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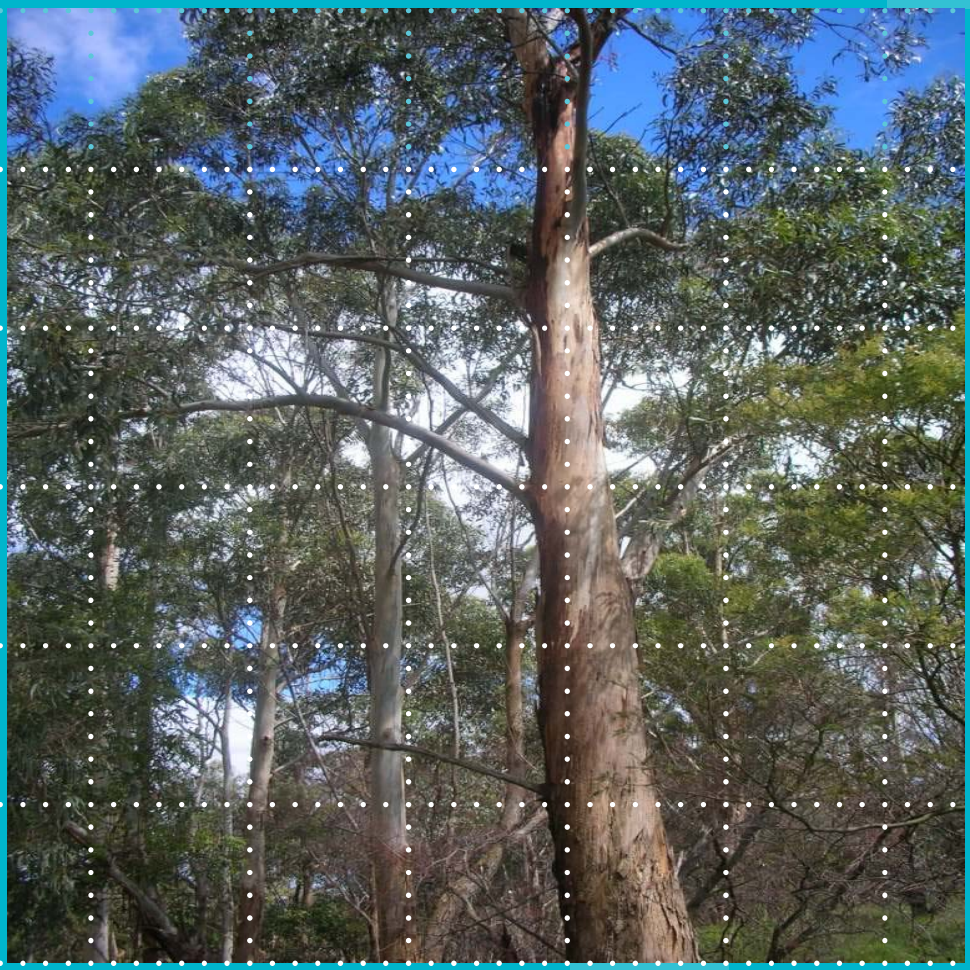
DRAFT REPORT:

Biodiversity Assessment for Area 1054 – 'Clyde'

PREPARED FOR:

Growth Areas Authority
June 2011



Ecology Partners Pty Ltd

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- Bill Vasiliadis and Fiona McDougall (Growth Areas Authority) for assistance throughout the project.
- The Department of Sustainability and Environment for the use of data available on the Victorian Biodiversity Atlas.
- The landowners who permitted access, and discussed details of their properties.

The following Ecology Partners Pty Ltd employees either undertook the field assessments and/or contributed to the preparation of the final report:
Jenna Forbes, Simon Scott, Aaron Organ and Amanda Feetham.

EXECUTIVE SUMMARY

Introduction

Ecology Partners Pty Ltd was commissioned by the Growth Areas Authority (GAA) to undertake a biodiversity assessment for the 2010-11 Biodiversity Mapping Project, at Area 1054 - 'Clyde' in the urban fringe of south-east Melbourne. Area 1054 is located approximately 55 kilometres south-east of the Melbourne CBD, and contains both private and public land, which is used for farming, local sporting facilities and low density residential housing (Figure ES1).

Site assessments were undertaken wherever access was granted (Figure ES2). The purpose of the biodiversity assessment was to provide a report that will be incorporated into the GAA's Precinct Structure Planning process.

Methods

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

- The Victorian Biodiversity Atlas (VBA), the Atlas of Victorian Wildlife (AVW) and Flora Information System (FIS) databases.
- Department of Sustainability and Environment (DSE) Biodiversity Interactive Maps showing historic and current Ecological Vegetation Classes (EVCs).
- Aquatic Fish Database and 'DSE verified unpublished aquatic records'.
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) Protected Matters Search Tool providing matters of National Environmental Significance (NES) (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.
- Relevant legislation and policies.
- Ecological reports relevant to the precinct.

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

Site assessments were undertaken wherever access was granted. Biodiversity assessment methods followed the methodology stipulated within the Request for Tender, and included the following:

- *General flora and fauna survey*: Spotlighting for nocturnal species, bat call detectors (ANABATs) and bird transects were undertaken as part of a general fauna survey methodology.

- *Vegetation survey*: Information regarding vegetation (both patches of vegetation and scattered remnant trees) quality and extent, and the presence of significant flora and fauna species were recorded into hand-held PDAs. Flora and fauna species observed within the precinct during the assessments were noted.

- *Targeted flora assessment*: Targeted flora surveys were undertaken in spring and summer. Species targeted in spring included Maroon Leek Orchid *Prasophyllum frenchii*, Grey Billy Buttons *Craspedia canens*, River Swamp Wallaby-grass *Amphibromus fluitans*, Wine-lipped Spider Orchid *Caladenia oenochila*, Purple Diuris *Diuris punctata* var. *punctata* and Pale Swamp Everlasting *Helichrysum aff. rutidolepis*. Species targeted during summer included Swamp Everlasting *Xerochrysum palustre*, Frankston Spider-orchid *Caledonia robinsonii*, Matted Flax-lily *Dianella amoena* and Veined Spear-grass *Austrostipa rudis* subsp. *australis*.

- *Targeted fauna assessment:* Targeted surveys for the nationally significant Dwarf Galaxias *Galaxiella pusilla*, state significant Swamp Skink *Egernia coventryi* and regionally significant Glossy Grass Skink *Pseudemoia rawlinsoni* were undertaken in suitable or potentially suitable habitat during optimal surveys season and weather conditions to maximise detection. Targeted surveys for Southern Toadlet *Pseudophryne semimarmorata* were undertaken in May. Targeted surveys for Growling Grass Frog *Litoria raniformis* and Southern Brown Bandicoot *Isoodon obesulus obesulus* were not conducted given that sub regional surveys for these two species were being undertaken at the time of the current assessments.

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

Results

Flora

Much of the remnant native vegetation within the precinct has been cleared as a result of previous land use activities (i.e. agriculture). Areas of remnant native vegetation mainly occur within the rail reserve in the south west corner of the precinct, and in the road reserves of Ballarto Road, Railway Road and Tuckers Road. These areas support examples of Swampy Riparian Woodland, Plains Grassy Woodland, Swampy Woodland, Sedge Wetland, Swamp Scrub and Grassy Woodland (Figure ES3).

No threatened flora species were recorded during the current assessment.

Habitat hectare assessment

Habitat hectare assessments were completed in areas where remnant native vegetation constituted a 'patch' under the *Native Vegetation Management – A Framework for Action* and where site access was granted.

There are modified examples of six EVCs within the precinct; Grassy Woodland (EVC 175), Plains Grassy Woodland (EVC 55), Swampy Woodland (EVC 937), Sedge Wetland (EVC 136), Swampy Riparian Woodland (EVC 83) and Swamp Scrub (EVC 53_61).

Approximately **1.89 habitat hectares** of remnant vegetation is present within the precinct, including:

- **0.09 habitat hectares** of High conservation significance Swampy Woodland;
- **0.16 habitat hectares** of High conservation significance Plains Grassy Woodland;
- **0.93 habitat hectares** of High conservation significance Grassy Woodland;
- **0.25 habitat hectares** of High conservation significance Sedge Wetland;
- **0.41 habitat hectares** of Medium conservation significance Sedge Wetland; and
- **0.05 habitat hectares** of High conservation significance Swampy Riparian Woodland (Figure ES4).

There are five Large Old Trees within remnant patches of vegetation, which are of High conservation significance. There are 131 scattered remnant trees within the precinct. These consist of Very Large, Large, Medium and small trees, which are of High and Low conservation significance (Figure ES4).

Fauna

No significant fauna species was recorded within the precinct at the time of assessment. However, Growling Grass Fog has recently been recorded within the precinct and is likely to use waterbodies for breeding (Figure ES5, Figure ES6). State significant waterbirds also use habitat within the precinct. Targeted surveys for Growling Grass Frog and Southern Brown Bandicoot were not conducted as part of the flora and fauna investigations, as detailed surveys were undertaken for both species as part of the sub-regional surveys, and as part of the Growling Grass Frog Sub-regional Conservation Management Strategy.

The site currently supports six broad habitat types: modified woodlands, Swamp Scrub, creeks and drainage lines, scattered trees, shelterbelts and planted vegetation, as well as artificial waterbodies and pasture grasses/crops (Figure 9).

Discussion

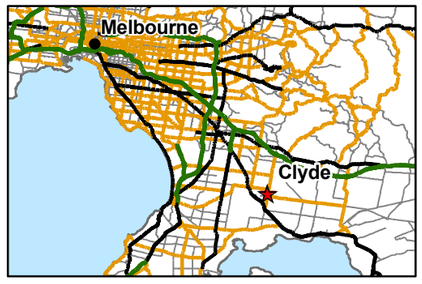
A summary of legislative considerations is provided in Section 4 of this report. A permit to 'take' native vegetation under the *Flora and Fauna Guarantee Act 1988* (FFG Act) will be required for the removal of protected species located on public land.

The 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.

Legend

- Study Area
- Parcel Boundaries
- Urban Growth Boundary
- Railway
- Freeway
- Highway
- Arterial Road
- Major Road
- Minor Road
- Elevation Contours (10m)
- Watercourses
- Waterbodies



Overveiw of Study Area PSP 1054

Biodiversity Assessment Project 2010/11

GDA 1994; VicGrid 1994

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FIGURE ES1

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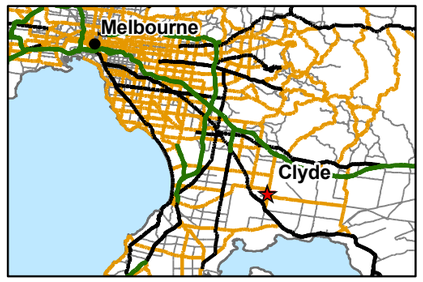
Legend

- Study Area
- Property Boundaries
- Urban Growth Boundary

Access Status

- Access Unattainable (42.19 ha)
- Surveyed (849.25 ha)
- Survey Not Required (Area under 0.14ha)
- Access Denied (116.6 ha)



Access Information
PSP 1054
Biodiversity Assessment Project 2010/11

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FIGURE ES2

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Issue Date: 30/05/2011

Legend

- Study Area
- Urban Growth Boundary
- Property Boundaries

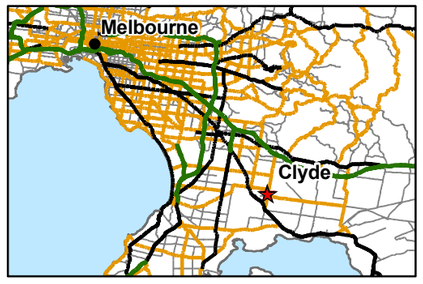
Access Status

- Access Unattainable
- Survey Not Required (Area under 0.14ha)
- Access Denied

Scattered Tree Locations

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree

- Degraded Treeless Vegetation
- Non Native Vegetation
- 53, Swamp Scrub
- 55, Plains Grassy Woodland
- 83, Swampy RiparianWoodland
- 136, Sedge Wetland
- 175, Grassy Woodland
- 937, Swampy Woodland



Extent of Native Vegetation PSP 1054

Biodiversity Assessment Project 2010/11

GDA 1994; VicGrid 1994

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FIGURE ES3

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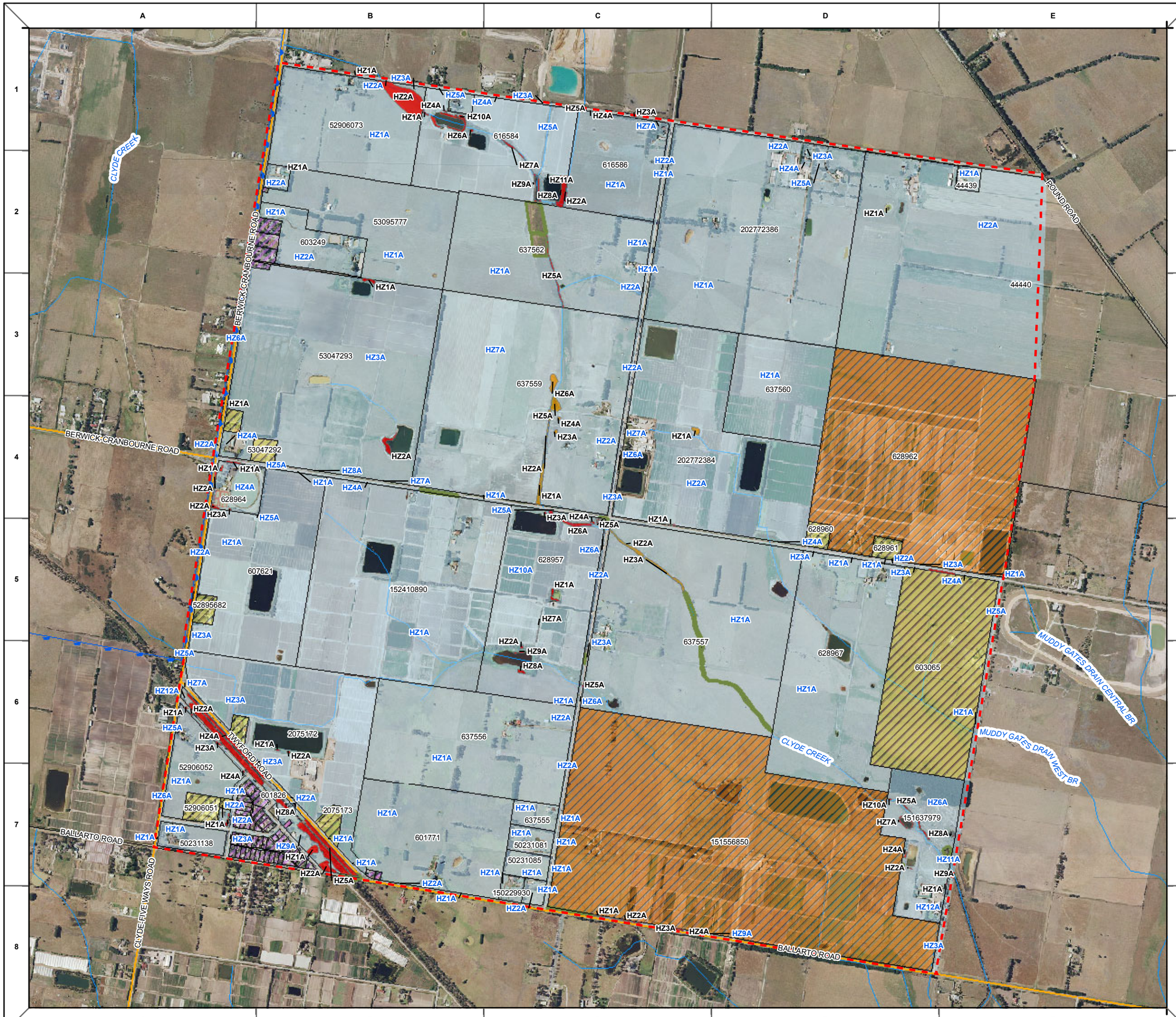


Legend

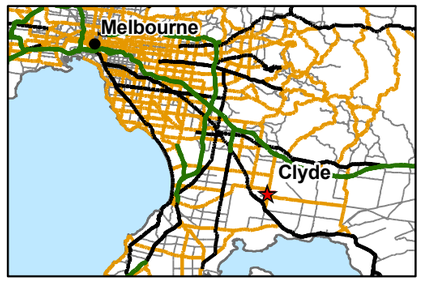
- Study Area
- Urban Growth Boundary
- Property Boundaries

Access Status

- Access Unattainable
- Survey Not Required (Area under 0.14ha)
- Access Denied
- Degraded Treeless Vegetation
- Non Native Vegetation

Conservation Significance

- High
- Medium



Conservation Significance of the Vegetation within the Study Area PSP 1054

Biodiversity Assessment Project 2010/11

GDA 1994; VicGrid 1994

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FIGURE ES4

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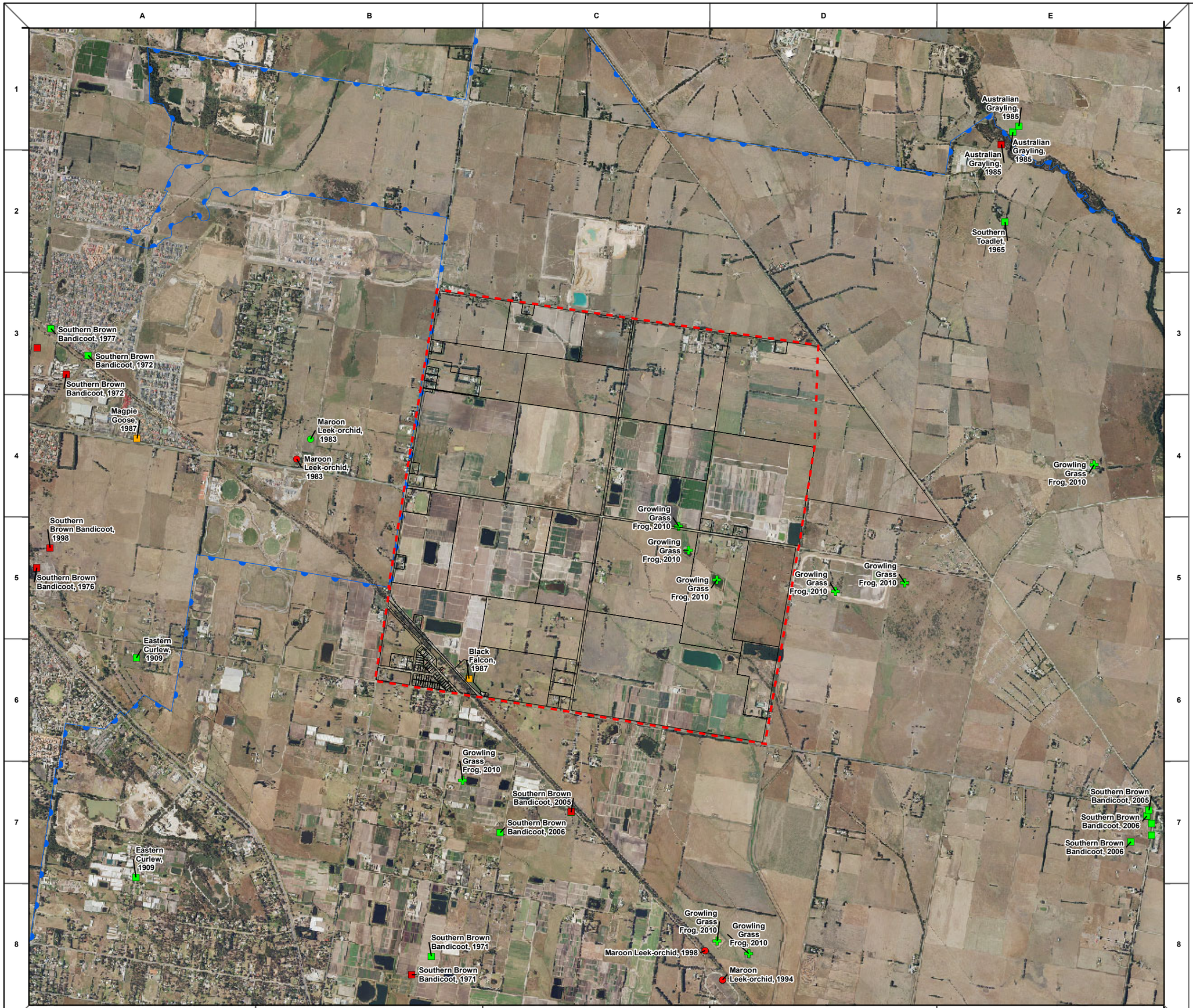


Legend

- Urban Growth Boundary
- Study Area
- Property Boundaries

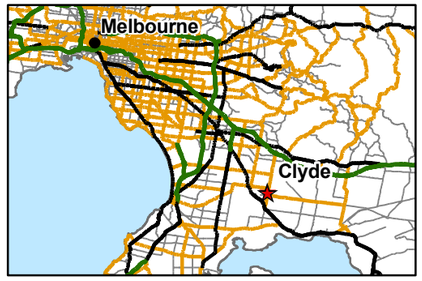
Database Fauna Records

- Nationally Listed Species
- State Listed Species
- Victorian Biodiversity Atlas Fauna Records
- DSE Unverified Fauna Records

Database Flora Records

- Nationally Listed Species
- State Listed Species
- Victorian Biodiversity Atlas Flora Records

Note: Database fauna records include the Aquatic Fauna Database (AFD) and Atlas of Victorian Wildlife(AVW). The locations of significant flora and fauna species are based on data available from DSEs AVW and FIS databases and Victorian Biodiversity Atlas (VBA 2010), the current field investigations and other sources. It is possible that additional fauna species of conservation significance have been recorded within the local area but are not shown



Threatened Flora and Fauna Records PSP 1054

Biodiversity Assessment Project 2010/11

GDA 1994; VicGrid 1994

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FIGURE ES5

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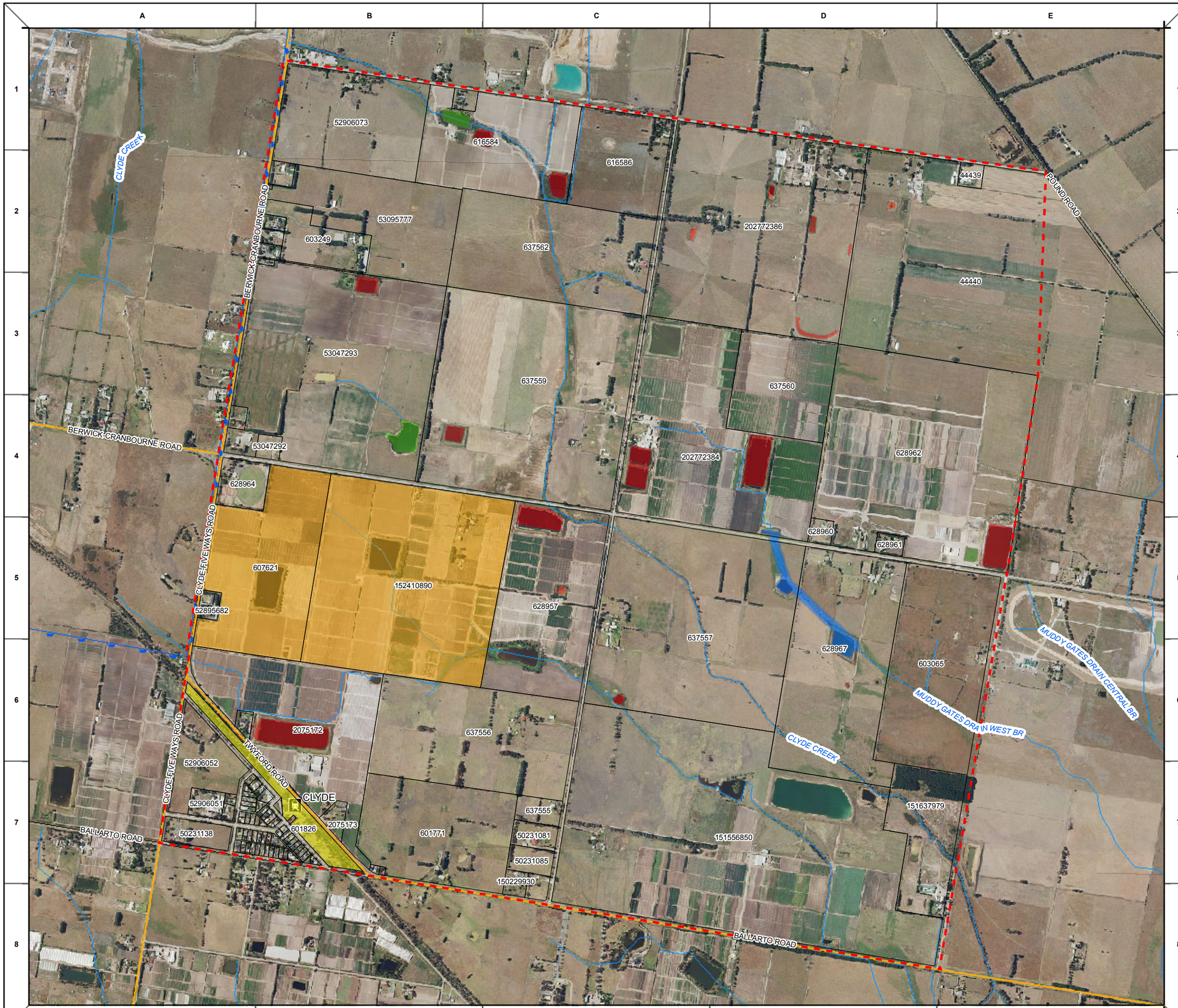
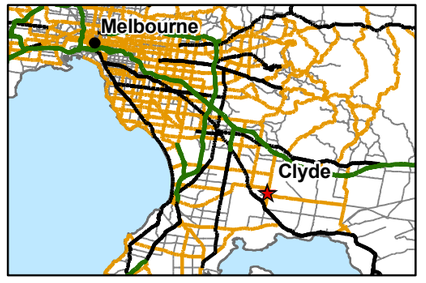


Legend

- Urban Growth Boundary
- Study Area
- Property Boundaries

Potential Habitat

- Known Growling Grass Frog Habitat
- Low Quality Growling Grass Frog Habitat
- Low Quality Habitat for Royal Spoonbill, Eastern Great Egret and Blue-billed Duck
- Low Quality Southern Brown Bandicoot Habitat
- Moderate Quality Growling Grass Frog Habitat



Potential Fauna Habitat
PSP 1054

Biodiversity Assessment Project 2010/11

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FIGURE ES6

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1 INTRODUCTION

1.1 Background

Ecology Partners Pty Ltd was commissioned by the Growth Areas Authority (GAA) to undertake a biodiversity assessment as part of the 2010/11 GAA Biodiversity Mapping Project, at Area 1054, 'Clyde', in the urban fringe of south-east Melbourne (Figure 1). The purpose of this report is to identify biodiversity values within the precinct and to inform the planning process.

A general flora and fauna assessment was completed for each property accessed within the precinct, together with targeted flora surveys for Maroon Leek-orchid *Prasophyllum frenchii*, Grey Billy-buttons *Craspedia canens*, River Swamp Wallaby-grass *Amphibromus fluitans*, Wine-lipped Spider-orchid *Caladenia oenochila*, Purple Diuris *Diuris punctata* var. *punctata*, Pale Swamp Everlasting *Helichrysum* aff. *rutidolepis*, Swamp Everlasting *Xerochrysum palustre*, Veined Spear-grass *Austrostipa rudis* subsp. *australis,* Matted Flax-lily *Dianella amoena*; and Frankston Spider-orchid *Caladenia robinsonii*.

