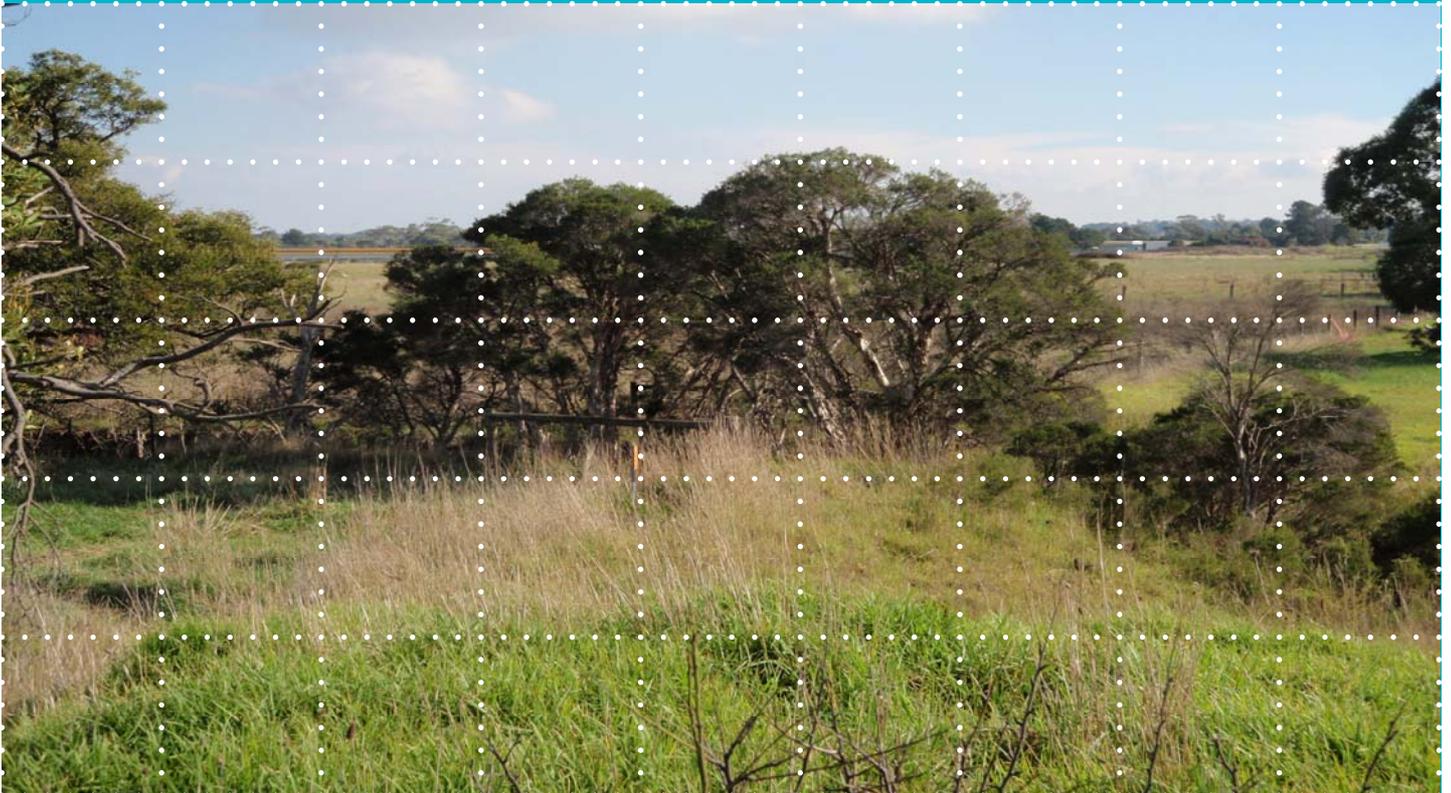


FINAL REPORT:

# Biodiversity Assessment for Area 1, 'Beaconsfield', Beaconsfield

PREPARED FOR:

**Growth Areas Authority**  
October 2010



**Ecology Partners Pty Ltd**

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## Acknowledgments

We thank the following people for their contribution in the project.

- Bill Vasiliadis (Growth Areas Authority) for assistance throughout the project and for comments on the draft versions of the report.
- Clare White and Michelle McHugh (Department of Sustainability and Environment) for ongoing involvement in the project and comments on the draft report.
- The Department of Sustainability and Environment for the use of data available on the Flora Information System and Atlas of Victoria Wildlife.
- The landowners who permitted access, and discussed details of their properties.

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The following Ecology Partners Pty Ltd employees either undertook the field assessments and/or contributed to the preparation of this report:

Jenna Forbes, Simon Scott, Aaron Organ, Mark Stockdale and Amanda Feetham

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## EXECUTIVE SUMMARY

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### Introduction

Ecology Partners Pty Ltd was commissioned by the Growth Areas Authority (GAA) to undertake a Biodiversity Assessment for the 2010 Biodiversity Mapping Project, at 'Area 1' in the urban fringe of south-east Melbourne. Area 1 is located approximately 50 kilometres south-east of the Melbourne CBD, and contains both private and public land, which is used for farming and low density residential housing (Figure ES1).

