamp

Gums *Eucalyptus ovata*. A sparse shrub component may also be present. Time-stamped data identifies areas of Plains Grassy Wetland in the Beveridge Central Precinct and the "Baldi" Property.

3.3.4 Stony Knoll Shrubland (EVC 649)

Knoll Shrubland (EVC 649) is a shrubland to three metres tall or low non-eucalypt woodland to eight metres tall with a grassy understorey. It occurs on low stony rises on basalt flows. The soils are fertile and well drained but shallow (DSE 2011a). Stony Knoll Shrublands have been recorded throughout the "Baldi" Property on stony knolls.

3.3.5 Swamp Scrub (EVC 53)

Swamp Scrub is a closed scrub to 8m tall, located at low elevations along streams or on poorly drained sites. Soils vary from organic loams to fine silts and peats which are inundated during the wetter months of the year. It is dominated by Woolly Tea-tree *Leptospermun lanigerum* which often forms a dense impenetrable thicket, out-competing other species. Emergent trees may sometimes be present. DSE time-stamped data identified five patches of Swamp Scrub in the Beveridge Central Precinct.

3.3.6 Creekline Tussock Grassland (EVC 654)

Creekline Tussock Grassland is generally dominated by native tussock-grasses with small herbs and mat-forming grasses in the inter-tussock spaces. It grows along low gradient ephemeral and intermittent drainage lines, on fertile heavy dark clays. Exposed basalt rocks, and small areas of sedgeland and/or wetland, can be common in this EVC. DSE time-stamped data identified two patches of Creekline Tussock Grassland along the southern boundary of the "Baldi" Property.

3.4 Habitat Hectare Assessment

3.4.1 Remnant patches of native vegetation

DSE Time-stamped Native Vegetation Data indicates that 80 patches of remnant vegetation are present within the study area (Appendix 4.1) (Figure 3). The vegetation is of at least High conservation significance due to the endangered status of Plains Grassland, Plains Grassy Wetland, Stony Knoll Shrubland, Swamp Scrub and Creekline Tussock Grassland in the Victorian Volcanic Plain (Figure 4).

Four patches of Plains Grassy Wetland, one patch of Plains Grassland and one patch of Creekline Tusoock Grassland were of Very High Significance due to their high vegetation quality score.

Overall approximately **7.29 habitat hectares** of remnant vegetation is present within the study area, including:

- **1.32 habitat hectares** of High conservation significance Plains Grassland;
- **0.01 habitat hectares** of Very High conservation significance Plains Grassland;
- **1.24 habitat hectares** of High conservation significance Plains Grassy Wetland;
- **0.64 habitat hectares** of High conservation significance Plains Grassy Wetland;
- **3.51 habitat hectares** of High conservation significance Stony Knoll Shrubland;
- **0.02 habitat hectares** of High conservation significance Creekline Tussock Grassland**;**
- **0 habitat hectares** of Very High conservation significance Creekline Tussock Grassland**;** and,
- **0.55 habitat hectares** of High conservation significance Swamp Scrub.

3.4.2 Trees within remnant vegetation

No trees within remnant vegetation patches (as indicated by DSE time-stamped native vegetation data) were recorded during the site assessments.

3.4.3 Scattered trees

One very large old tree (VLOT), seven large old trees (LOT), one Stag (large), five medium old trees (MOTs) and two small trees (STs) were recorded during the site assessments. Figure 3 illustrates the location of these trees. Table 5 outlines the species, size and potential Net Gain Offset requirements if these trees are to be removed or disturbed.

Table 5. Scattered Trees in the Precincts

Tree No.	Species	DBH (cm)	Size Class	Conservation Significance	GPS Coordinates		Net Gain Offset Requirements	
					POINT X	POINT Y	Option 1: Protect and Recruit	Option 2: Recruitment only
1	Swamp Gum *Eucalyptus ovata*	90	LOT	High	320346.195207	5850974.20043	Protect 4 LOTs & Recruit 20 new plants	Recruit 120 new plants
2	Manna Gum *Eucalyptus viminalis*	92	LOT	High	321211.874238	5848864.03357	Protect 4 LOTs & Recruit 20 new plants	Recruit 120 new plants
3	Stag	80	LOT	High	321267.686192	5848859.28362		Recruit 120 new plants
4	Manna Gum *Eucalyptus viminalis*	105	LOT	High	321367.435216	5848918.65803	Protect 4 LOTs & Recruit 20 new plants	Recruit 120 new plants
5	Swamp Gum *Eucalyptus ovata*	94	LOT	High	322268.738899	5848810.59659	Protect 4 LOTs & Recruit 20 new plants	Recruit 120 new plants
6	River Red Gum *Eucalyptus camaldulensis*	60	MOT	High	319979.443527	5848127.16171	Protect 2 MOTs & Recruit 20 new plants	Recruit 60 new plants
7	River Red Gum *Eucalyptus camaldulensis*	62	MOT	High	319983.399965	5848121.08231	Protect 2 MOTs & Recruit 20 new plants	Recruit 60 new plants
8	River Red Gum *Eucalyptus camaldulensis*	61	MOT	High	319987.347849	5848109.52434	Protect 2 MOTs & Recruit 20 new plants	Recruit 60 new plants
9	Manna Gum *Eucalyptus viminalis*	85	LOT	High	319943.636645	5847847.54351	Protect 4 LOTs & Recruit 20 new plants	Recruit 120 new plants
10	Manna Gum *Eucalyptus viminalis*	65	MOT	High	319940.07418	5847836.85612	Protect 2 MOTs & Recruit 20 new plants	Recruit 60 new plants
11	Manna Gum *Eucalyptus viminalis*	124	VLOT	High	322025.303781	5848033.97919	Protect 5 VLOTs & Recruit 30 new plants	Recruit 180 new plants
12	Manna Gum *Eucalyptus viminalis*	20	ST	High	321782.59543	5847931.81315		Recruit 4 new plants
13	Manna Gum *Eucalyptus viminalis*	29	ST	High	321773.87478	5847918.47569		Recruit 13 new plants
14	Manna Gum *Eucalyptus viminalis*	89	LOT	High	320996.809326	5850817.35997	Protect 4 LOTs & Recruit 20 new plants	Recruit 120 new plants
15	River Red Gum *Eucalyptus camaldulensis*	62	MOT	High	320982.268331	5851003.91758	Protect 2 MOTs & Recruit 20 new plants	Recruit 60 new plants
16	Manna Gum *Eucalyptus viminalis*	96	LOT	High	322493.082525	5849359.79868	Protect 4 LOTs & Recruit 20 new plants	Recruit 120 new plants

3.5 Preliminary Net Gain Analysis

Due to the endangered status of the EVCs identified in the study area, remnant patches of vegetation in the study area are considered of at least 'High' conservation significance. Four patches of Plains Grassy Wetland, one patch of Plains Grassland and one patch of Creekline Tusoock Grassland were also of Very High Significance based on their vegetation quality score. Patches of native vegetation that were not surveyed as part of this assessment (due to lack of approved access) are assumed as High conservation significance. The conservation significance of these patches may change if targeted surveys are undertaken in them in the future.

The total Net Gain Offset requirement for the removal or disturbance of native vegetation of 'High' conservation significance is **9.96 habitat hectares** (Table 6). The total Net Gain Offset requirement for the removal or disturbance of native vegetation of 'Very High' conservation significance is **1.3 habitat hectares**.

Table 6. Habitat Hectares and Preliminary Net Gain Offset Summary

Native Vegetation Present	Habitat Hectares	Total Net Gain Requirement	
		High Con Sig	Very High Con Sig
High Conservation Significance Plains Grassland	1.32	1.98	-
Very High Conservation Significance Plains Grassland	0.01	-	0.02
High Conservation Significance Plains Grassy Wetland	1.24	1.86	-
Very High Conservation Significance Plains Grassland	0.64	-	1.28
High Conservation Significance Stony Knoll Shrubland	3.51	5.27	-
High Conservation Significance Swamp Scrub	0.55	0.83	-
High Conservation Significance Creekline Tussock Grassland	0.02	0.03	-
Very High Conservation Significance Creekline Tussock Grassland	-	-	-
Total	**7.29**	**9.96**	**1.3**

As outlined in Table 5, the total Net Gain requirements for the removal or disturbance of scattered trees in the Beveridge Central and Lockerbie North Precincts are:

- Protect 5 VLOTs, 28 LOTs and 10 MOTs, and recruit 407 new plants.

  Or

- Recruit 1,457 new plants.

3.6 Fauna

3.6.1 Fauna species

Overall, there were 55 species recorded during the current survey. Of these, there were five mammals (one native and four introduced), 44 birds (39 native, 5 introduced), four native reptiles and two native amphibians (Appendix 3.1).

3.6.2 Fauna habitats

The study area supports seven broad habitat types: native grasslands, ephemeral drainage line, modified woodland and scattered remnant trees, planted native and introduced trees, artificial waterbodies, introduced pasture grass and crops, and rocky outcrops/stony knolls. Areas of potential habitat for significant species are mapped independently of DSE time-stamped data (Figure 7).

Native Grasslands (Corresponding EVC: Plains Grassland)

Whilst patchy in distribution, several areas of vegetation were classified as Plains Grassland (EVC 132) within the precinct, particularly within the 'Lockerbie' and 'Baldi' parcels of land.

Overall habitat value – This habitat is of **moderate** habitat value for fauna (Appendix 1.5). Indigenous vegetation diversity was the highest in these areas, and some areas contained surface and embedded rocks. These areas provide a higher diversity of micro-habitats and are expected to provide refuge and foraging areas for native reptiles and frogs.

Description – This habitat occurs in areas that have not been cropped, or where secondary grassland has recolonised following disturbances. It typically contains a high cover abundance of native tussock grasses such as wallaby grass *Austrodanthonia* spp. and spear grass *Austrostipa* spp. These areas contained both surface and embedded rock, as well as cracking soils. Shrubs and trees were generally absent from these areas.

Fauna – These areas are generally isolated and provide habitats to locally common species such as Raven *Corvus* spp. and Australian Magpie *Gymnorhina tibicen*, along with introduced species such as Common Starling *Sturnus vulgaris* and House Sparrow *Passer domesticus* which were prevalent in this habitat during the survey. Raptors including Brown Falcon *Falco berigora*, Peregrine Falcon *Falco peregrinus* and Wedge-tailed Eagle *Aquila audax* were observed searching for prey items over these areas. Grassland areas are also likely to provide refuge for native reptiles and frogs, although no indigenous ground-dwelling mammals are expected to occur in these isolated and degraded areas. These areas may also provide potential habitat for Golden Sun Moth, which is known to occur in habitat mixed with native and introduced grasses throughout northern Melbourne.

Ephemeral drainage line (Corresponding EVCs: Non-native Vegetation)

Several drainage lines occur within the precinct. It is highly modified and is located within the 'Lockerbie' parcel of land. It extends from the north-east corner of the property to the south-east.

Overall habitat value – The ephemeral drainage line provides **low** to **moderate** habitat values for fauna (Appendix 1.5). When inundated the drainage line would provide temporary habitat for waterbirds and frogs.

Description – At the time of the assessment, the drainage line was wet but not inundated in its entirety. The vegetation along the drainage line comprises exotic pasture, with little aquatic vegetation and ground debris such as rocks and logs. There were also large algal blooms in sections of the drainage line.

Fauna – The ephemeral drainage line principally provides foraging and refuge habitat for native fauna, including waterbirds such as White-faced Heron *Egretta novaehollandiae*, Australian Wood Duck *Chenonetta jubata* and Pacific Black Duck *Anas superciliosa*, along with native frogs such as Common Froglet *Crinia signifera* and Spotted Marsh Frog *Limnodynastes tasmaniensis*. It is likely that the vegetation adjoining these areas would be used by Ibis *Threskiornis* spp, and possibly opportunistically by the regionally significant Latham's Snipe *Gallinago hardwickii*.

3.6.3 Modified woodland and scattered remnant trees

Overall habitat value – Modified woodland is of **moderate** to **high** habitat value for fauna, principally due to the presence of River Red-gums, Swamp Gums and Manna Gums. The scattered trees are large with some hollows and are likely to act as 'stepping stone' habitats for mobile species (especially birds).

Description – This habitat type occurs patchily throughout the majority of the study area and is characterised by an overstorey supporting mature River Red-gum, Swamp Gums and Manna Gums. The majority of these trees provide a variety of hollows as habitat. The mid-storey is entirely absent and the understorey is largely comprises introduced pasture grasses and weeds. The ground immediately below overstorey trees contains some fallen wood debris (logs, branches and twigs), though is often eroded and heavily infested with annual weeds.

Terrestrial fauna – Modified woodland and remnant trees provide habitat for a range of native mammals (i.e. possums and gliders). Remnant trees containing hollows are also an important habitat feature for many bird species including; cockatoos, parrots, lorikeets, corellas, rosellas and honeyeaters. Smaller spout hollows are important habitat for microbats such as White-striped Freetail Bat *Tadarida australis*.

When in flower, remnant woodland trees provide an important nectar resource for a variety of honeyeaters and lorikeets. Diurnal raptors (e.g., Nankeen Kestrel *Falco cenchroides*, Black-shouldered Kite *Elanus axillaris*), also use mature trees for perching, roosting and foraging activities.

Although native ground and mid storey layers are largely absent within areas of modified woodland, some complexity of structure is still provided by the existing introduced grasses and fallen woody debris. Where some structure remains, a ground fauna component of reptiles (e.g., lizards, snakes) may persist.

Planted native and introduced trees

Overall habitat value – Habitat value for planted vegetation and scattered trees is **low** (Appendix 1.5). Very few mature trees are present within the precinct. A few of the trees present have some hollows and small amounts of shredding bark, though no nests were recorded, which is used as evidence of higher quality habitat for fauna.

Description – A mixture of exotic and planted non-indigenous (Australian native) trees are present across the precinct. They are generally located round houses or along fencelines as windrows. As stated they did not contain features associated with higher quality fauna habitats and were generally isolated with exotic understorey vegetation.

Terrestrial fauna – Planted trees provide roosting habitat for a low diversity of birds and bats. When in flower, they provide food resources for nectarivorous birds. Whilst no nests or dreys were observed, these trees may provide such opportunities in the future for birds, common arboreal mammals and bats.

Artificial waterbodies/ modified ephemeral wetland (Farm Dams) (Corresponding EVC: Plains Grassy Wetland)

Overall habitat value – Artificial waterbodies and modified wetlands are of **moderate** habitat value for fauna (Appendix 1.5).

Description – Several artificial waterbodies (i.e. dams) exist within the precinct. They currently support low levels of emergent and submergent aquatic vegetation, with few refuge sites such as logs or rocks present. The surrounding vegetation comprises introduced pasture grasses and weeds. One good quality dam (Plate 1) demonstrates habitat characteristics consistent with suitable Growling Grass Frog *Litoria raniformis* habitat. Some remnant areas of Plains grassy Wetland also exist, particularly within the 'Lockerbie' land parcel.

Fauna – Waterbirds such as Australian Wood Duck *Chenonetta jubata* and Pacific Black Duck *Anas superciliosa*, and frog species such as Common Froglet *Crinia signifera* and Spotted Marsh Frog *Limnodynastes tasmaniensis* may use this habitat. Common wetland associated birds, such as Australian Ibis *Threskiornis molucca* and White-faced Heron *Egretta*

novaehollandiae may forage in inundated wetlands. There is a moderate to high likelihood that these areas provide habitat to for the nationally significant Growling Grass Frog.

Plate 1. Likely Growling Grass Frog habitat at Lockerbie land parcel, Beveridge, Victoria

Introduced pasture grass and crops (Corresponding EVC: None)

Overall habitat value – This habitat is of **low** habitat value for fauna (Appendix 1.5). Ungrazed pasture grasses, which in some areas was up to one metre high, provides habitat for several birds, reptiles and frogs adapted to agricultural landscapes.

Description – This habitat occurs throughout the majority of the precinct where native vegetation has been removed. It comprises almost exclusively perennial pasture grasses and environmental weeds.

Fauna – Few native species are known to use this habitat, and these include birds adapted to modified habitats such as Little Raven *Corvus mellori*, Straw-necked Ibis *Threskiornis spinicollis*, Australian Magpie and Galah *Eolophus roseicapilla*. Introduced species such as Common Starling *Sturnus vulgaris* and House Sparrow *Passer domesticus* were also prevalent in this habitat during the site surveys. Raptors including Brown Falcon *Falco berigora* and Whistling Kite *Haliastur sphenurus* were observed flying and foraging over the study area. In addition, Nankeen Kestrel *Falco cenchroides* and Black-shouldered Kite *Elanus axillaris* are likely to search for prey items over these areas.

Although introduced grasses do not provide optimal habitat for fauna, they do provide dispersal opportunities (cover) for reptiles, frogs and other species into more optimal habitats throughout the local area. Golden Sun Moths *Synemon plana* have also been recorded in similar habitat throughout northern Melbourne.

Rocky Outcrops/Stony Knolls

Overall habitat value- Rocky outcrops are considered moderate-high habitat value for fauna.

Description- Several rocky outcrops were identified at the study area, vegetated with predominantly weedy species, with sparse stands of native tussock grasses and shrubs including Kangaroo Grass and Wallaby Grass. The stony knoll areas contain patches of exposed basalt rock, bare ground and loose rocks.

Terrestrial fauna – The rocky outcrops, interspersed with vegetation and loose rocks, provides suitable basking habitat for reptiles, such as snakes and skinks. Little Whip Snake *Parasuta flagellum* and Bougainville's Skink *Lerista bougainvillii* were observed under loose rock. Various species of shrub support smaller foraging birds, reptiles and small mammals and provide cover from predators. Yellow-rumped Thornbills *Acanthiza chrysorrhoa* and Superb Fairy-wrens *Malurus cyaneus* were observed nesting and foraging within shrubs on the rocky outcrops.

3.6.4 Significant fauna species

Terrestrial fauna species derived from respective Commonwealth and State databases as occurring, or having the potential to occur within the precinct is provided below (Appendix 3.2). No nationally significant fauna species were recorded during the present assessment; although it is possible three nationally significant species may occur within the study area.

National

Eighteen nationally significant fauna have previously been recorded in the local area, within 10 kilometres of the precinct (VBA 2010) (Appendix 3.2). These species include:

- Four mammals: Spot-tailed Quoll *Dasyurus maculates,* Southern Brown Bandicoot *Isoodon obesulus obesulus*, Smoky Mouse *Pseudomys fumeus* and Grey-headed Flying Fox *Pteropus poliocephalus;*
- Six birds: Australasian Bittern *Botaurus poiciloptilus*, Australian Painted Snipe *Rostratula australis,* Plains Wanderer *Pedionomus torquatus,* Fairy Tern *Sternula nereis,* Regent Honeyeater *Anthochaera Phrygia* and Swift Parrot *Lathamus discolor*;
- Two reptiles: Striped Legless Lizard and Grassland Earless Dragon *Tympanocryptis pinguicolla*;
- One frog: Growling Grass Frog*;*

- Four fish: Australian Grayling *Prototroctes maraena*, Dwarf Galaxias *Galaxiella pusilla*, Macquarie Perch *Macquaria australasica* and Murray Cod *Maccullochella peelii peelii;* and,

- One invertebrate: Golden Sun Moth.

Most of these species are unlikely to reside or regularly occur within the precinct due to the absence of suitable habitat, although Grey-headed Flying-fox may use flowering eucalypts within the precincts on an occasional basis. Growling Grass Frog has previously been recorded in the study area (Figure 6) and suitable habitat is present within the 'Lockerbie' land parcel. Golden Sun Moth may be located in areas where patches of native and introduced grasses occur (Appendix 3.2).

State

Twenty state significant fauna species have previously been documented from the local area (AVW 2009; VBA 2010), and the likely use of the precinct by these species is provided in Appendix 3.2. These species include:

- Two mammals: Brush-tailed Phascogale *Phascogale tapoatafa tapoatafa* and Common Dunnart *Sminthopsis murina murina*;

- One diurnal raptor: Black Falcon *Falco subniger*;

- One nocturnal raptor: Barking Owl *Ninox connivens*;

- Eight wetland associated birds: Musk Duck *Biziura lobata*, Freckled Duck *Stictonetta naevosa*, Australasian Shoveler *Anas rhynchotis*, Hardhead *Aythya australis*, Blue-billed Duck *Oxyura australis*, Eastern Great Egret *Ardea modesta*, Royal Spoonbill *Platalea regia*, and Lewin's Rail *Lewinia pectoralis*;

- One grassland associated bird: Red-chested Button-quail, *Turnix pyrrhothorax*;

- Five woodland associated birds: Brown Treecreeper *Climacteris picumnus victoriae*, Painted Honeyeater *Grantiella picta*, Speckled Warbler *Chthonicola sagittata*, Diamond Firetail *Stagonopleura guttata* and Hooded Robin *Melanodryas cucullata cucullata*; and,

- Two amphibians: Brown Toadlet *Pseudophryne bibronii* and Southern Toadlet *Pseudophryne semimarmorata*.

Of these, Black Falcon, Eastern Great Egret and Royal Spoonbill may occasionally visit the precinct for foraging. However, none are likely to breed within the precinct and none are likely to occur on a regular basis.

Regional and local

Twelve regionally significant fauna species have been previously recorded within the local area (AVW 2009, VBA 2010). Due to the high level of modification of habitat across the precinct, the likelihood of occurrence for other regionally significant fauna species is considered low. All other native fauna (primarily common open country birds) are of local significance, as they are not listed as rare or threatened on a national, state and regional level.

3.6.5 Best or remaining 50% habitat for rare and threatened fauna species

A habitat assessment in accordance with the *Native Vegetation Guide for assessment of referred planning permit applications* and The Framework has been undertaken below (NRE 2002; DSE 2007).

The significant fauna species and remnant patches which may contain habitat for these species as well as the determination on the best or remaining habitat for these species is provided below (Table 7).

Table 7. Habitat assessment for significant species within properties accessed for the precinct.

Potential Habitat (Remnant Patch No)	Significant Species or Species' with the Highest Likelihood of Occurrence[1]	Steps Followed	Best or Remaining 50% of Habitat for the Species?	Notes	Conservation Significance Rating Prior to this Evaluation	Conservation Significance Rating after this Evaluation
See Figure 7	Striped Legless Lizard, Golden Sun Moth, Growling Grass Frog	A, D, F	Remaining 50%	Potential to occur	High	High

1 The assessment is undertaken on the species or species' with a low likelihood of occurrence as a resident, or most regular occurrence if it is a mobile fauna species. Ecology and Heritage Partners Pty Ltd has not assessed species' that are unlikely to occur, as they will not alter the outcome of the assessment.