Targeted fauna surveys were undertaken within the precinct for Swamp Skink *Egernia coventryi*, Glossy Grass Skink *Pseudemoia rawlinsoni*, Southern Toadlet *Pseudophryne semimarmorata* and Dwarf Galaxias *Galaxiella pusilla*. Discussion on recommendations and requirements under Commonwealth, State, and local legislation and polices, along with potential impacts and mitigation measures has also been included.

A habitat hectare assessment was undertaken in accordance with Victoria's *Native Vegetation Management – A Framework for Action* (the Framework) (NRE 2002) for any remnant patches of native vegetation within the precinct.

1.2 Objectives

The objectives of the flora, fauna and habitat hectare assessment, and targeted significant flora and fauna surveys were to:

- Identify, assess and map significant flora, fauna and habitat within the precinct and the level of conservation significance for any species or habitat found;
- Collect data at a sufficient detail and standard to enable the development of a Precinct Structure Plan (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 ecological communities.

1.3 Precinct

Area 1054 (the precinct) is located approximately 55 kilometres southeast of the Melbourne CBD, Victoria (Figure 1). The precinct covers around 280 hectares (Figure 2). It is bound to the north by Hardys Road, to the east by private farmland and Bells Road, Ballarto Road to the south, and Clyde Five-ways Road to the west.

The majority of properties within the precinct are privately owned, and there is some land adjacent the railway owned by Vline and VicTrack, and local sports facilities owned by City of Casey. There is also a small property on Clyde Five-ways Road owned by VicRoads. The precinct has largely been cleared for agricultural purposes, with areas of remnant native vegetation occurring in the rail reserve and in road reserves. Remnant native vegetation comprises modified examples of Sedge Wetland (EVC 136), Swampy Riparian Woodland (EVC 83), Grassy Woodland (EVC 175), Plains Grassy Woodland (EVC 55), Swamp Scrub (EVC 53) and Swampy Woodland (EVC 937).

According to the Department of Sustainability and Environment's (DSE's) Biodiversity Interactive Map (DSE 2010a) the precinct falls within the Gippsland Plain bioregion. The Gippsland Plain bioregion extends from Port Phillip Bay in the west to Bairnsdale in the east, between the southern slopes of the Great Dividing Range and Wilsons Promontory, excluding the Strzelecki Ranges.

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

There is one BioSite within the precinct (DSE 2011a), which is listed as a Plains Grassy Woodland remnant. BioSites within the precinct also include large areas of habitat of national, state and regional significance (Table 1).

Table 1: BioSites located in, or within the immediate vicinity of the precinct.

Biosite No.	Name	Size (hectares)	Location	Significance	Attributes
5611	Clyde	0.1	Within the rail reserve, near the southern boundary of the precinct	Regional	Native vegetation remnant constituting an EVC. Asset description states that it is Grassy Riverine Forest/(Mallee) Lake Bed Herbland Mosaic. Significance description describes it as Plains Grassy Woodland
7987	Muddy Gates Lane private grassland	unknown	Near Pattersons Road east of the precinct	State	Plains Grassland (South Gippsland) Community. On private land

2 METHODS

The following survey methodology was developed based on the contractual requirements prescribed by the GAA, the Biodiversity Precinct Structure Planning Kit (DSE 2010b), liaison with DSE and GAA and the assessor's experience.

2.1 Nomenclature

Common and scientific names of vascular plants follow the Flora Information System (FIS) (FIS 2009) and the Census of Vascular Plants of Victoria (Walsh and Stajsic 2007). Vegetation community names follow the DSE EVC Benchmarks (DSE 2011).

Naming of terrestrial and vertebrate fauna (mammals, birds, reptiles, amphibians and fish) follow the Atlas of Victorian Wildlife (AVW) (AVW 2009).

2.2 Literature and Database Review

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

- The Victorian Biodiversity Atlas (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 2011a);
- 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 (NES) (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).
- Relevant legislation and policies.
- Known ecological reports relevant to the precinct; and
- Liaison was undertaken with the GAA and DSE to confirm the extent and intensity of the proposed methodology.

The significance assessment criteria of taxa and vegetation communities are presented in Appendix 1.

2.3 Field Surveys

Vegetation assessments were undertaken by experienced personnel who had current certificates of competency in the conduct of Vegetation Quality Assessments (Habitat Hectares), issued by DSE.

A summary of the dates where each of the flora and fauna surveys was undertaken is provided in Section 2.3.7.

2.3.1 General flora survey

Flora surveys were undertaken on 20, 21, 22, 27, 28 and 29 October, and 5, 10, 11, 15 and 20 November 2010. All properties for which access was provided were assessed on foot (Figure 2). Records of all vascular plants were recorded within each property. All remnant EVCs, scattered remnant trees and significant flora species were recorded and mapped on aerial photographs.

2.3.2 Native vegetation (habitat hectare) assessment

A habitat hectare assessment was undertaken concurrently with the general flora survey on 20, 21, 22, 27, 28 and 29 October, and 5, 10, 11, 15 and 20 November 2010. All patches of remnant native vegetation were compared to historic and current EVC mapping (DSE 2010a) and relevant EVC benchmarks (DSE 2010b) to determine the most likely EVC from which it would have originated.

Remnant patches were assessed in accordance with the DSEs habitat hectare assessment methodology (DSE 2004), and the Biodiversity Assessment Project 2010/11 Vegetation Mapping and Condition Assessment Procedures 1.5 (DSE 2010). Data was entered into the DSEs 'Habitat Hectare Form' loaded onto a Nomad Trimble Personal Digital Assistant (PDA) with ArcPad 8.0 software. These files were stored on memory cards and uploaded onto the company hard drive after each assessment.

All scattered indigenous trees (i.e. those not located within a remnant patch of vegetation) were mapped onto aerial photography and as a point file in the required software. The species, size class (compared with the relevant EVC benchmark) and the conservation significance of each tree was determined. The survey assessment date, duration and assessor are provided below (Table 2).

Table 2: Habitat hectare assessment date, duration and assessor.

Property Number*	Assessment Date	Duration	Assessor
601826	5 and 15-Nov-10	11.30pm – 1.15pm	Jenna Forbes
628964	22-Oct-10	12.33pm -1.30pm	Jenna Forbes
637559	27-Oct-10	2.12pm – 5.00pm	Jenna Forbes
628397	27-Oct-10	7.30am – 7.45am	Jenna Forbes
R601826	11-Nov-10	1.00pm – 2.00pm	Jenna Forbes

Property Number*	Assessment Date	Duration	Assessor
R2075172	5-Nov-10	1.20pm – 2.00pm	Jenna Forbes
628957	10-Nov-10	12.30pm – 2.30pm	Jenna Forbes
53047293	10-Nov-10	2.35pm – 3.55pm	Jenna Forbes
150229930	11-Nov-10	2.30pm – 3.00pm	Jenna Forbes
150229938	11-Nov-10	3.00pm – 3.30pm	Jenna Forbes
628967	11-Nov-10	11.00am – 12.30pm	Jenna Forbes
52906052	15-Nov-10	11.00am – 11.15am	Jenna Forbes
50231138	15-Nov-10	11.30am – 12.00pm	Jenna Forbes
151618589	15-Nov-10	12.05pm – 2.30pm	Jenna Forbes
637682	15-Nov-10	4.30pm – 4.45pm	Jenna Forbes
637556	5-Nov-10	2.00pm – 3.00pm	Jenna Forbes
2075172	5-Nov-10	9.30am – 11.30am	Jenna Forbes
R151556850	10-Nov-10	4.00pm – 4.30pm	Jenna Forbes
R603065	22-Oct-10	10.00am – 10.15am	Jenna Forbes
R628962	22-Oct-10	10.15am – 10.20am	Jenna Forbes
R637557	22-Oct-10	10.30am – 10.50am	Jenna Forbes
R607621	22-Oct-10	10.50am – 11.00am	Jenna Forbes
R628961	22-Oct-10	10.20am 10.25am	Jenna Forbes
R628957	22-Oct-10	11.00am – 11.15am	Jenna Forbes
R53047293	22-Oct-10	11.15am – 11.30am	Jenna Forbes
R53047292	22-Oct-10	11.35am – 11.40am	Jenna Forbes
R628960	22-Oct-10	10.25am – 10.30am	Jenna Forbes
R637559	22-Oct-10	11.30am – 11.35am	Jenna Forbes
R202772384	22-Oct-10	11.40 – 12.00pm	Jenna Forbes
R15240890	22-Oct-10	12.00pm - 12.20pm	Jenna Forbes
152410890	21-Oct-10	9.30am – 10.00am	Jenna Forbes
637557	20-Oct-10	2.00pm – 4.00pm	Jenna Forbes
50231081	5-Nov-10	2.00pm – 3.00pm	Jenna Forbes
202772384	21-Nov-10	10.00am – 11.30am	Jenna Forbes
202772386	20-Oct-10	10.50am – 2.00pm	Jenna Forbes
R151556850	21-Oct-10	12.30pm – 1.15pm	Jenna Forbes
R202772384	21-Oct-10	3.15pm – 5.00pm	Jenna Forbes
R637562	21-Oct-10	5.00pm – 5.10pm	Jenna Forbes
R202772386	22-Oct-10	1.55pm – 2.00pm	Jenna Forbes
R637557	21-Oct-10	2.48pm – 3.05pm	Jenna Forbes
R44440	22-Oct-10	1.42pm – 1.50pm	Jenna Forbes
R444439	22-Oct-10	1.50pm – 1.55pm	Jenna Forbes
637555	5-Nov-10	2.00pm – 3.00pm	Jenna Forbes
637562	28-Oct-10	3.30pm – 4.30pm	Jenna Forbes
616586	28-Oct-10	3.00pm – 3.25pm	Jenna Forbes
R628964	27-Oct-10	1.00pm – 1.15pm	Jenna Forbes
53095780	27-Oct-10	11.15am – 11.30am	Jenna Forbes
53095773	27-Oct-10	12.45pm – 1.00pm	Jenna Forbes

Property Number*	Assessment Date	Duration	Assessor
151618144	27-Oct-10	12.15pm - 12.30pm	Jenna Forbes
151618128	27-Oct-10	12.30pm – 12.45pm	Jenna Forbes
44440	28-Oct-10	11.08am – 12.30pm	Jenna Forbes
616584	28-Oct-10	1.30pm – 2.55pm	Jenna Forbes
529066073	29-Oct-10	1.45pm – 4.00pm	Jenna Forbes
603249	29-Oct-10	9.55am – 10.30am	Jenna Forbes
151637979	29-Oct-10	10.35am – 12.30pm	Jenna Forbes
616580	29-Oct-10	1.25pm – 1.45pm	Jenna Forbes

2.3.3 Targeted flora surveys

Targeted flora assessments were undertaken at all properties which were accessed (Figure 2), and were required to be undertaken in spring and summer. The following species were targeted on 20, 21, 22, 27, 28 and 29 October and on 5, 10, 11, 15 and 21 November 2010:

- Maroon Leek-orchid;
- Grey Billy Buttons;
- River Swamp Wallaby-grass;
- Wine-lipped Spider Orchid;
- Purple Diuris;
- Frankston Spider-orchid; and
- Pale Swamp Everlasting.

Species targeted during summer surveys on 19 and 20 January 2011, included:

- Swamp Everlasting;
- Matted Flax-lily; and
- Veined Spear Grass.

The targeted spring surveys were undertaken concurrently with habitat hectare assessments above (Section 2.3.2). Targeted summer assessments were undertaken in areas of suitable habitat for significant flora. The survey assessment date, duration and assessor are provided in Table 3.

Table 3: Summer targeted flora assessment date, duration and assessor.

Property Number*	Assessment Date	Duration	Assessor
601826	19-Jan-11	9.30am – 11.00am	Jenna Forbes
616584	19-Jan-11	11.30am – 12.30pm	Jenna Forbes
52906073	19-Jan-11	11.10am – 11.30am	Jenna Forbes
637557	19-Jan-11	1.30pm – 2.30pm	Jenna Forbes
637559	20-Jan-11	2.10pm – 2.55pm	Jenna Forbes
628957	20-Jan-11	3.30pm – 4.15pm	Jenna Forbes
53047293	20-Jan-11	9.10am – 9.30am	Jenna Forbes
628967	19-Jan-11	4.20pm –4.45pm	Jenna Forbes
R637557	20-Jan-11	9.45am – 9.55am	Jenna Forbes
R628957	20-Jan-11	9.30am – 9.45am	Jenna Forbes
637555	20-Jan-11	10.00am – 10.15am	Jenna Forbes
637562	20-Jan-11	3.00pm – 3.25pm	Jenna Forbes
151637979	19-Jan-11	4.45pm – 5.30pm	Jenna Forbes

*Only sites assessed are presented in this table. Properties that aren't shown in this table did not contain suitable habitat for significant flora.

In each case, the targeted flora survey methodology for these flora species remained the same. The assessor traversed the property at the same time as the general flora surveys (described in Section 2.3.1), and concentrated in areas supporting remnant native vegetation that had the highest potential to support significant flora species. That is, greatest time was spent targeting species in areas comprising the highest cover/abundance of native vegetation, or ecological features with suitable habitat (i.e. waterways, dams).

Areas of potential habitat within the precinct were limited to fringes of waterways, and modified remnant vegetation. These areas were generally so small that they could be traversed on foot and assessed visually. There were no patches sufficiently large enough that warranted transects to be undertaken.

Where further assessment for additional flora is recommended (e.g. for additional flora species, or outside of the survey period undertaken within this report) then this is recommended below (Section 5).

2.3.4 General fauna survey

General fauna assessments were undertaken on 8 October and on 10, 12, 13, 17, 22 and 23 November 2009, concurrently with the general flora surveys. Weather conditions over this period were varied, some days being extremely hot and sunny, and others being overcast and rainy. 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 precinct included waterbodies, trees (including the presence or absence of hollows), drainage lines or different EVCs. The level of ground cover and vegetation composition and structure within these areas was also recorded.

2.3.4.1 Bird transects

Bird transects were undertaken during the mornings and afternoons (concurrently with tiling). This involved walking the railway reserve, Clyde Creek and Tuckers Road, road reserve to include the varying habitat types within the precinct. Each transect was 20 minutes long, which was generally about two kilometres in length. All species heard and seen during these surveys were recorded.

2.3.4.2 Spotlighting

Spotlighting was undertaken during the evenings of 14 – 17 February 2011. This involved two assessors walking through well vegetated areas with hand-held spotlights. Observations and calls of nocturnal mammals and birds were recorded. Spotlighting was undertaken at the same locations as bird transects.

2.3.4.3 ANABATs

Bat detectors (ANABAT II recorders) were placed at three locations within the precinct; Tuckers Road, Hardys Road and within the railway reserve. Detectors were left for two nights, on the 14th and 15th of December 2010. The locations were selected as they contained treed vegetation, and away from noises and livestock. Files with the collected bat calls were sent to Rob Gration, Certified Wildlife Ecologist, Ecological Consulting Services.

2.3.5 Targeted terrestrial fauna surveys

Targeted surveys were undertaken on species that we were contractually required to assess. This included the nationally significant Dwarf Galaxias, state significant Swamp Skink and regionally significant Glossy Grass Skink were assessed over spring and summer, while targeted surveys for Southern Toadlet were undertaken in May. The biodiversity assessment did not include targeted surveys of Growling Grass Frog or Southern Brown Bandicoot which were undertaken through the sub regional surveys, and for the former species as part of the Sub-regional Growling Grass Frog Conservation Management Strategy.

2.3.5.1 Roof tiling

Tile grids are used to survey for ground dwelling reptiles, which are known to use roof tiles for both artificial cover and thermoregulation. This survey method is effective and non-destructive to habitats, and is an accepted method for surveying reptiles (i.e. reptiles will use artificial shelter sites for thermoregulation).

A total of 295 tiles were laid in areas that were most suitable for the target species. This generally areas of remnant vegetation or low-lying vegetation along Clyde Creek, Tuckers Road and the railway line (Figure 6). Tiles were laid in tow rows approximately five metres apart on 6 December 2010. Tiles in each grid were checked five times, 15 December 2010, 6 January, 28 January, 11 February and 25 February 2011. Each time, the tiles were checked in mornings or evenings on mild days, at a time when reptiles are more likely to stay under tiles, and not be actively foraging. The survey effort, assessors and weather conditions are provided in Table 4 and 5.

2.3.5.2 Elliott trapping

Elliott (Type A, Elliot Scientific, Upwey, Victoria) trapping was also undertaken in potential habitat for Swamp Skink and Glossy Grass Skink. One hundred traps were deployed in areas with the highest quality habitats for the target species (the same areas as described above (Figure 6). Traps were checked over five nights during the early morning and the afternoon, to allow surveys for other non-target ground dwelling fauna. Traps were baited with a mixture of peanut butter, rolled oats, and honey, or sardines. The survey effort, assessors and weather conditions are provided below (Table 4 and 5).

2.3.5.3 Active searching

Active searching for ground dwelling fauna such as reptiles and frogs was undertaken at many sites containing ground debris such as logs, course woody debris, rocks, tin and old fence posts. Field personnel routinely checked underneath ground cover for prescribed search periods (direct searching) and attempted to capture fauna for identification. They identified fauna indirectly by collecting remains (e.g. bones and skin), scats (droppings) and fur, and also looked for other signs such as footprints, diggings and burrows.

2.3.5.4 Call Playback

Male frogs call to attract females and can be readily identified by their unique advertisement call. Frog call playback involves playing the call of different frog species through a hand held megaphone to elicit a response from resident frogs.

Assessors undertook targeted surveys for Southern Toadlet at four locations on 4 May and 21 May 2011. These included the areas with the highest quality habitat which was road reserves, the railway reserve and two sections of Clyde Creek (Figure 6).

Owls may also respond to call playback and this was undertaken during nights of spotlighting.

Assessors generally arrive at the suitable habitat and listen for five to ten minutes. This is followed by five minutes of call playback through the microphone, then followed by a further ten minutes of quiet listening. This process was completed up to four times along areas of suitable habitat. In each case, approximately 20 minutes of active searching with hand held spotlights was also undertaken.

2.3.6 Targeted aquatic fauna surveys

Bait trapping and dip netting were undertaken to survey for Dwarf Galaxias within the waterways located within the precinct.

Bait trapping with glow sticks was carried out three survey sites. Assessors targeted the highest quality habitats for these species (i.e. water within a creeks or drains with vegetated margins), within Clyde Creek and the Western Outfall Drain.

Eight bait traps were set for each assessment area, totalling 48 traps. These traps were left overnight and checked the next morning. Dip netting was undertaken by sweeping the net backwards and forwards swiftly through aquatic vegetation and areas of open water. Fish that were captured were identified to species level, and then released. The survey effort is provided below (Table 4 and 5).

2.3.7 Incidental flora and fauna surveys

Several site assessments were undertaken within the precinct over the duration of the project. Throughout this period, flora and fauna records of native species 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).

2.3.8 Summary of flora and fauna survey effort

A summary of the dates for the flora and fauna surveys undertaken over the duration of the project is provided below (Table 4).

Table 4: *Summary of dates for the fauna survey effort.*

Property Number*	Incidental Recording	General Fauna Assessment			Targeted Fauna Assessment					
					Dwarf Galaxias		Swamp Skink and Glossy Grass Skink		Southern Toadlet	
Assesssment Methodology		Bird Transects	Spotlighting	ANABAT Recording	Bait Trapping	Dip Netting	Elliott Trapping	Tiling	Call playback	Active Searching
Assessors	Jenna Forbes Simon Scott, Stuart Cooney, Kim Downs, Naomi Dart, Andrew Taylor, Amanda Smith, George Appleby, Daniel Weller	Stuart Cooney, Kim Downs, Naomi Dart, Andrew Taylor, Amanda Smith, George Appleby, Daniel Weller	Stuart Cooney, Kim Downs, Naomi Dart, Andrew Taylor, Amanda Smith, George Appleby, Daniel Weller	Andrew Taylor, (Call analysis undertaken by Rob Gration)	Amanda Smith, Kim Downs	Amanda Smith, Kim Downs	Stuart Cooney, Kim Downs, Naomi Dart, Andrew Taylor, Amanda Smith, George Appleby, Daniel Weller	Stuart Cooney, Kim Downs, Naomi Dart, Andrew Taylor, Amanda Smith, George Appleby, Daniel Weller	Simon Scott	Simon Scott
R601826	Throughout									
R2075172	Throughout									
R603065	Throughout									
R151556850	Throughout									

Property Number*	Incidental Recording	General Fauna Assessment			Targeted Fauna Assessment					
					Dwarf Galaxias		Swamp Skink and Glossy Grass Skink		Southern Toadlet	
Assesssment Methodology		Bird Transects	Spotlighting	ANABAT Recording	Bait Trapping	Dip Netting	Elliott Trapping	Tiling	Call playback	Active Searching
R603065	Throughout									
R628962	Throughout									
R637557	Throughout									
R607621	Throughout									
R628961	Throughout									
R628957	Throughout	7-11 December 11 (2 transects, 15 mins duration each)	7-11 December 11 (2 transects, 15 mins duration each)				7-11 December 11	15 Dec 10, 6 Jan 11, 28 Jan 11, 11 Feb 11, 25 Feb 11	4 May 11, 21 May 11 (15 mins per assessment)	4 May 11, 21 May 11 (15 mins per assessment)
R53047293	Throughout									
R53047292	Throughout									
R628960	Throughout									
R637559	Throughout								4 May 11, 21 May 11 (15 mins per assessment)	4 May 11, 21 May 11 (15 mins per assessment)
R202772304	Throughout									
R15240890	Throughout									
R151556850	Throughout									
R202772384	Throughout								4 May 11, 21 May 11 (15 mins per assessment)	4 May 11, 21 May 11 (15 mins per assessment)
R637562	Throughout									
R202772386	Throughout									
R637557	Throughout								4 May 11,	4 May 11,

Property Number*	Incidental Recording	General Fauna Assessment			Targeted Fauna Assessment					
					Dwarf Galaxias		Swamp Skink and Glossy Grass Skink		Southern Toadlet	
Assesssment Methodology		Bird Transects	Spotlighting	ANABAT Recording	Bait Trapping	Dip Netting	Elliott Trapping	Tiling	Call playback	Active Searching
									21 May 11 (15 mins per assessment)	21 May 11 (15 mins per assessment)
R44440	Throughout									
R444439	Throughout									
R628964	Throughout									
44440	Throughout									
601826	Throughout	7-11 December 11 (12 transects, 15 mins duration each)	7-11 December 11 (4 transects, 35 mins duration each)	14-16 December 11	22-24 Marc 11	22-24 Marc 11	7-11 December 11	15 Dec 10, 6 Jan 11, 28 Jan 11, 11 Feb 11, 25 Feb 11	4 May 11, 21 May 11 (45 mins per assessment)	4 May 11, 21 May 11 (45 mins per assessment)
603249	Throughout									
603249	Throughout									
616580	Throughout									
616584	Throughout				22-24 Marc 11	22-24 Marc 11 (20 mins per assessment)				
616586	Throughout	7-11 December 11 (2 transects, 15 mins duration each)	7-11 December 11 (2 transects, 15 mins duration each)	14-16 December 11						
628397	Throughout									
628957	Throughout				22-24 Marc 11	22-24 Marc 11 (20 mins			4 May 11, 21 May 11	4 May 11, 21 May 11

Property Number*	Incidental Recording	General Fauna Assessment			Targeted Fauna Assessment					
					Dwarf Galaxias		Swamp Skink and Glossy Grass Skink		Southern Toadlet	
Assesssment Methodology		Bird Transects	Spotlighting	ANABAT Recording	Bait Trapping	Dip Netting	Elliott Trapping	Tiling	Call playback	Active Searching
						per assessment)			(15 mins per assessment)	(15 mins per assessment)
628964	Throughout									
628967	Throughout									
637555	Throughout									
637556	Throughout									
637557	Throughout	7-11 December 11 (2 transects, 15 mins duration each)	7-11 December 11 (2 transects, 15 mins duration each)		22-24 Marc 11	22-24 Marc 11 (20 mins per assessment)	7-11 December 11	15 Dec 10, 6 Jan 11, 28 Jan 11, 11 Feb 11, 25 Feb 11	4 May 11, 21 May 11 (15 mins per assessment)	4 May 11, 21 May 11 (15 mins per assessment)
637559	Throughout								4 May 11, 21 May 11 (15 mins per assessment)	4 May 11, 21 May 11 (15 mins per assessment)
637562	Throughout									
637682	Throughout									
2075172	Throughout									
50231081	Throughout									
50231138	Throughout									
52906052	Throughout									
52906073	Throughout			14-16 December 11			7-11 December 11	15 Dec 10, 6 Jan 11, 28 Jan 11, 11 Feb 11, 25 Feb 11	4 May 11, 21 May 11 (15 mins per assessment)	4 May 11, 21 May 11 (15 mins per assessment)

Property Number*	Incidental Recording	General Fauna Assessment			Targeted Fauna Assessment					
					Dwarf Galaxias		Swamp Skink and Glossy Grass Skink		Southern Toadlet	
Assesssment Methodology		Bird Transects	Spotlighting	ANABAT Recording	Bait Trapping	Dip Netting	Elliott Trapping	Tiling	Call playback	Active Searching
53047293	Throughout									
53095773	Throughout									
53095780	Throughout									
150229930	Throughout									
150229938	Throughout									
151618128	Throughout									
151618144	Throughout									
151618589	Throughout									
151637979	Throughout									
152410890	Throughout									
202772386	Throughout								4 May 11, 21 May 11 (15 mins per assessment)	4 May 11, 21 May 11 (15 mins per assessment)
202772386	Throughout									

Table 5: *Weather conditions during the targeted fauna surveys*

Date	Rain (mm)	Morning (at approximately 9am)			Night (at approximately 9pm)		
		Temp (°C)	Wind	Cloud (%)	Temp (°C)	Wind	Cloud (%)
7 Dec 10	2.4	22	Slight northerly	80	26	Northerly	80
8 Dec 10	2.8	18	Northerly	85	20	Slight northerly	100
9 Dec 10	28	16	Slight south-westerly	85	20	Slight northerly	80
10 Dec 10	2.4	15	Westerly	50	17	Slight northerly	60
11 Dec 10	0.2	15	Northerly	0	18	Slight northerly	0
14 Dec 10	0	16	Slight northerly	10	22	Slight northerly	20
15 Dec 10	0	20	Northerly	90	18	Slight northerly	70
16 Dec 10	0	15	Slight southerly	70	18	Slight northerly	60
6 Jan 11	0	18	Slight northerly	0	21	Southerly	10
28 Jan 11	0	18	Southerly	5	19	Southerly	5
11 Feb 11	1.8	23	Northerly	90	18	South-westerly	95
25 Feb 11	0	17	Southerly	80	20	Southerly	80
22 March 11	0	19	Westerly	95	19	South-westerly	95
23 March 11	0	17	Slight northerly	80	20	Northerly	80
24 March 11	0	17	Slight westerly	85	15	Northerly	80
4 May 11	0	13	Westerly	90	14	South-westerly	90
21 May 11	0	14	Northerly	0	15	Northerly	0

Source: Field notes and BoM (2011)

2.4 Assessment Qualifications and Limitations

The objectives of the assessment were to document flora and fauna species and communities that occur, or may occur, within the precinct. Targeted surveys were undertaken for several significant flora and fauna species that were stipulated within the contract provided by GAA.

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 surveys across the properties meant that some species, particularly migratory, transitory or uncommon fauna species may have been absent from habitats at the time of the present field assessments.