A general flora and fauna assessment was completed wherever site access was granted (Figure ES2). The purpose of the biodiversity assessment was to provide an accurate account of the ecological values within the precinct, which will be incorporated into the GAA's Precinct Structure Planning (PSP) process.

### Methods

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

- 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' (sent by Clare White, Senior Biodiversity Officer, DSE, 5 October).
- Department of Sustainability, Environment, Water, Population and Communities Protected (DSEWPC) 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 study area.

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*: 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. While much of the study area is highly modified and supports few areas of potentially suitable habitat for significant flora species, targeted surveys for Maroon Leek Orchid, Grey Billy Buttons, River Swamp Wallaby-grass, Wine-lipped Spider Orchid, Purple Diuris and Pale Swamp Everlasting were undertaken in spring. Species targeted during summer included Swamp Everlasting, Matted Flax-lily and Veined Spear-grass. A targeted flora survey for Frankston Spider Orchid (low likelihood of occurrence) was also undertaken during early summer.
- *Targeted fauna survey:* Targeted fauna surveys were undertaken in spring, summer and autumn. That is, targeted surveys for Swamp Skink and Glossy Grass Skink were undertaken in spring; targeted surveys for Dwarf Galaxias were undertaken in summer, while targeted surveys for Southern Toadlet were undertaken in autumn.
- *Incidental records:* All incidental observation of significant flora and fauna species observed were recorded with hand-held PDAs.

## Results

### *Flora*

No threatened flora species were recorded within the study area during the assessment. The majority of native vegetation within the study area has been largely cleared as a result of previous land use activities (i.e. agriculture). Areas of remnant vegetation mainly occur in the northern half of the study area, consisting of modified examples of Sedge Wetland, Swampy Riparian Woodland and Grassy Woodland. Based on available information (i.e. the literature review, results of the field surveys), the likelihood of nationally and state significant flora species occurring within the study area is considered low.

### *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*.

Overall approximately **0.02 habitat hectares** of remnant vegetation is present within the study area (Figure ES3). This is comprised of:

- **0.01 habitat hectares** of High conservation significance Sedge Wetland, and
- **0.01 habitat hectares** of High conservation significance Grassy Woodland.

There is a small patch of Swampy Riparian Woodland, however this amounts to less than 0.01 habitat hectares.

There are 44 scattered trees within the study area (Figure ES4). These comprise very large, large, medium and small trees, which are of High and Low conservation significance.

### *Fauna*

No significant fauna species were recorded during the general fauna assessments and during the detailed targeted surveys. There is a low likelihood of occurrence for nationally significant fauna species such as Dwarf Galaxias, Australian Grayling and Growling Grass Frog within dams and low-lying areas, and a moderate likelihood of occurrence for state significant Eastern Great Egret and Royal Spoonbill. Regionally significant Latham's Snipe is also considered moderately likely to occur. Potential habitat for these fauna species are shown in Figure ES6. Eleven nationally significant and 28 state significant fauna species have been previously recorded within the local area (Figure ES5). Targeted surveys for Growling Grass Frog and Southern Brown Bandicoot were not conducted as part of this assessment as these are to be undertaken through sub-regional surveys completed for these two species.

The study area supports four broad habitat types; pasture and crops; modified woodland/remnant trees; planted native and introduced vegetation, and artificial waterbodies. The majority of this habitat supports locally common fauna species that are typically associated with highly modified environments.

### **Conclusion**

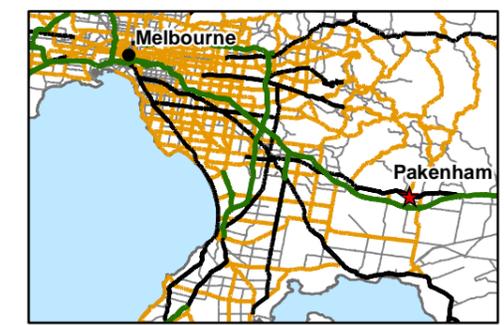
The study area is highly modified and dominated by exotic vegetation. However, there are modified examples of three EVCs within the study area; Grassy Woodland (EVC 175), Swampy Riparian Woodland (EVC 83) and Sedge Wetland (EVC 136).

A permit under the *Flora and Fauna Guarantee Act 1988* (FFG Act) will be required for the removal of protected species under the Act, if protected species are located on public land.

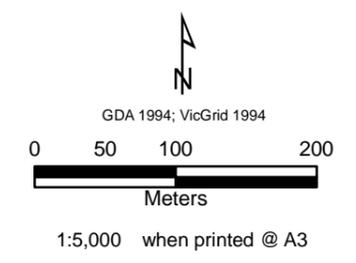
There are opportunities to enhance ecological values within the study area, principally through the regeneration of native vegetation, revegetation and weed control.