4 RELEVANT LEGISLATION AND POLICY

This section discusses the implications of relevant environmental legislation and policies within the three tiers of government; Commonwealth, State and Local.

4.1 Commonwealth

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act establishes a Commonwealth process for assessment of proposed actions that are likely to have a significant impact on matters of National Environmental Significance (NES), or on Commonwealth land. An action (i.e. project, development, undertaking, activity, or series of activities), unless otherwise exempt, requires approval from the Commonwealth Environment Minister if they are likely to have an impact on any matters of NES. A referral under the EPBC Act is required if a proposed action is likely to have a 'significant impact' on any of the following matters of NES (unless otherwise covered by the Strategic Impact Assessment Report (DSE 2010c) as discussed below):

- World Heritage properties
- National heritage places
- Ramsar wetlands of international significance
- Significant species and ecological communities
- Migratory and marine species
- Commonwealth marine area
- Great Barrier Reef
- Nuclear actions (including uranium mining)

Ramsar Wetlands of International Significance

There are no Ramsar listed wetlands within the precinct area. The study area is however adjacent to Merri Creek which flows out to Port Phillip Bay, where the Port Phillip (Western Shoreline) and Bellarine Peninsula Ramsar Wetlands are situated. If future development works pose potential impacts to Merri Creek and the downstream Ramsar sites, that cannot be avoided, then an Environment Protection and Biodiversity Conservation Act 1999 referral to the Commonwealth Environment Minister is recommended. As such, future development should ensure that best practice sedimentation and pollution control measures to the satisfaction of EPA are undertaken at all times to prevent offsite impacts to waterways to adjacent waterways.

Listed Flora and Fauna Species and Ecological Communities

An action requires approval from the Commonwealth Environment Minister if it will, or if it is likely to, have a significant impact on an endangered or critically endangered species, or on an 'important population' or critical habitat of a listed significant species.

Flora – One flora species, Matted Flax-lily, listed as Endangered under the EPBC Act was recorded during the targeted flora surveys.

Fauna – No fauna species listed under the EPBC Act were recorded during the assessment, although targeted surveys were not conducted for Growling Grass Frog, Striped Legless Lizard and Golden Sun Moth. With the exception of Growling Grass Frog which has a moderate to high likelihood of occurrence within the PSP, Striped Legless Lizard and Golden Sun Moth has a low/moderate likelihood of occurrence within the PSP.

Communities – This report does not identify or map nationally threatened floristic communities, including *Natural Temperate Grassland of the Victorian Volcanic Plain* (NTGVVP). The presence, mapping and requirements for nationally significant vegetation communities within PSP areas are currently being negotiated between DSE and SEWPaC.

Listed Migratory and Marine Species

No listed migratory or marine species were recorded during the current survey, and the use of the precinct by these species is considered to be low at best. One record exists for Latham's Snipe, which may use vegetation fringing waterbodies and waterways as habitat on an irregular basis.

Commonwealth Marine Area and Nuclear Actions

The precinct is not within a marine area, nor are the proposed works related to nuclear actions.

Implications and Recommendations

One EPBC Act-listed flora species was recorded during the targeted flora surveys. The prescriptions for this species is covered by the *Strategic Impact Assessment Report* (SIAR) outlined below.

It is understood that surveys for Golden Sun Moth and Growling Gras Frog have being conducted at a sub-regional scale, and the consideration of these surveys will be included as part of the PSP process. Further targeted surveys for EPBC Act-listed flora and fauna species are not likely to be required.

An agreement under the Strategic Assessment provision of the EPBC Act (Section 146(1) Agreement, Part 10 Strategic Assessment (EPBC Act)) was made between the Commonwealth of Australia and the State of Victoria on 16 June 2009. The Strategic Assessment allows the State and Commonwealth to approve issues of common interest. All

species of NES that may be significantly impacted by future development are covered by the SIAR (DSE 2010b) and a Part 9 approval is not recommended for the proposed development of this precinct.

4.2 Strategic Impact Assessment (SIA)

In June 2009 the Victorian Government entered into an agreement with the Commonwealth Government to undertake a Strategic Impact Assessment (SIA) under the EPBC Act. The program defined in the Commonwealth-State agreement is the Urban Growth Boundary Review for Melbourne undertaken by the State of Victoria. The Strategic Impact Assessment Report (SIAR) provides details of potential impacts of the proposed program of urban development on matters of NES (DSE 2009).

It is important to note however that the *Biodiversity Conservation Strategy for Melbourne's Growth Areas* (DSE 2011d), currently in draft form for consultation, is intended to supersede SIAR. This Strategy is likely to be finalised mid-2012 (as per DSE's time constraints), and may alter the offset requirements for Matted Flax-lily, Golden Sun Moth and Growling Grass Frog as prescribed by SIAR.

As part of the SIAR, prescriptions have been developed for managing several Matters of NES which are likely to be impacted as a result of the Victorian Government's *Delivering Melbourne's newest sustainable communities* program. These prescriptions identify decision guidelines on what habitat must be retained and what can be cleared. They also identify how impacts are to be mitigated, including through the provision of appropriate offsets.

The prescriptions are to be used in the Precinct Structure Planning process, as required by the Precinct Structure Planning Guidelines, and in approvals required for transport infrastructure, extractive industries and other development approvals within the Program. To date, prescriptions have been prepared for the following:

- Flora species:
    - Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*; and,
    - Matted Flax-lily *Dianella amoena.*
- Fauna species:
    - Golden Sun Moth *Synemon plana;*
    - Striped Legless Lizard *Delma impar;*
    - Southern Brown Bandicoot *Isoodon obesulus obesulus;*
    - Growling Grass Frog *Litoria raniformis;* and,
    - Migratory species.
- Vegetation communities:
    - Natural Temperate Grassland of the Victorian Volcanic Plain; and,

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain.

Implications

Matted Flax-lily was recorded in Hz135 in the "Baldi" property. Prescriptions developed under the SIAR state that if Matted Flax-lily is recorded at a site, habitat within the whole parcel in which it is recorded will be designated as 'confirmed'. Clearing of native vegetation at the "Baldi" Property, 75 Stewart St, Beveridge, may not occur until there is protection of at least 80 per cent of the total area in the Victorian Volcanic Plain where 'high contribution to species persistence' and 'confirmed habitat'. If the 80 per cent of 'protected confirmed high contribution habitat' has not been reached, clearing may only be permitted in the following circumstances:

1. If the clearance is unavoidable for the provision of infrastructure of state significance; or

2. If the native vegetation that could be otherwise retained within the land parcel contains >25 per cent of high threat perennial grasses

As the native vegetation in the remnant patch and land parcel in which the Matted Flax-lily plant has been recorded contains >25 per cent high threat perennial grasses, including Toowoomba Canary-grass and Browntop bent, clearing may be permitted by DSE.

If clearing of high contribution habitat is permitted, a suitable offset must be found and secured prior to the development approval and a Matted Flax-lily translocation plan must be prepared to the satisfaction of DSE.

There is suitable habitat within the study area for the EPBC Act-listed Growling Grass Frog, Golden Sun Moth and Striped Legless Lizard. Targeted surveys should be undertaken for these species in accordance with methodology outlined in the Biodiversity Precinct Structure Planning Kit (DSE 2010), with the exception of Striped Legless Lizard, because procedures under the *Striped Legless Lizard in the urban growth area of Melbourne: Strategic Approach* (DSE 2011e) are to be followed for any works impacting suitable habitat within the Urban Growth Zone. Should any of these species be recorded within the study area, habitat retention and/or offset requirements will follow as per the prescriptions under the SIAR.

The prescriptions outlined in the SIAR for Striped Legless Lizard state that native vegetation that is habitat within precincts will be retained if they are manageable and able to be maintained for the long term, if they are contiguous with at least 150 ha including adjacent areas outside the precinct. All clearing of habitat that is native vegetation will be offset as per the Victorian Native Vegetation Framework. If Lizards occur in an area that will be cleared, a fully costed salvage and Translocation Plan must be prepared to the satisfaction of DSE.

The SIAR prescriptions for Golden Sun Moth is as follows:

- If clearing of high contribution habitat is permitted (that is, native vegetation which displays high contribution to species existence intersects with confirmed habitat) then

an offset site that contains GSM must be found and secured prior to development being approved;

- Prior to clearing of medium contribution habitat (that is, areas of non-native vegetation within well-connected GSM habitat), an equivalent area of native vegetation known to support GSM must be found and secured; and,
- Prior to clearing of low contribution habitat (that is) the proponent must commission surveys and confirm the presence of GSM habitat outside the Urban Growth Boundary equivalent to that proposed to be cleared.

Under the SIAR prescriptions for Growling Grass Frog (DSE 2009), a Conservation Management Plan (CMP) must be prepared to the satisfaction of the Department of Sustainability and Environment. This must include how, for an important population (or potentially important population);

- Habitat will be created and maintained for the long term;
- Monitoring will be employed to determine effectiveness of the CMP;
- Threatening processes will be effectively managed; and,
- Actions relating to the development are sequenced to ensure no net loss of habitat and local population

4.3 State

4.3.1 Planning and Environment Act 1987

All planning schemes contain native vegetation provisions at Clause 52.17. A planning permit is required under the *Planning and Environment Act 1987* to remove, destroy or lop native vegetation, unless:

- The application is exempt under the schedule to Clause 52.17; or
- A NVPP applies.

Planning schemes may contain other provisions in relation to the removal of native vegetation.

Clause 52.16 applies to land where a NVPP, corresponding to that land, is incorporated into this scheme. Where an NVPP applies, a permit is required to remove destroy or lop native vegetation, except where it is in accordance with that NVPP and Clause 52.16. Though an NVPP can stand alone, it may form part of a more general strategic or precinct structure plan. The purpose of an NVPP is to protect and conserve native vegetation to reduce the impact of land and water degradation and provide habitat for plants and animals, and to enable other areas of native vegetation to be removed in accordance with the NVPP. The NVPP may require specified works to be provided or specified payments to be made to offset the removal, destruction or lopping of native vegetation. No permit is required under clause 52.17 where an NVPP is incorporated and listed in the schedule to clause 52.16 NVPP.

Implications and Recommendations

A planning permit is required from the Mitchell Shire Council to remove, destroy or lop native vegetation within the precinct. However, consistent with above, once the NVPP is an incorporated document in the local planning scheme, Clause 52.16 applies to the protection and removal of native vegetation.

4.3.2 Flora and Fauna Guarantee Act 1988

The primary legislation for the protection of flora and fauna in Victoria is the FFG Act. The Act builds on broader national and international policy in the conservation of biodiversity.

The broad objectives of the FFG Act are to; 1) ensure native flora and fauna survive, flourish and maintain *in situ* evolutionary potential, 2) manage threatening processes, 3) encourage the conserving of flora and fauna through cooperative community endeavours, and 4) establish a regulatory structure for the conservation of flora and fauna in Victoria.

The Act contains protection procedures such as the listing of threatened species and/or communities of flora and fauna, and the preparation of action statements to protect the long-term viability of these values.

Flora – One species, Matted Flax-lily, listed as endangered under the Act was recorded during the targeted flora surveys.

Vegetation Communities – One FFG Act listed vegetation community, Western Basalt Plains Grassland (WBPG), was recorded in the study area. All patches of Plains Grassland indicated by the DSE time-stamped data (figure 3) also constitute WBPG. No other FFG Act listed communities are located within the precinct.

Fauna – Twenty-nine fauna species listed as threatened under the FFG Act have previously been recorded from within the local area (i.e. within a 10 kilometre radius of the study area) (Appendix 3.2). The habitat quality for most of these species is low, except for several potential areas of suitable habitat for Growling Grass frog, Striped legless Lizard and Golden Sun Moth (Figure 7). There is only a low likelihood of occurrence for ground-dwelling fauna, and birds are only expected to visit the precinct on an infrequent or occasional basis.

Threatening processes – Future development of the precinct should consider FFG Act-listed threatening process such as invasion of native vegetation by environmental weeds.

Implications and Recommendations

One FFG Act-listed species was recorded during the targeted flora surveys. An FFG Act permit is only required for the removal or disturbance of recorded species and communities located on public land. As this flora species was not recorded on public land, an FFG Act permit is not required.

4.3.3 Environment Effects Act 1978

Environmental impacts or effects of a proposed development can be assessed according to the *Environment Effects Act 1978*. It is not an approval process itself, but a way of enabling Ministers, local government and statutory authorities to make informed decisions about whether a project with potentially significant environmental effects should proceed.

The central part of the process is the preparation of an Environmental Effects Statement (EES). The proponent is responsible for preparing an EES if the Minister for Planning decides that one is required. After the EES is completed and released for public comment, the Minister provides an assessment to the relevant decision-makers. There are also opportunities for community involvement at certain stages of the process. The Department of Planning and Community Development coordinates the process, implementing Ministerial Guidelines that set out the details under the Act.

Implications and Recommendations

An EES is unlikely be required for major developments within the Precincts.

4.3.4 Catchment and Land Protection Act 1994

The CALP Act contains provisions relating to catchment planning, land management, noxious weeds and pest animals. This Act also provides a legislative framework for the management of private and public land and sets out the responsibilities of land managers, stating that they must take all reasonable steps to:

- avoid causing or contributing to land degradation which causes or may cause damage to land of another land owner;
- protect water resources;
- conserve soil;
- eradicate regionally prohibited weeds;
- prevent the growth and spread of regionally controlled weeds; and
- prevent the spread of, and as far as possible eradicate, established pest animals.

Essentially the Act establishes a framework for the integrated management and protection of catchments, and provides a framework for the integrated and coordinated management, which aims to ensure that the quality of the State's land and water resources and their associated plant and animal life are maintained and enhanced.

Implications and Recommendations

Based on the site assessments, a total of 14 noxious weed species were recorded within the precinct (Table A2.1.2). Landowners are responsible to control any infestation of noxious weeds that may become established within the precinct.

4.3.5 Wildlife Act 1975

The *Wildlife Act 1975* is the primary legislation in Victoria providing for protection and management of wildlife. The Act requires people engaged in wildlife research (e.g. fauna surveys, salvage and translocation activities) to obtain a permit under the Act to ensure that these activities are undertaken in a manner consistent with the appropriate controls.

The *Wildlife Act 1975* has the following objectives:

- To establish procedures for the promotion of protection and conservation of wildlife, the prevention of species extinctions, and the sustainable use and access to wildlife; and
- To prohibit and regulate the conduct of those involved in wildlife related activities.

Implications and Recommendations

While a permit will be required for removal of habitat within the precinct, this could be in the form of a permit to remove native vegetation under the *Planning and Environment Act 1987*.

4.3.6 The Native Vegetation Framework

Since 1989, most proposals to clear native vegetation have required a planning permit from the local Council (Responsible Authority), under the native vegetation provisions of Clause 52.17 of the Victoria Planning Provisions ("VPPs"). In 2002, the Victorian Government released Victoria's Native Vegetation Management – A Framework for Action (NRE 2002) ("the Framework"), which establishes a 'strategic direction for the protection, enhancement and revegetation of native vegetation across the State'.

Amendment (VC19) to Victoria's Planning Provisions introduced the Framework in July 2003 as an incorporated document for all Victorian Planning Schemes. Clauses 11 and 15.09 in the State Planning Policy Framework provide the framework for considering native vegetation issues in the planning system.

These clauses require planning and responsible authorities to have regard to the Framework, which establishes the strategic direction for the protection, enhancement and revegetation of native vegetation across Victoria.

The Framework states that the primary goal is to achieve 'a reversal, across the entire landscape, of the long-term decline in the extent and quality of native vegetation, leading to a Net Gain' (NRE 2002).

Net Gain is the overall outcome where native vegetation and habitat gains are greater than the losses and where losses are avoided, where possible.

When Net Gain is considered for potential impacts on native vegetation within all planning schemes, the Framework has defined a three-step approach for applying Net Gain to protection and clearance decisions. The three-step approach is:

1. To avoid adverse impacts, particularly through vegetation clearance.

2. If impacts cannot be avoided, to minimise impacts through appropriate consideration in planning processes and expert input to project design or management.

3. Identify appropriate offset options.

The three-step approach to Net Gain is the first consideration for all planning permit applications and planning scheme amendments, with emphasis placed on the first two steps of avoidance and minimisation. Only after these two steps have been taken should offsets (actions undertaken to achieve commensurate gains) be considered (NRE 2002).

Implications and Recommendations

Native vegetation within the precinct was identified through DSE time-stamped native vegetation data provided. This data contains geographical references and habitat hectare information for patches of native vegetation deemed present in Melbourne's Urban Growth Boundary. Habitat hectare is a unit of measurement, which combines both quality (relative to an EVC Benchmark) and quantity (EVC type) for a habitat zone (DSE 2004).

Individual Net Gain Offset Management Plans will be required for the proposed removal of native vegetation identified on land parcels.

4.3.7 Port Phillip and Westernport Native Vegetation Plan

The *Port Phillip and Westernport Native Vegetation Plan* (PPWCMA 2006) is a guide for local government in assessing planning applications for vegetation removal and determining permit conditions (Net Gain requirements) to ensure that ecological values across the region are not compromised.

The plan provides information on biodiversity values across the region and gives guidance to local municipalities on how clearing applications should be assessed. The document also outlines actions to ensure there is a more strategic and coordinated approach to address ongoing degradation in quantity and quality of native vegetation throughout Victoria.

The recommendations made in the *Native Vegetation Plan*, should be taken into consideration in the planning phase of any proposed future works.

Implications and Recommendations

The *Port Phillip and Westernport Native Vegetation Plan* (PPWCMA 2006) has been referred to when preparing this report as required.

4.3.8 Victoria's Biodiversity Strategy

The Victorian Government endorses this strategy titled '*Victoria's Biodiversity – Directions in Management* (NRE 1997) and represents a benchmark for biodiversity conservation and management throughout the state.

The Biodiversity Strategy encourages Victorians to better understand and appreciate flora and fauna and ecosystems throughout the state, and to take an active part in conservation and management to ensure biodiversity is managed in an ecologically sound and sustainable manner. The Strategy should be taken into account for any proposed developments.

4.4 Local

4.4.1 Mitchell Shire Council

The precinct lies within the boundaries of the Port Phillip and Westernport CMA. Under the Mitchell Shire Council planning scheme majority of the precinct is a within the Urban Growth Zone (UGZ). The existing Beveridge Township is zoned as Township zone. Property owned by Mitchell Shire Council is classified as a Public Park and Recreation Zone (PPRZ) and Public Use Zone – Education (PUZ2). A Salinity Management Overlay covers all farmland areas and a Vegetation Protection Overlay – Schedule 2 covers the centre island of the Hume Freeway. There is a Public Land Acquisition Overlay 7 over the western side of Site 2 - Lockerbie North and on either side of the Hume Freeway. This overlay pertains to the future extension of the Outer Metropolitan Ring.

Implications and Recommendations

Once the NVPP has been prepared, this will guide future development from the time they become incorporated in the Mitchell Shire Council Planning Scheme.

5 POTENTIAL IMPACTS AND MITIGATION MEASURES

Potential impacts caused by future development of the precinct include:

- The loss of:
    - 1.32 habitat hectares of High conservation significance Plains Grassland;
    - 0.01 habitat hectares of Very High conservation significance Plains Grassland;
    - 1.24 habitat hectares of High conservation significance Plains Grassy Wetland;
    - 0.64 habitat hectares of Very High conservation significance Plains Grassy Wetland;
    - 3.51 habitat hectares of High conservation significance Stony Knoll Shrubland;
    - 0.02 habitat hectares of High conservation significance Creekline Tussock Grassland;
    - 0 habitat hectares of Very High conservation significance Creekline Tussock Grassland; and,
    - 0.55 habitat hectares of High conservation significance Swamp Scrub.
- The loss and/or disturbance of the nationally significant Matted Flax-lily;
- The removal of potential habitat for nationally significant species including Growling Grass Frog, Striped Legless Lizard, and Golden Sun Moth;
- The removal of the remaining grassland and stony knoll shrubland which are expected to provide habitat for native reptiles and frogs;
- The removal of wetlands and swamp scrub which are expected to provide habitat for a wide range of native fauna;
- The removal of dams and the drainage line in the south-western portion of the study area which provide habitat for native frogs;
- The removal of pastures which provide low quality habitat for native birds and reptiles; and
- The removal of trees that provide temporary roosting and foraging habitat for native arboreal mammals, bats and birds.

5.1 Opportunities to Reduce Potential Impacts

Future development of the precinct has the potential to impact (direct and indirect) native flora and fauna species within the precinct, and habitat for threatened fauna species. Measures to mitigate/ameliorate impacts of the future development upon the ecological values in the precinct include:

- Retention and management of remnant native vegetation where appropriate;
- Prepare Revegetation Plans which outline measures to improve the cover of native vegetation and mimic the EVCs what would have originally occurred within the precinct;
- Prepare a Conservation Management Plan (CMP) to retain and enhance the quality of habitat for significant flora and fauna, including Matted Flax-lily, which may occur within the precinct;
- Ensure silt fences and appropriate run-off control measures are implemented to avoid impacts to amphibian habitat along the drainage line in the south-western portion of the study area;
- Prepare a Weed Management Plan that aims to eradicate or control weeds appropriately to minimise the spread of material into, within, and beyond the precinct;
- Prepare a Pest Animal Management Plan. This should target foxes and feral cats which prey on native fauna along with rabbits and hares which will graze on planted vegetation and reduce vegetation cover for native fauna;
- Incorporate Water Sensitive Urban Design into future housing developments in the precinct;
- A zoologist or wildlife handler should be present at the time of tree removal to salvage any fauna using trees, and if deemed appropriate, translocate the specimens to a suitable site in the local area.

5.2 Opportunities to Protect and Enhance Regional and Local Biodiversity Values

Habitat within the precinct is highly fragmented, and patches of remnant native vegetation are small and degraded. Opportunities to enhance local biodiversity values include:

- The control of noxious weeds and environmental weeds within the precinct such as Scotch Thistle, Artichoke Thistle, African Boxthorn, Sweet Briar, Blackberry and Gorse which will spread beyond the precinct. This should be undertaken in accordance with a Revegetation Plan to avoid removing weeds which may currently provide habitat to native fauna (e.g. Blackberry which may provide habitat to Southern Brown Bandicoot or trees which provide habitat to arboreal mammals including bats);

- If the removal or disturbance of Matted Flax-lily cannot be avoided, clearing may be permitted by DSE. Prior to clearing, a suitable offset must be found and secured prior to the development approval and a Matted Flax-lily translocation plan must be prepared to the satisfaction of DSE and according to the guidelines outlined in the *Guidelines for the Translocation of Threatened Species*, 2nd Ed..