Vegetation assessments were undertaken in October and November, at a time considered appropriate to undertake habitat hectare 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. Where this was the case, and where the assessor felt that additional assessments are warranted, this is noted within the report.

In addition, not all properties within the precinct were assessed due to the lack of property access. Properties that weren't accessed include:

203866818	36-38 Railway Road
638027	5 Valetta Street
1933811	350 Berwick Cranbourne Road
628960	275 Pattersons Road
628961	289 Pattersons Road
52896582	400 Clyde Five Ways Road
52906051	3 Oroya Grove
637563	1/230 Hardys Road
603065	25 Bells Road
601827	1755 Ballarto Road
628962	285 Pattersons Road
151556850	Ballarto Road
5304 7292	Pattersons Road

The reasons that access was not granted included:

- Could not be contacted (by phone, letter dropping, or by door-knocking); and/or
- Landholders objecting due to scepticism of the process.

GAA were advised of landholders where accessed was not obtained of denied in October and November, however, GAA were also unsuccessful in gaining site access.

3 RESULTS

3.1 Flora

3.1.1 Flora species

One hundred and twenty-three flora species (34 indigenous, 89 exotics) were recorded within the precinct (Appendix 2.1). The majority of the precinct was highly modified and dominated by exotic vegetation. The precinct has largely been cleared of remnant vegetation for agricultural purposes, and areas of remnant vegetation were predominantly recorded along the rail reserve and in road reserves.

Indigenous species recorded within the precinct included tree species such as Coast Manna-gum *Eucalyptus viminalis*, River Red-gum *Eucalyptus camaldulensis*, Narrow-leaf Peppermint *Eucalyptus radiata* and Swamp Gum *Eucalyptus ovata*. Shrubs species included Swamp Paperbark *Melaleuca ericifolia*, Prickly Tea-tree *Leptospermum continentale*, Silky Tea-tree *Leptospermum myrsinoides* and Tree Violet *Melicytus dentatus*. Herb species included Small Loosestrife *Lythrum hyssopifolia*, Grassland Wood-sorrel *Oxalis perennans*, Slender Knotweed *Persicaria decipiens* and Kidney Weed *Dichondra repens*.

Exotic species recorded include Cocksfoot *Dactylis glomerata*, Barley Grass *Hordeum vulgare*, Cape Weed *Arctotheca calendula*, Spear Thistle *Cirsium vulgare,* Perennial Rye-grass *Lolium perenne* and Toowoomba Canary-grass *Phalaris aquatica*. Other grassy weed species located within the precinct include Prairie Grass *Bromus hordeaceus* and Brown-top Bent *Agrostis capillaris*. Woody weeds included Weeping Willow *Salix babylonica*, Radiata Pine *Pinus radiata*, Hawthorn *Crataegus monogyna*, Monterey Cypress *Cupressus macrocarpa*, Sweet Briar *Rosa rubiginosa*, Blackberry *Rubus fruticosus* sp. agg. and Gorse *Ulex europaeus.*

A consolidated list of all of flora species recorded during the general and targeted flora surveys within the precinct is provided below (Appendix 2).

3.1.2 Significant flora species and communities

One site of Biological Significance (BioSite) is present within the precinct; including Greater Pakenham Habitat (5611), which is of regional conservation significance and contains remnant Plains Grassy Woodland vegetation (DSE 2011a). No significant flora species were recorded within the precinct during the current assessment.

3.1.2.1 National

No nationally significant flora species were recorded within the precinct during the assessment (Figure 7). Six nationally significant flora species have previously been recorded from within the local area (FIS 2010), and two nationally significant flora species are listed as potentially occurring within a 10 kilometre radius of the precinct (DSEWPC 2011) (Appendix 2.2) (Figure 5).

There is potential habitat for River Swamp Wallaby-grass in, and adjacent to, the dam on property 50231081. However this species was not detected during general or targeted flora surveys, and its likelihood of occurrence is low.

3.1.2.2 State

No state significant flora species were recorded within the precinct during the assessment (Figure 7). There have been 32 state significant flora species previously recorded from within the local area (FIS 2010) (Appendix 2.2.). Based on the current surveys and literature review, there is a low likelihood for two other state significant flora species, (Veined Spear-grass *Austrostipa rudis* subsp. *australis* and Green Scentbark *Eucalyptus fulgens*) to occur within the precinct (Appendix 2.2).

3.1.2.3 Regional and local

Nine 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).

3.1.2.4 Significant communities

No vegetation communities listed as threatened under the EPBC Act or the *Flora and Fauna Guarantee Act 1988* (FFG Act) were recorded within the precinct. Plains Grassy Woodland (EVC 55), Grassy Woodland (EVC 175) Swampy Woodland (EVC 937), Swampy Riparian Woodland (EVC 83) and Swamp Scrub (EVC 53) are listed as Endangered within the Gippsland Plain bioregion (DSE 2011b). Sedge Wetland (EVC 136) is listed as Vulnerable within the Gippsland Plain bioregion (DSE2011b).

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

No national or state significant flora species were recorded within the precinct. Based on the current surveys and literature review, there is s low likelihood for nationally significant flora species River Swamp Wallaby-grass to occur, and a low likelihood for state significant species Veined Spear-grass and Green Scentbark to occur. These species have potential habitat within the precinct, however were not recorded during the general or targeted flora surveys, and have not been recorded previously within the precinct (VBA 2010). The habitat assessment in accordance with the Native Vegetation Guide for assessment of referred planning permit applications (DSE 2007b) is summarised in Table 6.

The habitat assessment for threatened species potentially occurring within the precinct is provided (Table 7).

Table 6. Habitat assessment for threatened 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 7. Habitat assessment for threatened flora species within properties accessed for the precinct.

Potential Habitat (Remnant Patch No)	Threatened 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
601826 - 1A, 2A, 3A, 4A, 5A, 6A, 7A, 8A	Veined Spear-grass	A - No, D - No	No further consideration	Potential habitat, not recorded in precinct	n/a	n/a
R637557 - 5A R151556850 - 1A, 2A, 3A, 4A	Green Scentbark	A - No, D - No	No further consideration	Potential habitat, not recorded in precinct	n/a	n/a

(1) From Table 2 in the Guide for Assessment of Referred Planning Permit Applications (DSE 2007a) specify steps taken in habitat assessment to determine best 50% or remaining 50% of habitat.

Note: The assessment is undertaken on the species with the highest likelihood of occurrence as a resident, or most regular occurrence if it is a mobile fauna species. This assessment does not include species with a low likelihood of occurrence consistent with DSE advice (Mick Baker pers. comm.).

In summary, no national or state listed significant flora species was recorded during the site assessment, and none are considered likely to make significant use of the precinct, due to the modified condition of vegetation. Therefore, following steps A and D in Table 4 (DSE 2007b), vegetation within the precinct is not considered to be the 'best' or 'remaining' 50% habitat for any threatened flora species within the Gippsland Plain bioregion.

3.2 Ecological Vegetation Classes

The DSE bioregional pre-1750 EVC mapping shows that the precinct was once covered by Plains Grassy Woodland (EVC 55) and Plains Grassland (EVC 132_62) (DSE describe a mosaic of these EVCs), Swamp Scrub (EVC 53_61) and Heathy Woodland (EVC 48). Current EVC mapping (DSE 2010a) shows only isolated occurrences of Plains Grassland, Plains Grassy Woodland and Swamp Scrub within the precinct.

Plains Grassy Woodland, Plains Grassland, and Swamp Scrub remnants are listed as Endangered, and Heathy Woodland remnants are listed as Least Concern within the Gippsland Plain bioregion (DSE 2010b).

Remnant native vegetation within the precinct comprises the following EVCs (Figure 3):

3.2.1 Grassy Woodland (EVC 175)

Grassy Woodland is considered to be open woodland containing eucalypts or sheoaks with a diverse understorey of grasses and herbs (DSE 2011b). The shrub component is usually sparse. It occurs on sites with moderate fertility on gentle slopes or undulating hills on a range of geologies (DSE 2011b).

Patches of Grassy Woodland are present within the rail reserve, properties 628964, 53047293 and 2075173; and the road reserves of Railway Road, Berwick-Cranbourne Road. Most of these remnant patches are in poor condition and do not contain any large trees, comprising a species-poor understorey containing species such as Black Wattle *Acacia mearnsii* and Blackwood *Acacia melanoxylon,* amongst introduced weed species. The patches of Grassy Woodland within the rail reserve were better quality and were in moderate condition, containing large trees such as Narrow-leaf Peppermint *Eucalyptus radiata*, with a shrub layer containing Sheoak *Allocasuarina* spp., Blackwood, Cherry Ballart *Exocarpos cupressiformis*, Hedge Wattle *Acacia paradoxa* and Black Wattle. The ground layer contained species such as Spiny-headed Mat-rush *Lomandra longifolia*, Common Reed *Phragmites australis* and Austral Bracken *Pteridium esculentum*. The understorey is heavily infested with weeds such as Wild Watsonia *Watsonia meriana* var. *bulbillifera* and Blackberry *Rubus fruticosus*.

3.2.2 Plains Grassy Woodland (EVC 55)

Plains Grassy Woodland occurs on a range of different soil types, and is typically open woodland with sparse shrubs and a diverse understorey of grasses and herbs. It occupies poorly drained, fertile soils on flat or gently undulating plains at low elevations. The

understorey consists of a few sparse shrubs over a species-rich grassy and herbaceous ground layer (DSE 2011b).

Plains Grassy Woodland is present throughout the precinct, on properties 628957, 151637979, 616584, 616586; and the road reserves of Tuckers Road, Pattersons Road and Hardys Road. These patches are highly modified and without large trees, and most patches lacked a canopy layer. The understorey is generally species-poor, containing species such as Blackwood *Acacia melanoxylon*, Black Wattle *Acacia mearnsii* and Hedge Wattle. There are also large presence of perennial grassy weeds in these patches.

3.2.3 Swampy Woodland (EVC 937)

Swampy Woodland comprises open eucalypt woodland to 15 metres tall with a ground-layer dominated by tussock grasses and/or sedges and often rich in herbs. It occurs on poorly drained, seasonally waterlogged heavy soils, primarily on swamp deposits and is generally distributed in damp or waterlogged areas (DSE 2011b).

Areas of Swampy Woodland are present throughout the precinct, within properties 628957, 151618589, and in the road reserves of Ballarto Road, Clyde Five Ways Road and Hardys Road. They contain Swamp Gum and Black Wattle and Hedge Wattle. Indigenous understorey species such as Pale Rush *Juncus pallidus*, Spiny-headed Mat-rush, Common Reed and Austral Bracken are also present.

3.2.4 Swamp Scrub (EVC 53_61)

Swamp Scrub consists of closed scrub to eight metres tall at low elevations on alluvial deposits along streams or on poorly drained sites with higher nutrient availability. The EVC is dominated by Swamp Paperbark *Melaleuca ericifolia* which often forms a dense thicket, out-competing other species. Where light penetrates to ground level, a moss/lichen/liverwort or herbaceous ground cover is often present. Dry variants have a grassy/herbaceous ground layer (DSE 2011b).

There is one very small area of Swamp Scrub within the precinct, located within the Pattersons Road reserve, near the intersection of Tuckers Road. This patch contains Swamp Paperbark specimens in poor condition, over an understorey of grassy weeds including Barley Grass.

3.2.5 Swampy Riparian Woodland (EVC 83)

Swampy Riparian Woodland occupies the banks of streams of foothills and plains, and has a canopy reaching heights of 15 metres tall. Typical canopy species include Narrow-leaf Peppermint and Swamp Gum. The understorey contains a diverse understorey of shrubs, with sedges and grasses in the ground layer (DSE 2011b).

Two small patches of Swampy Riparian Woodland are present within the precinct on properties 616584 and 637559, recorded adjacent a major drainage line which runs north to south east within the precinct. Remnant patches contain tree species such as Swamp Gum and

River Red Gum *Eucalyptus camaldulensis* as immature trees, and understorey species such as Black Wattle, Blackwood, Hedge Wattle, Common Reed, Common Spike-sedge *Eleocharis acuta* and Pacific Azolla *Azolla filiculoides*. At the time of survey, the drainage line and surrounding vegetation was inundated.

3.2.6 Sedge Wetland (EVC 136)

Sedge Wetland is generally treeless, and dominated by sedges with isolated shrubs present. It occupies seasonal wetlands on fertile soils, and is typically of low species diversity (DSE 2011b).

Sedge Wetland occurs adjacent to several dams and drainage lines within the precinct (Figure 3). These patches are generally not remnants and contain aquatic graminoids, herbs and rushes such as Pale Rush, Common Reed, Cumbungi *Typha orientalis*, Bog Sedge *Schoenus* spp., Water Buttons and Common Spike-sedge.

3.3 Habitat Hectare Assessment

3.3.1 Remnant patches of native vegetation

There were 79 patches of remnant vegetation mapped within the precinct (Appendix 4.1) (Figure 3). The vegetation is of High and Medium conservation significance.

Overall approximately **1.89 habitat hectares** of remnant vegetation is present within the precinct:

- **0.09 habitat hectares** of Very High conservation significance Swampy Woodland;
- **0.16 habitat hectares** of High conservation significance Plains Grassy Woodland;
- **0.93 habitat hectares** of Very High conservation significance Grassy Woodland;
- **0.25 habitat hectares** of High conservation significance Sedge Wetland;
- **0.41 habitat hectares** of Medium conservation significance Sedge Wetland; and,
- **0.05 habitat hectares** of High conservation significance Swampy Riparian Woodland.

There was also one small patch of Swamp Scrub present within the precinct however the habitat hectares amounted to less than zero when rounding to two decimal palces.

3.3.2 Trees within remnant vegetation

There are five Large Old Trees (LOTs) within patches of native vegetation in the precinct. These are of High conservation significance.

3.3.3 Scattered trees

The precinct contains 31 scattered trees including:

- Six Very Large Old Trees (VLOTs);
- Seven Large Old Trees (LOT);
- 11 Medium Old Trees (MOTs); and,
- Seven Small Trees (ST) (Appendix 4.2)

Twenty four scattered trees are considered to be of High conservation significance, and seven scattered trees within the precinct are considered to be of Low conservation significance (Figure 4).

3.4 Fauna

3.4.1 Fauna species

Seventy six terrestrial fauna species were detected during the surveys, comprising of seven mammals (three native, four introduced), 65 birds (55 native, 10 introduced), one native reptile and three native frogs (Appendix 3.1).

3.4.2 Targeted threatened species surveys

3.4.2.1 Southern Toadlet

Southern Toadlet was not recorded at any of the four survey locations (Figure 6). Common Froglet was heard at all survey locations, and were the only frogs heard at Survey Site 1 and 2. On each occasion, greater than five individuals were heard.

Whistling Tree Frog, Southern Brown Tree Frog and Banjo Frog were each heard at Survey Site 3, but no more than three individuals were heard at any one assessment. The railway reserve contained Spotted Marsh Frog, Ewing's Tree Frog and Whistling Tree Frog. Higher numbers of calls from each of these five species was recorded incidentally during other assessments and it is expected that the waterbodies, drains and Clyde Creek all provide habitat to these frogs which are common in the local area.

3.4.2.2 Dwarf Galaxias

Dwarf Galaxias was not recorded during the assessment. Large numbers of Eastern Gambusia *Gambusia holbrookii* were recorded in each of the waterbodies assessed. Common Jollytail *Galaxias maculatus* was also recorded at each location, and two Short-finned Eels *Anguila australis*, along with one Mountain Galaxias *Galaxias olidus* was recorded at Clyde Creek within property 628957.

3.4.2.3 Bats

Three ANABAT detectors were placed across the precinct. Over 688 recordings were made. Of these, 464 were identified as bat species. The species and number of records include:

- Chocolate Wattled Bat *Chalinolobus morio*– 289
- Gould's Wattled Bat *Chalinolobus gouldi*- 80
- Little Forest Bat *Vespadelus vulturnus* – 64
- Large Forest Bat *Vespadelus darlingtoni* – 17
- White-striepd Freetail Bat *Tadarida australis* - 14

An additional six sets of calls, comprising of 116 total calls, could only be identified to complex level:

- Long-eared Bat *Nyctophilus* sp - 44
- Little Forest Bat / Chocolate Wattled Bat - 31
- Goulds Watted Bat / *Mormopterus* sp 2 and sp. 4 - 20
- Forest Bat sp *Vespadelus* sp – 15
- Large Forest Bat *Vespadelus darlingtoni* / Eastern Bent-wing Bat *Miniopterus schreibersii oceanensis* - 6

3.4.2.4 Birds

Bird transects were walked in areas of varying habitat within the precinct. No additional birds were recorded other than those identified incidentally. All birds identified are common species that are adapted to modified landscapes. The highest recorded species were Australian Magpie, Little Raven, and Magpie-lark.

3.4.2.5 Nocturnal fauna

Nocturnal fauna were surveyed by spotlighting. Spotlighting was undertaken along the entire length of the railway reserve and within nearby paddocks. It was also undertaken along Tuckers Road. Ringtail Possum was recorded twice Common Brushtail Possum was once.

3.4.2.6 Roof Tiling

Despite checking 295 tiles on five separate occasions, no fauna species, or evidence of fauna species, was recorded underneath tiles.

3.4.2.7 Elliott Trapping

Swamp Rat *Rattus lutreolus* was the only native species recorded in the Elliott traps. It was recorded within the rail reserve (property 601826) on two occasions. House Mice *Mus musculus* were also trapped on two occasions at property 52906073.

3.4.3 Fauna habitats

The site supports six broad habitat types: modified woodlands, Swamp Scrub, creeks and drainage lines, scattered trees, shelterbelts and planted vegetation, as well as artificial waterbodies and pasture grasses/crops (Figure 9).

Woodlands (modified remnants of Swampy Woodland, Grassy Woodland, Swampy Riparian Woodland and Plains Grassy Woodland)

Overall habitat value - Remnant woodland patches are of **moderate** habitat value for fauna (Appendix 1.5). These areas are found in road reserves, the railway reserve and along Clyde Creek. They are highly modified, generally lacking the range of species associated with these EVCs. Still, these patches may provide habitat or temporary habitat when moving between higher quality woodlands near riparian vegetation and reserves. That is, patches of this habitat are also likely to facilitate fauna movement between habitats throughout the otherwise cleared landscape.

Description - This habitat type is highly modified with a poor quality understorey and general lack of midstorey native vegetation. Some of these areas contain mature trees currently with hollows of varying size and shape.

Fauna – A relatively high number of species were observed in this area. Woodland birds observed included Eastern and Crimson Rosellas *Platycercus* spp., White-plumed honeyeater *Lichenostomus penicillatus*, Red Wattlebird *Anthochaera carunculata* and Sulphur-crested Cockatoo *Cacatua galerita*, all of which are common species within the local area.

These areas provide habitat for arboreal mammals such as Common Brush-tailed Possum *Trichosurus vulpecula* and Common Ring-tailed Possum *Pseudocheirus peregrines*, while microbats are expected to use tree hollows for roosting and breeding purposes. When in flower, remnant woodland trees provide an important nectar resource for a variety of honeyeaters and lorikeets, while Grey-headed Flying-fox *Pteropus policepahlus* may occasionally use these areas. The native Swamp Rat *Rattus lutreolus* is known to occur in these areas and Bush Rat *Rattus fuscipes* is also likely to occur. While the common Garden Skink *Lampropholis guichenoti* was recorded during the assessments, these areas provide lower quality habitat for other ground dwelling species such as reptiles and frogs.

Several common frog species, including Common Froglet *Crinia signifera*, Spotted Marsh Frog *Limnodynastes tasmaniensis* and Whistling Tree Frog *Litoria vereauxi vereauxi* were recorded in vegetation along waterways and waterbodies.

Swamp Scrub (Corresponding EVC: Swamp Scrub)

Overall habitat value – The partially intact Swamp Scrub is of **moderate** habitat value for a range of native fauna (Appendix 1.5). Despite lacking in floristic diversity, the dense and protective habitat structure provides refuge for native birds and potentially ground dwelling species such as reptiles and frogs.

Description - This habitat type is typically present along low-lying areas and the artificial drains. They generally occur in isolated patches throughout the precinct. Swamp Scrub is characterised by an extensive thicket of dense Swamp Paperbark, which typically shades the understorey, and prevents understory vegetation from becoming established. The dense, sheltered environment is favoured by several small woodland birds for shelter, foraging, roosting and nesting.

Fauna – This area is surrounded by highly modified agricultural land. However, locally common mammals (e.g. Common Ring-tail Possum), woodland birds (e.g. wrens, thornbills), and ground dwelling species such as small mammals, reptiles and frogs may occur in this area.

Creeks and drainage lines associated riparian vegetation (Corresponding EVCs: Swampy Riparian Woodland)

Overall habitat value – Ephemeral drainage lines provide **low - moderate** habitat values for fauna (Appendix 1.5). When inundated drainage lines provide temporary habitat for waterbirds, native fish and frogs.

Description – This habitat is highly variable in its vegetation composition and structure. Vegetation in this area comprises a mix of remnant and planted trees, with an understorey largely dominated by exotic pasture grasses and other environmental weeds. In-stream, emergent and fringing vegetation comprises Slender Knotweed *Persicaria decipiens*, Rushes *Juncus* spp., and Spike Sedge *Eleocharis acuta*. During the assessments, these areas were generally grazed by livestock or modified for irrigation purposes.

Fauna – Ephemeral drainage lines currently provide foraging and refuge habitat for a suite of native fauna, including waterbirds such as White-faced Heron *Egretta novaehollandiae*, Australian Wood Duck *Chenonetta jubata* and Pacific Black Duck *Anas superciliosa*. Areas of long vegetation provide habitat for regionally significant Latham's Snipe *Gallinago hardwickii*.

Several common frog species, including Common Froglet, Spotted Marsh Frog and Whistling Tree Frog were recorded along many sections of Cardinia Creek and at farm dams. These areas provide some fish habitat however they were generally poor quality habitat. These drains do not connect with other known areas of higher quality fish habitats within the catchment.

Scattered Trees, Shelterbelts and Planted Vegetation

Overall habitat value – Habitat value for planted vegetation and scattered trees ranges from **low** for juvenile or immature trees, to **moderate** for mature trees (Appendix 1.5).

Description – A total of 120 scattered indigenous trees along with other native and exotic trees occur throughout the precinct (Appendix 1.5). An assortment of Australian native and introduced trees and shrubs have been planted as shelterbelts throughout the precinct. Many of these trees are mature and some support crevices and hollows of varying sizes. The midstorey is generally absent, with an understorey dominated by introduced pasture grasses and weeds.

Terrestrial fauna – Many of these trees provide an important foraging resource, primarily for a range of locally common birds. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills and fantails for nesting and foraging purposes. Trees are also vantage points for raptors, and are likely to provide habitat for bats within hollows or underneath bark.

Artificial Waterbodies (Farm Dams and Irrigation Dams) (Corresponding EVC: None)

Overall habitat value – Artificial waterbodies are considered to be of **moderate** habitat value for most fauna (Appendix 1.5). Some areas also contain high quality habitat for frogs including the nationally significant Growling Gras Frog.

Description – Several artificial waterbodies exist within the precinct. They currently support varying levels of emergent vegetation, along with refuge sites such as logs or rocks. The surrounding vegetation typically comprises introduced pasture grasses and weeds.

Fauna – Waterbirds such as Australian Wood Duck and Pacific Black Duck, and locally common frog species such as Common Froglet, Spotted Marsh Frog, Striped Marsh Frog, Whistling Tree Frog, Southern Banjo Frog are expected to use this habitat. Growling Grass Frog has been recorded in farm dams within the precinct as discussed below (Section 3.4.4).

Pasture grass and crops (Corresponding EVC: None)

Overall habitat value – This habitat is considered to be 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 adapted to agricultural landscapes, reptiles and frogs.

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, these include birds adapted to modified habitats such as Raven *Corvus* spp., Straw-necked Ibis *Threskiornis spinicollis*, Australian Magpie *Gymnorhina tibicen* and Galah *Eolophus roseicapilla*. Introduced species such as Common Starling *Sturnus vulgaris*, House Sparrow *Passer domesticus* were also

prevalent in this habitat during the survey. Raptors including Brown Falcon *Falco berigora*, Nankeen Kestrel *Falco cenchroides* and Black-shouldered Kite *Elanus axillaris* are known 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.

3.4.4 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. However, Growling Grass Frog *Litoria raniformis*, Southern Brown Bandicoot *Isoodon obesulus obesulus*, Dwarf Galaxias *Galaxiella pusilla* and Australian Grayling *Prototroctes maraena* have previously been recorded within the vicinity of precinct and may occur within the precinct (AVW 2007, DSE 2010a) (Figure 8).

National

Eleven nationally significant fauna have previously been recorded in the local area, within ten kilometres of the study site (VBA 2010) (Appendix 3.2). These species include:

- Three mammals: Southern Brown Bandicoot *Isoodon obesulus obesulus* (low quality habitat) and Grey-headed Flying-fox *Pteropus poliocephalus* (occasional visitor).
- Three birds: Australasian Bittern *Botaurus poiciloptilus* (occasional visitor), Swift Parrot *Lathamus discolor* (occasional visitor) and Helmeted Honeyeater *Lichenostomus melanops cassidix* (no suitable habitat present).
- Two fish: Dwarf Galaxias and Australian Grayling (low quality habitat present for these species along Clyde Creek).
- One frog: Growling Grass Frog (known resident in a two farm dams and may occur in additional dams).
- Two invertebrates: Golden Sun Moth *Synemon plana* (no suitable habitat), and Large Ant-blue Butterfly *Acrodipsas brisbanensis cryilus* (no suitable habitat).

A further eight species or their habitats identified as potentially occurring within a ten kilometre radius of the precinct (DSEWPC 2011). These include Australian Painted Snipe *Rostratula australis*, Spot-tailed Quoll *Dasyurus maculatus,* Long-nosed Potoroo *Potorous tridactylus*, Smoky Mouse *Pseudomys fumeus*, Orange-bellied Parrot *Neophema chrysogaster,* Regent Honeyeater *Anthochaera phrygia,* Leathery Turtle *Dermochelys coriacea* and Loggerhead Turtle *Caretta caret.* However, none of there is no suitable habitat for any of these nationally significant species within the precinct (Appendix 3.2). .

The following are descriptions of significant fauna species that have at least a low likelihood of occurrence within the precinct.

Southern Brown Bandicoot

Southern Brown Bandicoot (eastern subspecies) is a marsupial with coarse brindled dark grey to yellow-brown fur on its back, with creamy white feet and underbelly. Ears are short and rounded, barely extending above the head (Menkhorst and Knight 2004). It is listed as endangered under the EPBC Act (DSEWPC 2010).

Southern Brown Bandicoot occurs in a variety of habitats in south-eastern Australia, including heathland, swamp habitat, shrubland and forest usually with well-drained soils and dry heath communities, as well as lowland forest and woodland (Menkhorst 1999). Favoured habitat requirements appear to comprise a range of native and exotic vegetation types with a dense ground cover and short understorey vegetation (approximately 0.5 – 1 metre high) (Willig 2006). The species also uses roadside vegetation for foraging and habitat corridors (Rees and Paull 2000), especially in close proximity to patches of dense vegetation, and man-made and natural drainage lines. While many patches of vegetation are adjacent to open pasture that lack suitable cover for animals, individuals are known to forage along the margins of these areas (Willig 2006). The species is known to regularly use non-native habitats such as blackberry (*Rubus* spp.) thickets and rabbit warrens for shelter.

The south-central region of Victoria, in the Port Phillip-Westernport and West Gippsland areas, has been extensively surveyed for Southern Brown Bandicoot (eastern subspecies) and assessed against historical data by Coates *et al.* (2008). Results show declines of known populations in the greater Melbourne area, and strong populations in the Koo Wee Rup, Bayles, Cardinia and Garfield-Longwarry areas face a range of threats. These locations are considered important for the viability of Southern Brown bandicoot in south-central Victoria.

The sub regional survey for Southern Brown Bandicoot assessed two locations within the precinct; 'Active Search Point 31' which included roadside vegetation at Tuckers Road, midway between Hardy's Road and Patterson's Road, and 'Intensive Search Point 12' located within the railway reserve in the south-western corner of the precinct (Practical Ecology 2010). Active Search Point 31 was dominated by Blackberry and tall exotic grasses, described as degraded habitat. Intensive Search Point 12 was a combination of native and exotic vegetation with scattered Gums and Black Wattle as well as areas dominated by exotic grasses and Blackberry. Practical Ecology (2010) note that surveys along Cardinia Creek were not undertaken, and no evidence of Southern Brown Bandicoot was identified within the precinct. However, Practical Ecology (2010) identified areas of potentially suitable habitat along Ballarto Road, the railway reserve, and potentially along Clyde Creek. The authors also identify Clyde Creek as a potential boilink (Practical Ecology 2010).

Targeted assessments for Southern Brown Bandicoot were beyond the scope of the current assessment. However, the results of this assessment, which includes access to private properties, suggest that the vegetation along Clyde Creek is highly modified and generally does not contain vegetation that is suitable for Southern Brown Bandicoot. The results of the

historic records of Southern Brown Bandicoot indicate that no individuals have been recorded within the precinct, or to the north-west of the precinct. In its current state vegetation along Clyde Creek is unlikely to provide a boilink and therefore further assessments and consideration of the appropriateness of the potential boilink is recommended. Ballarto Road and the railway reserve currently provide higher quality habitat, and relatively recent Southern Brown Bandicoot records (within the last 20 years, and within approximately three kilometres of the precinct) have been made within these areas. These areas are more likely to provide potential habitat currently and therefore also warrant further consideration as a boilink. It is recommended that further analysis of Southern Brown Bandicoot habitat within the precinct be undertaken and a Conservation Management Plan be developed for the species.

Growling Grass Frog

The Growling Grass Frog is listed as endangered in Victoria (DSE 2007a), is listed under the FFG Act, and vulnerable under the EBPC Act (DSEWPC 2010). A draft Flora and Fauna Guarantee Action Statement (Robertson 2003) and a draft National Recovery Plan have been development for the species (DEC 2005). Overall the species is of national conservation significance.

Although formerly widely distributed across southern eastern Australia, including Tasmania (Littlejohn 1963, 1982; Hero *et al.* 1991), the species has declined markedly across much of its former range. This has been most evident over the past two decades and in many areas, particularly in south and central Victoria, populations have experienced apparent declines and local extinctions (AVW 2007; Mahony 1999; Organ pers. obs.).

This species is largely associated with permanent or semi-permanent still or slow flowing waterbodies (i.e. streams, lagoons, farm dams and old quarry sites) (Hero *et al.* 1991; Barker *et al.* 1995). Frogs can also use temporarily inundated waterbodies for breeding purposes providing they contain water over the breeding season, including down in south-eastern Melbourne (A. Organ pers. obs.).

Based on previous investigations there is a strong correlation between the presence of the species and key habitat attributes at a given waterbody. For example, the species is typically associated with waterbodies supporting extensive cover of emergent, submerged and floating vegetation (Robertson *et al.* 2002; Ecology Partners Pty Ltd 2006; Hamer and Organ 2008).

Sub-regional surveys have recently been completed by Ecology Australia (2010a). Ten assessments were undertaken along roadsides, and four within private property. Growling Gras Frogs were recorded in the Patterson's Road reserve east of Tuckers Road, and at the waterbodies to its south. These waterbodies were dominated by exotic grasses, but contained an 16 Growling Grass Frogs, and an additional five were heard calling (amongst other species). These farm dams are considered potential breeding habitat by the authors (Ecology Australia 2010) with a population estimated up to 40 frogs. These records represent the first records of the species west of Cardinia Creek (Ecology Australia 2010).

The presence of this species was not confirmed during the current assessment as a targeted assessment for this species was beyond the scope of this assessment. Waterbodies in similar condition to those containing Growling Grass Frogs have been identified within the precinct, a and it is therefore likely that additional populations will be identified with further surveys. Ecology Australia (2010) have also recommended corridor buffers along Clyde Creek and the Muddy Gates Drain West. It is understood, further assessments have commenced, and the results of additional surveys will assist to inform the appropriateness of such a buffer, and areas of retained Growling Gras Frog habitats within the precinct. A Conservation Management Plan will be required for this species.

Australian Grayling

Australian Grayling is a medium sized fish, generally growing to 190 millimetres, although it has been known to grow to 330 millimetres (Backhouse *et al.* 2008b). It is a slender, laterally compressed fish with soft-rayed fins that lack any spines (McDowall 1996; Allen *et al.* 2002). Australian Grayling is a greyish-bronze fish (though may sometimes appear greenish) which is darker on the dorsal surface, graduating to a silvery underside with translucent to yellowish-grey fins (Backhouse *et al.* 2008).

Most of its life is spent in freshwater, though at least some of its juvenile stage is spent in coastal seas (Backhouse *et al.* 2008b). Spawning occurs in freshwater in late summer to winter, and is generally initiated by increase in volume and flow rate of rivers and streams, possibly coupled with decreases in water temperature (Backhouse *et al.* 2008). It is believed that most individuals die after their second year, often after only having spawned for one season, with only a small proportion of the population living for four to five years (Backhouse *et al.* 2008b).

Known from rivers and streams draining into the sea, south and east of the Great Dividing Range (McDowall 1996), Australian Grayling is now a relatively uncommon resident of south-east Australia (Allen *et al.* 2002).

It seems much of the decline is due to habitat decline, though recent research suggests the lack of suitable conditions for breeding is likely responsible for the reduction in numbers of the species (Allen *et.al.* 2002).

Australian Grayling has been previously recorded within Cardinia Creek, east of the precinct (VBA 2010). This creek is located within the Cardinia Creek catchment, but not within the current catchment. This species was not recorded during the current assessment and the lack of habitat suggests that this species has a low likelihood of occurrence within Clyde Creek.

Dwarf Galaxias

Dwarf Galaxias is a very small Galaxiid, with females reaching up to 40 millimetres and males only 35 millimetres (DPIW 2006). It is a slightly stocky fish, with a deepened trunk at the belly and small head with a blunt snout (McDowall 1996). The fins are small and

membranous (McDowall 1996) with large flanges on the caudal (tail) fin that cause it to almost reach the dorsal and anal fin (McDowall 1996; DPIW 2006).

Breeding occurs in spring, where pairs will spawn eggs one by one on aquatic plants (likely less than 100 eggs), each approximately one millimetre in diameter. Dwarf Galaxias lives its entire life cycle in freshwater (McDowall 1996; DPIW 2006).

Dwarf Galaxias occurs in southern Victoria from Gippsland east to Mount Gambier in South Australia, also on Flinders Island and in the east of the north coast of Tasmania (Humphries 1996; McDowall 1996) and is intermittent in occurrence, though often locally abundant (DPIW 2006). It is mostly found in still (McDowall 1996) or slow-flowing waters (DPIW 2006), which are often overgrown with aquatic and/or emergent plants. They can occur within permanent waterbodies, though are commonly located within ephemeral pools (connected to permanent waterways) and are thought to be able to aestivate when waterbodies are dry (McDowall 1996).

Dwarf Galaxias has been previously recorded within Cardinia Creek, east of the precinct (McGuckin 2010, VBA 2010). This creek is located within the Cardinia Creek catchment, but not within the current catchment. This species was not recorded during the current assessment and the degraded habitat suggests that this species has a low likelihood of occurrence within Clyde Creek.

State

Thirty-four state significant fauna species have previously been documented from the local area (VBA 2010), and the likely use of the precinct by these species is provided below (Appendix 3.2). These species include:

- One mammal: New Zealand Fur Seal *Arctocephalus forsteri* (although this is likely to be an error with the database as the record is locted inland);
- Three diurnal raptors: Grey Goshawk *Accipiter novaehollandiae,* Black Falcon *Falco subniger,* and White-bellied Sea-Eagle *Haliaeetus leucogaster* (rare or vagrant visitors to the precinct);
- Two nocturnal raptors: Powerful Owl *Ninox strenua*, Sooty Owl *Tyto tenebricosa* (unlikely to occur within the precinct);
- Twelve wetland associated birds: Lewin's Rail *Lewinia pectoralis pectoralis,* Baillon's Crake *Porzana pusilla palustris*, Little Bittern *Ixobrychius minutes dubius*, Royal Spoonbill *Platalea regia*, Intermediate Egret *Ardea modesta*, Eastern Great Egret *Ardea modesta*, Magpie Goose *Anseranas semipalmata*, Australasian Shoveler *Anas rhynchotis*, Freckled Duck *Stictonetta naevosa*, Hardhead *Aythya australis*, Blue-billed Duck *Oxyura australis* and Musk Duck *Biziura lobata* (occasional use of the precinct by a small number of these species).

- Four shorebirds: Black-tailed Godwit *Limosa limosa,* Whimbrel *Numenius phaeopus,* Common Sandpiper *Actitis hypoleucos,* and Wood Sandpiper *Tringa glareola* (none of which are likely to occur);

- Two marine seabirds: Gull-billed Tern *Gelochelidon nilotica macrotarsa,* and Caspian Tern *Hydroprogne caspia* (none of which are likely to occur);

- Six woodland associated birds: Turquoise Parrot *Neophema pulchella,* Brown Treecreeper *Climacteris picumnus victoriae,* Speckled Warbler *Chthonicola sagittata,* Painted Honeyeater *Grantiella picta,* Hooded Robin *Melanodryas cucullata cucullata* and Grey-crowned Babbler *Pomatostomus temporalis* (all unlikely to occur due tot eh absence of large areas of woodland habitat);

- One reptile: Swamp Skink *Egernia coventryi* (low likelihood of occurrence);

- One amphibian: Southern Toadlet *Pseudophryne semimarmorata* (some low quality habitat and low likelihood of occurrence);

- One fish: Pale Mangrove Goby *Mugilogobius paludis* (no suitable habitat); and

- Foothill Burrowing Crayfish *Engaeus victoriensis* (no suitable habitat).

The following discussion provides further guidance on species with at least a low likelihood of occurrence within the precinct.

Royal Spoonbill

Royal Spoonbill inhabits shallow wetlands and margins of deeper waters, such as fresh or saline swamps and flooded pastures, either open water or vegetated, and also coastal lagoons and mangroves (Morcombe 2000). Royal Spoonbill was not recorded during the site assessments, however the species has been widely recorded within close proximity to the precinct, and is expected to forage at creeks, drains, farm dams and irrigation It is considered to have a high likelihood of occurrence within the precinct, although the habitat is not likely to provide important breeding or roosting habitat.

Eastern Great Egret

Eastern Great Egret occurs throughout most of Victoria, with the exception of Mallee or Alpine areas. This species occupies a variety of wetlands and wet grasslands, preferring permanent waterbodies on floodplains (Marchant and Higgins 1990). Eastern Great Egret has been previously recorded within the vicinity of the precinct and is likely to forage at waterbodies and watercourses throughout the precinct opportunistically (Figure 8).

Other Waterbirds

Hardhead and Blue-billed Duck are also likely occur at large open waterbodies occasionally, probably the large irrigation dams (Appendix 3.2). Australian Shoveler, Musk Duck and

Freckled Duck tend to favour larger, well-vegetated wetlands than those available within the precinct, never the less may also occur at the large dams infrequently.

Swamp Skink

Swamp Skink occurs predominantly in Victorian, south and east of the Great Dividing Range, but also extends from south-east South Australia to south-east New South Wales (AVW 2007). The species is currently listed as threatened under the FFG Act and listed as vulnerable by DSE (2007a). It is an omnivorous, medium, robust skink (approximately 100 millimetres) of a fourth toe that is noticeably longer than the third, and the presence of separated parietal scales. It produces live young, usually around January to February, and litter sizes vary from one to eight (Greer 1989).

The species can be found in a range of habitats, most notably in densely vegetated freshwater swamps and watercourses, wet heaths, sedgelands (often sedge-rich, low lying marshes or drainage lines) or saltmarshes (Organ pers. obs.). However, the species is not restricted to these vegetation types and it has been recorded in areas where vegetation structure comprises dense ground cover, up to two metres, with sparse to no overstorey (Clemann 2006; Ecology Partners Pty Ltd 2009b).

Swamp Skink was not recorded during general or targeted fauna surveys, but has been recorded within the vicinity of the precinct as recently as 1997 (VBA 2010). Vegetation along drains and creeks is generally degraded due to historic and ongoing land uses. However, potential habitat exists within remnant vegetation along drains at road reserves and alongside waterbodies. This species has a low likelihood of occurrence within these areas of the precinct.

Southern Toadlet

Southern Toadlet is a small frog, with adult body length up to 30 millimetres. The back is warty and varies from brown to dark olive-green with darker flecks (Barker *et al.* 1995; Robinson 2000). The chest has black and white marbling, while the throat, lower belly and underside of the limbs are tan to orange in colour (Barker *et al.* 1995; Robinson 2000). Males have a granular belly, while the female belly is smooth (Hero *et al.* 1991; Barker et al. 1995; Robinson 2000). Tadpoles are dark grey to brown, sometimes with a copper sheen and with transparent, spotted fins (Anstis 2002). Breeding season occurs from March to June and males call anytime from February to June depending on environmental conditions. The male call is a short, grating "cre-ek" repeated every few seconds (Hero *et al.* 1991).

Southern Toadlet can be found in forest, woodland, shrubland, grassland and heathland. Adults shelter under leaf litter, rocks, logs and other debris in damp areas (Hero et al. 1991; Robinson 2000). They are a ground dwelling frog with a preference for walking (Hero et al. 1991). Males of this species call from shallow burrows in low lying areas, usually near water or boggy ground (Hero *et al.* 1991; Robinson 2000). Males usually call in late summer to autumn, before and after periods of heavy rain (Robinson 2000).

The species was not recorded during targeted fauna surveys, but low quality habitat for this species is present within the railway reserve, and the drain alongside Tuckers Road. All other artificial waterbodies are unlikely to provide suitable habitat. Southern Toadlet has a low likelihood of occurrence within these portions of the precinct.

Regional and Local

Sixteen regionally significant fauna species have been previously recorded within the local area (AVW 2007, VBA 2010). Two of these have at least a low likelihood of occurrence.

Latham's Snipe

Latham's Snipe is a migratory species that occurs in Victoria during spring and summer. It has previously been recorded within the vicinity of the precinct and is likely to occur in well vegetated paddocks in close proximity to waterbodies or waterways. The precinct contains opportunistic foraging habitat within ungrazed paddocks, vegetation remnants or within the railway reserve for this species.

Glossy Grass Skink

Glossy Grass Skink is dark brown to black above with a narrow, dark brown vertebral stripe from the nape to the base of the tail (Cogger 1996).

A narrow, white or cream, dorso-lateral stripe extends from the temporal region to the base of the tail. Glossy Grass Skinks can grow up to 62 millimetres length and are known to inhabit areas close waterbodies including dense vegetation coverage (i.e. rushes and grasses).

Glossy Grass Skink prefers confined humid microhabitats including waterbodies such as swamps and wetlands including dry sclerophyll forests that adjoin wet heathland areas that are exposed to frequent bouts of flooding (Cogger 1996). The Glossy Grass Skink uses dense vegetation, fallen logs, dead trees or rocky outcrops for shelter, and their distribution spreads through the highlands of south-eastern Australia, with peripheral or outlying populations on the Blue Mountains, west of Sydney (NSW), and in the Gisborne region and Otway Ranges in Victoria (Cogger 1996).

Furthermore, while Glossy Grass Skink was not recorded during targeted or general fauna surveys, this species is considered to have a low likelihood of occurrence within the remnant vegetation that occurs along Clyde Creek, the margins of wetlands, and within the railway reserve (Appendix 3.2).

Other Fauna

The precinct is unlikely to provide habitat to other regionally significant fauna (listed in Appendix 3.2) which includes marine coastal birds, or other species that have habitat requirements which aren't present on the precinct.

All other native fauna is of local significance.

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

Remnant patches within the precinct, particularly along the railway reserve as well as creeks, drains and waterbodies have the possibility of containing habitat for threatened fauna. A habitat assessment in accordance with the *Native Vegetation Guide for assessment of referred planning permit applications* and The Framework has been undertaken below (DSE 2007b, NRE 2002).

The threatened 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 8).

Southern Brown Bandicoot is listed as near threatened on the DSE Advisory List (DSE 2007a) and is not assessed under this methodology, despite being nationally significant. Further consideration of this species and its habitats should be undertaken at the precinct level despite not being listed below (Table 8).

Species which may occur within the precinct such as Blue-billed Duck and Hardhead are also not assessed in this methodology as their habitat is limited to open water and not remnant patches of native vegetation.

The recent records of Growling Grass Frog within the precinct occur within areas of non-native vegetation. This is consistent with the findings of Ecology Australia (2010) that also describe these areas as highly modified and 100% exotic vegetation. Accordingly, these areas are not considered below, but are probably breeding habitat and should still be considered a high priority for further management.

With this exception, there are no areas of high quality habitat for rare or threatened species within the precinct. No habitat on-site is likely to constitute the "Best 50%" of habitat for the species within the bioregion, and therefore the conservation status of the remnant patches of vegetation is not altered by this assessment.

Table 8. Habitat assessment for threatened species within properties accessed for the precinct.

Potential Habitat (Remnant Patch No)	Threatened 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
Private property alongside waterbodies and waterways with Very High Conservation Significance rating **52916179 –** 1A, 2A **616584 –** 1A, 2A, 4A, 6A, 7A, 8A, 9A, 10A, 11A, **53047293 –** 1A, 2A **628957 –** 1A, 2A, 3A,	Eastern Great Egret, Royal Spoonbill, Growling Grass Frog	A, D, F	Remaining 50%	Potential to occur	Very High	Very High

Potential Habitat (Remnant Patch No)	Threatened 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
4A, 6A, 8A, 9A **151637979 –** 1A, 2A, 4A, 5A, 7A, 8A, 9A, 10A **2075172** – 1A, 2A						
Private property alongside waterbodies and waterways with High Conservation Significance Rating **637559 –** 1A, 2A, 3A, 4A, 5A, 6A **202772384 –** 1A **637557** -2A, 3A	Eastern Great Egret, Royal Spoonbill, 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 moderate or higher likelihood of occurrence the. Ecology Partners Pty Ltd has not assessed species' with a lower likelihood of occurrence as they are unlikely to 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
- Threatened 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. It also appears that Clyde Creek and other drains which occur within the precinct terminate prior to reaching the Port Phillip and Western Port Ramsar Wetland site, located approximately eight kilometres south of the precinct. It is therefore unlikely that impacts associated with future development of the precinct will impact on any Ramsar Wetlands.

Listed Flora and Fauna Species and Ecological Communities

Flora – No flora species listed under the EPBC Act was recorded during the assessment. Six nationally significant flora species are listed as having potential habitat within a 10 kilometre radius of the precinct (DSEWPC 2010). There is suitable habitat for River Swamp Wallaby-grass within the dam on property 50231081, and some other farm dams. However, it was not recorded during the targeted assessments, the habitats are degraded, and there is no previous records within the local area. Accordingly, it is considered to have a low likelihood of occurrence.

Due to the level of modification of vegetation within the precinct, it is unlikely that other nationally significant flora species occur.

Fauna – No fauna species listed under the EPBC Act were recorded during the assessment, although Growling Grass Frog is known to reside in waterbodies within the precinct. No other nationally significant fauna are likely to occur within the precinct. Southern Brown Bandicoot, Dwarf Galaxias and Australian Grayling have a low likelihood of occurrence.

Communities – The remnant native vegetation within the precinct is not part of a listed ecological community under the EPBC Act.

Listed Migratory and Marine Species

Latham's Snipe was recorded during the fauna assessment, and several species have been previously recorded from within the precinct. The precinct is unlikely to provide important foraging habitat, limiting or breeding habitat to any of the migratory and marine species identified during the desktop assessment (AVW 2007, DSE 2010a).

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 current assessment. No EPBC Act-listed fauna species was recorded during the current surveys, however, Growling Grass Frog is known to occur, and probably breed, within the precinct (Ecology Australia 2010).

Southern Brown Bandicoot has low quality habitat within the precinct, predominantly in the railway reserve. The sub-regional surveys for this species have recommended potential biolinks and habitat enrichment for this species. Further consideration of the recommendations of this report is warranted.

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 16th 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 2010c) and a Part 9 approval is not recommended for the proposed development of this precinct.

4.2 State

4.2.1 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 Native Vegetation Precinct Plan (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 City of Casey 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.

4.2.2 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 – Nine flora species listed as threatened under the FFG Act have been recorded within a 10-kilometre radius of the precinct (VBA 2010). Species listed under the FFG Act and

previously recorded within ten kilometres of the precinct (FIS 2007) are considered to have a low likelihood of occurrence within the precinct.

Flora listed as protected under the FFG Act that are present within the precinct include Black Wattle.

Vegetation Communities – No FFG Act listed communities are located within the precinct.

Fauna – Thirty-four fauna species listed as threatened under the FFG Act have previously been recorded from within the local area (Appendix 3.2). Growling Grass Frog is known to occur within the precinct. Two dams have been identified as potential breeding habitat, and there are likely to be additional records with further assessment (the outcome of additional sub-regional surveys is not yet provided). As discussed, habitat or potential habitat exists for other FFG Act-listed species.

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

Based on the current survey, only Growling Grass Frog is known to reside within the precinct. Southern Brown Bandicoot may also occur within the precinct, or move through the precinct, and further assessment for this species is recommended. Other FFG-listed species which may utilise the precinct are only likely to occur on an infrequent basis and the precinct is not expected to form important habitat.

An FFG Act Protected Flora Licence or Permit will be required for the removal of protected species under the Act, if protected species are located on public land. Species protected under the FFG Act that was recorded within the precinct includes Black Wattle.

4.2.3 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 unlikley be required for major developments within the precinct.

4.2.4 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 recent flora surveys a total of 10 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.

4.2.5 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*.

4.2.6 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 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 VPPs 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

Vegetation within the precinct was assessed according to the habitat hectare methodology, which is described in the Vegetation Quality Assessment Manual (DSE 2004). 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). Habitat hectare

assessments have been undertaken on remnant patches of vegetation within the precinct (Appendix 4.1).

4.2.7 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.

4.2.8 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.

4.3 Local

4.3.1 City of Casey

The precinct lies within the boundaries of the Port Phillip and Westernport Catchment Management Authority (CMA). Under the City of Casey planning scheme the entire precinct is a within the Urban Growth Zone (UGZ). Land adjacent Clyde Creek is zoned Urban Floodway Zone (UFZ). The railway and rail reserve, Clyde Primary School and local CFA building are zoned Public Use Zone (PUZ), a small section of parkland in the south west of the precinct is zoned Public Park and Recreation Zone (PPRZ) and there is a small area of Farming Zone (FZ) covering land in the north of the precinct. There are a number of overlays covering the precinct including a Heritage Overlay (HO133, HO134, HO164, HO184); Land Subject to Inundation Overlay (LSIO) and a Public Acquisition Overlay (PAO3) (DPCD 2011).

Implications and Recommendations

Once the NVPP has been prepared, this will guide future development from the time they become incorporated in the City of Casey Planning Scheme.

5 POTENTIAL IMPACTS AND MITIGATION MEASURES

5.1 Potential Impacts

Potential impacts caused by future development of the precinct include:

- The loss of native vegetation including:
    - 0.09 habitat hectares of High conservation significance Swampy Woodland.
    - 0.16 habitat hectares of High conservation significance Plains Grassy Woodland.
    - 0.93 habitat hectares of High conservation significance Grassy Woodland.
    - 0.25 habitat hectares of High conservation significance Sedge Wetland.
    - 0.41 habitat hectares of Medium conservation significance Sedge Wetland.
    - 0.05 habitat hectares of High conservation significance Swampy Riparian Woodland.
    - Five LOTs within patches of remnant native vegetation in the precinct. These are of High conservation significance.
- The loss of known habitat for resident Growling Grass Frog. In addition, there may be a loss of habitat for Royal Spoonbill, Eastern Great Egret and Latham's Snipe, and low quality habitat for other ducks such as Blue-billed Duck and Hardhead;
- The loss of pastures that provide low quality habitat for native birds and reptiles;
- The loss of farm dams which provide habitat to common species of frog and fish species, and possibly also Growling Grass Frog dispersal corridors or future habitats;
- Sedimentation and degradation of waterways and drains and waterbodies, reducing habitat quality for flora and fauna; and
- The further fragmentation of remnant native vegetation and loss of linkages between habitats, particularly for arboreal and ground-dwelling native mammals. In particular, this includes the railway reserve, Ballarto Road and Clyde Creek which have previously been proposed as biolinks for fauna (Ecology Australia 2010, Practical Ecology 2010).

5.2 Opportunities to Reduce Potential Impacts

Future development of the precinct has the potential to impact (direct and indirect) indigenous 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 include:

- Fencing around areas of remnant vegetation and ecological value, (i.e. remnant trees waterways, dams), especially those containing known fauna and threatened flora habitat;

- Prepare a Revegetation Plan to improve the cover of native vegetation, mimic the EVCs what would have originally occurred within the precinct;
- Prepare a Conservation Management Plan to retain and enhance the quality of habitat for significant flora and fauna which occur within the precinct. It is understood that a Conservation Management Plan will be prepared specifically for Growling Grass Frog. These plans should consider movement routes and biolinks recommended in previous reports. Providing a movement corridor across Tucker Road within the vicinity of the known populations of growling Grass Frog is also recommended;
- Finalise the Sub-regional Strategy for Growling Grass Frog and determine if further assessment is required within the precinct;
- Ensure silt fences and appropriate run-off control measures are implemented to avoid impacting fish and amphibian habitat if future development occurs near Clyde Creek and drainage lines;
- Prepare a Weed Management Plan that outlines measures 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 Eastern Gambusia and other exotic fish within waterways and dams which are known to predate on native fish and frog eggs and tadpoles. It should also target foxes and feral cats which prey upon on native fauna. Rabbits and hares which will graze on planted vegetation and reduce vegetation cover important for native fauna should also be managed;
- Consider recommendations provided within sub-regional surveys and strategies (Ecology Australia 2010, Practical Ecology 2010)
- Incorporate Water Sensitive Urban Design into any future housing;
- Avoid alteration to the drainage which would adversely affect flows and linkages with other nearby waterways;
- Ensure that an Environmental Management Plan is prepared prior to construction, including a section on sediment and erosion control to avoid impacts to waterways and dams;
- Eradicate or control weeds appropriately to minimise the spread of material into, within and outside of the precinct; and,
- 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 specimen to a suitable site in the local area.