- Prior to permitting clearing, targeted Golden Sun Moth surveys are required to confirm the presence or absence of the moth within the study area. The surveys are required as part of the SIAR Prescriptions and must be undertaken according to the standard methodology set out in the Biodiversity Precinct Structure Planning Kit (DSE 2010c). Given the presence of potential Striped Legless Lizard habitat, it is likely that a fully costed Salvage and Translocation Plan will need to be prepared to the satisfaction of the DSE, following the methodology outlined in the SLL Salvage and Translocation Operational Plan (DSE 2011d).

- Where required, detailed Conservation Management Plans for species (e.g. Growling Grass Frog and Golden Sun Moth) and their habitats may be required if these species are recorded within the precinct. The Growling Grass Frog CMP for the Beveridge PSP should take into consideration the CMP being prepared for this species as part of the Lockerbie PSP;

- The preparation of a NVPP which identifies areas to be retained and areas to be removed; and,

- Offset the losses of habitats in accordance with the prescriptions detailed under the SIAR (DSE 2010c).

6 CONCLUSION

The precinct is highly modified, and the majority of the precinct has been cleared for agriculture and is dominated by exotic vegetation. According to DSE time-stamped data, native vegetation within the precinct comprises four EVCs, including Plains Grassland (EVC 132), Plains Grassy Wetland (EVC 125), Stony Knoll Shrubland (EVC 649), Swamp Scrub (EVC 53) and Creekline Tussock Grassland (EVC 654).

Due to the endangered status of the EVCs identified in the study area, remnant patches of vegetation in the study area are considered of at least 'High' conservation significance. Four patches of Plains Grassy Wetland, one patch of Plains Grassland and one patch of Creekline Tusoock Grassland were also of Very High

Native vegetation is of at least High conservation significance due to the endangered status of these EVCs in the Victorian Volcanic Plains, with six patches being of Very High Conservation Significance due to their vegetation quality score. Patches of native vegetation that were not surveyed as part of this assessment (due to lack of approved access) are assumed as High conservation significance. The conservation significance of these patches may change if targeted surveys are undertaken in them in the future.

Overall approximately **7.29 habitat hectares** of remnant vegetation is present within the study area, including:

- **1.32 habitat hectares** of High conservation significance Plains Grassland;
- **0.01 habitat hectares** of Very High conservation significance Plains Grassland;
- **1.24 habitat hectares** of High conservation significance Plains Grassy Wetland;
- **0.64 habitat hectares** of Very High conservation significance Plains Grassy Wetland;
- **3.51 habitat hectares** of High conservation significance Stony Knoll Shrubland;
- **0.02 habitat hectares** of High conservation significance Creekline Tussock Grassland**;**
- **0 habitat hectares** of Very High conservation significance Creekline Tussock Grassland**;** and,
- **0.55 habitat hectares** of High conservation significance Swamp Scrub.

The total Net Gain Offset requirement for the removal or disturbance of native vegetation of 'High' conservation significance is **9.96 habitat hectares**. The total Net Gain Offset requirement for the removal or disturbance of native vegetation of 'Very High' conservation significance is **1.3 habitat hectares**.

One very large old tree (VLOT), Seven large old trees (LOT), one Stag (large), five medium old trees (MOTs) and two small trees (STs) were recorded during the site assessments. The total Net Gain Offset implications for these scattered trees are:

- Protect 5 VLOTs, 28 LOTs and 10 MOTs, and recruit 407 new plants.

  Or

- Recruit 1,457 new plants.

One nationally significant flora species, Matted Flax-lily, was recorded during the targeted flora surveys. One species listed as endangered, Basalt Peppercress *Lepidium hyssopifolium*, has been recorded previously in the "Baldi" Property. Suitable habitat was identified for five other nationally significant flora species, and eighteen other state significant species.

The use of DSE time-stamped data in the place of onsite native vegetation and significant species habitat assessments has resulted in limitations to the native vegetation and habitat hectare assessment outlined in this report. In particular, known areas of native vegetation have not been recorded.

Additional surveys for significant vegetation communities, including NTGVVP, may be required to confirm the significance of native vegetation deemed present in the precinct and implications for their removal or disturbance under the *Strategic Impact Assessment Report* (SIAR).

According to the Prescriptions for Matted Flax-lily under SIAR, removal and/or disturbance of the Matted Flax-lily plant recorded in the "Baldi" property may be permitted by DSE, however a suitable offset must be found and secured prior to the development approval and a Matted Flax-lily translocation plan must be prepared to the satisfaction of DSE.

A permit to 'take' native vegetation under the *Flora and Fauna Guarantee Act 1988* (FFG Act) will be required for the removal of protected species located on public land.

The site supports seven broad fauna habitat types: native grasslands, ephemeral drainage line, modified woodland and scattered remnant trees, planted native and introduced trees, artificial waterbodies, introduced pasture grass and crops, and rocky outcrops/stony knolls.

There were no national or state significant fauna species recorded during the assessment. The habitat quality for significant fauna is mostly low due to its highly modified nature, although there are several areas of potential habitat for Striped Legless Lizard, Growling Grass Frog and Golden Sun Moth. Some waterbirds, Black Falcon and Grey-headed Flying-fox may also use habitat opportunistically, although they are unlikely to rely on the study area for any parts of their life cycle. Under the SIAR prescriptions, there are specific protocols under which the proponent is obliged to comply with regards to Golden Sun Moth, Striped Legless Lizard and Growling Grass Frog. These must be addressed during the planning process and prior to the removal of vegetation within the precinct areas.

Targeted Golden Sun Moth surveys are required to confirm the presence or absence of the moth within the study area. Detailed Conservation Management Plans should be prepared in accordance with the sub regional surveys for EPBC Act listed species (e.g. Golden Sun Moth and Growling Grass Frog), and a detailed Striped Legless Lizard Salvage and Translocation Plan is recommended to be prepared to the satisfaction of DSE.

There are opportunities to enhance ecological values within the precinct, principally through protection of native vegetation and areas of fauna habitat, and allowing the regeneration of native vegetation, as well as undertaking revegetation and weed control. Such activities should be undertaken in accordance with relevant Management Plans.

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FIGURES

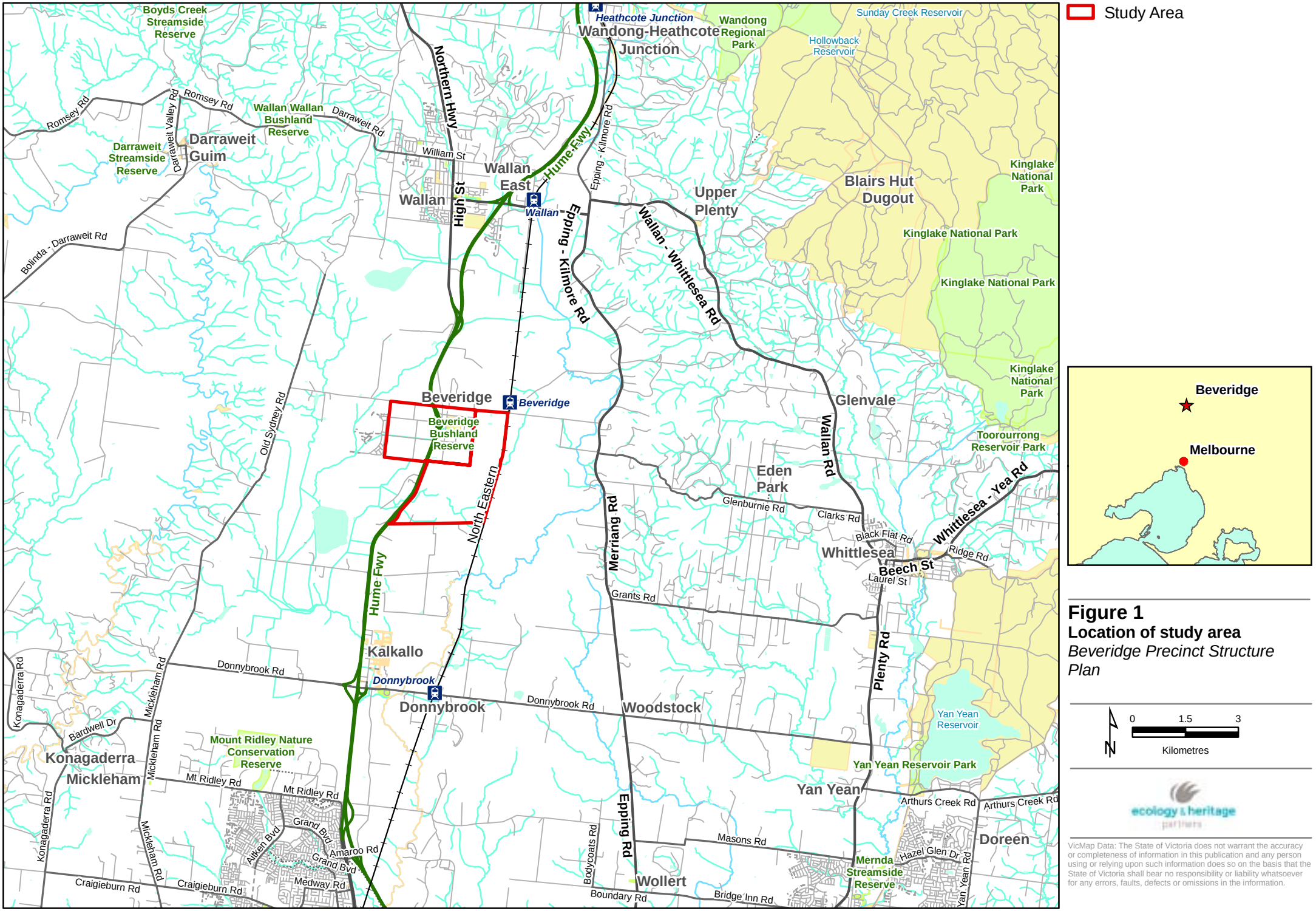
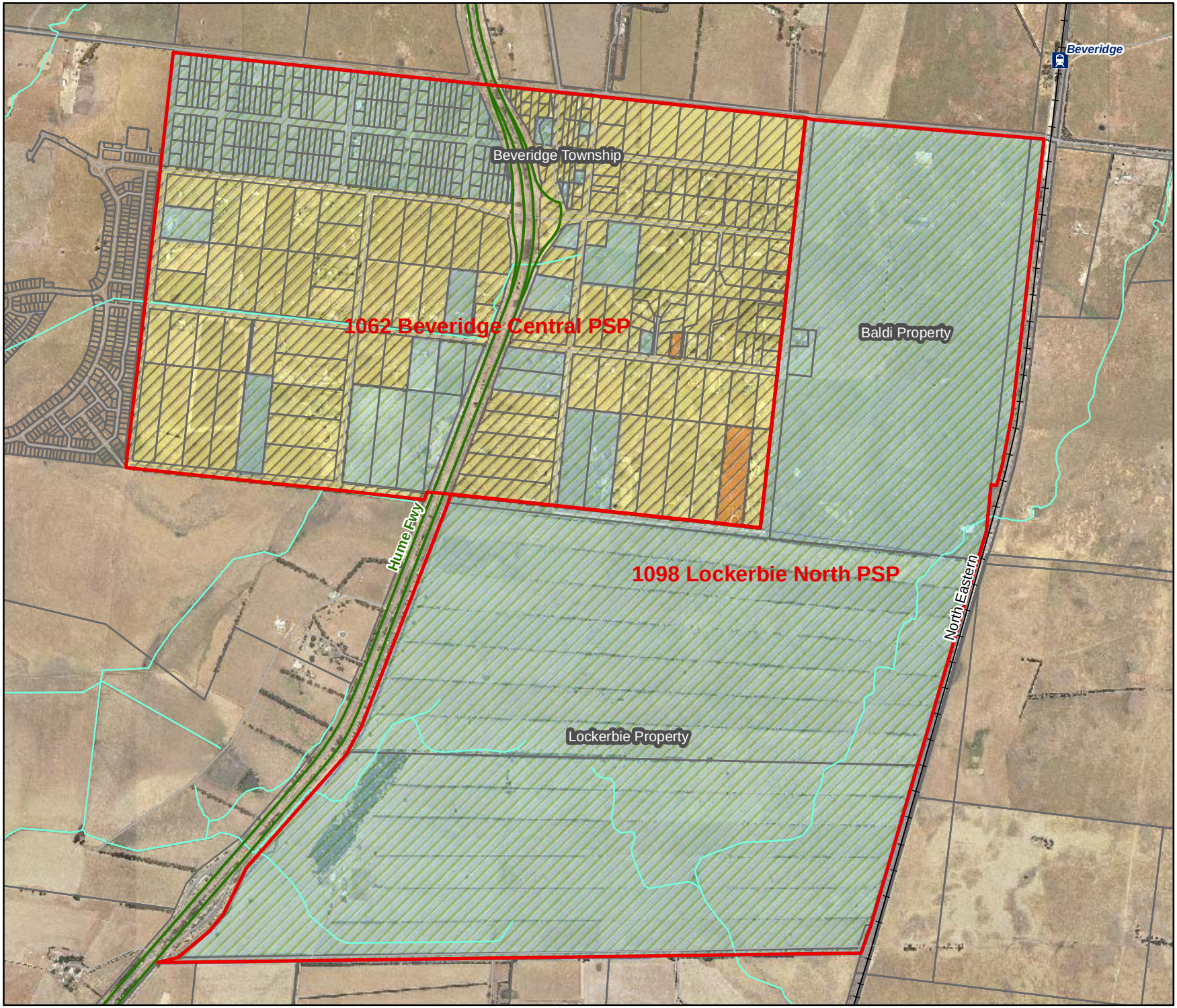


Figure 1
Location of study area
Beveridge Precinct Structure Plan

ecology & heritage partners



Legend

- Study Area
- Access Denied
- Areas Assessed
- Access Unattainable

Figure 2

Access Information

Beveridge Precinct Structure Plan

N

0 312.5 625

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

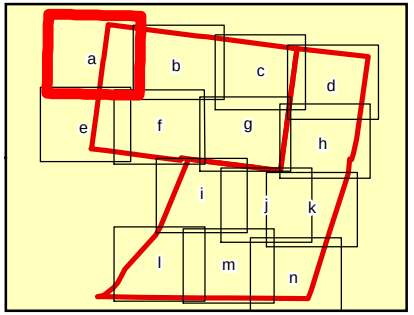


Figure 3a

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

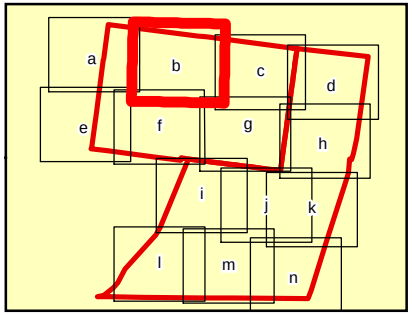


Figure 3b

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

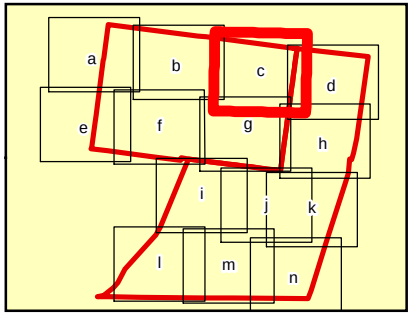


Figure 3c

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

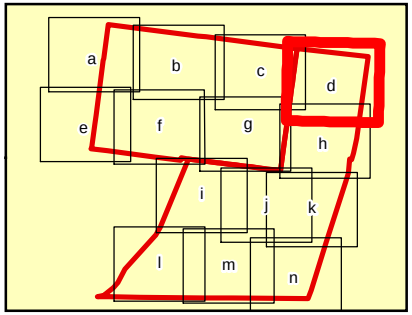


Figure 3d

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

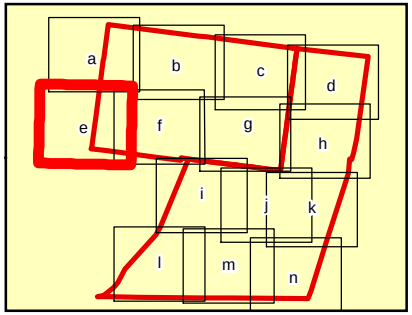


Figure 3e

Ecological Features within the Study Area

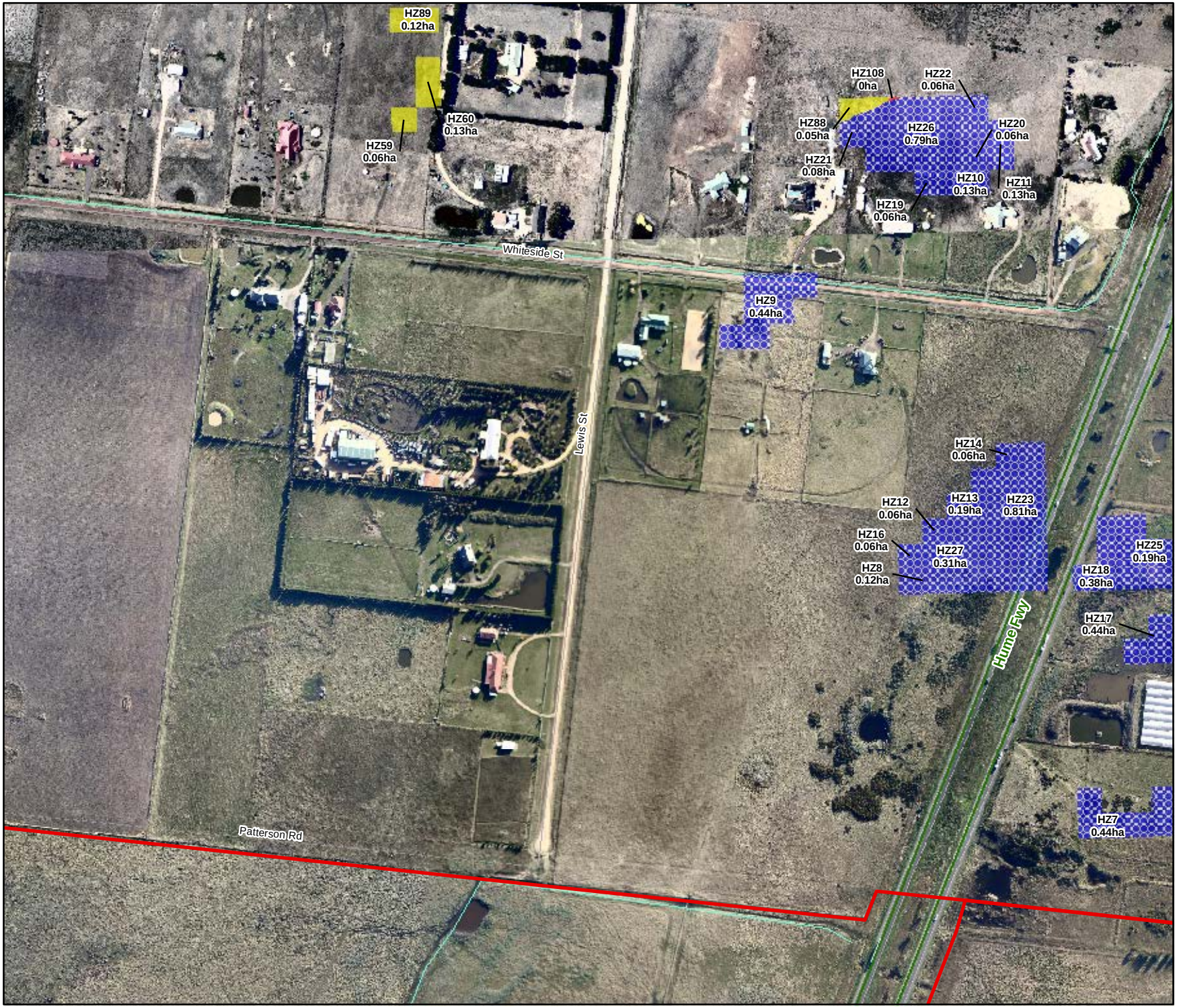
Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners



Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

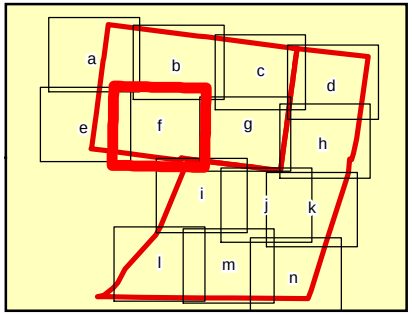


Figure 3f

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

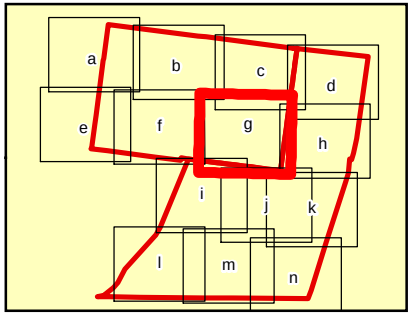


Figure 3g

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

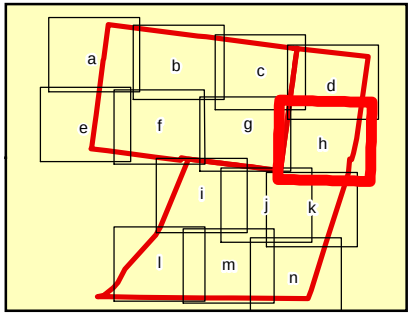


Figure 3h

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

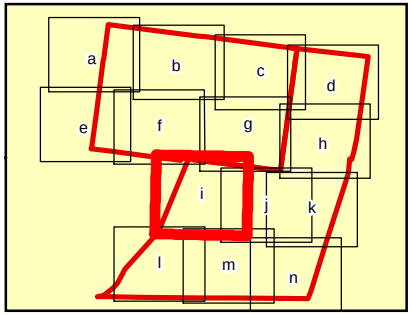


Figure 3i

Ecological Features within the Study Area

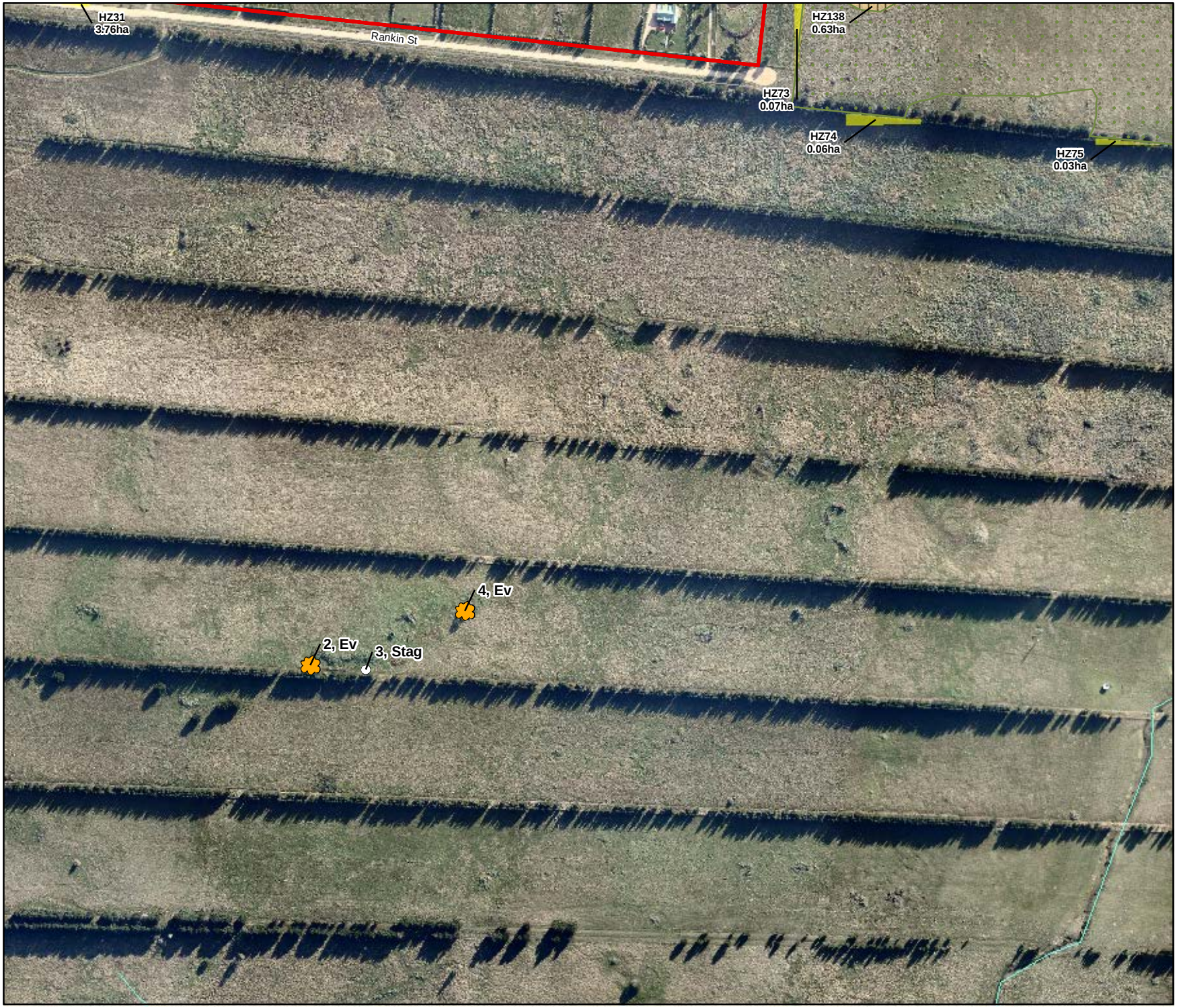
Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners



Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

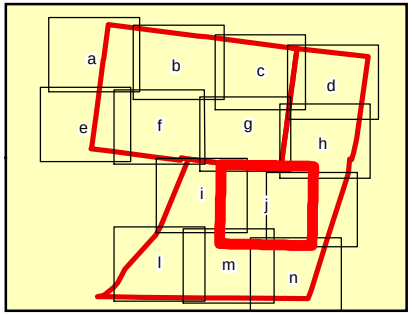


Figure 3j

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

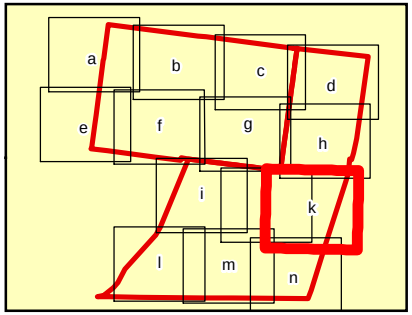


Figure 3k

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

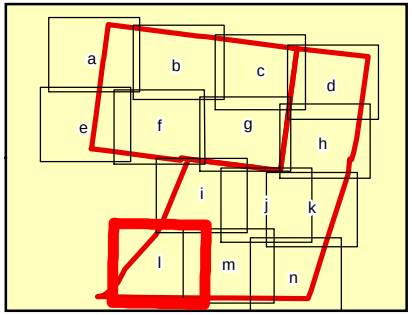


Figure 3l

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

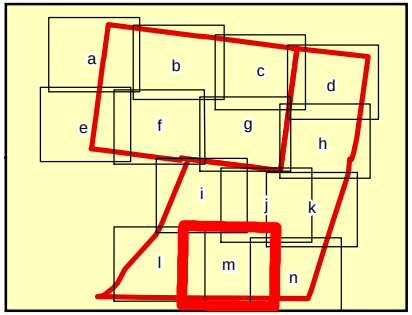


Figure 3m

Ecological Features within the Study Area

Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners

Legend

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree
- Dead Standing Tree
- Matted Flax-lily

DSE Time Stamped EVC Mapping

- 53, Swamp Scrub
- 125, Plains Grassy Wetland
- 132, Plains Grassland
- 649, Stony Knoll Shrubland
- 654, Creekline Tussock Grassland
- Degraded Treeless Vegetation

Ec = Eucalyptus camaldulensis
Eo = Eucalyptus ovata
Ev = Eucalyptus viminalis

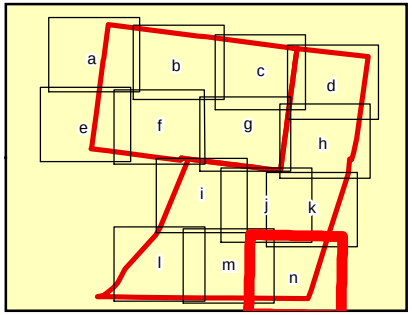


Figure 3n

Ecological Features within the Study Area

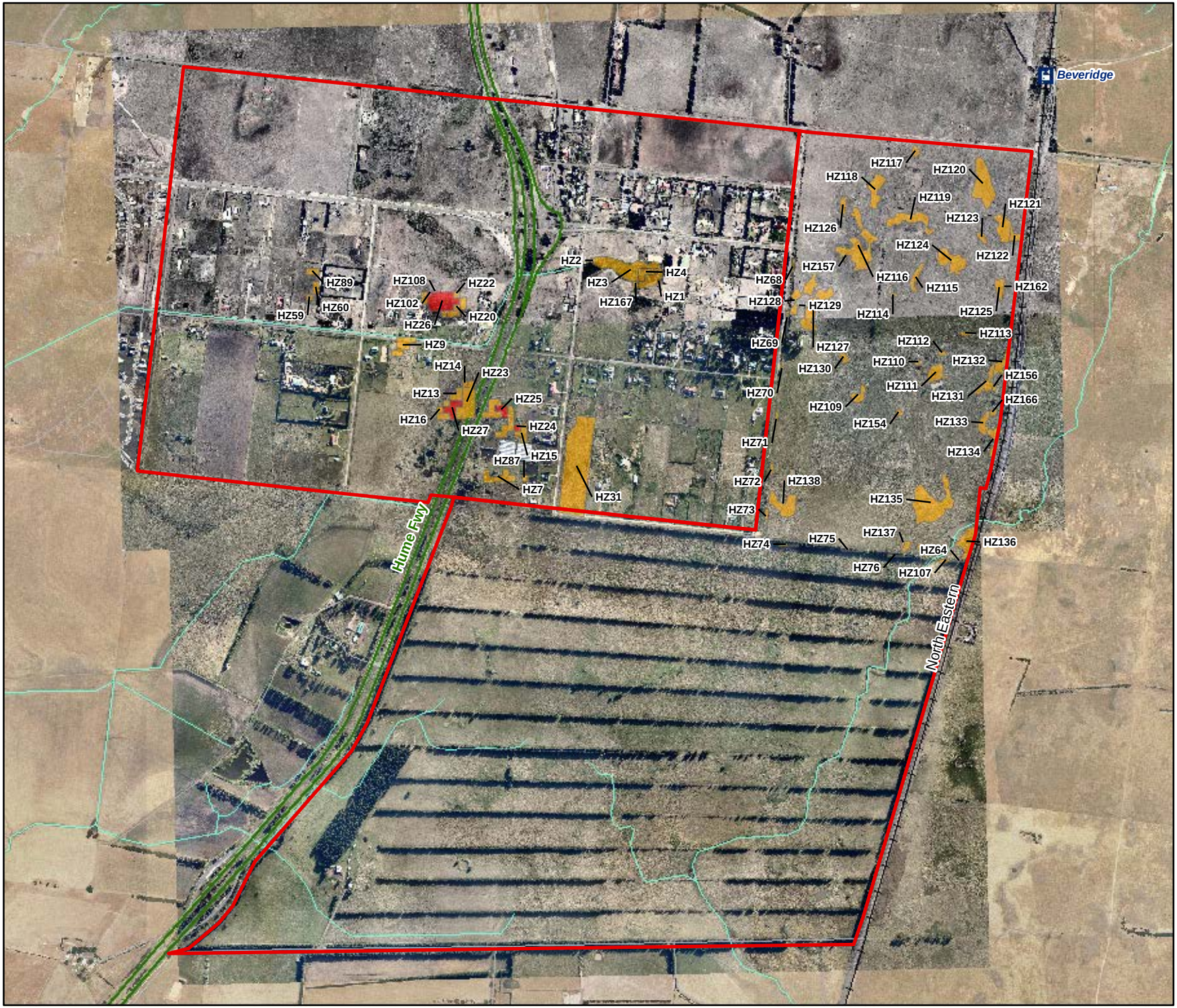
Beveridge Precinct Structure Plan

N

0 75 150

Metres

ecology & heritage partners



Legend

- Study Area
- High Conservation Significance
- Very High Conservation Significance

Figure 4

Conservation Significance

Beveridge Precinct Structure Plan

N

0 340 680

Metres

ecology & heritage partners

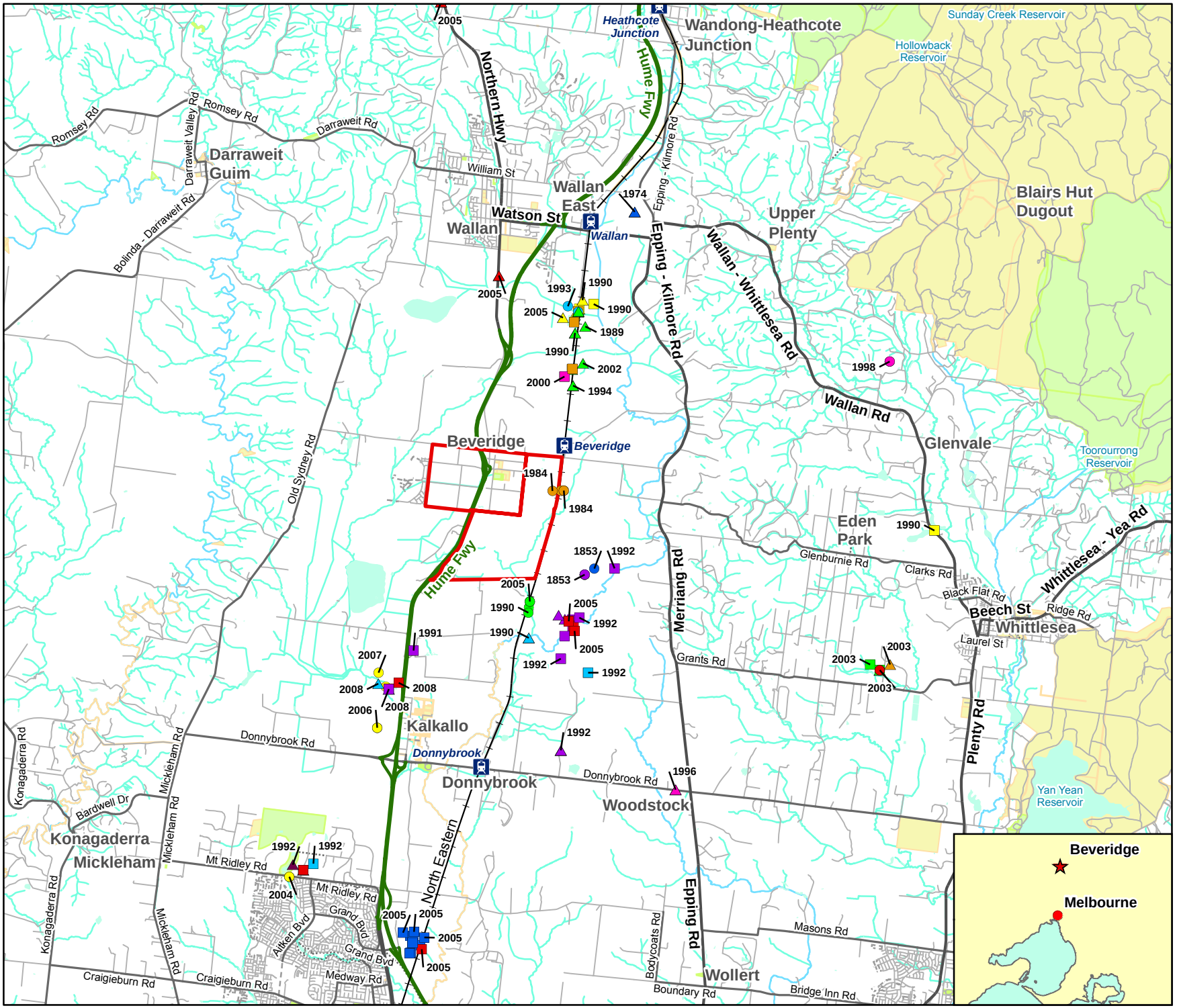
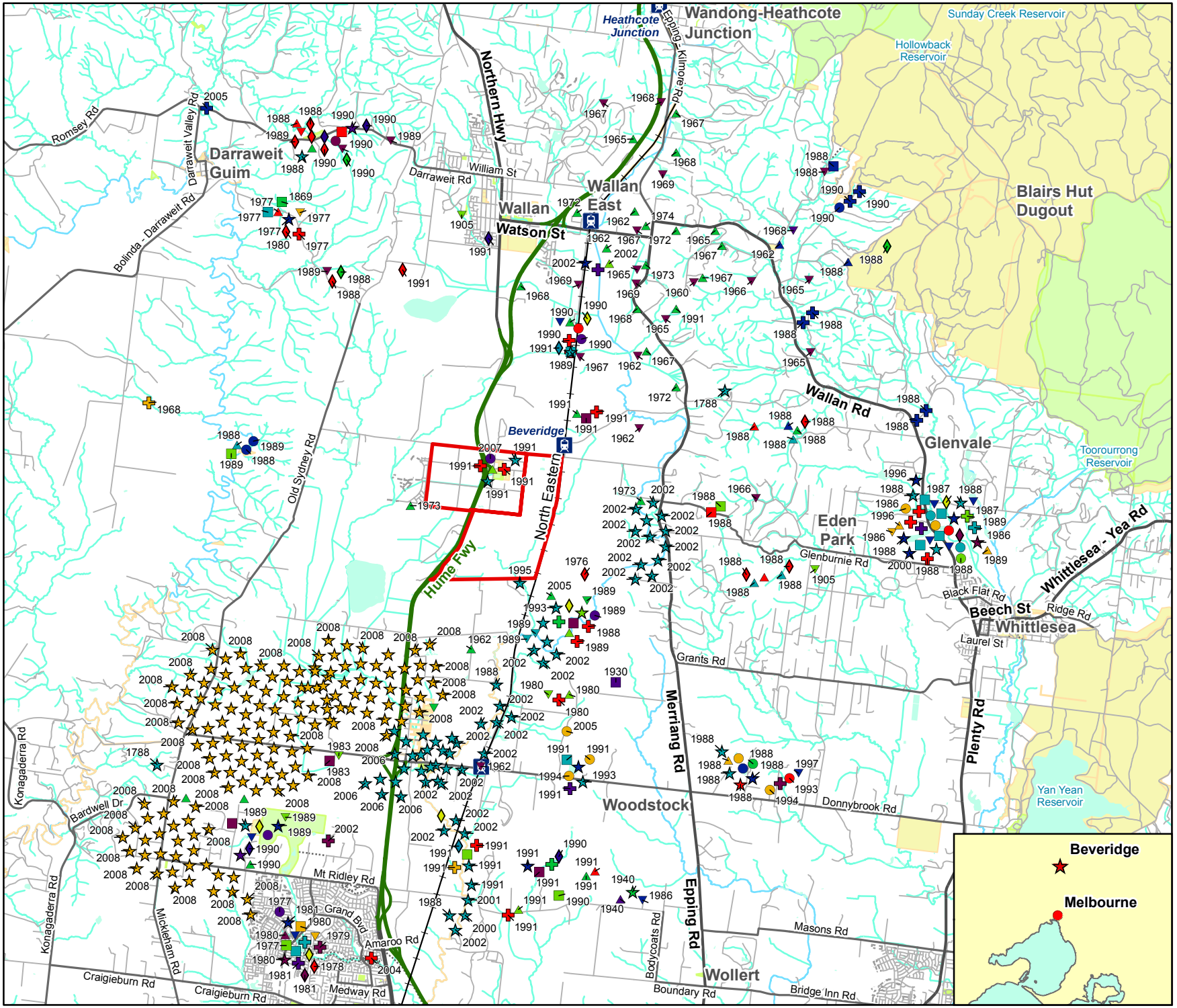


Figure 5

Previously documented significant flora within 10km of the study area

Beveridge Precinct Structure

ecology & heritage partners



Study Area

Significant Fauna

- Australasian Bittern
- Australasian Shoveler
- Australian Painted Snipe
- Azure Kingfisher
- Baillon's Crake
- Barking Owl
- Black Falcon
- Black-chinned Honeyeater
- Black-eared Cuckoo
- Blue-billed Duck
- Brown Quail
- Brown Toadlet
- Brown Treecreeper (south-eastern ssp.)
- Brush-tailed Phascogale
- Bush Stone-curlew
- Caspian Tern
- Common Dunnart
- Common Sandpiper
- Diamond Firetail
- Eastern Bettong
- Eastern Great Egret
- Eastern Horseshoe Bat
- Eastern Quoll
- Fat-tailed Dunnart
- Freckled Duck
- Golden Sun Moth
- Grassland Earless Dragon
- Grey-crowned Babbler
- Growling Grass Frog
- Hardhead
- Hooded Robin
- Intermediate Egret
- Latham's Snipe
- Lewin's Rail
- Little Bittern
- Little Button-quail
- Little Egret
- Mountain Galaxias
- Musk Duck
- Nankeen Night Heron
- Painted Honeyeater
- Pied Cormorant
- Plains-wanderer
- Red-chested Button-quail
- River Blackfish
- Royal Spoonbill
- Southern Brown Bandicoot
- Southern Toadlet
- Speckled Warbler
- Spotted Harrier
- Spotted Quail-thrush
- Striped Legless Lizard
- Swift Parrot
- Whiskered Tern

Figure 6

Previously documented significant fauna within 10km of the study area

Beveridge Precinct Structure

0 1.5 3

Kilometres

ecology & heritage partners

Legend

Study Area

Potential Fauna Habitat

- Growling Grass Frog
- Latham's Snipe
- Striped Legless Lizard
- Golden Sun Moth

Figure 7

Potential Fauna Habitat

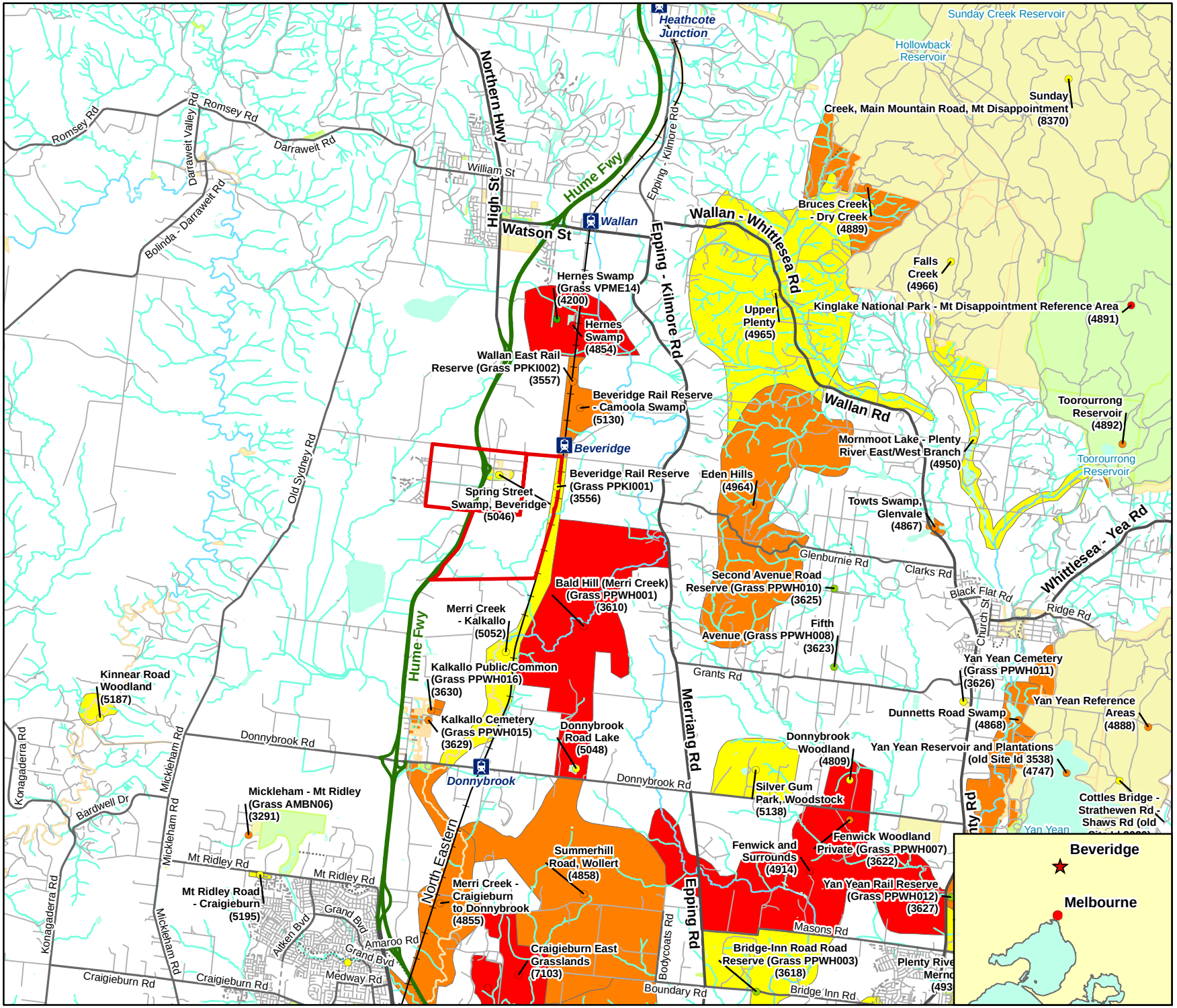
Beveridge Precinct Structure Plan

N

0 325 650

Metres

ecology & heritage partners



Study Area

BioSites

- National
- State
- Regional
- Local
- Yet to be determined

Figure 8

Previously documented BioSites within 10km of the study area

Beveridge Precinct Structure

0 1.5 3

Kilometres

ecology & heritage partners

APPENDICES

Appendix 1 – Significance Assessment

Criteria used by Ecology and Heritage Partners Pty Ltd to define conservation significance, vegetation condition and habitat quality is provided below.