5.3 Opportunities to Protect and Enhance Regional and Local Biodiversity Values

Habitat within the precinct is highly fragmented, and remnant patches of vegetation are small and often without connectivity to other remnant vegetation. Opportunities to enhance local biodiversity values include:

- Provide supplementary planting in areas retained for conservation purposes to rehabilitate Clyde Creek, drainage lines and dams. The purpose should be to improve the quality and extent of native vegetation, and use plants site indigenous species associated with the former EVCs that occurred within the study, and improve the quality of habitat for significant fauna values;

- Where practical ensure habitat connectivity between suitable waterbodies is maintained. If required, undertake further assessments for Growling Grass Frog to determine the extent, potential movement corridors, and appropriate buffers for the conservation of Growling Grass Frog within the precinct. A detailed Conservation Management Plan for the Growling Grass Frog is required.

- Increase the width of native vegetation to buffer the railway reserve, Ballarto Road, and potentially Clyde Creek. A key outcome would be areas would provide greater habitat for Southern Brown Bandicoot if the area is to become a biolink (Practical Ecology Pty Ltd 2010). Linkages between these areas should be retained and enhanced wherever practical; and

- The control of noxious weeds within the precinct such as Montpellier Broom, Hawthorn, Blackberry and Gorse which will spread beyond the precinct. This should be undertaken in accordance with a Revegetation Plan to avoid removing weeds that may currently provide habitat for native fauna (e.g. Blackberry which may provide habitat to Southern Brown Bandicoot or trees that provide habitat to arboreal mammals including bats).

6 CONCLUSION

The precinct is highly modified, and the majority of the precinct has been cleared for agriculture and is dominated by exotic vegetation. Remnant native vegetation within the precinct comprises six EVCs, including; Swampy Woodland (EVC 937), Plains Grassy Woodland (EVC 55), Grassy Woodland (EVC 175), Swampy Riparian Woodland (EVC 83), Sedge Wetland (EVC 136) and Swamp Scrub (EVC 53_61).

There are approximately **1.89 habitat hectares** of remnant vegetation present within the precinct. This includes **0.09 habitat hectares** of Swampy Woodland, **0.16 habitat hectares** of Plains Grassy Woodland, **0.93 habitat hectares** of Grassy Woodland, **0.66 habitat hectares** of Sedge Wetland **0.05 habitat hectares** of Swampy Riparian Woodland and a small area of Swamp Scrub. The majority of vegetation within the precinct is considered to be of High conservation significance, as it is vegetation with an endangered conservation status within the Gippsland Plain bioregion.

There are five LOTs within remnant patches in the precinct. All of these are of High conservation significance. There are 31 scattered trees comprising of VLOTs, LOTs, MOTs, and STs which are of High and Low conservation significance. If any scattered trees within the precinct are proposed to be removed, they must be offset in accordance with the Framework and Port Phillip and Westernport Native Vegetation Plan (PPWCMA 2006).

No nationally significant or state significant flora species were recorded within the precinct during the assessment. Based on the current assessment, there is a low likelihood that Veined Spear-grass, Green Scentbark and River Swamp Wallaby-grass may occur within the precinct. However, the likelihood of significant populations of national and state significant flora species occurring within the precinct is considered low.

The precinct currently supports seven broad habitat types: modified woodland/remnant trees, swamp scrub, creeks and riparian areas, ephemeral drainage lines, planted native and introduced vegetation, artificial waterbodies, and introduced pasture grass and crops.

There were no national or state significant fauna species recorded during the assessment. However, there are previous records for Growling Grass Frog within the precinct. Eleven nationally significant fauna species have been previously recorded within the local area, and one nationally significant species (Growling Grass Frog) is known to use habitat within the precinct.

An FFG Act permit will be required for the removal of protected species under the Act, if protected species are located on public land. Species protected under the FFG Act that were recorded within the precinct include Black Wattle.

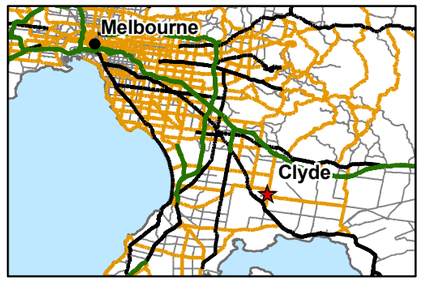
There are opportunities to enhance ecological values within the precinct, principally through protection of native vegetation and areas of fauna habitat, and allowing the regeneration of native vegetation, as well as undertaking revegetation and weed control. Such activities should be undertaken in accordance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

Detailed Conservation Management Plans will be required in accordance with the sub regional surveys for Growling Grass Frog and possibly Southern Brown Bandicoot.

FIGURES

Legend

- Study Area
- Parcel Boundaries
- Urban Growth Boundary
- Railway
- Freeway
- Highway
- Arterial Road
- Major Road
- Minor Road
- Elevation Contours (10m)
- Watercourses
- Waterbodies



Overveiw of Study Area PSP 1054

Biodiversity Assessment Project 2010/11

GDA 1994; VicGrid 1994

0 150 300 600

Metres

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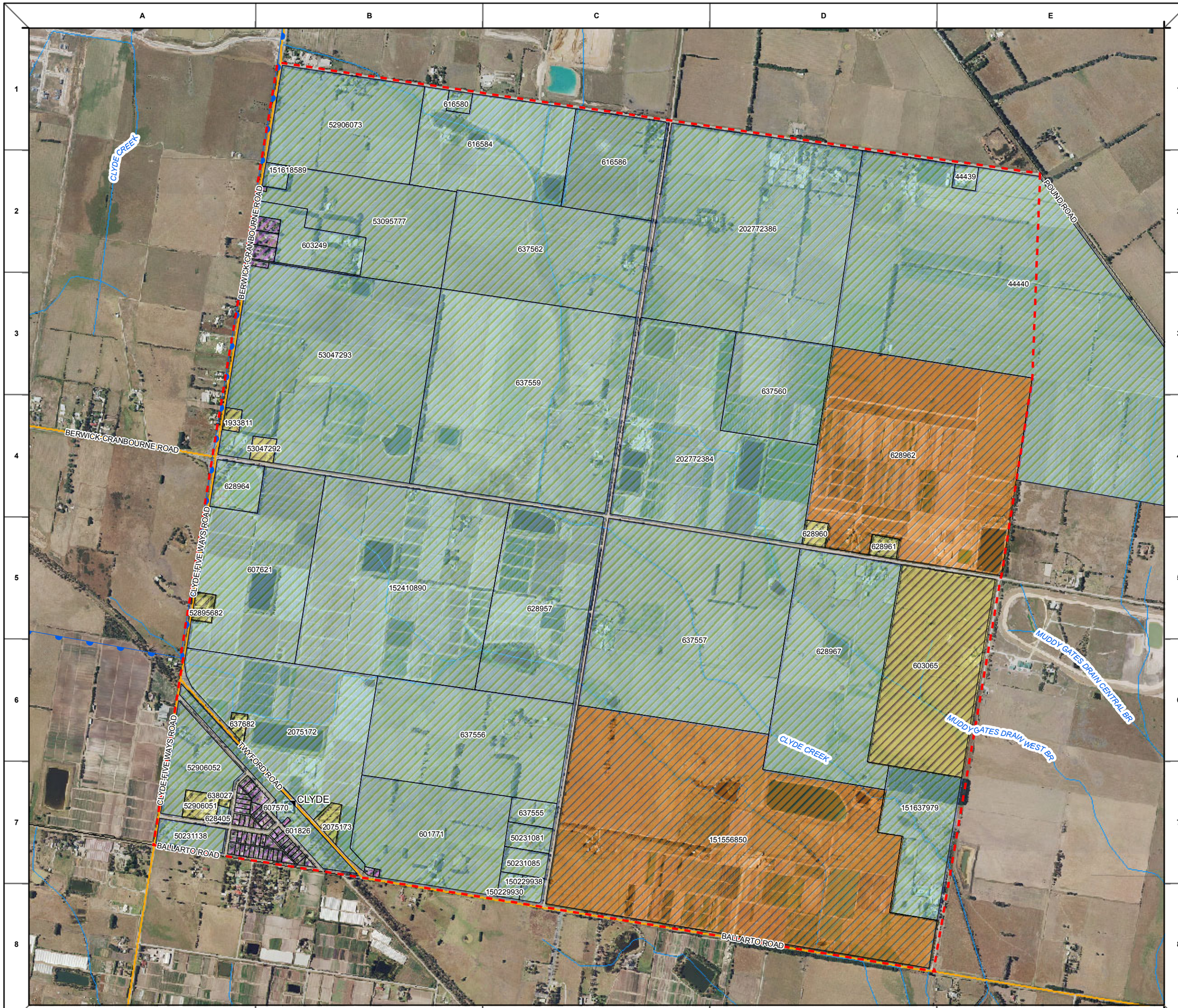
ecologypartners

FIGURE 1

2476_Fig01_Overveiw.mxd
Issue Date: 31/05/2011

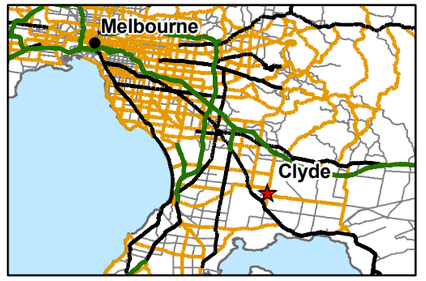


Legend

- Study Area
- Property Boundaries
- Urban Growth Boundary

Access Status

- Access Unattainable (42.19 ha)
- Surveyed (849.25 ha)
- Survey Not Required (Area under 0.14ha)
- Access Denied (116.6 ha)



Access Information
PSP 1054
Biodiversity Assessment Project 2010/11

GDA 1994; VicGrid 1994

0 150 300 600

Metres

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ecologypartners

FIGURE 2

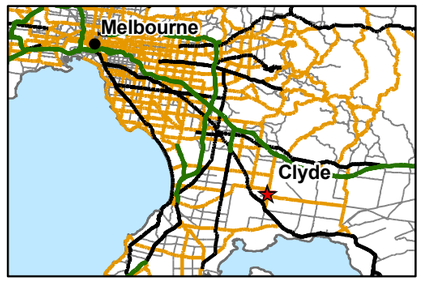
File Path: 2476_Fig02_AccessInfo.mxd
Issue Date: 30/05/2011

Legend

- Study Area
- Urban Growth Boundary
- Property Boundaries

Access Status

- Access Unattainable
- Survey Not Required (Area under 0.14ha)
- Access Denied
- Degraded Treeless Vegetation
- Non Native Vegetation
- 53, Swamp Scrub
- 55, Plains Grassy Woodland
- 83, Swampy RiparianWoodland
- 136, Sedge Wetland
- 175, Grassy Woodland
- 937, Swampy Woodland



Extent of Native Vegetation PSP 1054

Biodiversity Assessment Project 2010/11

GDA 1994; VicGrid 1994

0 150 300 600

Metres

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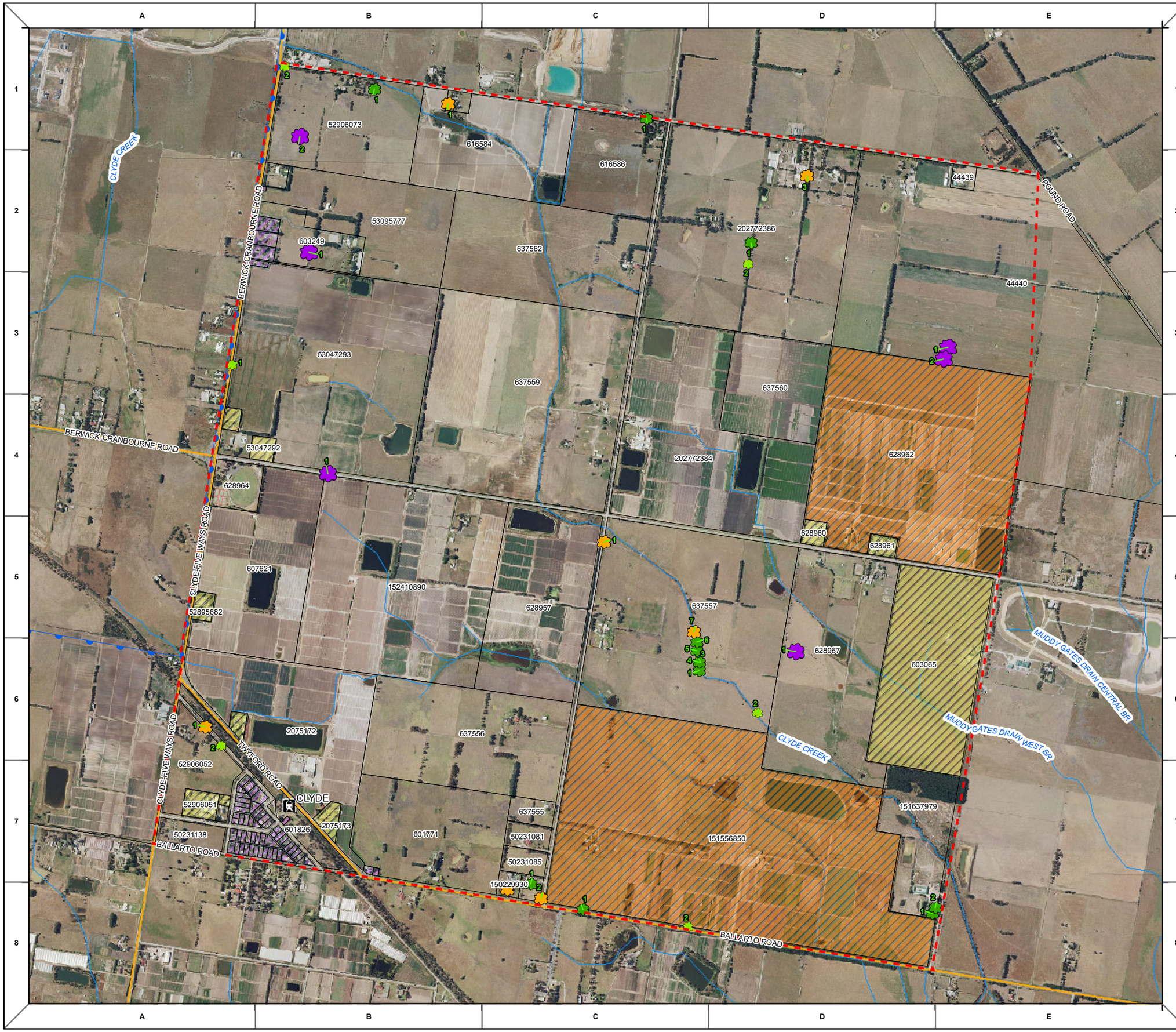
FIGURE 3

ecologypartners

2476_Fig03_Native_Vegetation.mxd
Issue Date: 31/05/2011



Legend

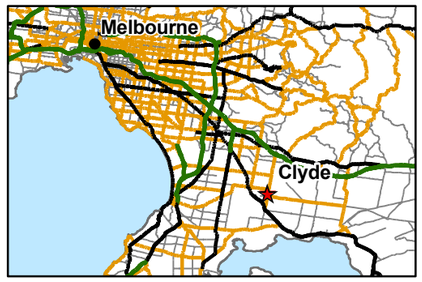
- Study Area
- Urban Growth Boundary
- Property Boundaries

Access Status

- Access Unattainable
- Survey Not Required (Area under 0.14ha)
- Access Denied

Scattered Tree Locations

- Very Large Old Tree
- Large Old Tree
- Medium Old Tree
- Small Tree



Location of Scattered Trees PSP 1054

Biodiversity Assessment Project 2010/11

GDA 1994; VicGrid 1994

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Metres

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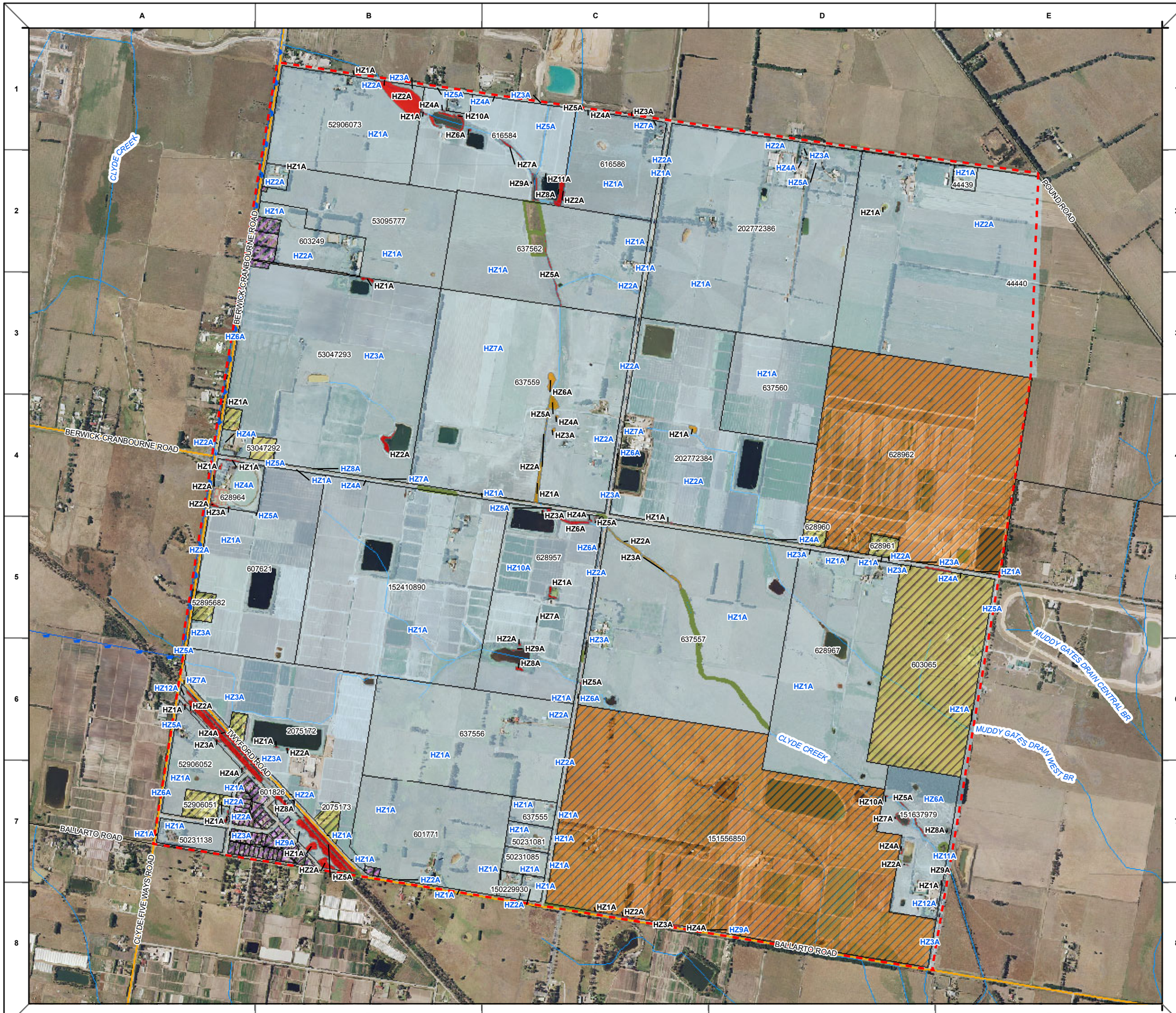
FIGURE 4

2476_Fig04_Scattered_Trees.mxd
Issue Date: 31/05/2011



Legend

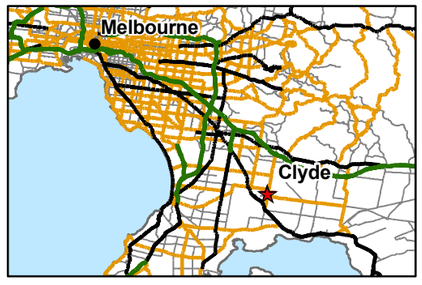
- Study Area
- Urban Growth Boundary
- Property Boundaries

Access Status

- Access Unattainable
- Survey Not Required (Area under 0.14ha)
- Access Denied
- Degraded Treeless Vegetation
- Non Native Vegetation

Conservation Significance

- High
- Medium



Conservation Significance of the Vegetation within the Study Area PSP 1054

Biodiversity Assessment Project 2010/11

GDA 1994; VicGrid 1994

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Metres

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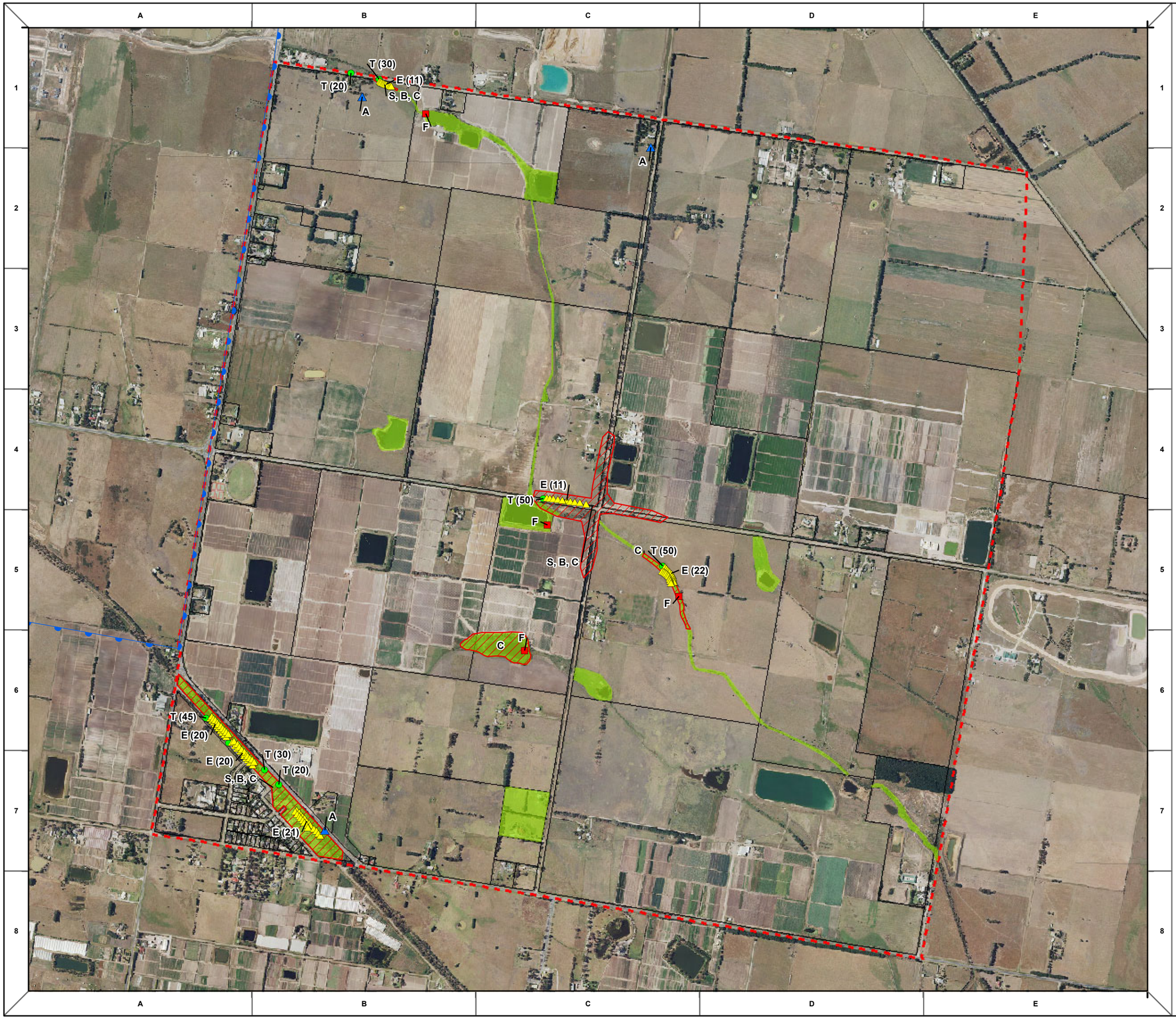
FIGURE 5

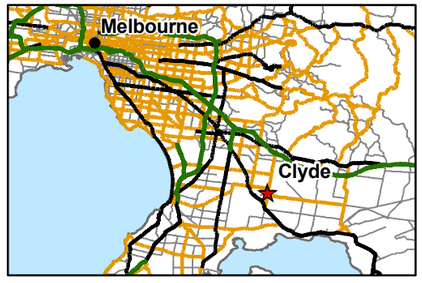
2476_Fig05_Cons_Sig.mxd
Issue Date: 31/05/2011



Legend

- Study Area
- Urban Growth Boundary
- Property Boundaries
- **Targeted Flora Surveys (Spring/Summer)**
- **Targeted Fauna Surveys (Spring/Summer)**
- E = Elliott Traps (100 Traps)
- T = Tile Grids (295 Tiles)
- F = Traps and Dip Netting
- A = Anabat Locations

S=Spotlighting
B=Bird Transects
C=Call Playback and Spotlighting



Location of Targeted Surveys within the Study Area
PSP 1054
Biodiversity Assessment Project 2010/11

GDA 1994; VicGrid 1994

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Metres

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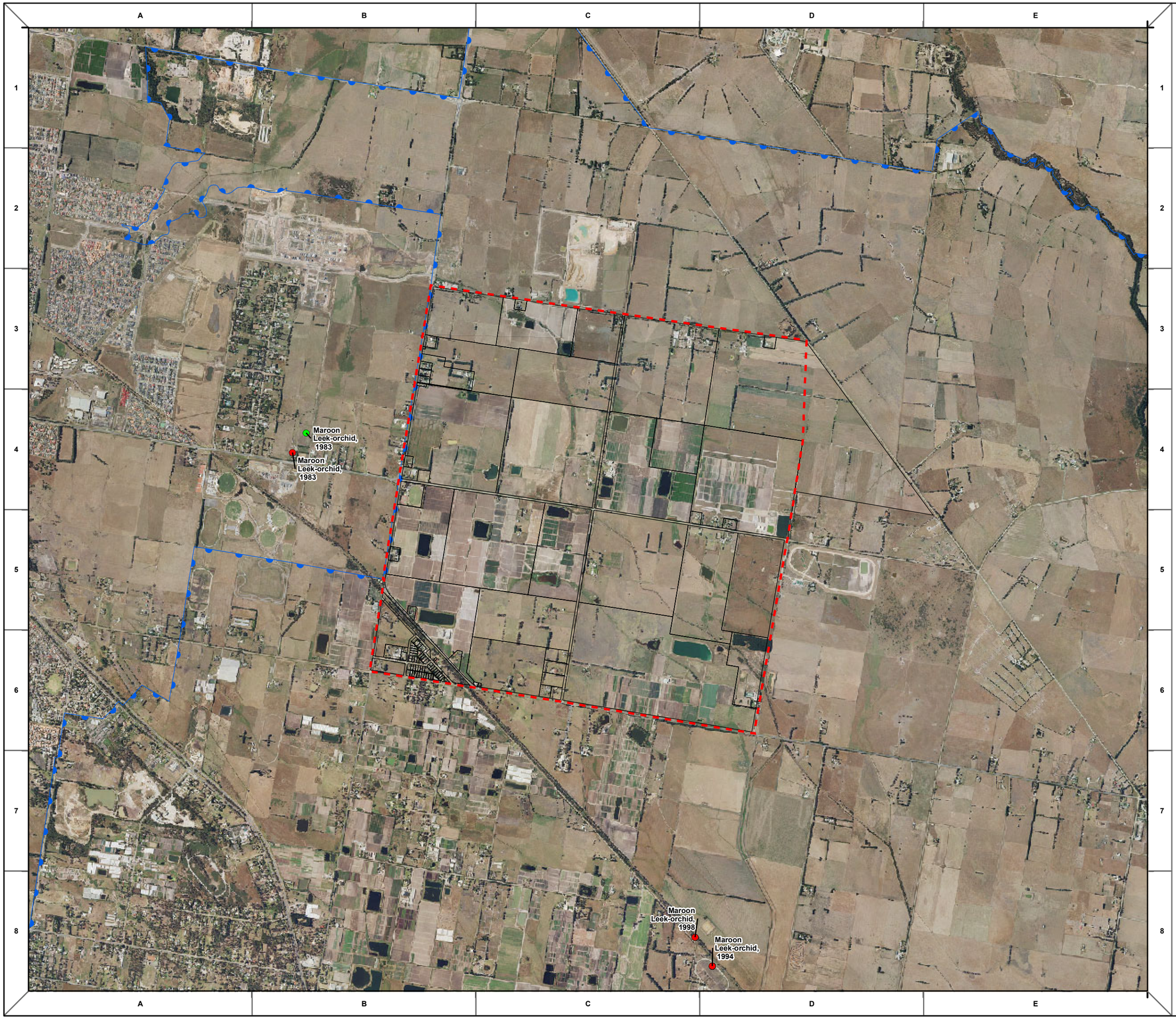
FIGURE 6

2476_Fig06_Targeted_Surveys.mxd
Issue Date: 31/05/2011



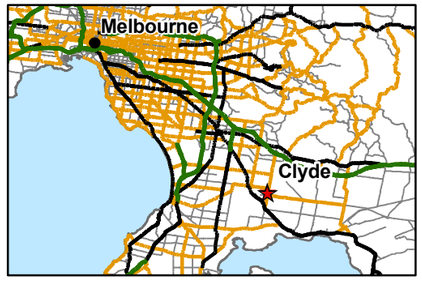
Legend

- Urban Growth Boundary
- Study Area
- Property Boundaries

Database Flora Records

- Nationally Listed Species
- State Listed Species
- Victorian Biodiversity Atlas Flora Records

Note: The locations of significant flora species are based on data available from DSEs AVW and FIS databases and Victorian Biodiversity Atlas (VBA 2010), the current field investigations and other sources. It is possible that additional fauna species of conservation significance have been recorded within the local area but are not shown.



Threatened Flora Records within and Near the Vicinity of the Study Area PSP 1054

Biodiversity Assessment Project 2010/11

GDA 1994; VicGrid 1994

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Metres

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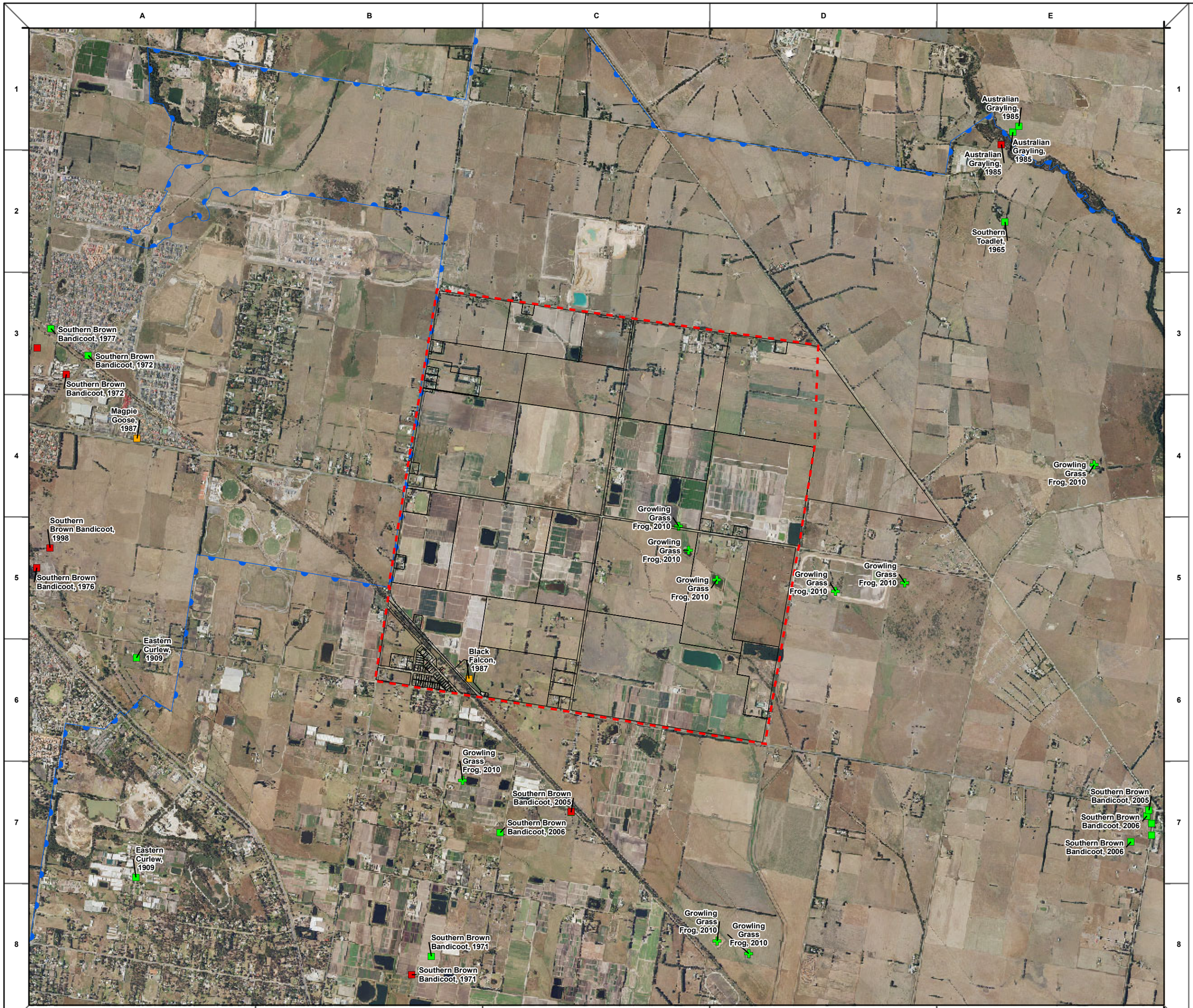
ecologypartners

FIGURE 7

2476_Fig07_Flora.mxd
Issue Date: 31/05/2011



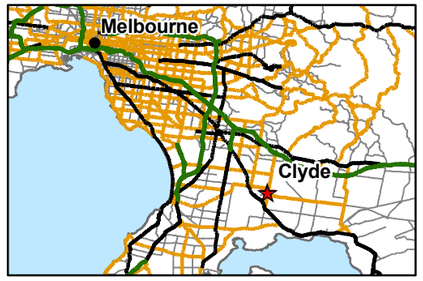
Legend

- Urban Growth Boundary
- Study Area
- Property Boundaries

Database Fauna Records

- Nationally Listed Species
- State Listed Species
- Victorian Biodiversity Atlas Fauna Records
- DSE Unverified Fauna Records

Note: Database fauna records include the Aquatic Fauna Database (AFD) and Atlas of Victorian Wildlife(AVW). The locations of significant fauna species are based on data available from DSEs AVW database and Victorian Biodiversity Atlas (VBA 2010), the current field investigations and other sources. It is possible that additional fauna species of conservation significance have been recorded within the local area but are not shown



Threatened Flora Records within and Near the Vicinity of the Study Area PSP 1054

Biodiversity Assessment Project 2010/11

GDA 1994; VicGrid 1994

0 250 500 1,000

Metres

1:30,000 when printed @ A3

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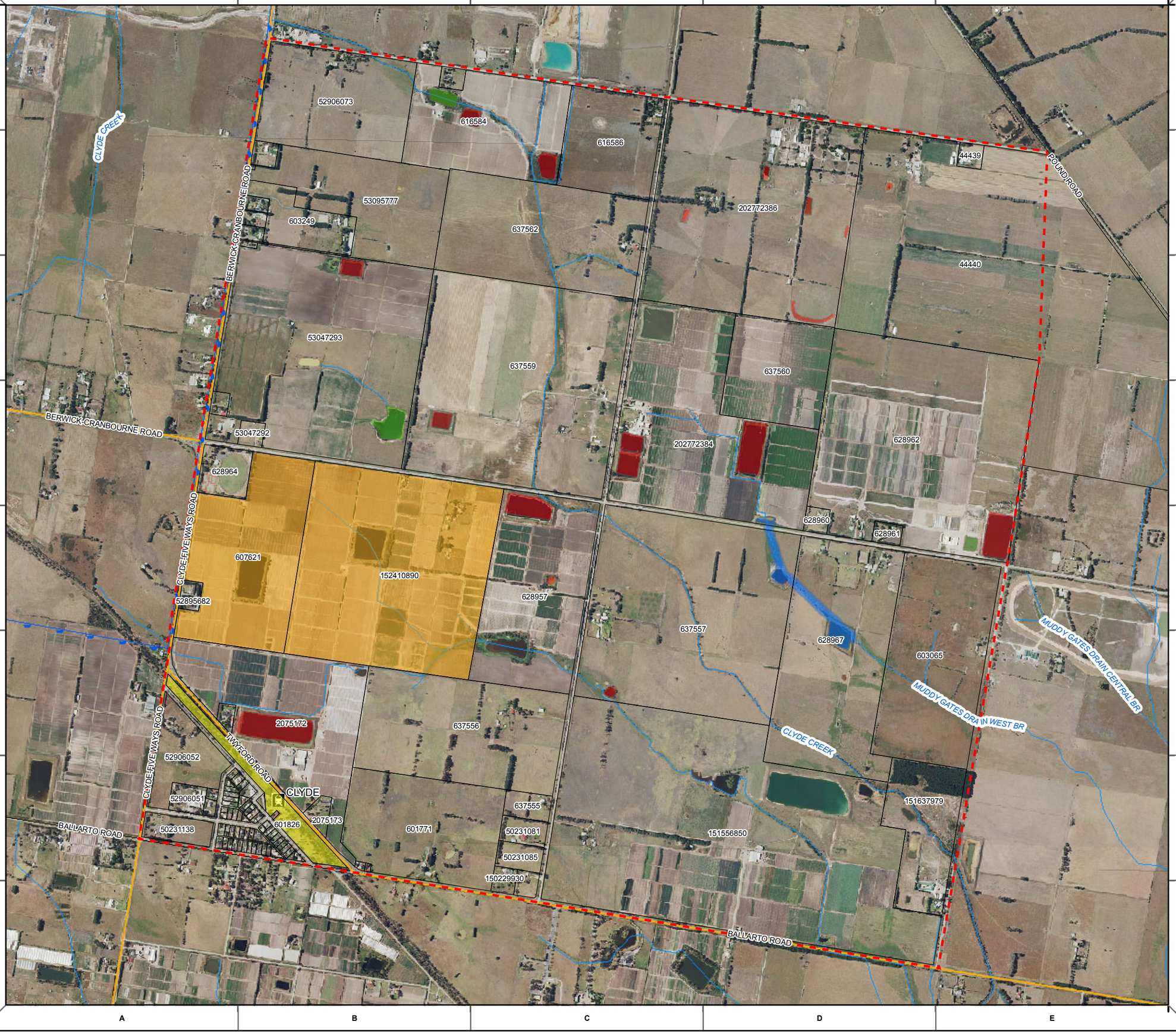
FIGURE 8

2476_Fig08_Fauna.mxd
Issue Date: 31/05/2011

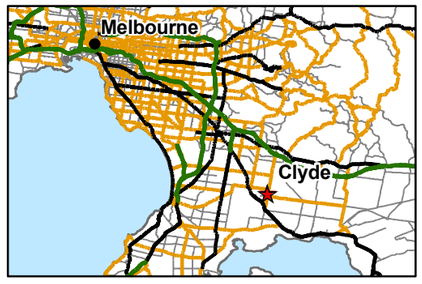


Legend

- Urban Growth Boundary
- Study Area
- Property Boundaries

Potential Habitat

- Known Growling Grass Frog Habitat
- Low Quality Growling Grass Frog Habitat
- Low Quality Habitat for Royal Spoonbill, Eastern Great Egret and Blue-billed Duck
- Low Quality Southern Brown Bandicoot Habitat
- Moderate Quality Growling Grass Frog Habitat



Potential Fauna Habitat
PSP 1054

Biodiversity Assessment Project 2010/11

GDA 1994; VicGrid 1994

0 125 250 500

Metres

1:15,000 when printed @ A3

ecologypartners

FIGURE 9

2476_Fig09_Potential_Habitat.mxd
Issue Date: 31/05/2011

APPENDICES

Appendix 1 – Significance Assessment

Criteria used by Ecology 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, FIS)
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, Rare or Lower Risk (near threatened, conservation dependent or least concern) under National Action Plans for terrestrial taxon prepared for the Department of Sustainability, Environment, Water, Population and Communities: threatened marsupials and monotremes (Maxwell *et al.* 1996), bats (Duncan *et al.* 1999), birds (Garnett and Crowley 2000), reptiles (Cogger *et al.* 1993), and amphibians (Tyler 1997).
	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 2007a).
	Listed as Data Deficient, Insufficiently Known or Near-threatened under National Action Plans for terrestrial species prepared for the Department of Sustainability, Environment, Water, Population and Communities: threatened marsupials and monotremes (Maxwell *et al.* 1996), bats (Duncan *et al.* 1999), birds (Garnett and Crowley 2000), reptiles (Cogger *et. al.* 1993), and amphibians (Tyler 1997).

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 (DSE Website) 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 Gippsland Plain bioregion.
	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* – 2007a (DSE 2007a).
Communities	Ecological vegetation class listed as depleted or least concern in a Native Vegetation Plan for a particular bioregion (DSE Website) 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: Gippsland Plain 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 Department of Sustainability, Environment, Water, Population and Communities. - 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, 2007), 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%) 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 Ecological Vegetation Class, 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.

Life form	Scientific name	Common name	Conservation Status			
			EPBC	DSE	FFG	Regional
Tree	**Allocasuarinaceae**					
	Allocasuarina sp.	She oak				
	Mimosaceae					
	Acacia mearnsii	Black wattle				
	Acacia melanoxylon	Blackwood				
	Myrtaceae					
	Eucalyptus camaldulensis	River Red Gum				✓
	Eucalyptus ovata	Swamp Gum				
	Eucalyptus radiata	Narrow-leaf Peppermint				
	Eucalyptus viminalis subsp. *pryoriana*	Coast Manna-gum				
	Santalaceae					
	Exocarpus cupressiformis	Cherry Ballart				
Shrub	**Mimosaceae**					
	Acacia paradoxa	Hedge Wattle				
	Myrtaceae					
	Leptospermum continentale	Prickly Tea-tree				
	Leptospermum myrsinoides	Silky Tea-tree				
	Melaleuca ericafolia	Swamp Paperbark				
	Violaceae					
	Melicytus dentatus	Tree Violet				✓
Herb / Forb	**Asteraceae**					
	Cotula coronopifolia	Water Buttons				✓
	Convolvulaceae					
	Dichondra repens	Kidney Weed				
	Lythraceae					
	Lythrym hyssopifolia	Small Loosestrife				✓
	Oxalidaceae					
	Oxalis perennans	Grassland Wood-sorrell				✓
	Polygonaceae					
	Persecaria decipiens	Slender Knotweed				✓
	Rosaceae					
	Acaena novae-zelandiae	Bidgee Widgee				
	Thymelaeaceae					
	Pimelea humilis	Common Rice-flower				
Graminoid (grass-like plant)	**Liliaceae**					
	Arthropodium strictum	Chocolate Lily				
	Dianella admixta	Black-anther Flax-lily				✓
	Poaceae					
	Austrodanthonia spp.	Wallaby Grass				
	Austrostipa spp.	Spear Grass				
	Distichlis distichophylla	Australian Salt-grass				
	Themeda triandra	Kangaroo Grass				
	Typhaceae					
	Typha orientalis	Cumbungi				
	Xanthorrhoeaceae					

	Lomandra longifolia	Spiny-headed Mat-rush				
Rushes/ Sedges	**Cyperaceae**					
	Eleocharis acuta	Common Spike-sedge				✓
	Schoenus spp.	Bog Sedge				
	Juncaceae					
	Juncus pallidus	Pale Rush				
	Poaceae					
	Phragmites australis	Common Reed				
Ferns	**Azollaceae**					
	Azolla filiculoides	Pacific Azolla				
	Dennstaedtiaceae					
	Pteridium esculentum	Austral Bracken				

Table A2.1.2. Exotic flora recorded during the present survey (.

Life form	Scientific name	Common name	Listed Status		
NON-INDIGENOUS NATIVE SPECIES			**EPBC**	**DSE**	**FFG**
Shrub	**Mimosaceae**				
	Acacia baileyana	Cootamundra Wattle			
	Myrtaceae				
	Corymbia maculata	Spotted Gum		v	
	Melaleuca armillaris	Giant Honey-myrtle		r	
	Pittosporaceae				
	Pittosporum undulatum	Sweet Pittosporum			
EXOTIC SPECIES			**CALP ACT LISTED WEEDS**		
Tree	**Agavaceae**				
	Pinus radiata	Radiata Pine			
	Anacardiaceae				
	Schinus molle	Peppercorn Tree			
	Cupressaceae				
	Cupressus macrocarpa	Monterey Cypress			
	Fagaceae				
	Quercus robur	English Oak			
	Rosaceae				
	Prunus armeniaca	Apricot			
	Salicaceae				
	Populus spp.	Poplar			
	Salix babylonica	Weeping Willow			
Shrub	**Fabaceae**				
	Genista linifolia	Flax-leaf Broom	✓		
	Genista monspessulana	Montpellier Broom	✓		
	Genista spp.	Broom			
	Rosaceae				
	Crataegus monogyna	Hawthorn	✓		
	Rhaphiolepis indica	Indian Hawthorn			
	Rosa rubiginosa	Sweet briar	✓		
	Rubus fruticosus sp. agg.	Blackberry	✓		
	Rubiaceae				
	Coprosma repens	Mirror Bush			
	Solanaceae				
	Lycium ferrocissimum	African Boxthorn	✓		
	Solanum nigrum sensu Willis (1972)	Black Nightshade			
Herb/Forb	**Apiaceae**				
	Daucus carota	Carrot			
	Alliaceae				
	Allium triquetrum	Three-cornered Garlic	✓		
	Asteraceae				
	Arctotheca calendula	Cape Weed			
	Cirsium vulgare	Spear Thistle	✓		
	Hypochaeris radicata	Cat's ear			
	Silybum marianum	Variegated Thistle	✓		
	Sonchus oleraceus	Sow thistle			
	Brassicaceae				
	Brassica fruticulosa	Twiggy Turnip			

	Cardamine flexuosa	Wood Bitter-cress	
	Carophyllaceae		
	Cerastium glomeratum	Common Mouse-ear Chickweed	
	Fabaceae		
	Lotus angustissimus	Slender Birds-foot Trefoil	
	Lotus subbiflorus	Hairy Birds-foot Trefoil	
	Medicago arabica	Spotted Medic	
	Trifolium fragiferum var. *fragiferum*	Stawberry Clover	
	Trifolium repens var. *repens*	White Clover	
	Vicia hirsuta	Tiny Vetch	
	Vicia sativa	Common Vetch	
	Fumariaceae		
	Fumaria bastardii	Bastard's Fumitory	
	Geraniaceae		
	Erodium cicutarium	Common Heron's-bill	
	Geranium dissectum	Cut-leaf Geranium	
	Iridaceae		
	Freesia alba	White Freesia	
	Sisyrinchium iridifolium	Striped Rush-leaf	
	Malvaceae		
	Modiola caroliniana	Red-flowered Mallow	
	Malva nicaeensis	Mallow of Nice	
	Oxalidaceae		
	Oxalis pes-caprae	Soursob	
	Oxalis purpurea	Large-flower Wood-sorrel	
	Plantaginaceae		
	Plantago lanceolata	Ribwort	
	Polygonaceae		
	Acetosella vulgaris	Sheep sorrel	
	Rumex crispus	Curled dock	
	Primulaceae		
	Anagallis arvensis	Scarlet Pimpernel	
	Rubiaceae		
	Galium aparine	Cleavers	
	Urticaceae		
	Urtica dioica	Common Nettle	
Graminoid (Grass-like plant)	**Iridaceae**		
	Romulea rosea	Onion grass	
	Watsonia meriana var. *bulbilifera*	Bulbil Watsonia	
	Liliaceae		
	Agapanthus praecox subsp. *orientalis*	Agapanthus	
	Poaceae		
	Aira caryophylla	Silvery Hairgrass	
	Agrostis capillaris	Brown-top Bent	
	Alopercurus pratensis	Meadow Fox-tail	
	Anthoxanthum odoratum	Sweet Vernal-grass	
	Avena fatua	Wild oat	
	Briza maxima	Large Quaking-grass	
	Briza minor	Lesser Quaking Grass	
	Bromus catharticus	Prairie Grass	
	Bromus diandrus	Great Brome	
	Bromus hordeaceus subsp. *hordeaceus*	Soft brome	

	Capsella bursa-pastoris	Shepard's Purse	
	Cortaderia selloana	Pampas-grass	
	Cynodon dactylon	Couch	
	Dactylis glomerata	Cocksfoot	
	Ehrharta erecta	Panic Veldt-grass	
	Ehrharta longiflora	Annual Veldt-grass	
	Gaudinia fragilis	Fragile Oat	
	Festuca arundinaceae	Tall Fescue	
	Holcus lanatus	Yorkshire fog	
	Hordeum lvulgare	Barley grass	
	Lolium perenne	Perennial Rye Grass	
	Paspalum dilatatum	Paspalum	
	Pennisetum clandestinum	Kikuyu	
	Phalaris aquatica	Toowoomba Canary grass	
	Poa annua	Annual Meadow-grass	
	Polypogon viridus	Water Bent	
	Sporobolous africanus	Rat-tail Grass	
	Stenotaphrum secumdatum	Buffalo Grass	
	Triticum aestivum	Wheat	
Climber/ Creeper	**Araliaceae**		
	Hedera helix	English Ivy	
	Asparagaceae		
	Asparagus asparagoides	Bridal Creeper	✓
	Cucurbitaceae		
	Cucumis myriocarpus subsp. *leptodermis*	Paddy Melon	
Rush/ Sedge	**Cyperaceae**		
	Cyperus eragrostis	Drain Flat-sedge	

Appendix 2.2 – Flora database results

Table A2.2. *Significant flora within 10 kilometres of the precinct.*

Source: Flora Information System

Sources used to determine species status:
EPBC *Environment Protection and biodiversity Conservation Act 1999* (Commonwealth)
DSE Advisory List of Threatened Flora in Victoria (DSE 2005c)
FFG *Flora and Fauna Guarantee Act 1988* (Victoria)

National status of species is designated by:
EX Extinct
CE Critically Endangered
EN Endangered
VU Vulnerable
K Poorly Known
EPBC Act Protected Matters Search Tool.

State status of species is designated by:
e Endangered
v Vulnerable
r Rare
k Poorly Known
L Listed under the FFG Act

Lifeform	Scientific Name	Common Name	Total number of documented records (FIS)	EPBC	VROTS	FFG	Detected During Current Survey	Likely occurrence within the precinct and reasoning for likelihood	Habitat Description
NATIONAL SIGNIFICANCE									
Graminoid	*# Amphibromus fluitans*	River Swamp Wallaby-grass	9	VU	-	-	-	Moderate. Habitat present within farm dam with Sedge Wetland vegetation on property 50231081	Permanent wetlands, swamps and dams

Herb/Forb	# *Caladenia fragrantissima* subsp. *orientalis*	Cream Spider-orchid	-	EN	e	L	-	Unlikely. No habitat within precinct or in near vicinity of precinct. Prefers coastal habitats.	Coastal heath and heathlands
Graminoid	# *Dianella amoena*	Matted Flax-lily	-	EN	e	L	-	Low . Potential habitat along rail line, however is highly modified, and weren't found during targeted surveys.	Lowland grasslands and grassy woodlands
Tree	*Eucalyptus crenulata*	Buxton Gum	1	EN	e	L	-	Unlikely. No habitat within the precinct or near vicinity.	Deep, wetter loams, floodplain areas in open forests
Herb/Forb	# *Prasophyllum frenchii*	Maroon Leek-orchid	5	EN	e	L	-	Unlikely. No habitat within the precinct.	In or around coastal swamps
Herb/Forb	# *Thelymitra epipactoides*	Metallic Sun-orchid	1	EN	e	L	-	Unlikely. Rail line is potential habitat, but in highly modified condition and unlikely to support any orchids.	Mainly coastal in fertile loams; scrubby heath or swampy areas
Herb/Forb	# *Xerochrysum palustre*	Swamp Everlasting	2	VU	v	L	-	Low. Habitat fringing farm dams and drainage lines degraded.	Swamps and wetlands in lowland areas
Herb/Forb	*Senecio psilocarpus*	Swamp Fireweed	1	VU	v	-	-	Unlikely. No habitat. Prefers high quality grassland plain areas.	Swampy or peaty lowland areas
				STATE SIGNIFICANCE					
Shrub	*Acacia howittii*	Sticky Wattle	1	-	r	-	-	Unlikely No habitat within the precinct.	Moist forest south-east Vic
Shrub	*Atriplex paludosa subsp. paludosa*	Marsh Saltbush	20	-	r	-	-	Unlikely No habitat within the precinct.	Coastal areas, saltmarsh
Graminoid	*Austrostipa rudis* subsp. *australis*	Veined Spear-grass	4	-	r	-	-	Moderate. Potential habitat present, species has not been recorded within precinct.	Open forest on sandy or sandstone derived soils

Shrub	*Avicennia marina* subsp. *australasica*	Grey Mangrove	11	-	r	-	-	Unlikely No Habitat within the precinct.	Intertidal mudflats, saltmarshes
Herb/Forb	*Caladenia aurantiaca*	Orange-tip Finger-orchid	2	-	r	-	-	Unlikely. No habitat within precinct. Potential habitat may exist in rail reserve, however species has not been recorded.	Damp coastal to near-coastal heath or open woodlands
Herb/Forb	*Caladenia oenochila*	Wine-lipped Spider-orchid	1	-	v	-	-	Unlikely. No habitat within precinct, rail reserve unlikely to support this species due to modification.	Moist open grassy forest or woodland in shaded areas
Shrub	*Cardamine tenuifolia*	Slender Bitter-cress	1	-	k	-	-	Unlikely. Degraded habitat adjacent drainage lines is heavily grazed, unlikely to be present.	Swamps and stream/riparian zones
Graminoid	*Carex alsophila*	Forest Sedge	2	-	r	-	-	Unlikely. No habitat within precinct.	Mountain gullies and swamps
Shrub	*Correa reflexa* var. *lobata*	Powelltown Correa	1	-	r	-	-	Low. No Heathy Woodland present within precinct, rail line too modified to support large diversity of species.	Heathy Woodland in high rainfall areas
Herb/Forb	*Corybas aconitiflorus*	Spurred Helmet-orchid	1	-	r	-	-	Unlikely. No habitat within precinct.	Colonies in sheltered positions, in damp sand under ferns or shrubs
Herb/Forb	*Craspedia canens*	Grey Billy-buttons	7	-	e	L	-	Low. Habitat along drainage lines and farm dams degraded.	Wetlands and swampy grasslands
Herb/Forb	*Diuris punctata* var. *punctata*	Purple Diuris	10	-	v	L	-	Unlikely. No habitat within the precinct. Rail line is most likely too modified to support species such as this.	Grassy woodlands and grasslands
Graminoid	*Eleocharis macbarronii*	Grey Spike-sedge	2	-	k	-	-	Low. Potential habitat along drainage lines, however species has not been previously recorded.	Drainage lines of heavy clay soils, often inundated