A1.1. Rare or Threatened Categories for listed Victorian taxa

Table A1.1. *Rare or Threatened categories for listed Victorian taxa.*

Rare or Threatened Categories
CONSERVATION STATUS IN AUSTRALIA (Based on the EPBC Act 1999, Briggs and Leigh 1996)
EX - Extinct: Extinct is when there is no reasonable doubt that the last individual of the species has died.
CR - Critically Endangered: A species is critically endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.
EN - Endangered: A species is endangered when it is not critically endangered but is facing a very high risk of extinction in the wild in the near future.
VU - Vulnerable: A species is vulnerable when it is not critically endangered or endangered but is facing a high risk of extinction in the wild in the medium-term future.
R* - Rare: A species is rare but overall is not currently considered critically endangered, endangered or vulnerable.
K* - Poorly Known: A species is suspected, but not definitely known, to belong to any of the categories extinct, critically endangered, endangered, vulnerable or rare.
CONSERVATION STATUS IN VICTORIA (Based on DSE 2005, DSE 2007a DSE 2009)
x - Presumed Extinct in Victoria: not recorded from Victoria during the past 50 years despite field searches specifically for the plant, or, alternatively, intensive field searches (since 1950) at all previously known sites have failed to record the plant.
e - Endangered in Victoria: at risk of disappearing from the wild state if present land use and other causal factors continue to operate.
v - Vulnerable in Victoria: not presently endangered but likely to become so soon due to continued depletion; occurring mainly on sites likely to experience changes in land-use which would threaten the survival of the plant in the wild; or, taxa whose total population is so small that the likelihood of recovery from disturbance, including localised natural events such as drought, fire or landslip, is doubtful.
r - Rare in Victoria: rare but not considered otherwise threatened - there are relatively few known populations or the taxon is restricted to a relatively small area.
k - Poorly Known in Victoria: poorly known and suspected, but not definitely known, to belong to one of the above categories (x, e, v or r) within Victoria. At present, accurate distribution information is inadequate.

A1.2. Defining Ecological Significance

Table A1.2. Defining Ecological Significance.

Criteria for defining Ecological Significance	
NATIONAL SIGNIFICANCE	
Flora	National conservation status is based on the EPBC Act list of taxa considered threatened in Australia (i.e. extinct, critically endangered, endangered, vulnerable).
	Flora listed as rare in Australia in *Rare or Threatened Australian Plants* (Briggs and Leigh 1996).
Fauna	National conservation status is based on the EPBC Act list of taxa considered threatened in Australia (i.e. Extinct, Critically Endangered, Endangered, Vulnerable).
	Fauna listed as Extinct, Critically Endangered, Endangered, Vulnerable, or Rare under National Action Plans for terrestrial taxon prepared for the SEWPaC: threatened marsupials and monotremes (Maxwell *et al.* 1996), bats (Duncan *et al.* 1999), birds (Garnett and Crowley 2000), reptiles (Cogger *et al.* 1993), amphibians (Tyler 1997) and butterflies (Sands and New 2002).
	Species that have not been included on the EBPC Act but listed as significance according to the *IUCN 2009 Red List of Threatened Species* (IUCN 2009).
Communities	Vegetation communities considered critically endangered, endangered or vulnerable under the EPBC Act and considering vegetation condition.
STATE SIGNIFICANCE	
Flora	Threatened taxa listed under the provisions of the FFG Act.
	Flora listed as extinct, endangered, vulnerable or rare in Victoria in the DSE Flora Information System (most recent Version).
	Flora listed in the State Government's *Advisory List of Rare or Threatened Plants in Victoria*, 2005 (DSE 2005).
	Flora listed as poorly known in Australia in *Rare or Threatened Australian Plants* (Briggs and Leigh 1996).
Fauna	Threatened taxon listed under Schedule 2 of the FFG Act.
	Fauna listed as Extinct, Critically Endangered, Endangered and Vulnerable on the State Government's *Advisory List of Threatened Vertebrate Fauna in Victoria - 2007* (DSE 2007b).
	Listed as Lower Risk (Near Threatened, Conservation Dependent or Least concern) or Data Deficient under National Action Plans for terrestrial species prepared for the DSEWPC: threatened marsupials and monotremes (Maxwell *et al.* 1996), bats (Duncan *et al.* 1999), birds (Garnett and Crowley 2000), reptiles (Cogger *et al.* 1993), amphibians (Tyler 1997) and butterflies (Sands and New 2002).

Criteria for defining Ecological Significance	
Communities	Ecological communities listed as threatened under the FFG Act.
	Ecological Vegetation Class listed as threatened (i.e. endangered, vulnerable) or rare in a Native Vegetation Plan for a particular bioregion (www.dse.vic.gov.au) and considering vegetation condition.
REGIONAL SIGNIFICANCE	
Flora	Flora considered rare in any regional native vegetation plan for a particular bioregion.
	Flora considered rare by the author for a particular bioregion.
Fauna	Fauna with a disjunct distribution, or a small number of documented recorded or naturally rare in the particular Bioregion in which the precinct is located.
	A particular taxon that is has an unusual ecological or biogeographical occurrence or listed as Lower Risk – Near Threatened, Data Deficient or Insufficiently Known on the State Government's *Advisory List of Threatened Vertebrate Fauna in Victoria - 2007* (DSE 2007b).
Communities	Ecological Vegetation Class listed as depleted or least concern in a Native Vegetation Plan for a particular bioregion (www.dse.vic.gov.au) and considering vegetation condition.
	Ecological Vegetation Class considered rare by the author for a particular bioregion.
LOCAL SIGNIFICANCE	
Local significance is defined as flora, fauna and ecological communities indigenous to a particular area, which are not considered rare or threatened on a national, state or regional level.	

A1.3 Defining Site Significance

The following geographical areas apply to the overall level of significance with respect to the current survey.

National: Australia

State: Victoria

Regional: Victorian Volcanic bioregion

Local: Within 10 kilometres surrounding the precinct

Table A1.3. *Defining Site Significance.*

Criteria for defining Site Significance
NATIONAL SIGNIFICANCE
A site is of National significance if: - It regularly supports, or has a high probability of regularly supporting individuals of a taxon listed as 'Critically Endangered' or 'Endangered' under the EPBC Act and/or under National Action Plans for terrestrial taxon prepared for the SEWPaC. - It regularly supports, or has a high probability of supporting, an 'important population' as defined under the EPBC Act of one or more nationally 'vulnerable' flora and fauna taxon. - It is known to support, or has a high probability of supporting taxon listed as 'Vulnerable' under National Action Plans. - It is known to regularly support a large proportion (i.e. greater than 1%) of a population of a taxon listed as 'Conservation Dependent' under the EPBC Act and/or listed as Rare or Lower Risk (near threatened, conservation dependent or least concern) under National Action Plans. - It contains an area, or part thereof designated as 'critical habitat' under the EPBC Act, or if the site is listed under the Register of National Estate compiled by the Australian Heritage Commission. - It is a site which forms part of, or is connected to a larger area(s) of remnant native vegetation or habitat of national conservation significance such as most National Park, and/or a Ramsar Wetland(s).
STATE SIGNIFICANCE
A site is of State significance if: - It occasionally (i.e. every 1 to 5 years) supports, or has suitable habitat to support taxon listed as 'Critically Endangered' or 'Endangered' under the EPBC Act and/or under National Action Plans. - It regularly supports, or has a high probability of regularly supporting (i.e. high habitat quality) taxon listed as 'Vulnerable', 'Near threatened', 'Data Deficient' or 'Insufficiently Known' in Victoria (DSE 2005, 2007b), or species listed as 'Data Deficient' or 'Insufficiently Known' under National Action Plans. - It contains an area, or part thereof designated as 'critical habitat' under the FFG Act. - It supports, or likely to support a high proportion of any Victorian flora and fauna taxa. - It contains high quality, intact vegetation/habitat supporting a high species richness and diversity in a particular bioregion. - It is a site which forms part of, or connected to a larger area(s) of remnant native vegetation or habitat of state conservation significance such as most State Parks and/or Flora and Fauna Reserves.

Criteria for defining Site Significance
REGIONAL SIGNIFICANCE
A site is of Regional significance if: - It regularly supports, or has a high probability of regularly supporting regionally significant fauna as defined in Table 1.2. - Is contains a large population (i.e. greater than 1% or 5%) of flora considered rare in any regional native vegetation plan for a particular bioregion. - It supports a fauna population with a disjunct distribution, or a particular taxon that has an unusual ecological or biogeographical occurrence. - It is a site which forms part of, or is connected to a larger area(s) of remnant native vegetation or habitat of regional conservation significance such as most Regional Parks and/or Flora and Fauna Reserves.
LOCAL SIGNIFICANCE
Most sites are considered to be of at least local significant for conservation, and in general a site of local significance can be defined as: - An area which supports indigenous flora species and/or a remnant EVC, and habitats used by locally significant fauna species. - An area which currently acts, or has the potential to act as a wildlife corridor linking other areas of higher conservation significance and facilitating fauna movement throughout the landscape.

A1.4. Defining Vegetation Condition

Table A1.4. Defining Vegetation Condition.

Criteria for defining Vegetation Condition
Good condition - Vegetation dominated by a diversity of indigenous species, with defined structures (where appropriate), such as canopy layer, shrub layer, and ground cover, with little or few introduced species present.
Moderate condition - Vegetation dominated by a diversity of indigenous species, but is lacking some structures, such as canopy layer, shrub layer or ground cover, and/or there is a greater level of introduced flora species present.
Poor condition - Vegetation dominated by introduced species, but supports low levels of indigenous species present, in the canopy, shrub layer or ground cover.

A1.5. Defining Habitat Quality

Several factors are taken into account when determining the value of habitat. Habitat quality varies on both spatial and temporal scales, with the habitat value varying depending upon a particular fauna species.

Table A1.5. *Defining Habitat Quality.*

Criteria for defining Habitat Quality
HIGH QUALITY
High degree of intactness (i.e. floristically and structurally diverse), containing several important habitat features such as ground debris (logs, rocks, vegetation), mature hollow-bearing trees, and a dense understorey component.
High species richness and diversity (i.e. represented by a large number of species from a range of fauna groups).
High level of foraging and breeding activity, with the site regularly used by native fauna for refuge and cover.
Habitat that has experienced, or is experiencing low levels of disturbance and/or threatening processes (i.e. weed invasion, introduced animals, soil erosion, salinity).
High contribution to a wildlife corridor, and/or connected to a larger area(s) of high quality habitat.
Provides known, or likely habitat for one or more rare or threatened species listed under the EPBC Act, FFG Act, or species considered rare or threatened according to DSE 2005.
MODERATE QUALITY
Moderate degree of intactness, containing one or more important habitat features such as ground debris (logs, rocks, vegetation), mature hollow-bearing trees, and a dense understorey component.
Moderate species richness and diversity - represented by a moderate number of species from a range of fauna groups.
Moderate levels of foraging and breeding activity, with the site used by native fauna for refuge and cover.
Habitat that has experienced, or is experiencing moderate levels of disturbance and/or threatening processes.
Moderate contribution to a wildlife corridor, or is connected to area(s) of moderate quality habitat.
Provides potential habitat for a small number of threatened species listed under the EPBC Act, FFG Act, or species considered rare or threatened according to DSE 2005.
LOW QUALITY
Low degree of intactness, containing few important habitat features such as ground debris (logs, rocks, vegetation), mature hollow-bearing trees, and a dense understorey component.
Low species richness and diversity (i.e. represented by a small number of species from a range of fauna groups).
Low levels of foraging and breeding activity, with the site used by native fauna for refuge and cover.
Habitat that has experienced, or is experiencing high levels of disturbance and/or threatening processes.
Unlikely to form part of a wildlife corridor, and is not connected to another area(s) of habitat.
Unlikely to provide habitat for rare or threatened species listed under the EPBC Act, FFG Act, or considered rare or threatened according to DSE 2005.

Appendix 2.1 – Flora survey results

Table A2.1.1. Indigenous Flora recorded during the present survey from the precinct.

Life form	Scientific name	Common name	Conservation Status				Present in Sites	
			EPBC	DSE	FFG	Regional	Bev Centr	Lock Nth
Tree	**Myrtaceae**							
	Eucalyptus camaldulensis	River Red-gum	-	-	-			✓
	Eucalyptus ovata	Swamp Gum	-	-	-	✓	✓	✓
	Eucalyptus viminalis	Manna-gum	-	-	-	✓		✓
Shrub	*Kunzea ericoides spp. agg.*	Burgan	-	-	-		✓	✓
Shrub	**Mimosaceae**							
	Acacia paradoxa	Hedge Wattle	-	-	-			✓
	Pittosporaceae							
	Bursaria spinosa	Sweet Bursaria	-	-	-			✓
	Violaceae							
	Melicytus dentatus	Tree Violet	-	-	-			✓
	Adiantaceae							
	Adiantum aethiopicum	Common Maidenhair	-	-	-		✓	✓
	Cheilanthes austrotenuifolia	Green Rock-fern	-	-	-			✓
	Amaranthaceae							
	Alternanthera denticulate s.s.	Lesser Joyweed	-	-	-		✓	✓
	Anthericaceae							
	Arthropodium minus	Small Vanilla-lily	-	-	-			✓
	Arthropodium strictum s.s.	Chocolate Lily	-	-	-		✓	
	Thysanotus patersonii	Twining Fringe-lily	-	-	-		✓	
	Thysanotus tuberosus	Common Fringe-lily	-	-	-			✓
	Apiaceae							
	Eryngium ovinum	Blue Devil	-	-	-		✓	✓
	Asteraceae							
	Calocephalus lacteus	Milky Beauty-heads	-	-	-			✓
	Chrysocephalum apiculatum s.l.	Common Everlasting	-	-	-	✓	✓	✓
	Senecio hispidulus s.s.	Rough Fireweed	-	-	-	✓	✓	✓
	Senecio quadridentatus	Cotton Fireweed	-	-	-	✓	✓	✓
	Vittadinia gracilis	Woolly New Holland Daisy	-	-	-			✓
	Campanulaceae							
	Wahlenbergia communis s.s.	Tufted Bluebell	-	-	-			✓
	Convolvulaceae							
	Convolvulus angustissimus subsp. omnigracilis	Slender Bindweed	-	✓	-			✓
	Convolvulus remotus	Grass Bindweed	-	-	-			✓
	Chenopodiaceae							
	Atriplex prostrata	Hastate Orache	-	-	-			✓
	Droseraceae							

Life form	Scientific name	Common name	Conservation Status				Present in Sites	
			EPBC	DSE	FFG	Regional	Bev Centr	Lock Nth
	Drosera peltata subsp. peltata	Pale Sundew	-	-	-			✓
	Fabaceae							
	Glycine clandestina	Twining Glycine	-	-	-			✓
	Glycine tabacina s.s.	Variable Glycine	-	-	-			✓
	Kennedia prostrata	Running Postman	-	-	-	✓	✓	✓
	Geraniaceae							
	Geranium sp. 2	Variable Crane's-bill	-	-	-	✓		✓
	Geranium sp. 5	Naked Crane's-bill	-	-	-	✓	✓	✓
	Geranium spp.	Crane's Bill	-	-	-	✓	✓	✓
	Haloragaceae							
	Myriophyllum crispatum	Upright Water-milfoil	-	-	-			✓
	Hemerocallidaceae							
	Caesia calliantha	Blue Grass-lily	-	-	-			✓
	Tricoryne elatior	Yellow Rush-lily	-	-	-			✓
	Hypericaceae							
	Hypericum gramineum	Small St John's Wort	-	-	-		✓	✓
	Lythraceae							
	Lythrum hyssopifolia	Small Loosestrife	-	-	-		✓	✓
	Onagraceae							
	Epilobium billardierianum	Variable Willow-herb	-	-	-	✓	✓	✓
	Orchidaceae							
	Microtis unifolia	Common Onion-orchid	-	-	-			✓
	Oxalidaceae							
	Oxalis perennans	Grassland Wood-sorrel	-	-	-			✓
	Phormiaceae							
	Dianella amoena	Matted Flax-lily	✓	-	-			✓
	Polygonaceae							
	Persicaria decipiens	Slender Knotweed	-	-	-			✓
	Rumex bidens	Mud Dock	-	-	-	✓		✓
	Ranunculaceae							
	Ranunculus amphitrichus	Small River Buttercup	-	-	-	✓	✓	✓
	Rocaceae							
	Acaena echinata	Sheep's Burr	-	-	-		✓	✓
	Acaena ovina	Australian Sheep's Burr	-	-	-		✓	✓
	Rubiaceae							
	Asperula conferta	Common Woodruff	-	-	-		✓	✓
	Solanaceae							
	Solanum aviculare	Kangaroo Apple	-	-	-			✓
	Thymelaeaceae							
	Pimelea glauca	Smooth Rice-flower	-	-	-			✓
	Pimelea humilis	Common Rice-flower	-	-	-			✓
	Veronicaceae							
	Veronica gracilis	Slender Speedwell	-	-	-	✓	✓	✓

Life form	Scientific name	Common name	Conservation Status				Present in Sites	
			EPBC	DSE	FFG	Regional	Bev Centr	Lock Nth
Graminoid (Grass-like plant)	**Poaceae**							
	Amphibromus nervosus	Common Swamp Wallaby-grass	-	-	-	✓		✓
	Austrodanthonia caespitosa	Common Wallaby-grass	-	-	-		✓	✓
	Austrodanthonia duttoniana	Brown-back Wallaby-grass	-	-	-		✓	✓
	Austrodanthonia racemosa var. racemosa	Slender Wallaby-grass	-	-	-		✓	✓
	Austrodanthonia setacea	Bristly Wallaby-grass	-	-	-		✓	✓
	Austrostipa bigeniculata	Kneed Spear-grass	-	-	-			✓
	Austrostipa mollis	Supple Spear-grass	-	-	-	✓		✓
	Austrostipa scabra subsp. falcata	Rough Spear-grass	-	-	-	✓	✓	✓
	Austrostipa scabra subsp. scabra	Rough Spear-grass	-	-	-			✓
	Elymus scaber var. scaber	Common Wheat-grass	-	-	-		✓	✓
	Lachnagrostis filiformis s.l.	Common Blown-grass	-	-	-			✓
	Microlaena stipoides var. stipoides	Weeping Grass	-	-	-			✓
	Phragmites australis	Common Reed	-	-	-		✓	✓
	Poa labillardierei var. labillardierei	Common Tussock-grass	-	-	-	✓	✓	✓
	Poa morrisii	Soft Tussock-grass	-	-	-			✓
	Themeda triandra	Kangaroo Grass	-	-	-		✓	✓
	Typhaceae							
	Typha domingensis	Narrow-leaf Cumbungi	-	-	-	✓	✓	✓
	Xanthorrhoeaceae							
	Lomandra filiformis	Wattle Mat-rush	-	-	-			✓
Rushes / Sedges	**Cyperaceae**							
	Carex appressa	Tall Sedge	-	-	-			✓
	Carex gaudichaudiana	Fen Sedge	-	-	-	✓	✓	✓
	Carex inversa	Knob Sedge	-	-	-			✓
	Carex tereticaulis	Poong'ort	-	-	-	✓		✓
	Eleocharis acuta	Common Spike-sedge	-	-	-		✓	✓
	Schoenus apogon	Common Bog Sedge	-	-	-		✓	✓
	Juncaceae							
	Juncus bufonius	Toad Rush	-	-	-			✓
	Juncus holoschoenus	Joint-leaf Rush	-	-	-			✓
	Juncus procerus	Tall Rush	-	-	-	✓	✓	✓
	Juncus subsecundus	Finger Rush	-	-	-		✓	✓

Table A2.1.2. Exotic flora recorded during the present survey from the precinct.