Graminoid	*Entolasia stricta*	Upright Panic	1	-	k	-	-	Unlikely. No habitat within precinct, rail reserve unlikely to support this species due to modification.	Scrub in dry areas on sandy or sandstone-derived soils
Tree	*Eucalyptus fulgens*	Green Scentbark	6	-	r	-	-	Low. This species is generally restricted to areas above Princes Freeway, but recorded during assessment	Grassy woodland in south-east Vic
Tree	*Eucalyptus yarraensis*	Yarra Gum	1	-	r	-	-	Low. Habitat within precinct but not recorded during assessment.	Moist woodland, southern Vic.
Herb/Forb	*Geranium solanderi* var. *solanderi* s.s.	Austral Crane's-bill	2	-	v	-	-	Low. Woodland vegetation within rail reserve highly degraded. No other suitable habitat within precinct.	Grassland and Grassy Woodlands
Herb/Forb	*Helichrysum* aff. *rutidolepis* (Lowland Swamps)	Pale Swamp Everlasting	4	-	v	-	-	Low. Potential habitat along drainage lines, however these are degraded, and species has not been previously recorded.	Moist areas of open forest and woodland
Graminoid	*Juncus revolutus*	Creeping Rush	3	-	r	-	-	Unlikely. No habitat within precinct or near vicinity.	Saline habitats such as saltmarsh
Graminoid	*Lachnagrostis perennis* spp. *agg.*	Perennial Blown-grass	2	-	k	-	-	Unlikely. No habitat within precinct.	Moist areas of open forest and woodland
Graminoid	*Lachnagrostis punicea* subsp. *filifolia*	Purple Blown-grass	6	-	r	L	-	Low. Potential habitat along drainage lines, however habitat is highly degraded and species has not been previously recorded.	Wetlands, dams and grassy swamp areas
Herb/Forb	*Lawrencia spicata*	Salt Lawrencia	2	-	r	-	-	Unlikely. No habitat within precinct.	Edges of coastal saltmarshes
Herb/Forb	*Limonium australe*	Yellow Sea-lavender	11	-	r	-	-	Unlikely. No habitat within precinct.	Coastal saltmarshes
Herb/Forb	*Microseris scapigera* s.s.	Plains Yam-daisy	3	-	v	-	-	Unlikely. No grassland habitat within precinct.	Grasslands on basalt plains

Herb/Forb	*Pterostylis grandiflora*	Cobra Greenhood	1	-	r	-	-	Unlikely. No Habitat	Moist, shady slopes in sclerophyll forest
Herb/Forb	*Pterostylis X ingens*	Sharp Greenhood	1	-	r	-	-	Unlikely No Habitat. Prefers shady spaces in sclerophyll forests	Moist areas in open forest
Graminoid	*Sparganium subglobosum*	Floating Burr-weed	1	-	k	-	-	Unlikely. No habitat within precinct or near vicinity.	Freshwater pools, lakes or streams
Shrub	*Tetratheca stenocarpa*	Long Pink-bells	1	-	r	-	-	Unlikely. No habitat, species prefers shrubby forest, more typical of central Victorian uplands.	Damp forests and woodlands, often in modified habitats
Graminoid	*Thelionema umbellatum*	Clustered Lily	2	-	r	-	-	Unlikely. Woodland within rail reserve too degraded.	Sandy soils of heathy woodlands, often poorly drained
Herb/Forb	*Thelymitra circumsepta*	Naked Sun-orchid	5	-	v	-	-	Unlikely. No habitat within precinct.	Mountainous areas with high rainfall and in wet areas on flatter ground
Herb/Forb	*Thelymitra X irregularis*	Crested Sun-orchid	1	-	r	-	-	Unlikely. No habitat within precinct.	Heathland and Heathy Forest
Herb/Forb	*Thryptomene calycina*	Grampians Thryptomene	1	-	r	-	-	Unlikely. No Habitat within precinct.	Low nutrient, sandy or gravelly soils often in rocky area in heathy woodland vegetation

Source: DSE Flora Information System (FIS 2009); DSEWPC Protected Matters Search Tool (DSEWPC 2011); Flora of Victoria Vol.4 (Walsh, N.G. and Entwisle, T.J. 1999); Flora of Victoria Vol.3 (Walsh, N.G. and Entwisle, T.J. 1996); and, Flora of Victoria Vol.2 (Walsh, N.G. and Entwisle, T.J. 1994)

Appendix 3.1 – Fauna results

Table A3.1.1. Native fauna species recorded during the present surveys.

Type of Record:
H – Heard
S – Seen
I – Incidental (identified from feathers, bones or scats, etc)
MI/MA – Migratory or Marine species under the commonwealth EPBC Act

Scientific name	Common name	Conservation Status				
		EPBC	DSE	FFG	Regional	Type of Record
BIRDS						
Tachybaptus novaehollandiae	Australasian Grebe	–	–	–	–	S
Poliocephalus poliocephalus	Hoary-headed Grebe	–	–	–	–	S
Microcarbo melanoleucos	Little Pied Cormorant	–	–	–	–	S
Elseyornis melanops	Black-fronted Dotterel	–	–	–	–	S
Threskiornis molucca	Australian White Ibis	–	–	–	–	S
Threskiornis spinicollis	Straw-necked Ibis	–	–	–	–	S
Ardea ibis	Cattle Egret	–	–	–	–	S
Cygnus atratus	Black Swan	–	–	–	–	S
Phaps chalcoptera	Common Bronzewing	–	–	–	–	S
Ocyphaps lophotes	Crested Pigeon	–	–	–	–	S
Gallinula tenebrosa	Dusky Moorhen	–	–	–	–	S
Anas castanea	Chesnut Teal	–	–	–	–	S
Vanellus miles	Masked Lapwing	–	–	–	–	S
Fulica atra	Eurasian Coot	–	–	–	–	S
Chroicocephalus novaehollandiae	Silver Gull	–	–	–	–	S
Egretta novaehollandiae	White-faced Heron	–	–	–	–	S
Ardea pacifica	White-necked Heron	–	–	–	–	S
Chenonetta jubata	Australian Wood Duck	–	–	–	–	S
Anas superciliosa	Pacific Black Duck	–	–	–	–	S
Circus approximans	Swamp Harrier	–	–	–	–	S
Psephotus haematonotus	Red-rumped Parrot	–	–	–	–	S
Dacelo novaeguineae	Laughing Kookaburra	–	–	–	–	S
Coracina novaehollandiae	Black-faced Cuckoo-shrike	–	–	–	–	S
Cracticus torquatus	Grey Butcherbird	–	–	–	–	S
Epthianura albifrons	White-fronted Chat	–	–	–	–	S
Acanthiza lineata	Striated Thornbill	–	–	–	–	S
Sericornis frontalis	White-browed Scrubwren	–	–	–	–	S
Strepera graculina	Pied Currawong	–	–	–	–	S
Rhipidura albiscarpa	Grey Fantail	–	–	–	–	S

Colluricincla harmonica	Grey Shrike-thrush	–	–	–	–	S
Malurus cyaneus	Superb Fairy-wren	–	–	–	–	S
Zosterops lateralis	Silvereye	–	–	–	–	S
Neochmia temporalis	Red-browed Finch	–	–	–	–	S
Cacatua sanguinea	Little Corella	–	–	–	–	S
Anthus novaeseelandiae	Australasian Pipit	–	–	–	–	S
Trichoglossus haematodus	Rainbow Lorikeet	–	–	–	–	H
Calyptorhynchus funereus	Yellow-tailed Black Cockatoo	–	–	–	–	S
Cacatua galerita	Sulphur-crested Cockatoo	–	–	–	–	S
Eolophus roseicapilla	Galah	–	–	–	–	S
Corvus mellori	Little Raven	–	–	–	–	S
Elanus axillaris	Black-shouldered Kite	–	–	–	–	S
Aquila audax	Wedge-tailed Eagle	–	–	–	–	S
Platycercus elegans elegans	Crimson Rosella	–	–	–	–	S
Platycercus eximius	Eastern Rosella	–	–	–	–	S
Hirundo neoxena	Welcome Swallow	–	–	–	–	S
Rhipidura leucophrys	Willie Wagtail	–	–	–	–	S
Grallina cyanoleuca	Magpie-lark	–	–	–	–	S
Acanthiza pusilla	Brown Thornbill	–	–	–	–	S
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	–	–	–	–	S
Manorina melanocephala	Noisy Miner	–	–	–	–	S
Anthochaera chrysoptera	Little Wattlebird	–	–	–	–	S
Phylidonyris novaehollandiae	New-holland Honeyeater	–	–	–	–	S
Lichenostomus penicillatus	White-plumed Honeyeater	–	–	–	–	S
Anthochaera carunculata	Red Wattlebird	–	–	–	–	S
Gymnorhina tibicen	Australian Magpie	–	–	–	–	S
MAMMALS						
Rattus lutreolus	Swamp Rat	–	–	–	–	S
Trichosurus vulpecula	Common Brushtail Possum	–	–	–	–	I
Pseudocheirus peregrinus	Common Ringtail Possum	–	–	–	–	I
REPTILES						
Lampropholis guichenoti	Garden Skink	–	–	–	–	S
AMPHIBIANS						
Crinia signifera	Common Froglet	–	–	–	–	H
Limnodynastes dumerilii dumerilii	Southern Banjo Frog	–	–	–	–	H
Limnodynastes peronii	Striped Marsh Frog					H
Limnodynastes tasmaniensis	Spotted Marsh Frog	–	–	–	–	H
Litoria ewingi	Southern Brown Tree Frog					H
Liroria vereaxii vereauxii	Whistling Tree Frog					H
FISHES						
Galaxias maculatus	Common Jollytail					S

Galaxias olidus	Mountain Galaxias					S
Anguila australis	Short-finned Eel					S

Source: DSE Victorian Biodiversity Atlas (2010)

Table A3.1.2. Introduced fauna species recorded during the present surveys.

Type of Record:
H – Heard
S – Seen
I – Incidental (identified from feathers, bones or scats, etc)

Scientific name	Common name	Type of Record
BIRDS		
Streptopelia chinensis	Spotted Turtle-Dove	S
Turdus merula	Common Blackbird	S
Columba livia	Feral Pigeon	S
Ocyphaps lophotes	Crested Pigeon	S
Alauda arvensis	European Skylark	S
Turdus philomelos	Song Thrush	S
Carduelis carduelis	European Goldfinch	S
Passer domesticus	House Sparrow	S
Acridotheres tristis	Common Myna	S
Sturnus vulgaris	Common Starling	S
MAMMALS		
Mus musculus	House Mouse	S
Rattus rattus	Black Rat	S
Felis catus	Cat	S
Oryctolagus cuniculus	European Rabbit	S
Vulpes vulpes	Red Fox	S

Appendix 3.2 – Significant fauna species

Table A3.2. Significant fauna within 10 kilometres of the precinct.

Sources used to determine species status:

EPBC *Environment Protection and biodiversity Conservation Act 1999* (Commonwealth)
DSE Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2007)
FFG *Flora and Fauna Guarantee Act 1988* (Victoria)

Species status:

EX Extinct
RX Regionally extinct
CR Critically endangered
EN Endangered
VU Vulnerable
RA Rare
NT Near threatened
L Listed as threatened under FFG Act
Protected Matters Search Tool (DSEWPC)

Common Name	Scientific Name	Last documented record	Total # of records	EPBC Act	DSE (2007)	FFG ACT	National Action Plan	Likely occurrence in precinct	Likelihood Reasoning	Habitat description
NATIONAL SIGNIFICANCE										
Australasian Bittern	*Botaurus poiciloptilus*	2008	9	-	EN	L	VU	Low	May forage within precinct on rare occasions	Large permanent waterbodies

# Swift Parrot	*Lathamus discolor*	1989	5	EN	EN	L	EN	Low	Opportunistically forage in flowering gums	Dry sclerophyll forest and woodland, suburban parks and flowering fruit trees.
# Regent Honeyeater	*Lichenostomus melanops cassidix*	-	-	EN	CR	L	EN	Low	Opportunistically forage in flowering gums	Forests and woodlands, particularly in blossoming trees and mistletoe
#New Holland Mouse	*Pseudomys novaehollandiae*	1976	3	VU	VU	L	-	Unlikely	No habitat	Heahtlands
Helmeted Honeyeater	*Lichenostomus melanops cassidix*	1932	5	EN	CR	L	CR	Low	Opportunistically forage in flowering gums	Dense riparian vegetation at dominated by Mountain Swamp Gum
#Orange-bellied Parrot	*Neophema chrysogaster*	-	-	CR	CR	L	CR	Unlikely	No habitat	Not Applicable
# Spot-tailed Quoll	*Dasyurus maculatus*	-	-	EN	EN	L	VU	Unlikely	No habitat	Not Applicable
# Southern Brown Bandicoot	*Isoodon obesulus obesulus*	2008	83	EN	NT	L	NT	Low to Moderate	May forage within potential habitat along Clyde Creek, Ballarto Road, Tuckers Road and the Dandenong - Leongatha rail reserve.	Varies from intact native vegetation to highly disturbed patches in agricultural or semi-urban areas dominated by exotic weed species

# Grey-headed Flying-fox	*Pteropus poliocephalus*	2003	1	VU	VU	L	VU	Low	May forage on flowering gums occasionally	Forests, rainforests, sclerophyll vegetation usually near water or in mangroves
# Growling Grass Frog	*Litoria raniformis*	2008	129	VU	EN	L	VU	Known	Known habitat present along drainage line withini property 628967 and 637557. Not recorded during current surveys	Permanent or semi-permanent waterways, wetlands and waterbodies
# Australian Grayling	*Prototroctes maraena*	1985	2	VU	VU	L	VU	Unlikely	Few records south east of Melbourne. No preferred habitat present	Fast flowing streams south east of Great Dviding Range
# Dwarf Galaxias	*Galaxiella pusilla*	2008	116	VU	VU	L	VU	Low	Potential habitat Clyde Creek and in drainage lines, however these are ephemeral and highly modified. Not previously recorded in current catchment.	Still-slow flowing waters with abundant macrophytes
# Golden Sun Moth	*Synemon plana*	1760	1	CR	CR	L	-	Unlikely	No habitat	Grasslands
# Australian Painted Snipe	*Rostratula australis*	-	-	VU	CR	L	VU	Low	Lack of previous records although may forage among large permanent waterbodies on rare occasions	Margins of large permanent waterbodies
# Long-nosed Potoroo	*Potorous tridactylus*	-	-	VU	EN	L	VU	Unlikely	No habitat	Heath, heathy woodland,a nd woodlands
Large Ant Blue	*Acrodipsas brisbanensis*	1941	1	-	EN	L	VU	Unlikely	Lack of previous records and presence of modified habitat within precinct	Native grasslands

# Smoky Mouse	*Pseudomys fumeus*	-	-	EN	CR	L	RA	Unlikely	No habitat	Heath
STATE SIGNIFICANCE										
Lewin's Rail	*Lewinia pectoralis*	1997	2	-	VU	L	NT	Unlikely	No habitat	Vegetated swamp; coastal Saltmarsh; swampy streams; tidal creeks
Baillon's Crake	*Porzana pusilla*	2003	6	-	VU	L	-	Low	May forage within precinct occasionally	Well vegetated, large permanent waterbodies
Royal Spoonbill	*Platalea regia*	2007	64	-	VU	-	-	Moderate to High	May forage within precinct occasionally	Large permanent waterbodies
Intermediate Egret	*Ardea intermedia*	1977	2	-	CR	L	-	Unlikely	Few records south east of Melbourne. No preferred habitat present	Grassy inland wetlands; flooded pasture or grasslands
Eastern Great Egret	*Ardea modesta*	2007	90	-	VU	L	-	Moderate to High	Has been previously recorded along Cardinia Creek, approximately 8kms from precinct	Large, permanent waterbodies and vegetated drainage lines (Clyde Creek)
Magpie Goose	*Anseranas semipalmata*	1994	2	-	NT	L	-	Unlikely	No habitat	Tropical species in reedbeds and flooded pasture
Australasian Shoveler	*Anas rhynchotis*	2005	27	-	VU	-	-	Low (vagrant visitor)	May opportunistically use large waterbodies or inundated areas within the precinct for foraging purposes	Large, permanent waterbodies

Freckled Duck	*Stictonetta naevosa*	2002	1	-	EN	L	-	Low (vagrant visitor)	May opportunistically use large waterbodies or inundated areas within the precinct for foraging purposes	Large, permanent waterbodies
Hardhead	*Aythya australis*	2005	48	-	VU	-	-	Moderate to high	May opportunistically use large waterbodies or inundated areas within the precinct for foraging purposes	Large, permanent waterbodies
Blue-billed Duck	*Oxyura australis*	2006	22	-	EN	L	-	Moderate to high	May opportunistically use large waterbodies or inundated areas within the precinct for foraging purposes	Large, permanent waterbodies
Musk Duck	*Biziura lobata*	1992	18	-	VU	-	-	Moderate to high	May opportunistically use large waterbodies or inundated areas within the precinct for foraging purposes	Large, permanent waterbodies
Little Bittern	*Ixobrychus minutus dubius*	2006	3	-	EN	-	-	Low	May forage within precinct on rare occasions	Large permanent waterbodies
Grey Goshawk	*Accipiter novaehollandiae*	1990	5	-	VU	L	-	Unlikely	Lack of preferred habitat throughout the precinct	Woodland areas
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	2008	9	-	VU	L	-	Low (vagrant visitor)	No habitat	Coastal islands, lakes, some inland rivers and lakes
Black Falcon	*Falco subniger*	2007	4	-	VU	-	-	Moderate (rare visitor)	May forage within precinct occasionally	All habitats are potential for foraging or roosting purposes

Black-tailed Godwit	*Limosa limosa*	1984	1	-	VU	-	-	Unlikely	Lack of preferred habitat throughout the precinct	Vegetated swamp; coastal saltmarshes; tidal mud flats
Whimbrel	*Numenius phaeopus*	1984	1	-	VU	-	-	Unlikely	Lack of preferred habitat throughout the precinct	Vegetated swamp; coastal saltmarshes; tidal mud flats
Common Sandpiper	*Actitis hypoleucos*	2000	36	-	VU	-	-	Unlikely	Lack of preferred habitat throughout the precinct	Vegetated swamp; coastal saltmarshes; tidal mud flats
Gull-billed Tern	*Gelochelidon nilotica macrotarsa*	1986	1	-	EN	-	-	Unlikely	Lack of preferred habitat throughout the precinct	Vegetated swamp; coastal saltmarshes; tidal mud flats
Caspian Tern	*Hydroprogne caspia*	1991	10	-	NT	L	-	Unlikely	Lack of preferred habitat throughout the precinct	Vegetated swamp; coastal saltmarshes; tidal mud flats
Turquoise Parrot	*Neophema pulchella*	1982	1	-	NT	L	NT	Unlikely	Outside of known distribution and lack of preferred habitat within precinct	Grassy Woodland with dead trees near permanent water
Painted Honeyeater	*Grantiella picta*	1981	2	-	VU	L	NT	Unlikely	Outside generally distribution of Western Victoria in addition to a lack of suitable foraging habitat	Dry open woodlands with a strong association with Mistletoe
Hooded Robin	*Melanodryas cucullata cucullata*	1981	3	-	NT	L	NT	Unlikely	Lack of preferred habitat throughout the precinct	Lightly timbered woodland, mainly dominated by acacia and/or eucalypts.

Swamp Skink	*Egernia coventryi*	1997	11	-	VU	L	-	Moderate	Lack of previous records although difficult to detect. This species may occur along modified drainage lines, creeklines and roadside reserves.	Wetlands or swampy heaths with dense vegetation
Speckled Warbler	*Chthonicola sagittata*	1908	1	-	VU	L	NT	Unlikely	No habitat	Dry sclerophyll forest and woodland
Chesnut-rumped Heathwren	*Calamanthus pyrrhopygius*	1999	3	-	VU	L	-	Unlikely	No habitat	Heathlands and dense heathy understorey
Powerful Owl	*Ninox strenua*	1990	1	-	VU	L	-	Unlikely	No habitat	Foothill and coastal forests; also mountain forest and box-ironbark woodlands
Sooty Owl	*Tyto tenebricosa tenebricosa*	1992	1	-	VU	L	-	Unlikely	No habitat	Wet Mountain Grey Gum; rainforest; Mountain Ash forest
Grey-crowned Babbler	*Pomatostomus temporalis temporalis*	1989	3	-	EN	L	NT	Unlikely	No habitat	Dry forests and woodland; wooded farmland associated with river floodplains
Brown Treecreeper	*Climacteris picumnus victoriae*	2000	1	-	NT	-	NT	Unlikely	No habitat	Lowland dry woodland and wooded farmland
Pale Mangrove Goby	*Mugilogobius paludis*	2000	7	-	VU	L	-	Unlikely	No habitat	Not Applicable
Foothill Burrowing Crayfish	*Engaeus victoriensis*	1962	1	-	EN	-	-	Unlikely	No habitat	Not Applicable

Southern Toadlet	*Pseudophryne semimarmorata*	1988	55	-	VU	-	-	Unlikely	No habitat	Moist ground layer in dry or wet sclerophyll forest; roadside gutters; small creeks
REGIONAL SIGNIFICANCE										
Brown Quail	*Coturnix ypsilophora*	2000	9	-	NT	-	-	Low	May forage within preferred habitat thoughout the precinct on occasions	Grassy and sedgy flats, agricultural crops; swamps
Cape Barren Goose	*Cereopsis novaehollandiae*	1999	2	-	NT	-	-	Unlikely	No habitat	Not Applicable
Pied Cormorant	*Phalacrocorax varius*	1997	2	-	NT	-	-	Unlikely	No habitat	Large freshwater and saline wetlands; tidal bays along coast
Black-faced Cormorant	*Phalacrocorax fuscescens*	1977	1	-	NT	-	-	Unlikely	No habitat	Shallow seagrass beds and coastal islands
Nankeen Night Heron	*Nycticorax caledonicus hillii*	2008	3	-	NT	-	-	Low to Moderate	May forage on margins of well vegetation drainage lines and large permanent waterbodies	well-vegetated wetlands, and is found along shallow river margins, mangroves, floodplains, swamps, and parks and gardens
Glossy Ibis	*Plegadis falcinellus*	1976	1	-	NT	-	-	Unlikely	Lack of preferred habitat throughout the precinct	Shallow water and mudflats

Spotted Harrier	*Circus assimilis*	2004	4	-	NT	-	-	Low	May forage within habitat throughout open woodland habitat within and adjancen to the precinct on an occasional basis	Open woodland country
Sooty Oystercatcher	*Haematopus fuliginosus*	1991	1	-	NT	-	-	Unlikely	Lack of preferred habitat throughout the precinct	Coasts
Pacific Golden Plover	*Pluvialis fulva*	1973	1	-	NT	-	-	Unlikely	Lack of preferred habitat throughout the precinct	Coast
Whiskered Tern	*Chlidonias hybridus*	2004	1	-	NT	-	-	Unlikely	No habitat	Shallow freshwater swamps; fresh or brackish lakes; large rivers; sewage lagoons.
White-fronted Tern	*Chlidonias hybridus javanicus*	2004	7		NT	-	-	Unlikely	Lack of preferred habitat throughout the precinct	Coast and marine
Pacific Gull	*Larus pacificus pacificus*	20077	265	-	NT	-	-	Unlikely	Lack of preferred habitat throughout the precinct	Coastal; intertidal mudflats; estuaries.
Eastern Curlew	*Numenius madagascariensis*	1991	4	-	NT	-	-	Unlikely	Lack of preferred habitat throughout the precinct	Coastal; tidal mudflats occasionally inland saline lakes

Latham's Snipe	*Gallinago hardwickii*	2006	43	-	NT	-	-	Low	Lack of preferred habitat throughout the precinct	Vegetated swamps; pools/ditches in heath or herblands; grasslands
Black-eared Cuckoo	*Chrysococcyx osculans*	1908	1	-	NT	-	-	Unlikely	Lack of preferred habitat throughout the precinct	Open woodlands
River Blackfish	*Gadopsis marmoratus*	2006	1	-	DD	-	-	Unlikely	Lack for suitable habitat	Prefer rivers and streams with plenty of cover and high velocity flows

Sources: Victorian Biodiversity Atlas (VBA 2010); DSEWPC Protected Matters Search Tool (DSEWPC 2011); Atlas of Victorian Birds (Emison, W.B. *et.al.* 1987); Mammals of Victoria (Menkhorst, P.W. 1995); and, Reptiles and Amphibians (Cogger, H.G. 1996).

Appendix 4.1 – Net Gain Tables

*Please note highlighted cells pertain to anomalies we have found with the data, after it was returned to us from DSE. These issues will be resolved for the final report.

Table A4.1.1. Habitat hectare analysis of remnant patches of vegetation within the precinct.

Habitat Zone			1	2	3	4	5	6	7	8
Map Reference			Fig 3 C5	Fig 3 C5	Fig 3 C4	Fig 3 C4	Fig 3 C8	Fig 3 C8	Fig 3 C8	Fig 3 C8
PFI			628957	628957	628957	628957	R151556850	R151556850	R151556850	R151556850
Site ID			1	2	3	4	1	2	3	4
Zone ID			A	A	A	A	A	A	A	A
EVC Name (Initials)			SW	SW	PGW	PGW	SW	SW	PGW	PGW
EVC Number			GipP0937	GipP0937	GipP0055	GipP0055	GipP0937	GipP0937	GipP0055	GipP0055
Total Area of Habitat Zone (ha)			0.07	0.01	0.01	0.01	0.02	0.08	0.04	0
		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
	Lack of Weeds	15	4	4	4	0	0	4	0	9
	Understorey	25	5	5	5	0	5	5	5	5
	Recruitment	10	0	0	6	5	0	10	5	0
	Organic Litter	5	5	5	0	0	5	5	5	5
	Logs	5	0	0	0	3	0	0	0	0
	Total Score	75	**14**	**14**	**15**	**8**	**10**	**24**	**15**	**19**
Standardiser (applies to treeless EVCs)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Standardised score			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Landscape Score		25	2	2	2	2	2	2	2	2
Habitat Score #		100	16	16	17	10	12	26	17	21
Habitat Score as above = #/100			0.16	0.16	0.17	0.10	0.12	0.26	0.17	0.21
Habitat Hectares			**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.02**	**0.01**	**0.00**
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Conservation Status			E	E	E	E	E	E	E	E
Conservation Significance	Conservation Status x Habitat Score		High	High	High	High	High	High	High	High
	Threatened Species Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Other Site Attribute Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Overall Conservation Significance (highest rating)		**High**	**High**	**High**	**High**	**High**	**High**	**High**	**High**
No. of Large Old trees in each Habitat Zone			0	0	0	0	0	0	0	0

Notes: PFI = Unique Property Identifier, EVC = Ecological Vegetation Class, GipP = Gippsland Plain, PGW = Plains Grassy Woodland, SW = Swampy Woodland, E = Endangered, n/a = not applicable.

Table A4.1.2. Habitat hectare analysis of remnant patches of vegetation within the precinct.