Life form	Scientific name	Common name	Conservation Status			Present at Sites Assessments	
NON-INDIGENOUS NATIVE SPECIES			EPBC	DSE	FFG	Bev Central	Lock Nth
Tree	**Myrtaceae**						
	Eucalyptus cladocalyx	Sugar Gum	-	-	-	✓	✓
	Eucalyptus spp.		-	-	-		✓
	Mimosaceae						
	Acacia baileyana	Cootamundra Wattle	-	-	-		✓
	Acacia mearnsii	Black Wattle	-	-	-	✓	✓
	Acacia melanoxylon	Blackwood	-	-	-	✓	✓
EXOTIC SPECIES			CALP ACT LISTED WEEDS				
Tree	**Cupressaceae**						
	Cupressus macrocarpa	Monterey Cypress	-			✓	✓
	Pinanceae						
	Pinus radiata	Radiata Pine	-				✓
	Salicaceae						
	Populus spp.	Poplar	-				✓
	Ulmaceae						
	Ulmus spp.	Elm	-				✓
Shrub	**Lamiaceae**						
	Marrubium vulgare	Horehound	✓				✓
	Rosaceae						
	Prunus spp.	Prunus	-			✓	✓
	Rosa rubiginosa	Sweet briar	✓			✓	✓
	Rubus fruticosus spp. agg.	Blackberry	✓			✓	✓
	Solanaceae						
	Solanum nigrum s.s.	Black Nightshade	✓				✓
Herb/ Forb	**Aizoaceae**						
	Carpobrotus aequilaterus	Angled Pigface	-			✓	✓
	Apiaceae						
	Bifora testiculata	Bifora					✓
	Foeniculum vulgare	Fennel	-			✓	✓
	Asteraceae						
	Arctotheca calendula	Cape Weed	-			✓	✓
	Carthamus lanatus	Saffron Thistle	✓			✓	✓
	Cirsium vulgare	Spear Thistle	✓			✓	✓
	Cynara cardunculus	Artichoke Thistle	✓			✓	✓
	Conyza bonariensis	Flaxleaf Fleabane	-			✓	✓
	Cotula coronopifolia	Water Buttons	-				✓
	Helminthotheca echioides	Ox Tongue	-			✓	✓
	Hypochaeris glabra	Smooth Cat's-ear	-			✓	✓
	Hypochaeris radicata	Flatweed	-			✓	✓
	Silybum marianum	Variegated Thistle	✓			✓	✓
	Lactuca saligna	Willow-leaf Lettuce	-				✓
	Sonchus apser s.l.	Rough Sow-thistle	-			✓	✓
	Sonchus oleraceus	Common Sow-thistle	-			✓	✓
	Taraxacum officinale spp. agg.	Dandelion	-				✓
	Xanthium spinosum	Bathurst Burr	✓				✓

Life form	Scientific name	Common name	Conservation Status	Present at Sites Assessments	
	Aizoaceae				
	Galenia pubescens var. *pubescens*	Galenia	-	✓	✓
	Boraginaceae				
	Echium plantagineum	Paterson's curse	✓	✓	✓
	Brassicaceae				
	Brassica X juncea	Indian Mustard	-		✓
	Capsella bursa-pastoris	Shepard's Purse	-		✓
	Caryophyllaceae				
	Cerastium glomeratum s.l.	Common Mouse-ear Chickweed	-	✓	✓
	Petrorhagia dubia	Velvety Pink			✓
	Crassulaceae				
	Crassula decumbens var. decumbens	Spreading Crassula	-		✓
	Fabaceae				
	Genista monspessulana	Montpellier Broom	✓	✓	✓
	Lotus angustissimus	Slender Birds-foot Trefoil	-	✓	✓
	Medicago minima	Little Medic	-		✓
	Medicago polymorpha	Burr Medic	-	✓	✓
	Trifolium angustifolium var. angustifolium	Narrow-leaf Clover	-		✓
	Trifolium arvense var. arvense	Hare's-foot Clover	-		✓
	Trifolium fragiferum var, fragiferum	Strawberry Clover	-	✓	✓
	Trifolium repens var. repens	White Clover	-	✓	✓
	Trifolium spp.	Clover	-	✓	✓
	Trifolium subterraneum	Subterranean Clover	-	✓	✓
	Ulex europaeus	Gorse	✓	✓	✓
	Vicia sativa	Common Vetch	-	✓	✓
	Vinca major	Blue Periwinkle	✓	✓	✓
	Gentianaceae				
	Centaurium erythraea	Common Centaury	-	✓	✓
	Centaurium tenuiflorum	Slender Centaury	-		✓
	Geraniaceae				
	Erodium crinitum	Blue Heron's-bill	-	✓	✓
	Iridaceae				
	Romulea rosea	Onion Grass	✓	✓	✓
	Sisyrinchium aff. iridifolium	Blue Scour-weed	-		✓
	Sisyrichium iridifolium	Striped Rush-leaf	-		✓
	Malvaceae				
	Modiola caroliniana	Red Flower-mallow	-		✓
	Modiola niceeensis	Mallow of Nice	-	✓	✓
	Oxalidaceae				
	Oxalis pes-caprae	Soursob	-	✓	✓
	Plantaginaceae				
	Plantago coronopus	Buck's-horn Plantain	-	✓	✓
	Plantago lanceolata	Ribwort	-	✓	✓
	Polygonaceae				
	Acetosella vulgaris	Sheep sorrel	-	✓	✓

Life form	Scientific name	Common name	Conservation Status	Present at Sites Assessments	
	Rumex dumosus	Wiry dock	-	✓	✓
	Rumex pulcher subsp. pulcher	Fiddle Dock	-	✓	✓
	Urticaceae				
	Urtica urens	Small Nettle	-	✓	✓
Graminoid (Grass-like plant)	**Boraginaceae**				
	Vulpia bromoides	Squirrel-tail fescue	-	✓	✓
	Vulpia myuros f. myuros	Rat's-tail Fescue	-	✓	✓
	Vulpia myuros	Foxtail fescue	-	✓	✓
	Vulpia spp.	Fescue	-	✓	✓
	Poaceae				
	Agrostis capillaris	Brown-top Bent	-	✓	✓
	Aira caryophyllea	Silvery Hair-grass	-		✓
	Anthoxanthum odoratum	Sweet Vernal-grass	-	✓	✓
	Avena barbata	Bearded Oat	-	✓	✓
	Brachypodium distachyon	False Brome	-		✓
	Briza maxima	Large Quaking-grass	-		✓
	Briza minor	Lesser Quaking-grass	-		✓
	Bromus catharticua	Prairie Brome	-	✓	✓
	Bromus hordeaceus subsp. hordeaceus	Soft brome	-	✓	✓
	Bromus rubens	Red Brome	-		✓
	Cynosurus echinatus	Rough Dog's-tail	-		✓
	Dactylis glomerata	Cocksfoot	-	✓	✓
	Echinopogon ovatus	Common Hedgehog-grass	-		✓
	Ehrharta erecta var. erecta	Panic Veldt-grass	-		✓
	Holcus lanatus	Yorkshire Fog	-	✓	✓
	Hordeum leporinum	Barley grass	-	✓	✓
	Hordeum spp.	Barley Grass	-	✓	✓
	Lolium spp.	Rye Grass	-	✓	✓
	Nassella neesiana	Chilean Needle-grass	-		✓
	Nassella trichotoma	Serrated Tussock	-		✓
	Paspalum dilatatum	Paspalum	-	✓	✓
	Phalaris aquatica	Toowoomba Canary-grass	-	✓	✓
	Poa annua	Annual Meadow-grass	-	✓	✓
	Polypogon monspeliensis	Annual Beard-grass	-		✓
	Vulpia bromoides	Squirrel-tail fescue	-	✓	✓
Rush/ Sedge	**Cyperaceae**				
	Cyperus eragrostis	Drain Flat-sedge	-		✓
	Juncaceae				
	Juncus acutus subsp. acutus	Spiny Rush	-	✓	✓

Appendix 2.2 – Flora database results

Table A2.2. *Significant flora recorded within 10 kilometres of the study area.*

EPBC	*Environment Protection and biodiversity Conservation Act 1999* (EPBC Act)
FFG	*Flora and Fauna Guarantee Act 1988* (FFG Act)
DSE	Advisory List of Threatened Flora in Victoria (DSE 2005); VROTS

X	Extinct
CR	Critically endangered
EN	Endangered
VU	Vulnerable
e	Endangered
v	Vulnerable
r	Rare
k	Poorly Known
L	Listed as threatened under FFG Act
D	De-listed from the FFG Act
#	Records identified from EPBC Act Protected Matters Search Tool.
*	Additional information from the Flora Information System
@	Native non-indigenous species

1	Known occurrence
2	Habitat present
3	Habitat present, but low likelihood
4	Unlikely
5	No suitable habitat

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likely occurrence in study area
NATIONAL SIGNIFCANCE							
**Amphibromus fluitans*	River Swamp Wallaby-grass	2	2008	VU	-	-	4
#Carex tasmanica	Curly Sedge	2	2005	VU	L	v	2
#Dianella amoena	Matted Flax-lily	3	2008	EN	L	e	1
#Glycine latrobeana	Clover Glycine	-	-	VU	L	v	3
#Lachnagrostis adamsonii	Adamson's Blown-grass	-	-	EN	L	v	3
#Lepidium hyssopifolium	Basalt Peppercress	6	1984	EN	L	e	2
#Prasophyllum frenchii	Maroon Leek-orchid	-	-	EN	L	e	4
#Senecio macrocarpus	Large-headed Fireweed	-	-	VU	L	e	4
Senecio psilocarpus	Swamp Fireweed	21	2002	VU	-	v	3
Xerochrysum palustre	Swamp Everlasting	2	2005	VU	L	v	3
STATE SIGNIFICANCE							
Amphibromus pithogastrus	Plump Swamp Wallaby-grass	1	1992	-	L	e	2
**Asperula charophyton*	Elongate Woodruff	1	2008	-	-	k	3
Austrodanthonia monticola	Small-flower Wallaby-grass	1	2005	-	-	r	2
Austrostipa rudis subsp. australis	Veined Spear-grass	1	1974	-	-	r	2
Callitriche umbonata	Winged Water-starwort	2	1992	-	-	r	3
**Comesperma polygaloides*	Small Milkwort	1	1995	-	L	v	4
Convolvulus angustissimus subsp. omnigracilis	Slender Bindweed	5	2005	-	-	k	3
Cullen parvum	Small Scurf-pea	1	2000	-	L	e	3
Cullen tenax	Tough Scurf-pea	2	2008	-	L	e	3
Desmodium varians	Slender Tick-trefoil	6	2008	-	-	k	3
Eucalyptus X studleyensis	Studley Park Gum	1	2004	-	-	e	4
Eucalyptus yarraensis	Yarra Gum	2	1996	-	-	r	4
Geranium solanderi var. solanderi s.s.	Austral Crane's-bill	4	2006	-	-	v	2

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likely occurrence in study area
Geranium sp. 1	Large-flower Crane's-bill	1	2004	-	-	e	2
Geranium sp. 3	Pale-flower Crane's-bill	7	2009	-	-	r	2
Helichrysum aff. rutidolepis (Lowland Swamps)	Pale Swamp Everlasting	8	2002	-	-	v	2
Hypoxis vaginata var. brevistigmata	Yellow Star	2	1992	-	-	k	3
Lachnagrostis perennis spp. agg.	Perennial Blown-grass	1	1990	-	-	k	2
Lachnagrostis punicea subsp. punicea	Purple Blown-grass	18	2006	-	-	r	2
Pellaea calidirupium	Inland Sickle-fern	1	2008	-	-	k	4
Pleurosorus subglandulosus	Glandular Blanket-fern	2	2008	-	-	k	5
Poa labillardierei var. (Volcanic Plains)	Basalt Tussock-grass	2	2007	-	-	k	2
Ranunculus diminutus	Brackish Plains Buttercup	3	1998	-	-	r	4
**Rhagodia parabolica*	Fragrant Saltbush	2	2005	-	-	r	5
Senecio campylocarpus	Floodplain Fireweed	1	1993	-	-	r	5
**Tripogon loliiformis*	Rye Beetle-grass	2	2005	-	-	r	3

Data source: Victorian Biodiversity Atlas (DSE 2010a); Flora Information System (Viridans 2011a); Protected Matters Search Tool (SEWPaC 2011).

Disclaimer: Due to modification of the study area and/or the surrounding landscape over the past 150 years, species records prior to 1950 (and that have not been recorded since) are excluded from this table.

Taxonomic order: Alphabetical.

Appendix 3.1 – Fauna results

Table A3.1. Fauna recorded during the present survey (September 2011), and previously recorded within 10 kilometres of the study area.

H Heard
S Seen
I Incidental (feathers, bones, scats etc)
T Trapped / handheld

Mi Migratory
Ma Marine
* Introduced species

Common name	Scientific name	Last documented record	Total # of documented records	Hollow use	Mi/ Ma	Present survey
	MAMMALS					
Platypus	*Ornithorhynchus anatinus*	1988	1	-	-	-
Short-beaked Echidna	*Tachyglossus aculeatus*	2005	21	-	-	-
Eastern Quoll	*Dasyurus viverrinus*	1930	1	-	-	-
Brush-tailed Phascogale	*Phascogale tapoatafa tapoatafa*	1988	2	Total	-	-
Fat-tailed Dunnart	*Sminthopsis crassicaudata*	1991	4	-	-	-
Common Dunnart	*Sminthopsis murina murina*	1988	1	-	-	-
Common Wombat	*Vombatus ursinus*	2008	20	-	-	-
Koala	*Phascolarctos cinereus*	1989	3	-	-	-
Common Brushtail Possum	*Trichosurus vulpecula*	1996	21	Total	-	-
Sugar Glider	*Petaurus breviceps*	2008	8	Total	-	-
Common Ringtail Possum	*Pseudocheirus peregrinus*	2008	8	Partial	-	-
Eastern Bettong	*Bettongia gaimardi*	1869	2	-	-	-
Eastern Grey Kangaroo	*Macropus giganteus*	2008	42	-	-	S
Black Wallaby	*Wallabia bicolor*	2008	19	-	-	-
Eastern Freetail Bat	*Mormopterus sp. 2*	1989	1	-	-	-
White-striped Freetail Bat	*Tadarida australis*	1993	5	Total	-	-
Gould's Wattled Bat	*Chalinolobus gouldii*	1993	7	Total	-	-
Chocolate Wattled Bat	*Chalinolobus morio*	1993	5	Total	-	-
Lesser Long-eared Bat	*Nyctophilus geoffroyi*	1993	7	Total	-	-
Inland Broad-nosed Bat	*Scotorepens balstoni*	1989	2	Total	-	-
Large Forest Bat	*Vespadelus darlingtoni*	1993	7	Total	-	-

Common name	Scientific name	Last documented record	Total # of documented records	Hollow use	Mi/ Ma	Present survey
Southern Forest Bat	*Vespadelus regulus*	1993	5	Total	-	-
Little Forest Bat	*Vespadelus vulturnus*	1991	4	Total	-	-
Water Rat	*Hydromys chrysogaster*	1993	4	-	-	-
House Mouse*	*Mus musculus*	2006	23	-	-	I
Swamp Rat	*Rattus lutreolus*	1988	1	-	-	-
Black Rat*	*Rattus rattus*	1993	5	-	-	-
Dingo & Dog (feral)*	*Canis lupus*	1993	1	-	-	-
Red Fox*	*Vulpes vulpes*	2008	32	-	-	S
Cat*	*Felis catus*	2006	2	-	-	-
European Rabbit*	*Oryctolagus cuniculus*	2008	36	-	-	I
European Hare*	*Lepus europeaus*	2006	16	-	-	I
BIRDS						
Emu	*Dromaius novaehollandiae*	2003	1	-	-	-
Stubble Quail	*Coturnix pectoralis*	2002	22	-	Ma	S
Brown Quail	*Coturnix ypsilophora australis*	2002	5	-	-	-
Plumed Whistling-Duck	*Dendrocygna eytoni*	1979	1	-	-	-
Musk Duck	*Biziura lobata*	2002	2	-	Ma	-
Freckled Duck	*Stictonetta naevosa*	1988	1	-	-	-
Black Swan	*Cygnus atratus*	1995	8	-	-	-
Australian Shelduck	*Tadorna tadornoides*	2005	25	Total	-	-
Australian Wood Duck	*Chenonetta jubata*	2008	35	Total	-	S
Pink-eared Duck	*Malacorhynchus membranaceus*	1991	4	Partial	-	-
Australasian Shoveler	*Anas rhynchotis*	2005	5	-	-	-
Grey Teal	*Anas gracilis*	2005	17	Total	-	-
Chestnut Teal	*Anas castanea*	2005	9	Total	-	-
Northern Mallard*	*Anas platyrhynchos*	1993	2	-	-	-
Pacific Black Duck	*Anas superciliosa*	2005	40	-	-	-
Hardhead	*Aythya australis*	2002	6	-	-	-
Blue-billed Duck	*Oxyura australis*	1988	1	-	-	-

Common name	Scientific name	Last documented record	Total # of documented records	Hollow use	Mi/ Ma	Present survey
Australasian Grebe	*Tachybaptus novaehollandiae*	2005	16	-	-	-
Hoary-headed Grebe	*Poliocephalus poliocephalus*	2005	10	-	-	-
Rock Dove*	*Columba livia*	2006	10	-	-	-
Spotted Turtle-Dove*	*Streptopelia chinensis*	2006	10	-	-	-
Common Bronzewing	*Phaps chalcoptera*	2008	8	-	-	-
Tawny Frogmouth	*Podargus strigoides*	1991	6	-	-	-
White-throated Nightjar	*Eurostopodus mystacalis*	1988	1	-	-	-
Australian Owlet-nightjar	*Aegotheles cristatus*	1991	3	Total	-	-
White-throated Needletail	*Hirundapus caudacutus*	1995	5	-	Mi/Ma	-
Little Pied Cormorant	*Microcarbo melanoleucos*	2006	15	-	-	-
Great Cormorant	*Phalacrocorax carbo*	1988	1	-	-	-
Little Black Cormorant	*Phalacrocorax sulcirostris*	1988	1	-	-	-
Pied Cormorant	*Phalacrocorax varius*	1977	1	-	-	-
Australian Pelican	*Pelecanus conspicillatus*	1988	3	-	Ma	-
Australasian Bittern	*Botaurus poiciloptilus*	1990	1	-	-	-
White-necked Heron	*Ardea pacifica*	2005	21	-	-	S
Eastern Great Egret	*Ardea modesta*	1991	4	-	Mi/Ma	-
Cattle Egret	*Ardea ibis*	1991	5	-	Mi/Ma	-
White-faced Heron	*Egretta novaehollandiae*	2006	59	-	-	S
Nankeen Night Heron	*Nycticorax caledonicus hillii*	2002	1	-	Ma	-
Australian White Ibis	*Threskiornis molucca*	2005	28	-	Ma	S
Straw-necked Ibis	*Threskiornis spinicollis*	2006	24	-	Ma	-
Royal Spoonbill	*Platalea regia*	1990	2	-	-	-
Yellow-billed Spoonbill	*Platalea flavipes*	1999	15	-	-	-
Black-shouldered Kite	*Elanus axillaris*	2006	33	-	-	-
Whistling Kite	*Haliastur sphenurus*	1991	4	-	Ma	-
Black Kite	*Milvus migrans*	1989	2	-	-	-
Brown Goshawk	*Accipiter fasciatus*	1993	24	-	Ma	-
Collared Sparrowhawk	*Accipiter cirrhocephalus*	2000	2	-	-	-

Common name	Scientific name	Last documented record	Total # of documented records	Hollow use	Mi/ Ma	Present survey
Spotted Harrier	*Circus assimilis*	1990	3	-	-	-
Swamp Harrier	*Circus approximans*	2002	5	-	Ma	-
Wedge-tailed Eagle	*Aquila audax*	2008	33	-	-	S
Little Eagle	*Hieraaetus morphnoides*	2004	6	-	-	-
Nankeen Kestrel	*Falco cenchroides*	2006	38	Partial	Ma	-
Brown Falcon	*Falco berigora*	2006	49	-	-	S
Australian Hobby	*Falco longipennis*	1993	2	-	-	-
Black Falcon	*Falco subniger*	2007	3	-	-	-
Peregrine Falcon	*Falco peregrinus*	1991	13	Partial	-	S
Purple Swamphen	*Porphyrio porphyrio*	1988	2	-	-	-
Lewin's Rail	*Lewinia pectoralis pectoralis*	1991	1	-	Mi	-
Buff-banded Rail	*Gallirallus philippensis*	2000	4	-	-	-
Australian Spotted Crake	*Porzana fluminea*	1991	1	-	-	-
Spotless Crake	*Porzana tabuensis*	1990	1	-	Ma	-
Black-tailed Native-hen	*Gallinula ventralis*	1988	1	-	-	-
Dusky Moorhen	*Gallinula tenebrosa*	1993	8	-	-	-
Eurasian Coot	*Fulica atra*	1995	10	-	-	-
Black-fronted Dotterel	*Elseyornis melanops*	1991	8	-	-	-
Red-kneed Dotterel	*Erythrogonys cinctus*	1993	1	-	-	-
Banded Lapwing	*Vanellus tricolor*	1990	1	-	-	-
Masked Lapwing	*Vanellus miles*	2005	40	-	-	S
Plains-wanderer	*Pedionomus torquatus*	1989	4	-	-	-
Latham's Snipe	*Gallinago hardwickii*	1991	10	-	Mi/Ma	-
Painted Button-quail	*Turnix varia*	2008	1	-	-	-
Red-chested Button-quail	*Turnix pyrrhothorax*	1990	2	-	-	-
Little Button-quail	*Turnix velox*	1991	2	-	-	-
Welcome Swallow	*Hirundo neoxena*	2008	70	Partial	-	S
Silver Gull	*Chroicocephalus novaehollandiae*	1977	2	-	Ma	-
Yellow-tailed Black-Cockatoo	*Calyptorhynchus funereus*	2001	3	Total	-	-

Common name	Scientific name	Last documented record	Total # of documented records	Hollow use	Mi/ Ma	Present survey
Galah	*Eolophus roseicapilla*	2008	56	Total	-	S
Long-billed Corella	*Cacatua tenuirostris*	2008	22	Total	-	S
Little Corella	*Cacatua sanguinea*	1988	8	Total	-	-
Sulphur-crested Cockatoo	*Cacatua galerita*	2008	62	Total	-	S
Musk Lorikeet	*Glossopsitta concinna*	1993	4	-	-	-
Little Lorikeet	*Glossopsitta pusilla*	1991	1	-	-	-
Purple-crowned Lorikeet	*Glossopsitta porphyrocephala*	1993	5	Total	-	-
Crimson Rosella	*Platycercus elegans*	2008	31	Total	-	-
Eastern Rosella	*Platycercus eximius*	2008	79	Total	-	-
Swift Parrot	*Lathamus discolor*	1991	2	Total	Ma	-
Red-rumped Parrot	*Psephotus haematonotus*	2005	56	-	-	S
Budgerigar	*Melopsittacus undulatus*	1991	1	Partial	-	-
Blue-winged Parrot	*Neophema chrysostoma*	1990	1	Partial	-	-
Horsfield's Bronze-Cuckoo	*Chrysococcyx basalis*	2008	17	-	Ma	-
Black-eared Cuckoo	*Chrysococcyx osculans*	1991	4	-	Ma	-
Shining Bronze-Cuckoo	*Chrysococcyx lucidus*	1991	20	-	Ma	-
Pallid Cuckoo	*Cuculus pallidus*	2008	18	-	Ma	H
Fan-tailed Cuckoo	*Cacomantis flabelliformis*	2008	22	-	-	-
Brush Cuckoo	*Cacomantis variolosus*	1988	3	-	-	-
Barking Owl	*Ninox connivens connivens*	1989	3	Total	-	-
Southern Boobook	*Ninox novaeseelandiae*	2008	17	Total	Ma	-
Pacific Barn Owl	*Tyto javanica*	2000	6	Partial	-	-
Azure Kingfisher	*Alcedo azurea*	1988	1	-	-	-
Laughing Kookaburra	*Dacelo novaeguineae*	2008	48	Total	-	-
Sacred Kingfisher	*Todiramphus sanctus*	1993	20	Partial	Ma	-
Rainbow Bee-eater	*Merops ornatus*	1991	17	-	Mi/Ma	-
White-throated Treecreeper	*Cormobates leucophaeus*	2008	38	Total	-	-
Red-browed Treecreeper	*Climacteris erythrops*	1990	1	Total	-	-
Brown Treecreeper (south-eastern ssp.)	*Climacteris picumnus victoriae*	1988	4	Total	-	-