Habitat Zone			9	10	11	12	13	14	15	16
Map Reference			Fig 3 A6	Fig 3 A6	Fig 3 A7	Fig 3 A4	Fig 3 A4	Fig 3 A4	Fig 3 B2	Fig 3 B3
PFI			R52906052	R52906052	R52906052	R628964	R628964	R53047293	151618589	53047293
Site ID			1	2	4	2	3	1	1	1
Zone ID			A	A	A	A	A	A	A	A
EVC Name (Initials)			GW	GW	GW	GW	GW	SW	SW	GW
EVC Number			GipP0175	GipP0175	GipP0175	GipP0175	GipP0175	GipP0937	GipP0937	GipP0175
Total Area of Habitat Zone (ha)			0.01	0.01	0.01	0.03	0.01	0.01	0.01	0.06
		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
	Lack of Weeds	15	4	6	4	0	0	0	6	4
	Understorey	25	5	5	5	5	5	5	5	5
	Recruitment	10	0	0	0	1	0	0	0	5
	Organic Litter	5	5	5	5	0	3	3	3	5
	Logs	5	0	0	0	0	0	0	0	0
	Total Score	75	**14**	**16**	**14**	**6**	**8**	**8**	**14**	**19**
Standardiser (applies to treeless EVCs)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Standardised score			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Landscape Score		25	2	2	4	2	2	2	2	2
Habitat Score #		100	16	18	18	8	10	10	16	21
Habitat Score as above = #/100			0.16	0.18	0.18	0.08	0.1	0.1	0.16	0.21
Habitat Hectares			**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Conservation Status			E	E	E	E	E	E	E	E
Conservation Significance	Conservation Status x Habitat Score		High	High	High	High	High	High	High	High
	Threatened Species Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Other Site Attribute Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Overall Conservation Significance (highest rating)		**High**	**High**	**High**	**High**	**High**	**High**	**High**	**High**
No. of Large Old trees in each Habitat Zone			0	0	0	0	0	0	0	0

Notes: PFI = Unique Property Identifier, EVC = Ecological Vegetation Class, GipP = Gippsland Plain, GW = Grassy Woodland, SW = Swampy Woodland, E = Endangered, n/a = not applicable.

Table A4.1.3. Habitat hectare analysis of remnant patches of vegetation within the precinct.

Habitat Zone			17	18	19	20	21	22	23	24
Map Reference			Fig 3 B4	Fig 3 C6	Fig 3 C6	Fig 3 C6	Fig 3 C6	Fig 3 C6	Fig 3 B7	Fig 3 B7
PFI			53047293	628957	628957	628957	628957	628957	601826	601826
Site ID			2	5	6	7	8	9	1	2
Zone ID			A	A	A	A	A	A	A	A
EVC Name (Initials)			Swet	Swet	SW	SW	SW	Swet	GW	GW
EVC Number			GipP0136	GipP0136	GipP0937	GipP0937	GipP0937	GipP0136	GipP0175	GipP0175
Total Area of Habitat Zone (ha)			0.17	0.02	0.23	0.03	0.04	0.04	0.13	0.19
		Max Score	Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	n/a	n/a	0	0	0	n/a	8	0
	Canopy Cover	5	n/a	n/a	0	0	0	n/a	0	0
	Lack of Weeds	15	0	15	4	11	4	15	2	4
	Understorey	25	5	5	5	5	5	5	5	5
	Recruitment	10	1	0	0	0	0	3	0	1
	Organic Litter	5	0	5	5	0	5	0	5	5
	Logs	5	n/a	n/a	0	0	0	n/a	0	0
	Total Score	75	**6**	**25**	**14**	**16**	**14**	**23**	**20**	**15**
Standardiser (applies to treeless EVCs)			1.36	1.36	n/a	n/a	n/a	1.36	n/a	n/a
Standardised score			8.16	34	n/a	n/a	n/a	31.28	n/a	n/a
Landscape Score		25	2	2	2	2	2	2	4	4
Habitat Score #		100	10.16	36	16	18	16	33.28	24	19
Habitat Score as above = #/100			0.10	0.36	0.16	0.18	0.16	0.33	0.24	0.19
Habitat Hectares			**0.02**	**0.01**	**0.04**	**0.01**	**0.01**	**0.01**	**0.03**	**0.04**
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Conservation Status			V	V	E	E	E	V	E	E
Conservation Significance	Conservation Status x Habitat Score		Medium	High	High	High	High	High	High	High
	Threatened Species Rating		High	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Other Site Attribute Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Overall Conservation Significance (highest rating)		**High**	**High**	**High**	**High**	**High**	**High**	**High**	**High**
No. of Large Old trees in each Habitat Zone			0	0	0	0	0	0	3	1

Notes: PFI = Unique Property Identifier, EVC = Ecological Vegetation Class, GipP = Gippsland Plain, GW = Grassy Woodland, SW = Swampy Woodland, SWet = Sedge Wetland, E = Endangered, V = Vulnerable, n/a = not applicable.

Table A4.1.4. Habitat hectare analysis of remnant patches of vegetation within the precinct.

Habitat Zone			25	26	27	28	29	30	31	32
Map Reference			Fig 3 B7	Fig 3 B7	Fig 3 B7	Fig 3 B7	Fig 3 B7	Fig 3 B7	Fig 3 A6	Fig 3 B6
PFI			601826	601826	601826	601826	601826	601826	R52906052	2075172
Site ID			3	4	5	6	7	8	3	1
Zone ID			A	A	A	A	A	A	A	A
EVC Name (Initials)			GW	GW	GW	GW	GW	GW	GW	GW
EVC Number			GipP0175	GipP0175	GipP0175	GipP0175	GipP0175	GipP0175	GipP0175	GipP0175
Total Area of Habitat Zone (ha)			0.93	0.49	0.46	0.73	0.13	0.03	0.02	0.02
		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
	Lack of Weeds	15	4	4	6	4	4	4	9	4
	Understorey	25	15	5	5	5	5	5	5	5
	Recruitment	10	5	5	6	6	5	5	0	5
	Organic Litter	5	5	5	5	5	5	5	0	3
	Logs	5	5	2	0	0	0	0	0	0
	Total Score	75	**34**	**21**	**22**	**20**	**19**	**19**	**14**	**17**
Standardiser (applies to treeless EVCs)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Standardised score			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Landscape Score		25	4	4	4	4	2	2	2	2
Habitat Score #		100	38	25	26	24	21	21	16	19
Habitat Score as above = #/100			0.38	0.25	0.26	0.24	0.21	0.21	0.16	0.19
Habitat Hectares			**0.35**	**0.12**	**0.12**	**0.18**	**0.03**	**0.01**	**0.00**	**0.00**
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Conservation Status			E	E	E	E	E	E	E	E
Conservation Significance	Conservation Status x Habitat Score		High	High	High	High	High	High	High	High
	Threatened Species Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Other Site Attribute Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Overall Conservation Significance (highest rating)		**High**	**High**	**High**	**High**	**High**	**High**	**High**	**High**
No. of Large Old trees in each Habitat Zone			0	1	0	0	0	0	0	0

Notes: PFI = Unique Property Identifier, EVC = Ecological Vegetation Class, GipP = Gippsland Plain, GW = Grassy Woodland, E = Endangered, n/a = not applicable.

Table A4.1.5. Habitat hectare analysis of remnant patches of vegetation within the precinct.

Habitat Zone			33	34	35	36	37	38	39	40
Map Reference			Fig 3 B6	Fig 3 A4	Fig 3 A4	Fig 3 A4	Fig 3 A4	Fig 3 A7	Fig 3 C1	Fig 3 C1
PFI			2075173	628964	628964	628964	R628964	628405	R616586	R616586
Site ID			2	1	2	3	1	1	2	3
Zone ID			A	A	A	A	A	A	A	A
EVC Name (Initials)			GW	GW	GW	GW	PGW	PGW	PGW	SW
EVC Number			GipP0175	GipP0175	GipP0175	GipP0175	GipP0055	GipP0055	GipP0055	GipP0937
Total Area of Habitat Zone (ha)			0.01	0.03	0.05	0.01	0.03	0.04	0	0.02
		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
	Lack of Weeds	15	15	4	9	9	6	7	4	4
	Understorey	25	5	5	5	5	5	5	5	5
	Recruitment	10	5	0	0	0	0	0	0	6
	Organic Litter	5	0	5	5	5	3	0	0	3
	Logs	5	0	0	0	0	0	0	0	0
	Total Score	75	**25**	**14**	**19**	**19**	**14**	**12**	**9**	**18**
Standardiser (applies to treeless EVCs)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Standardised score			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Landscape Score		25	2	4	2	2	2	2	2	2
Habitat Score #		100	27	18	21	21	16	14	11	20
Habitat Score as above = #/100			0.27	0.18	0.21	0.21	0.16	0.14	0.11	0.20
Habitat Hectares			**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Conservation Status			E	E	E	E	E	E	E	E
Conservation Significance	Conservation Status x Habitat Score		High	High	High	High	High	High	High	High
	Threatened Species Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Other Site Attribute Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Overall Conservation Significance (highest rating)		**High**	**High**	**High**	**High**	**High**	**High**	**High**	**High**
No. of Large Old trees in each Habitat Zone			0	0	0	0	0	0	0	0

Notes: PFI = Unique Property Identifier, EVC = Ecological Vegetation Class, GipP = Gippsland Plain, GW = Grassy Woodland, PGW = Plains Grassy Woodland, SW = Swampy Woodland, E = Endangered, n/a = not applicable.

Table A4.1.6. Habitat hectare analysis of remnant patches of vegetation within the precinct.

Habitat Zone			41	42	43	44	45	46	47	48
Map Reference			Fig 3 C1	Fig 3 C1	Fig 3 B1	Fig 3 A4	Fig 3 D7	Fig 3 D7	Fig 3 D7	Fig 3 D7
PFI			R616586	R616586	R52906073	R628964	151637979	151637979	151637979	151637979
Site ID			4	5	1	1	1	2	4	5
Zone ID			A	A	A	A	A	A	A	A
EVC Name (Initials)			PGW	PGW	PGW	PGW	PGW	PGW	PGW	PGW
EVC Number			GipP0055	GipP0055	GipP0055	GipP0055	GipP0055	GipP0055	GipP0055	GipP0055
Total Area of Habitat Zone (ha)			0.01	0	0.01	0.03	0.01	0.01	0.02	0.11
		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
	Lack of Weeds	15	4	0	6	6	4	6	6	0
	Understorey	25	5	5	5	5	5	5	5	5
	Recruitment	10	0	0	0	0	0	5	5	0
	Organic Litter	5	0	3	0	3	3	2	0	5
	Logs	5	0	0	0	0	0	0	0	0
	Total Score	75	**9**	**8**	**11**	**14**	**12**	**18**	**16**	**10**
Standardiser (applies to treeless EVCs)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Standardised score			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Landscape Score		25	2	2	2	2	2	2	2	2
Habitat Score #		100	11	10	13	16	14	20	18	12
Habitat Score as above = #/100			0.11	0.10	0.13	0.16	0.14	0.20	0.18	0.12
Habitat Hectares			**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Conservation Status			E	E	E	E	E	E	E	E
Conservation Significance	Conservation Status x Habitat Score		High	High	High	High	High	High	High	High
	Threatened Species Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Other Site Attribute Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Overall Conservation Significance (highest rating)		**High**	**High**	**High**	**High**	**High**	**High**	**High**	**High**
No. of Large Old trees in each Habitat Zone			0	0	0	0	0	0	0	0

Notes: PFI = Unique Property Identifier, EVC = Ecological Vegetation Class, GipP = Gippsland Plain, PGW = Plains Grassy Woodland, E = Endangered, n/a = not applicable.

Table A4.1.7. Habitat hectare analysis of remnant patches of vegetation within the precinct.

Habitat Zone			49	50	51	52	53	54	55	56
Map Reference			Fig 3 B1	Fig 3 B1	Fig 3 B1	Fig 3 B1	Fig 3 B1	Fig 3 B1	Fig 3 C2	Fig 3 C2
PFI			R616584	52906073	616584	616584	616584	616584	616584	616584
Site ID			1	2	1	2	3	4	6	7
Zone ID			A	A	A	A	A	A	A	A
EVC Name (Initials)			PGW	Swet	Swet	SRW	Swet	PGW	PGW	Swet
EVC Number			GipP0055	GipP0136	GipP0136	GipP0083	GipP0136	GipP0055	GipP0055	GipP0136
Total Area of Habitat Zone (ha)			0	1.41	0.02	0.07	0.15	0.01	0.02	0.12
		Max Score	Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	0	n/a	n/a	0	n/a	0	0	n/a
	Canopy Cover	5	0	n/a	n/a	0	n/a	0	0	n/a
	Lack of Weeds	15	0	4	15	4	11	7	11	11
	Understorey	25	5	5	5	5	5	5	5	5
	Recruitment	10	0	0	0	3	0	5	5	3
	Organic Litter	5	3	0	3	3	0	5	5	3
	Logs	5	0	n/a	n/a	0	n/a	0	0	n/a
	Total Score	75	**8**	**9**	**23**	**15**	**16**	**22**	**26**	**22**
Standardiser (applies to treeless EVCs)			n/a	1.36	1.36	n/a	1.36	n/a	n/a	1.36
Standardised score			n/a	12.24	31.28	n/a	21.76	n/a	n/a	29.92
Landscape Score		25	2	2	2	2	2	2	2	2
Habitat Score #		100	10	14.24	33.28	17	23.76	24	28	31.92
Habitat Score as above = #/100			0.10	0.14	0.33	0.17	0.24	0.24	0.28	0.32
Habitat Hectares			**0.00**	**0.20**	**0.01**	**0.01**	**0.04**	**0.00**	**0.01**	**0.04**
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Conservation Status			E	V	V	E	V	E	E	V
Conservation Significance	Conservation Status x Habitat Score		High	Medium	High	High	Medium	High	High	High
	Threatened Species Rating		n/a	n/a	High	n/a	High	n/a	n/a	High
	Other Site Attribute Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Overall Conservation Significance (highest rating)		**High**	**Medium**	**High**	**High**	**High**	**High**	**High**	**High**
No. of Large Old trees in each Habitat Zone			0	0	0	0	0	0	0	0

Notes: PFI = Unique Property Identifier, EVC = Ecological Vegetation Class, GipP = Gippsland Plain, SRW = Swampy Riparian Woodland, PGW = Plains Grassy Woodland, SWet = Sedge Wetland, E = Endangered, V = Vulnerable, n/a = not applicable.

Table A4.1.8. Habitat hectare analysis of remnant patches of vegetation within the precinct.

Habitat Zone			57	58	59	60	61	62	63	64
Map Reference			Fig 3 C2	Fig 3 C2	Fig 3 B1	Fig 3 C2	Fig 3 C2	Fig 3 C1	Fig 3 D2	Fig 3 C4
PFI			616584	616584	616584	616584	616586	637562	44440	637559
Site ID			8	9	10	11	2	5	1	1
Zone ID			A	A	A	A	A	A	A	A
EVC Name (Initials)			PGW	Swet	GW	PGW	PGW	Swet	Swet	SRW
EVC Number			GipP0055	GipP0136	GipP0175	GipP0055	GipP0055	GipP0136	GipP0136	GipP0083
Total Area of Habitat Zone (ha)			0.36	0.16	0.05	0	0.06	0.17	0.01	0.24
		Max Score	Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	0	n/a	0	0	0	n/a	n/a	0
	Canopy Cover	5	0	n/a	0	0	0	n/a	n/a	0
	Lack of Weeds	15	6	9	4	9	15	6	0	4
	Understorey	25	0	5	5	5	5	5	5	5
	Recruitment	10	5	0	5	0	5	3	3	5
	Organic Litter	5	5	3	5	5	5	0	0	0
	Logs	5	0	n/a	0	0	0	n/a	n/a	0
	Total Score	75	**16**	**17**	**19**	**19**	**30**	**14**	**8**	**14**
Standardiser (applies to treeless EVCs)			n/a	1.36	n/a	n/a	n/a	1.36	1.36	n/a
Standardised score			n/a	23.12	n/a	n/a	n/a	19.04	10.88	n/a
Landscape Score		25	2	2	2	2	2	2	2	2
Habitat Score #		100	18	25.12	21	21	32	21.04	12.88	16
Habitat Score as above = #/100			0.18	0.25	0.21	0.21	0.32	0.21	0.13	0.16
Habitat Hectares			**0.06**	**0.04**	**0.01**	**0.00**	**0.02**	**0.04**	**0.00**	**0.04**
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Conservation Status			E	V	E	E	E	V	V	E
Conservation Significance	Conservation Status x Habitat Score		High	Medium	High	High	High	Medium	Medium	High
	Threatened Species Rating		n/a	High	n/a	n/a	n/a	n/a	n/a	n/a
	Other Site Attribute Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Overall Conservation Significance (highest rating)		**High**	**High**	**High**	**High**	**High**	**Medium**	**Medium**	**High**
No. of Large Old trees in each Habitat Zone			0	0	0	0	0	0	0	0

Notes: PFI = Unique Property Identifier, EVC = Ecological Vegetation Class, GipP = Gippsland Plain, SRW = Swampy Riparian Woodland, GW = Grassy Woodland, SWet = Sedge Wetland, GW = Grassy Woodland, E = Endangered, V= Vulnerable, n/a = not applicable.

Table A4.1.9. Habitat hectare analysis of remnant patches of vegetation within the precinct.

Habitat Zone			65	66	67	68	69	70	71	72
Map Reference			Fig 3 C4	Fig 3 C4	Fig 3 C4	Fig 3 C4	Fig 3 C3	Fig 3 C4	Fig 3 C6	Fig 3 C5
PFI			637559	637559	637559	637559	637559	202772384	R637557	637557
Site ID			2	3	4	5	6	1	5	2
Zone ID			A	A	A	A	A	A	A	A
EVC Name (Initials)			Swet	Swet	Swet	Swet	Swet	Swet	PGW	Swet
EVC Number			GipP0136	GipP0136	GipP0136	GipP0136	GipP0136	GipP0136	GipP0055	GipP0136
Total Area of Habitat Zone (ha)			0.13	0.02	0.02	0.2	0.17	0.06	0.01	0.17
		Max Score	Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	n/a	n/a	n/a	n/a	n/a	n/a	0	n/a
	Canopy Cover	5	n/a	n/a	n/a	n/a	n/a	n/a	0	n/a
	Lack of Weeds	15	11	6	6	9	7	11	9	11
	Understorey	25	5	5	5	5	5	5	5	5
	Recruitment	10	0	0	0	3	0	0	0	0
	Organic Litter	5	0	0	0	5	0	0	5	0
	Logs	5	n/a	n/a	n/a	n/a	n/a	n/a	0	n/a
	Total Score	75	**16**	**11**	**11**	**22**	**12**	**16**	**19**	**16**
Standardiser (applies to treeless EVCs)			1.36	1.36	1.36	1.36	1.36	1.36	n/a	1.36
Standardised score			21.76	14.96	14.96	29.92	16.32	21.76	n/a	21.76
Landscape Score		25	2	2	2	2	2	2	2	2
Habitat Score #		100	23.76	16.96	16.96	31.92	18.32	23.76	21	23.76
Habitat Score as above = #/100			0.24	0.17	0.17	0.32	0.18	0.24	0.21	0.24
Habitat Hectares			**0.03**	**0.00**	**0.00**	**0.06**	**0.03**	**0.01**	**0.00**	**0.04**
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Conservation Status			V	V	V	V	V	V	E	V
Conservation Significance	Conservation Status x Habitat Score		Medium	Medium	Medium	High	Medium	Medium	High	Medium
	Threatened Species Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Other Site Attribute Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Overall Conservation Significance (highest rating)		**Medium**	**Medium**	**Medium**	**High**	**Medium**	**Medium**	**High**	**Medium**
No. of Large Old trees in each Habitat Zone			0	0	0	0	0	0	0	0

Notes: PFI = Unique Property Identifier, EVC = Ecological Vegetation Class, GipP = Gippsland Plain, SWet = Sedge Wetland, PGW = Plains Grassy Woodland, E = Endangered, n/a = not applicable.

Table A4.1.10. Habitat hectare analysis of remnant patches of vegetation within the precinct.

Habitat Zone			73	74	75	76	77	78	79
Map Reference			Fig 3 C5	Fig 3 C5	Fig 3 E5	Fig 3 D7	Fig 3 E7	Fig 3 D7	Fig 3 D7
PFI			637557	R202772384	R603065	151637979	151637979	151637979	151637979
Site ID			3	1	2	7	8	9	10
Zone ID			A	A	A	A	A	A	A
EVC Name (Initials)			Swet	SS	PGW	Swet	Swet	PGW	PGW
EVC Number			GipP0136	GipP0053_61	GipP0055	GipP0136	GipP0136	GipP0055	GipP0055
Total Area of Habitat Zone (ha)			0.19	0.01	0.08	0.07	0.01	0.01	0.01
		Max Score	**Score**	**Score**	**Score**	**Score**	**Score**	**Score**	**Score**
Site Condition	Large Old Trees	10	n/a	n/a	0	n/a	n/a	0	0
	Canopy Cover	5	n/a	n/a	0	n/a	n/a	0	0
	Lack of Weeds	15	11	11	6	15	15	0	9
	Understorey	25	5	5	5	5	5	5	5
	Recruitment	10	0	5	5	3	3	5	5
	Organic Litter	5	0	0	0	0	0	4	4
	Logs	5	n/a	0	0	n/a	n/a	n/a	0
	Total Score	75	**16**	**21**	**16**	**23**	**23**	**14**	**23**
Standardiser (applies to treeless EVCs)			1.36	1.15	n/a	1.36	1.36	n/a	n/a
Standardised score			21.76	24.15	n/a	31.28	31.28	n/a	n/a
Landscape Score		25	2	2	2	2	2	2	2
Habitat Score #		100	23.76	26.15	18	33.28	33.28	16	25
Habitat Score as above = #/100			0.24	0.26	0.18	0.33	0.33	0.16	0.25
Habitat Hectares			**0.05**	**0.00**	**0.01**	**0.02**	**0.00**	**0.00**	**0.00**
Bioregion			GipP	GipP	GipP	GipP	GipP	GipP	GipP
EVC Conservation Status			V	E	E	V	V	E	E
Conservation Significance	Conservation Status x Habitat Score		Medium	High	High	High	High	High	High
	Threatened Species Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Other Site Attribute Rating		n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Overall Conservation Significance (highest rating)		**Medium**	**High**	**High**	**High**	**High**	**High**	**High**
No. of Large Old trees in each Habitat Zone			0	0	0	0	0	0	0

Notes: PFI = Unique Property Identifier, EVC = Ecological Vegetation Class, GipP = Gippsland Plain, PGW = Plains Grassy Woodland, PGW = Plains Grassy Woodland, SWet = Sedge Wetland, E = Endangered, V = Vulnerable, n/a = not applicable.

Appendix 4.2 – Scattered Tree Table

Table A4.2. Scattered trees recorded during the present survey (October and November 2010).

Property No.	Scattered Tree Number	Species (scientific name)	Common Name	Size of Tree (VLOT, LOT, MOT, small)	Bioregion	Conservation Significance	Easting	Northing	Map no. (location)
202772386	1	*Eucalyptus ovata*	Swamp Gum	MOT	GipPlain	High	2530953.01	2376693.24	Fig 4 D2
	2	*Eucalyptus ovata*	Swamp Gum	ST	GipPlain	Low	2530942.18	2376603.28	Fig 4 D2
	3	*Eucalyptus ovata*	Swamp Gum	LOT	GipPlain	High	2531189.27	2376975.42	Fig 4 D2
637557	1	*Eucalyptus ovata*	Swamp Gum	MOT	GipPlain	High	2530735.63	2374887.25	Fig 4 C6
	2	*Eucalyptus ovata*	Swamp Gum	ST	GipPlain	Low	2530981.08	2374710.00	Fig 4 C6
	3	*Eucalyptus ovata*	Swamp Gum	ST	GipPlain	Low	2530740.96	2374920.94	Fig 4 C6
	4	*Eucalyptus ovata*	Swamp Gum	MOT	GipPlain	High	2530734.55	2374922.22	Fig 4 C6
	5	*Eucalyptus ovata*	Swamp Gum	MOT	GipPlain	High	2530724.44	2374971.05	Fig 4 C6
	6	*Eucalyptus ovata*	Swamp Gum	MOT	GipPlain	High	2530725.47	2375007.97	Fig 4 C6
	7	*Eucalyptus ovata*	Swamp Gum	LOT	GipPlain	High	2530711.73	2375051.18	Fig 4 C5
	8	*Eucalyptus ovata*	Swamp Gum	LOT	GipPlain	High	2530332.56	2375430.14	Fig 4 C5
R616586	1	*Eucalyptus ovata*	Swamp Gum	MOT	GipPlain	High	2530511.85	2377217.41	Fig 4 C1
44440	1	*Eucalyptus camaldulensis*	River Red-gum	VLOT	GipPlain	High	2531784.34	2376251.54	Fig 4 D3
	2	*Eucalyptus camaldulensis*	River Red-gum	VLOT	GipPlain	High	2531767.64	2376202.89	Fig 4 D3
603249	1	*Eucalyptus camaldulensis*	River Red-gum	VLOT	GipPlain	High	2529086.77	2376652.72	Fig 4 B2
151637979	1	*Eucalyptus viminalis*	Manna Gum	MOT	GipPlain	High	2531718.86	2373862.46	Fig 4 D8
	2	*Allocasuarina littoralis.*	Sheoak	MOT	GipPlain	High	2531731.64	2373887.47	Fig 4 D8
616580	1	*Eucalyptus camaldulensis*	River Red-gum	LOT	GipPlain	High	2529674.87	2377280.53	Fig 4 B1
52906073	1	*Eucalyptus camaldulensis*	River Red-gum	MOT	GipPlain	High	2529363.49	2377341.30	Fig 4 B1
	2	*Eucalyptus ovata*	Swamp Gum	VLOT	GipPlain	High	2529049.42	2377142.17	Fig 4 B1

Property No.	Scattered Tree Number	Species (scientific name)	Common Name	Size of Tree (VLOT, LOT, MOT, small)	Bioregion	Conservation Significance	Easting	Northing	Map no. (location)
R152410890	1	*Eucalyptus viminalis* subsp. *viminalis*	Coast Manna-gum	VLOT	GipPlain	High	2529166.95	2375718.22	Fig 4 B4
R1515568850	1	*Eucalyptus ovata*	Swamp Gum	MOT	GipPlain	High	2530244.13	2373879.13	Fig 4 C8
	2	Dead eucalypt	eucalypt	ST	GipPlain	Low	2530688.66	2373807.15	Fig 4 C8
628967	1	*Eucalyptus camaldulensis*	River Red-gum	VLOT	GipPlain	High	2531142.03	2374967.11	Fig 4 D6
R52906052	1	*Eucalyptus camaldulensis*	River Red-gum	LOT	GipPlain	High	2528648.79	2374649.43	Fig 4 A6
	2	*Eucalyptus radiata*	Narrow-leaf Peppermint	ST	GipPlain	Low	2528716.74	2374571.16	Fig 4 A6
150229930	1	*Eucalyptus ovata*	Swamp Gum	LOT	GipPlain	High	2529923.43	2373963.71	Fig 4 C8
150229938	1	*Eucalyptus ovata*	Swamp Gum	MOT	GipPlain	High	2530023.87	2373987.21	Fig 4 C8
	2	*Eucalyptus viminalis* subsp. *viminalis*	Coast Manna-gum	LOT	GipPlain	High	2530067.40	2373926.35	Fig 4 C8
R523047293	1	*Eucalyptus ovata*	Swamp Gum	ST	GipPlain	Low	2528761.75	2376178.85	Fig 4 A3
	2	*Eucalyptus ovata*	Swamp Gum	ST	GipPlain	Low	2528985.65	2377438.78	Fig 4.3 C3

Notes: VLOT = Very Large Old Tree, LOT = Large Old Tree, MOT = Medium Old Tree, ST = Small Tree, GipPlain = Gippsland Plain.

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