Common name	Scientific name	Last documented record	Total # of documented records	Hollow use	Mi/ Ma	Present survey
Superb Fairy-wren	*Malurus cyaneus*	2008	72	-	-	H
White-browed Scrubwren	*Sericornis frontalis*	2008	24	-	-	-
Speckled Warbler	*Chthonicola sagittata*	1991	10	-	-	-
Weebill	*Smicrornis brevirostris*	2000	4	-	-	-
White-throated Gerygone	*Gerygone olivacea*	1988	6	-	-	-
Striated Thornbill	*Acanthiza lineata*	2008	43	-	-	-
Yellow Thornbill	*Acanthiza nana*	2008	19	-	-	-
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	2008	73	-	-	S
Buff-rumped Thornbill	*Acanthiza reguloides*	1991	13	-	-	-
Brown Thornbill	*Acanthiza pusilla*	2008	26	-	-	S
Southern Whiteface	*Aphelocephala leucopsis*	1976	1	-	-	-
Spotted Pardalote	*Pardalotus punctatus*	2008	39	-	-	-
Striated Pardalote	*Pardalotus striatus*	2005	60	Partial	-	H
Eastern Spinebill	*Acanthorhynchus tenuirostris*	2008	9	-	-	-
Yellow-faced Honeyeater	*Lichenostomus chrysops*	2008	27	-	-	-
White-eared Honeyeater	*Lichenostomus leucotis*	2008	17	-	-	-
White-plumed Honeyeater	*Lichenostomus penicillatus*	2005	87	-	-	S
Bell Miner	*Manorina melanophrys*	1999	1	-	-	-
Noisy Miner	*Manorina melanocephala*	2005	17	-	-	-
Spiny-cheeked Honeyeater	*Acanthagenys rufogularis*	1991	1	-	-	-
Little Wattlebird	*Anthochaera chrysoptera*	1989	1	-	-	-
Red Wattlebird	*Anthochaera carunculata*	2008	56	-	-	S
White-fronted Chat	*Epthianura albifrons*	2006	29	-	-	-
Black Honeyeater	*Sugamel niger*	1986	2	-	-	-
Crescent Honeyeater	*Phylidonyris pyrrhoptera*	1999	3	-	-	-
New Holland Honeyeater	*Phylidonyris novaehollandiae*	1991	5	-	-	S
Brown-headed Honeyeater	*Melithreptus brevirostris*	1991	9	-	-	-
White-naped Honeyeater	*Melithreptus lunatus*	2008	21	-	-	-
Spotted Quail-thrush	*Cinclosoma punctatum*	1988	1	-	-	-

Common name	Scientific name	Last documented record	Total # of documented records	Hollow use	Mi/ Ma	Present survey
Varied Sittella	*Daphoenositta chrysoptera*	1991	28	-	-	-
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	2008	43	-	Ma	S
White-winged Triller	*Lalage sueurii*	2008	24	-	-	-
Crested Shrike-tit	*Falcunculus frontatus*	1991	23	-	-	-
Olive Whistler	*Pachycephala olivacea*	1978	1	-	-	-
Golden Whistler	*Pachycephala pectoralis*	2008	22	-	-	-
Rufous Whistler	*Pachycephala rufiventris*	2008	44	-	-	-
Grey Shrike-thrush	*Colluricincla harmonica*	2008	50	Partial	-	S
Crested Pigeon	*Ocyphaps lophotes*	2006	10	-	-	S
Olive-backed Oriole	*Oriolus sagittatus*	2008	22	-	-	-
Masked Woodswallow	*Artamus personatus*	1988	2	-	-	-
White-browed Woodswallow	*Artamus superciliosus*	1991	6	-	-	-
Dusky Woodswallow	*Artamus cyanopterus*	1997	24	Partial	-	-
Grey Butcherbird	*Cracticus torquatus*	2008	9	-	-	S
Australian Magpie	*Gymnorhina tibicen*	2008	122	-	-	S
Pied Currawong	*Strepera graculina*	1999	9	-	-	-
Grey Currawong	*Strepera versicolor*	2008	16	-	-	-
Rufous Fantail	*Rhipidura rufifrons*	1988	2	-	Mi/Ma	-
Grey Fantail	*Rhipidura albiscarpa*	2008	56	-	-	S
Willie Wagtail	*Rhipidura leucophrys*	2008	77	-	-	S
Australian Raven	*Corvus coronoides*	2008	48	-	-	-
Little Raven	*Corvus mellori*	2008	77	-	Ma	S
Leaden Flycatcher	*Myiagra rubecula*	1988	2	-	-	-
Satin Flycatcher	*Myiagra cyanoleuca*	1988	2	-	Mi/Ma	-
Restless Flycatcher	*Myiagra inquieta*	1999	30	-	-	-
Magpie-lark	*Grallina cyanoleuca*	2006	51	-	-	S
White-winged Chough	*Corcorax melanorhamphos*	2008	14	-	-	-
Jacky Winter	*Microeca fascinans*	1991	5	-	-	-
Scarlet Robin	*Petroica boodang*	2008	27	-	-	-

Common name	Scientific name	Last documented record	Total # of documented records	Hollow use	Mi/ Ma	Present survey
Red-capped Robin	*Petroica goodenovii*	1976	1	-	-	-
Flame Robin	*Petroica phoenicea*	2008	25	-	-	-
Rose Robin	*Petroica rosea*	1977	1	-	-	-
Pink Robin	*Petroica rodinogaster*	1977	1	-	-	-
Eastern Yellow Robin	*Eopsaltria australis*	2008	14	-	-	-
Horsfield's Bushlark	*Mirafra javanica*	1993	11	-	-	-
European Skylark*	*Alauda arvensis*	2006	49	-	-	S
Golden-headed Cisticola	*Cisticola exilis*	1993	26	-	-	S
Clamorous Reed Warbler	*Acrocephalus stentoreus*	1993	20	-	Mi/Ma	-
Little Grassbird	*Megalurus gramineus*	2006	10	-	-	-
Rufous Songlark	*Cincloramphus mathewsi*	2002	14	-	-	-
Brown Songlark	*Cincloramphus cruralis*	2006	17	-	-	-
Silvereye	*Zosterops lateralis*	2008	15	-	Ma	-
White-backed Swallow	*Cheramoeca leucosternus*	1976	1	-	-	-
Fairy Martin	*Hirundo ariel*	1993	14	Partial	-	-
Tree Martin	*Hirundo nigricans*	1993	44	Total	Ma	-
Bassian Thrush	*Zoothera lunulata*	1986	1	-	-	-
Common Blackbird*	*Turdus merula*	2008	32	-	-	S
Common Starling*	*Sturnus vulgaris*	2006	88	Partial	-	S
Common Myna*	*Acridotheres tristis*	2006	53	-	-	S
Mistletoebird	*Dicaeum hirundinaceum*	2008	19	-	-	-
Red-browed Finch	*Neochmia temporalis*	1993	30	-	-	-
Diamond Firetail	*Stagonopleura guttata*	1991	3	-	-	-
House Sparrow*	*Passer domesticus*	2006	42	-	-	S
Eurasian Tree Sparrow*	*Passer montanus*	1992	8	-	-	-
Australasian Pipit	*Anthus novaeseelandiae*	2006	50	-	Ma	-
European Greenfinch*	*Carduelis chloris*	2006	10	-	-	-
European Goldfinch*	*Carduelis carduelis*	2006	66	-	-	S
REPTILES						

Common name	Scientific name	Last documented record	Total # of documented records	Hollow use	Mi/ Ma	Present survey
Marbled Gecko	*Christinus marmoratus*	1991	2	Partial	-	-
Striped Legless Lizard	*Delma impar*	1991	2	-	-	-
Tree Dragon	*Amphibolurus muricatus*	2008	3	Partial	-	-
Grassland Earless Dragon	*Tympanocryptis pinguicolla*	1988	1	-	-	-
Large Striped Skink	*Ctenotus robustus*	1993	11	-	-	-
Cunningham's Skink	*Egernia cunninghami*	1993	9	-	-	-
Southern Water Skink	*Eulamprus tympanum tympanum*	1991	7	-	-	-
Delicate Skink	*Lampropholis delicata*	2008	4	-	-	-
Garden Skink	*Lampropholis guichenoti*	2008	19	-	-	S
Bougainville's Skink	*Lerista bougainvillii*	1995	18	-	-	S
McCoy's Skink	*Nannoscincus maccoyi*	1988	1	-	-	-
Southern Grass Skink	*Pseudemoia entrecasteauxii*	1988	1	-	-	-
Tussock Skink	*Pseudemoia pagenstecheri*	1988	2	-	-	-
Weasel Skink	*Saproscincus mustelinus*	1991	7	-	-	-
Eastern Three-lined Skink	*Bassiana duperreyi*	2008	9	-	-	-
Blotched Blue-tongued Lizard	*Tiliqua nigrolutea*	1991	10	-	-	-
Common Blue-tongued Lizard	*Tiliqua scincoides*	2002	20	-	-	S
Lowland Copperhead	*Austrelaps superbus*	1998	13	-	-	-
White-lipped Snake	*Drysdalia coronoides*	1990	1	-	-	-
Tiger Snake	*Notechis scutatus*	1991	10	-	-	-
Red-bellied Black Snake	*Pseudechis porphyriacus*	1991	1	-	-	-
Eastern Brown Snake	*Pseudonaja textilis*	2006	14	-	-	-
Little Whip Snake	*Suta flagellum*	2006	21	-	-	S
	AMPHIBIANS					
Plains Froglet	*Crinia parinsignifera*	2008	29	-	-	-
Common Froglet	*Crinia signifera*	2008	81	-	-	H
Victorian Smooth Froglet	*Geocrinia victoriana*	1988	1	-	-	-
Southern Bullfrog (ssp. unknown)	*Limnodynastes dumerilii*	2002	30	-	-	-
Striped Marsh Frog	*Limnodynastes peronii*	2008	8	-	-	-

Common name	Scientific name	Last documented record	Total # of documented records	Hollow use	Mi/ Ma	Present survey
Spotted Marsh Frog (race unknown)	*Limnodynastes tasmaniensis*	2008	18	-	-	S
Spotted Marsh Frog SCR	*Limnodynastes tasmaniensis SCR*	2006	38	-	-	-
Common Spadefoot Toad	*Neobatrachus sudelli*	1993	19	-	-	-
Brown Toadlet	*Pseudophryne bibronii*	2005	154	-	-	-
Southern Toadlet	*Pseudophryne semimarmorata*	1989	86	-	-	-
Southern Brown Tree Frog	*Litoria ewingii*	2008	26	-	-	-
Southern Brown Tree Frog SOUTHERN	*Litoria ewingii SOUTHERN*	1991	29	-	-	-
Lesueur's Frog	*Litoria lesueuri*	1988	2	-	-	-
Growling Grass Frog	*Litoria raniformis*	2006	68	-	-	-
Whistling Tree Frog	*Litoria verreauxii verreauxii*	2006	20	-	-	-
FISH						
Short-finned Eel	*Anguilla australis*	2002	14	-	-	-
Common Galaxias	*Galaxias maculatus*	2006	1	-	-	-
Australian Smelt	*Retropinna semoni*	1988	1	-	-	-
Goldfish*	*Carassius auratus*	2002	4	-	-	-
Gambusia*	*Gambusia holbrooki*	2006	4	-	-	-
Oriental Weatherloach*	*Misgurnus anguillicaudatus*	2002	7	-	-	-
River Blackfish	*Gadopsis marmoratus*	1989	2	-	-	-
Southern Pygmy Perch	*Nannoperca australis*	1988	2	-	-	-
MUSSELS & CRUSTACEANS						
Lowland Burrowing Crayfish	*Engaeus quadrimanus*	1988	1	-	-	-
INVERTEBRATES						
Golden Sun Moth	*Synemon plana*	2008	115	-	-	-

Source used to determine number of records and year: Victorian Biodiversity Atlas (DSE 2010b)

Source used to determine hollow use: Victorian Fauna Database (Viridans 2011b)

Source used to determine migratory and marine: Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

Appendix 3.2 – Significant fauna species

Table A3.2. *Significant fauna within 10 kilometres of the study area.*

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 2007); 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
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

1	Known resident
2	Possible resident
3	Frequent visitor
4	Occasional visitor
5	Rare visitor
6	Vagrant visitor
7	Unlikely/no suitable habitat

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
# Spot-tailed Quoll	*Dasyurus maculatus*	-	-	EN	EN	L	VU	7
*Southern Brown Bandicoot	*Isoodon obesulus obesulus*	1968	1	EN	NT	-	NT	7
# Smoky Mouse	*Pseudomys fumeus*	-	-	EN	CR	L	RA	7
# Grey-headed Flying-fox	*Pteropus poliocephalus*	-	-	VU	VU	L	VU	6
#Australasian Bittern	*Botaurus poiciloptilus*	1990	1	EN	EN	L	VU	7
# Australian Painted Snipe	*Rostratula australis*	-	-	VU	CR	L	VU	7

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Plains-wanderer	*Pedionomus torquatus*	1989	4	VU	CR	L	EN	7
# Fairy Tern	*Sternula nereis*	-	-	VU	EN	L	-	7
# Regent Honeyeater	*Anthochaera phrygia*	-	-	EN	CR	L	EN	7
#Swift Parrot	*Lathamus discolor*	1991	2	EN	EN	L	EN	7
#Striped Legless Lizard	*Delma impar*	1991	2	VU	EN	L	VU	2
#Grassland Earless Dragon	*Tympanocryptis pinguicolla*	1988	1	EN	CR	L	VU	7
#Growling Grass Frog	*Litoria raniformis*	2006	68	VU	EN	L	VU	1
# Australian Grayling	*Prototroctes maraena*	-	-	VU	VU	L	VU	7
# Dwarf Galaxias	*Galaxiella pusilla*	-	-	VU	VU	L	VU	7
# Macquarie Perch	*Macquaria australasica*	-	-	EN	EN	L	DD	7
# Murray Cod	*Maccullochella peelii peelii*	-	-	VU	EN	L	-	7
#Golden Sun Moth	*Synemon plana*	2008	115	CR	CR	L	-	2
STATE SIGNIFICANCE								
Brush-tailed Phascogale	*Phascogale tapoatafa tapoatafa*	1988	2	-	VU	L	NT	7
Common Dunnart	*Sminthopsis murina murina*	1988	1	-	VU	-	-	7
Musk Duck	*Biziura lobata*	2002	2	-	VU	-	-	7
Freckled Duck	*Stictonetta naevosa*	1988	1	-	EN	L	-	7
Australasian Shoveler	*Anas rhynchotis*	2005	5	-	VU	-	-	7
Hardhead	*Aythya australis*	2002	6	-	VU	-	-	7
Blue-billed Duck	*Oxyura australis*	1988	1	-	EN	L	-	7
Eastern Great Egret	*Ardea modesta*	1991	4	-	VU	L	-	7
Royal Spoonbill	*Platalea regia*	1990	2	-	VU	-	-	7
Black Falcon	*Falco subniger*	2007	3	-	VU	-	-	4
Lewin's Rail	*Lewinia pectoralis pectoralis*	1991	1	-	VU	L	NT	7
Red-chested Button-quail	*Turnix pyrrhothorax*	1990	2	-	VU	L	-	7
Barking Owl	*Ninox connivens connivens*	1989	3	-	EN	L	NT	7
Brown Treecreeper (south-eastern ssp.)	*Climacteris picumnus victoriae*	1988	4	-	NT	-	NT	7
*Painted Honeyeater	*Grantiella picta*	1988	1	-	VU	L	NT	7
Speckled Warbler	*Chthonicola sagittata*	1991	10	-	VU	L	NT	7

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Diamond Firetail	*Stagonopleura guttata*	1991	3	-	VU	L	NT	7
*Hooded Robin	*Melanodryas cucullata*	1990	1	-	NT	L	NT	7
Brown Toadlet	*Pseudophryne bibronii*	2005	154	-	EN	L	DD	7
Southern Toadlet	*Pseudophryne semimarmorata*	1989	86	-	VU	-	-	7
REGIONAL SIGNIFICANCE								
Fat-tailed Dunnart	*Sminthopsis crassicaudata*	1991	4	-	NT	-	-	7
Brown Quail	*Coturnix ypsilophora australis*	2002	5	-	NT	-	-	4
Black-chinned Honeyeater	*Melithreptus gularis*	1989	1	-	NT	-	-	7
Pied Cormorant	*Phalacrocorax varius*	1977	1	-	NT	-	-	7
Nankeen Night Heron	*Nycticorax caledonicus hillii*	2002	1	-	NT	-	-	7
Spotted Harrier	*Circus assimilis*	1990	3	-	NT	-	-	7
Latham's Snipe	*Gallinago hardwickii*	1991	10	-	NT	-	-	4
Little Button-quail	*Turnix velox*	1991	2	-	NT	-	-	7
Black-eared Cuckoo	*Chrysococcyx osculans*	1991	4	-	NT	-	-	7
Azure Kingfisher	*Alcedo azurea*	1988	1	-	NT	-	-	7
Spotted Quail-thrush	*Cinclosoma punctatum*	1988	1	-	NT	-	-	7
River Blackfish	*Gadopsis marmoratus*	1989	2	-	DD	-	-	7

Data source: Victorian Biodiversity Atlas (DSE 2010b); Victorian Fauna Database (Viridans 2011b) Protected Matters Search Tool (SEWPaC 2011).

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

Appendix 4.1 – Net Gain Table

Table A4.1.1. Habitat hectare and Preliminary Net Gain analysis of remnant patches of vegetation within the precinct.

Habitat Zone.			HZ1	HZ2	HZ3	HZ4	HZ7	HZ8	HZ9
Data Source			DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Name			SS	SS	SS	SS	PGWe	PGWe	PGWe
EVC Number			53	53	53	53	125	125	125
		Max Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	0	0	0	0	0	0	0
	Canopy Cover	5	0	0	0	0	0	0	0
	Under storey	25	0	0	0	0	0	0	0
	Lack of Weeds	15	0	0	0	0	0	0	0
	Recruitment	10	0	0	0	0	0	0	0
	Organic Matter	5	0	0	0	0	0	0	0
	Logs	5	0	0	0	0	0	0	0
Treeless EVC Multiplier		Multiplier	1.15	1.15	1.15	1.15	1.36	1.36	1.36
		Subtotal =	25	25	25	35	25	25	25
Landscape value	Patch Size	10	0	0	0	0	0	0	0
	Neighbourhood	10	2	2	4	4	2	2	2
	Distance to Core	5	0	0	0	0	0	0	0
Habitat points out of 100		100	27	27	29	39	27	27	27
Habitat Score (habitat points/100)			0.27	0.27	0.29	0.39	0.27	0.27	0.27
Total Area of Habitat Zone within the Study Area (ha)			0.01	0.00	1.53	0.25	0.44	0.12	0.44
Total habitat hectares within the Study Area			0	0	0.44	0.1	0.12	0.03	0.12
EVC Conservation Status			En	En	En	En	En	En	En
Conservation Significance	Conservation status x Habitat Score		High	High	High	High	High	High	High
	Threatened Species		N/A	N/A	N/A	N/A	High	High	High
	Other Site Attributes		N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Overall (highest rating)		High	High	High	High	High	High	High
No. of Large Old Trees in remnant patches			0	0	0	0	0	0	0
Potential Net Gain Offset Requirement if patch is removed			0.00	0.00	0.66	0.15	0.18	0.05	0.18

Notes: DSE Mod - DSE Modelled Data; Site Sur - Site Survey Data; VVP - Victorian Volcanic Plain; SS - Swamp Scrub; PGWe - Plains Grassy Wetland; PG(HS) - Heavier-soils Plains Grassland; CTG - Creekline Tussock Grassland; SKS - Stony Knoll Shrubland.

Habitat Zone.			HZ10	HZ11	HZ12	HZ13	HZ14	HZ15	HZ16
Data Source			DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Name			PGWe	PGWe	PGWe	PGWe	PGWe	PGWe	PGWe
EVC Number			125	125	125	125	125	125	125
		Max Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	0	0	0	0	0	0	0
	Canopy Cover	5	0	0	0	0	0	0	0
	Under storey	25	0	0	0	0	0	0	0
	Lack of Weeds	15	0	0	0	0	0	0	0
	Recruitment	10	0	0	0	0	0	0	0
	Organic Matter	5	0	0	0	0	0	0	0
	Logs	5	0	0	0	0	0	0	0
Treeless EVC Multiplier		Multiplier	1.36	1.36	1.36	1.36	1.36	1.36	1.36
		Subtotal =	25	25	25	25	25	35	35
Landscape value	Patch Size	10	0	0	0	0	0	0	0
	Neighbourhood	10	2	2	4	4	4	2	2
	Distance to Core	5	0	0	0	0	0	0	0
Habitat points out of 100		100	27	27	29	29	29	37	37
Habitat Score (habitat points/100)			0.27	0.27	0.29	0.29	0.29	0.37	0.37
Total Area of Habitat Zone within the Study Area (ha)			0.13	0.13	0.06	0.19	0.06	0.25	0.06
Total habitat hectares within the Study Area			0.03	0.03	0.02	0.05	0.02	0.09	0.02
EVC Conservation Status			En	En	En	En	En	En	En
Conservation Significance	Conservation status x Habitat Score		High	High	High	High	High	High	High
	Threatened Species		High	High	High	High	High	High	High
	Other Site Attributes		N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Overall (highest rating)		High	High	High	High	High	High	High
No. of Large Old Trees in remnant patches			0	0	0	0	0	0	0
Potential Net Gain Offset Requirement if patch is removed			0.05	0.05	0.03	0.08	0.03	0.14	0.03

Notes: DSE Mod - DSE Modelled Data; Site Sur - Site Survey Data; VVP - Victorian Volcanic Plain; SS - Swamp Scrub; PGWe - Plains Grassy Wetland; PG(HS) - Heavier-soils Plains Grassland; CTG - Creekline Tussock Grassland; SKS - Stony Knoll Shrubland.

Habitat Zone.			HZ17	HZ18	HZ19	HZ20	HZ21	HZ22	HZ23
Data Source			DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Name			PGWe	PGWe	PGWe	PGWe	PGWe	PGWe	PGWe
EVC Number			125	125	125	125	125	125	125
		Max Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	0	0	0	0	0	0	0
	Canopy Cover	5	0	0	0	0	0	0	0
	Under storey	25	0	0	0	0	0	0	0
	Lack of Weeds	15	0	0	0	0	0	0	0
	Recruitment	10	0	0	0	0	0	0	0
	Organic Matter	5	0	0	0	0	0	0	0
	Logs	5	0	0	0	0	0	0	0
Treeless EVC Multiplier		Multiplier	1.36	1.36	1.36	1.36	1.36	1.36	1.36
		Subtotal =	35	35	35	35	35	35	35
Landscape value	Patch Size	10	0	0	0	0	0	0	0
	Neighbourhood	10	2	2	2	2	2	2	4
	Distance to Core	5	0	0	0	0	0	0	0
Habitat points out of 100		100	37	37	37	37	37	37	39
Habitat Score (habitat points/100)			0.37	0.37	0.37	0.37	0.37	0.37	0.39
Total Area of Habitat Zone within the Study Area (ha)			0.44	0.38	0.06	0.06	0.08	0.06	0.81
Total habitat hectares within the Study Area			0.16	0.14	0.02	0.02	0.03	0.02	0.32
EVC Conservation Status			En	En	En	En	En	En	En
Conservation Significance	Conservation status x Habitat Score		High	High	High	High	High	High	High
	Threatened Species		High	High	High	High	High	High	High
	Other Site Attributes		N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Overall (highest rating)		High	High	High	High	High	High	High
No. of Large Old Trees in remnant patches			0	0	0	0	0	0	0
Potential Net Gain Offset Requirement if patch is removed			0.24	0.21	0.03	0.03	0.05	0.03	0.48

Notes: DSE Mod - DSE Modelled Data; Site Sur - Site Survey Data; VVP - Victorian Volcanic Plain; SS - Swamp Scrub; PGWe - Plains Grassy Wetland; PG(HS) - Heavier-soils Plains Grassland; CTG - Creekline Tussock Grassland; SKS - Stony Knoll Shrubland.

Habitat Zone.			HZ24	HZ25	HZ26	HZ27	HZ31	HZ59	HZ60
Data Source			DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Name			PGWe	PGWe	PGWe	PGWe	PG(HS)	PG(HS)	PG(HS)
EVC Number			125	125	125	125	132_61	132_61	132_61
		Max Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	0	0	0	0	0	0	0
	Canopy Cover	5	0	0	0	0	0	0	0
	Under storey	25	0	0	0	0	0	0	0
	Lack of Weeds	15	0	0	0	0	0	0	0
	Recruitment	10	0	0	0	0	0	0	0
	Organic Matter	5	0	0	0	0	0	0	0
	Logs	5	0	0	0	0	0	0	0
Treeless EVC Multiplier		Multiplier	1.36	1.36	1.36	1.36	1.36	1.36	1.36
		Subtotal =	45	45	45	45	25	25	25
Landscape value	Patch Size	10	0	0	0	0	0	0	0
	Neighbourhood	10	2	2	2	4	2	4	4
	Distance to Core	5	0	0	0	0	0	0	0
Habitat points out of 100		100	47	47	47	49	27	29	29
Habitat Score (habitat points/100)			0.47	0.47	0.47	0.49	0.27	0.29	0.29
Total Area of Habitat Zone within the Study Area (ha)			0.06	0.19	0.79	0.31	3.76	0.06	0.13
Total habitat hectares within the Study Area			0.03	0.09	0.37	0.15	1.01	0.02	0.04
EVC Conservation Status			En	En	En	En	En	En	En
Conservation Significance	Conservation status x Habitat Score		V. High	V. High	V. High	V. High	High	High	High
	Threatened Species		High	High	High	High	High	High	High
	Other Site Attributes		N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Overall (highest rating)		V. High	V. High	V. High	V. High	High	High	High
No. of Large Old Trees in remnant patches			0	0	0	0	0	0	0
Potential Net Gain Offset Requirement if patch is removed			0.06	0.18	0.74	0.30	1.52	0.03	0.06

Notes: DSE Mod - DSE Modelled Data; Site Sur - Site Survey Data; VVP - Victorian Volcanic Plain; SS - Swamp Scrub; PGWe - Plains Grassy Wetland; PG(HS) - Heavier-soils Plains Grassland; CTG - Creekline Tussock Grassland; SKS - Stony Knoll Shrubland.

Habitat Zone.			HZ64	HZ68	HZ69	HZ70	HZ71	HZ72	HZ73
Data Source			DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Name			PG(HS)	PG(HS)	PG(HS)	PG(HS)	PG(HS)	PG(HS)	PG(HS)
EVC Number			132_61	132_61	132_61	132_61	132_61	132_61	132_61
		Max Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	0	0	0	0	0	0	0
	Canopy Cover	5	0	0	0	0	0	0	0
	Under storey	25	0	0	0	0	0	0	0
	Lack of Weeds	15	0	0	0	0	0	0	0
	Recruitment	10	0	0	0	0	0	0	0
	Organic Matter	5	0	0	0	0	0	0	0
	Logs	5	0	0	0	0	0	0	0
Treeless EVC Multiplier		Multiplier	1.36	1.36	1.36	1.36	1.36	1.36	1.36
		Subtotal =	25	25	25	25	25	25	25
Landscape value	Patch Size	10	0	0	0	0	0	0	0
	Neighbourhood	10	6	6	6	6	6	6	6
	Distance to Core	5	0	0	0	0	0	0	0
Habitat points out of 100		100	31	31	31	31	31	31	31
Habitat Score (habitat points/100)			0.31	0.31	0.31	0.31	0.31	0.31	0.31
Total Area of Habitat Zone within the Study Area (ha)			0.01	0.08	0.07	0.06	0.05	0.05	0.07
Total habitat hectares within the Study Area			0	0.02	0.02	0.02	0.02	0.01	0.02
EVC Conservation Status			En	En	En	En	En	En	En
Conservation Significance	Conservation status x Habitat Score		High	High	High	High	High	High	High
	Threatened Species		High	High	High	High	High	High	High
	Other Site Attributes		N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Overall (highest rating)		High	High	High	High	High	High	High
No. of Large Old Trees in remnant patches			0	0	0	0	0	0	0
Potential Net Gain Offset Requirement if patch is removed			0.00	0.03	0.03	0.03	0.03	0.02	0.03

Notes: DSE Mod - DSE Modelled Data; Site Sur - Site Survey Data; VVP - Victorian Volcanic Plain; SS - Swamp Scrub; PGWe - Plains Grassy Wetland; PG(HS) - Heavier-soils Plains Grassland; CTG - Creekline Tussock Grassland; SKS - Stony Knoll Shrubland.

Habitat Zone.			HZ74	HZ75	HZ76	HZ87	HZ88	HZ89	HZ102	HZ107
Data Source			DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.	DSE Mod.
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Name			PG(HS)	PG(HS)	PG(HS)	PG(HS)	PG(HS)	PG(HS)	PG(HS)	CTG
EVC Number			132_61	132_61	132_61	132_61	132_61	132_61	132_61	654
		Max Score	Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	0	0	0	0	0	0	0	0
	Canopy Cover	5	0	0	0	0	0	0	0	0
	Under storey	25	0	0	0	0	0	0	0	0
	Lack of Weeds	15	0	0	0	0	0	0	0	0
	Recruitment	10	0	0	0	0	0	0	0	0
	Organic Matter	5	0	0	0	0	0	0	0	0
	Logs	5	0	0	0	0	0	0	0	0
Treeless EVC Multiplier		Multiplier	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36
		Subtotal =	25	25	25	35	35	35	45	25
Landscape value	Patch Size	10	0	0	0	0	0	0	0	0
	Neighbourhood	10	6	6	6	2	2	2	2	6
	Distance to Core	5	0	0	0	0	0	0	0	0
Habitat points out of 100		100	31	31	31	37	37	37	47	31
Habitat Score (habitat points/100)			0.31	0.31	0.31	0.37	0.37	0.37	0.47	0.31
Total Area of Habitat Zone within the Study Area (ha)			0.06	0.03	0.06	0.06	0.05	0.12	0.02	0.06
Total habitat hectares within the Study Area			0.02	0.01	0.02	0.02	0.02	0.05	0.01	0.02
EVC Conservation Status			En	En	En	En	En	En	En	En
Conservation Significance	Conservation status x Habitat Score		High	High	High	High	High	High	V. High	High
	Threatened Species		High	High	High	High	High	High	High	High
	Other Site Attributes		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Overall (highest rating)		High	High	High	High	High	High	V. High	High
No. of Large Old Trees in remnant patches			0	0	0	0	0	0	0	0
Potential Net Gain Offset Requirement if patch is removed			0.03	0.02	0.03	0.03	0.03	0.08	0.02	0.03

Notes: DSE Mod - DSE Modelled Data; Site Sur - Site Survey Data; VVP - Victorian Volcanic Plain; SS - Swamp Scrub; PGWe - Plains Grassy Wetland; PG(HS) - Heavier-soils Plains Grassland; CTG - Creekline Tussock Grassland; SKS - Stony Knoll Shrubland.

Habitat Zone.			HZ108	HZ109	HZ110	HZ111	HZ112	HZ113	HZ114	HZ115
Data Source			DSE Mod.	Site Sur.	Site Sur.	Site Sur.	Site Sur.	Site Sur.	Site Sur.	Site Sur.
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Name			CTG	SKS	SKS	SKS	SKS	SKS	SKS	SKS
EVC Number			654	649	649	649	649	649	649	649
		Max Score	Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	0	0	0	0	0	0	0	0
	Canopy Cover	5	0	0	0	0	0	0	0	0
	Under storey	25	0	5	5	10	5	10	5	10
	Lack of Weeds	15	0	6	6	6	6	6	6	6
	Recruitment	10	0	0	0	5	0	0	0	0
	Organic Matter	5	0	3	3	3	3	3	3	3
	Logs	5	0	0	0	0	0	0	0	0
Treeless EVC Multiplier		Multiplier	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36
		Subtotal =	45	19.04	19.04	32.64	19.04	25.84	19.04	25.84
Landscape value	Patch Size	10	0	0	0	0	0	0	0	0
	Neighbourhood	10	2	2	2	2	2	2	2	2
	Distance to Core	5	0	0	0	0	0	0	0	0
Habitat points out of 100		100	47	21.04	21.04	34.64	21.04	27.84	21.04	27.84
Habitat Score (habitat points/100)			0.47	0.21	0.21	0.35	0.21	0.28	0.21	0.28
Total Area of Habitat Zone within the Study Area (ha)			0.00	0.23	0.05	0.37	0.06	0.06	0.04	0.26
Total habitat hectares within the Study Area			0	0.05	0.01	0.13	0.01	0.02	0.01	0.07
EVC Conservation Status			En	En	En	En	En	En	En	En
Conservation Significance	Conservation status x Habitat Score		V. High	High	High	High	High	High	High	High
	Threatened Species		High	High	High	High	High	High	High	High
	Other Site Attributes		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Overall (highest rating)		V. High	High	High	High	High	High	High	High
No. of Large Old Trees in remnant patches			0	0	0	0	0	0	0	0
Potential Net Gain Offset Requirement if patch is removed			0.00	0.08	0.02	0.20	0.02	0.03	0.02	0.11

Notes: DSE Mod - DSE Modelled Data; Site Sur - Site Survey Data; VVP - Victorian Volcanic Plain; SS - Swamp Scrub; PGWe - Plains Grassy Wetland; PG(HS) - Heavier-soils Plains Grassland; CTG - Creekline Tussock Grassland; SKS - Stony Knoll Shrubland.

Habitat Zone.			HZ116	HZ117	HZ118	HZ119	HZ120	HZ121	HZ122	HZ123
Data Source			Site Sur.	Site Sur.	Site Sur.	Site Sur.	Site Sur.	Site Sur.	Site Sur.	Site Sur.
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Name			SKS	SKS	SKS	SKS	SKS	SKS	SKS	SKS
EVC Number			649	649	649	649	649	649	649	649
		Max Score	Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	0	0	0	0	0	0	0	0
	Canopy Cover	5	0	0	0	0	0	0	0	0
	Under storey	25	15	10	15	15	10	10	10	5
	Lack of Weeds	15	7	6	4	6	6	6	6	6
	Recruitment	10	0	0	0	0	0	0	0	0
	Organic Matter	5	3	3	2	3	3	3	3	3
	Logs	5	2	0	0	0	0	0	0	0
Treeless EVC Multiplier		Multiplier	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36
		Subtotal =	31.05	25.84	28.56	32.64	25.84	25.84	25.84	19.04
Landscape value	Patch Size	10	0	0	0	0	0	0	0	0
	Neighbourhood	10	2	2	2	2	2	2	2	2
	Distance to Core	5	0	0	0	0	0	0	0	0
Habitat points out of 100		100	33.05	27.84	30.56	34.64	27.84	27.84	27.84	21.04
Habitat Score (habitat points/100)			0.33	0.28	0.31	0.35	0.28	0.28	0.28	0.21
Total Area of Habitat Zone within the Study Area (ha)			1.42	0.10	0.56	0.69	1.09	0.51	0.17	0.10
Total habitat hectares within the Study Area			0.47	0.03	0.17	0.24	0.3	0.14	0.05	0.02
EVC Conservation Status			En	En	En	En	En	En	En	En
Conservation Significance	Conservation status x Habitat Score		High	High	High	High	High	High	High	High
	Threatened Species		High	High	High	High	High	High	High	High
	Other Site Attributes		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Overall (highest rating)		High	High	High	High	High	High	High	High
No. of Large Old Trees in remnant patches			0	0	0	0	0	0	0	0
Potential Net Gain Offset Requirement if patch is removed			0.71	0.05	0.26	0.36	0.45	0.21	0.08	0.03

Notes: DSE Mod - DSE Modelled Data; Site Sur - Site Survey Data; VVP - Victorian Volcanic Plain; SS - Swamp Scrub; PGWe - Plains Grassy Wetland; PG(HS) - Heavier-soils Plains Grassland; CTG - Creekline Tussock Grassland; SKS - Stony Knoll Shrubland.

Habitat Zone.			HZ124	HZ125	HZ126	HZ127	HZ128	HZ129	HZ130
Data Source			Site Sur.	Site Sur.	Site Sur.	Site Sur.	Site Sur.	Site Sur.	Site Sur.
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Name			SKS	SKS	SKS	SKS	SKS	PGWe	SKS
EVC Number			649	649	649	649	649	125	649
		Max Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	0	0	0	0	0	0	0
	Canopy Cover	5	0	0	0	0	0	0	0
	Under storey	25	15	5	5	10	15	10	5
	Lack of Weeds	15	6	6	6	6	6	9	6
	Recruitment	10	0	0	0	0	0	0	0
	Organic Matter	5	3	3	3	0	3	0	3
	Logs	5	0	0	0	0	0	0	0
Treeless EVC Multiplier		Multiplier	1.36	1.36	1.36	1.36	1.36	1.36	1.36
		Subtotal =	32.64	19.04	19.04	21.76	32.64	25.84	19.04
Landscape value	Patch Size	10	0	0	0	0	0	0	0
	Neighbourhood	10	2	2	2	2	2	2	2
	Distance to Core	5	0	0	0	0	0	0	0
Habitat points out of 100		100	34.64	21.04	21.04	23.76	34.64	27.84	21.04
Habitat Score (habitat points/100)			0.35	0.21	0.21	0.24	0.35	0.28	0.21
Total Area of Habitat Zone within the Study Area (ha)			0.74	0.25	0.17	1.06	0.23	0.00	0.12
Total habitat hectares within the Study Area			0.26	0.05	0.04	0.25	0.08	0	0.02
EVC Conservation Status			En	En	En	En	En	En	En
Conservation Significance	Conservation status x Habitat Score		High	High	High	High	High	High	High
	Threatened Species		High	High	High	High	High	High	High
	Other Site Attributes		N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Overall (highest rating)		High	High	High	High	High	High	High
No. of Large Old Trees in remnant patches			0	0	0	0	0	0	0
Potential Net Gain Offset Requirement if patch is removed			0.39	0.08	0.06	0.38	0.12	0.00	0.03

Notes: DSE Mod - DSE Modelled Data; Site Sur - Site Survey Data; VVP - Victorian Volcanic Plain; SS - Swamp Scrub; PGWe - Plains Grassy Wetland; PG(HS) - Heavier-soils Plains Grassland; CTG - Creekline Tussock Grassland; SKS - Stony Knoll Shrubland.

Habitat Zone.			HZ131	HZ132	HZ133	HZ134	HZ135	HZ136	HZ137
Data Source			Site Sur.	Site Sur.	Site Sur.	Site Sur.	Site Sur.	Site Sur.	Site Sur.
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Name			SKS	SKS	SKS	SKS	SKS	SKS	SKS
EVC Number			649	649	649	649	649	649	649
		Max Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	0	0	0	0	0	0	0
	Canopy Cover	5	0	0	0	0	0	0	0
	Under storey	25	5	5	10	10	10	5	5
	Lack of Weeds	15	6	6	6	6	6	6	2
	Recruitment	10	0	0	0	0	0	5	0
	Organic Matter	5	3	3	0	0	3	3	3
	Logs	5	0	0	0	0	0	0	0
Treeless EVC Multiplier		Multiplier	1.36	1.36	1.36	1.36	1.36	1.36	1.36
		Subtotal =	19.04	19.04	21.76	21.76	25.84	25.84	11.5
Landscape value	Patch Size	10	0	0	0	0	0	0	0
	Neighbourhood	10	2	2	2	2	2	2	2
	Distance to Core	5	0	0	0	0	0	0	0
Habitat points out of 100		100	21.04	21.04	23.76	23.76	27.84	27.84	13.5
Habitat Score (habitat points/100)			0.21	0.21	0.24	0.24	0.28	0.28	0.14
Total Area of Habitat Zone within the Study Area (ha)			0.34	0.31	0.26	0.30	1.61	0.53	0.17
Total habitat hectares within the Study Area			0.07	0.07	0.06	0.07	0.45	0.15	0.02
EVC Conservation Status			En	En	En	En	En	En	En
Conservation Significance	Conservation status x Habitat Score		High	High	High	High	High	High	High
	Threatened Species		High	High	High	High	High	High	High
	Other Site Attributes		N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Overall (highest rating)		High	High	High	High	High	High	High
No. of Large Old Trees in remnant patches			0	0	0	0	0	0	0
Potential Net Gain Offset Requirement if patch is removed			0.11	0.11	0.09	0.11	0.68	0.23	0.03

Notes: DSE Mod - DSE Modelled Data; Site Sur - Site Survey Data; VVP - Victorian Volcanic Plain; SS - Swamp Scrub; PGWe - Plains Grassy Wetland; PG(HS) - Heavier-soils Plains Grassland; CTG - Creekline Tussock Grassland; SKS - Stony Knoll Shrubland.

Habitat Zone.			HZ138	HZ154	HZ156	HZ157	HZ162	HZ166	HZ167	
Data Source			Site Sur.	Site Sur.	Site Sur.	Site Sur.	Site Sur.	Site Sur.	DSE Mod.	
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	
EVC Name			SKS	SKS	SKS	PGWe	SKS	SKS	SS	
EVC Number			649	649	649	125	649	649	53	
		Max Score	Score	Score	Score	Score	Score	Score	Score	
Site Condition	Large Old Trees	10	0	0	0	0	0	0	0	
	Canopy Cover	5	0	0	0	0	0	0	0	
	Under storey	25	10	10	5	10	5	10	0	
	Lack of Weeds	15	6	2	6	9	6	6	0	
	Recruitment	10	0	0	0	3	0	0	0	
	Organic Matter	5	0	3	3	3	3	0	0	
	Logs	5	0	0	0	0	0	0	0	
Treeless EVC Multiplier		Multiplier	1.36	1.36	1.36	1.36	1.36	1.36	1.15	
		Subtotal =	21.76	20.4	19.04	34	19.04	21.76	15	
Landscape value	Patch Size	10	0	0	0	0	0	0	0	
	Neighbourhood	10	2	2	2	2	2	2	4	
	Distance to Core	5	0	0	0	0	0	0	0	
Habitat points out of 100		100	23.76	22.4	21.04	36	21.04	23.76	19	Totals
Habitat Score (habitat points/100)			0.24	0.22	0.21	0.36	0.21	0.24	0.19	
Total Area of Habitat Zone within the Study Area (ha)			0.63	0.05	0.04	0.01	0.04	0.07	0.06	24.37ha
Total habitat hectares within the Study Area			0.15	0.01	0.01	0	0.01	0.02	0.01	7.29HH
EVC Conservation Status			En	En	En	En	En	En	En	
Conservation Significance	Conservation status x Habitat Score		High	High	High	High	High	High	High	
	Threatened Species		High	High	High	High	High	High	N/A	
	Other Site Attributes		N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Overall (highest rating)		High	High	High	High	High	High	High	
No. of Large Old Trees in remnant patches			0	0	0	0	0	0	0	1
Potential Net Gain Offset Requirement if patch is removed			0.23	0.02	0.02	0.00	0.02	0.03	0.02	2.70

Notes: DSE Mod - DSE Modelled Data; Site Sur - Site Survey Data; VVP - Victorian Volcanic Plain; SS - Swamp Scrub; PGWe - Plains Grassy Wetland; PG(HS) - Heavier-soils Plains Grassland; CTG - Creekline Tussock Grassland; SKS - Stony Knoll Shrubland.

Appendix 5 – Natural Temperate Grassland of the Victorian Volcanic Plain

Table A5.1.1. Condition Thresholds for Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP)

	NTGVVP
EVC	The native vegetation within the site includes one or several of the following EVCs: Plains Grassland (EVC 132), Stony Knoll Shrubland (EVC 649) or Creekline Tussock Grassland (EVC 654)
Bioregion	Site is in the Victorian Volcanic Plain or near to the Victorian Volcanic Plain (Central Victorian Uplands, Dundas Tablelands and Otway Plain Bioregions)
Size of Patch	If grassland remnant is ≤1 hectare, grassland patch needs to be at least 0.05 hectare in size with no more than 5% canopy cover of trees or shrubs.
	If grassland remnant is >1 hectare, grassland patch needs to be at least 0.5 hectare in size with no more than 2 trees per hectare.
Condition Thresholds	One or more of the following native grass genera accounts for at least 50% of the perennial ground layer cover: *Themeda*, *Rytidosperma, Austrostipa*, *Poa* and/or *Microlaena.* OR
	Native wildflowers account for 50% or more of the total vegetation from September to February. OR
	Non-grassy weeds account for less than 30% of the total vegetation cover at any time of the year.
Additional Characteristics	The conservation value of a patch of the ecological community is enhanced if it shows any of the following features: • a high native plant species richness; • large patch size or connectivity with a large patch of remnant vegetation; • minimal weed invasion; • presence of threatened plant and/or animal species; • presence of natural exposed rock platforms and outcrops; or • presence of mosses, lichens or a soil crust on the soil surface.