- Legend**
-  Urban Growth Boundary
  -  StudyBoundary
  -  Railway Station
  -  Railway
  -  Freeway
  -  Highway
  -  Arterial Road
  -  Major Road
  -  Minor Road
  -  Elevation Contours (10m)
  -  Watercourses
  -  Waterbodies
  -  Parks and Recreation



**Location & Overview of PSP Area 1**  
**Biodiversity Assessment Reporting 2009/10**





**Legend**

Urban Growth Boundary

Study Boundary

**Access Status**

**Justificat**

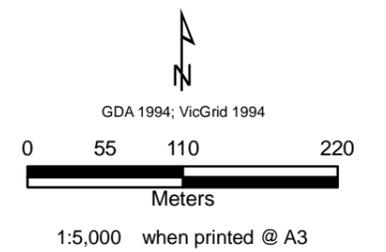
Property Assessed

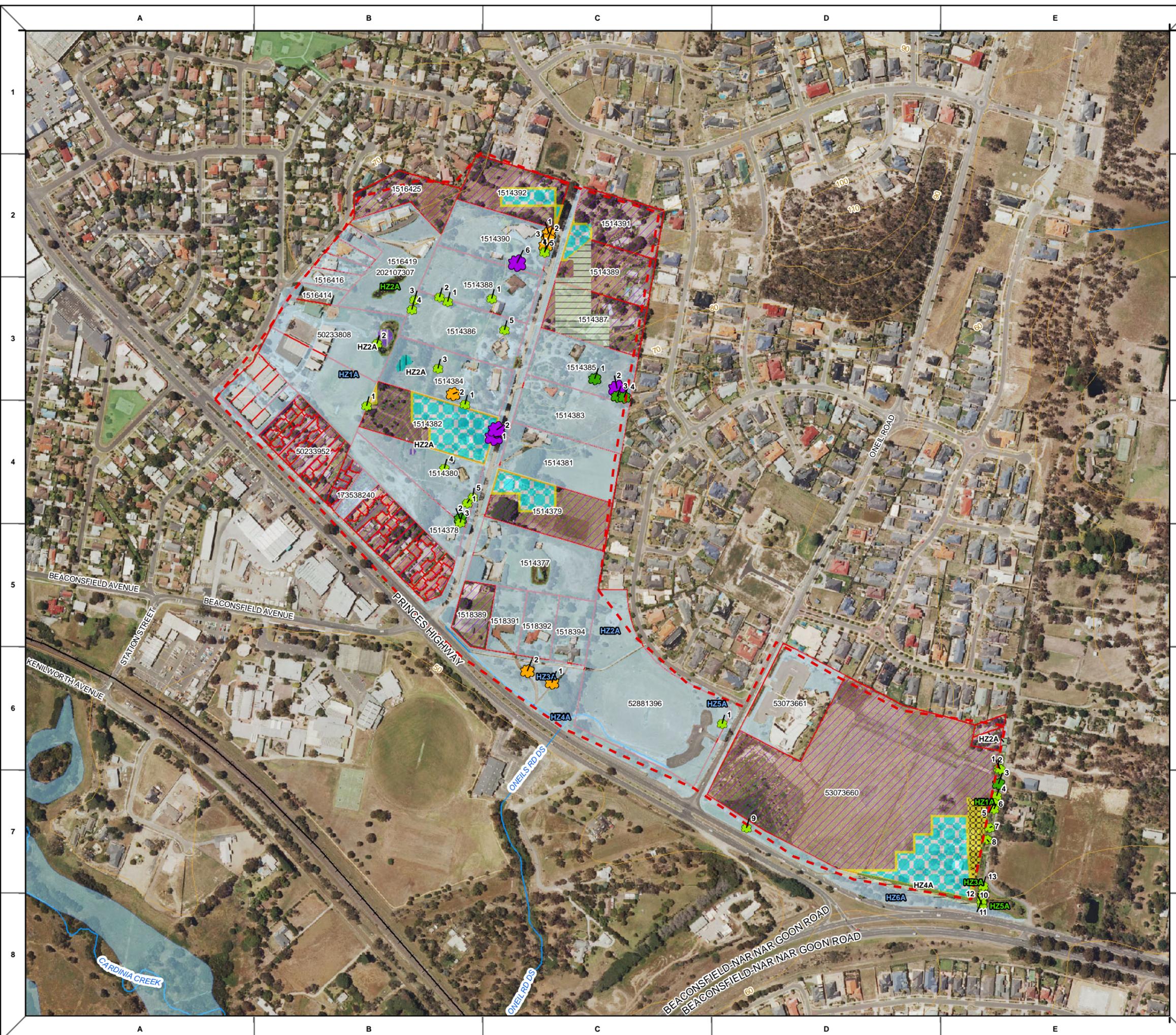
Access Denied

Unsuccessful - Unable to contact Landowner

Assessment Not Required - Residential Block

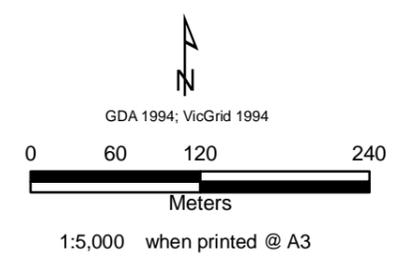
**Access Information for PSP Area 1**  
**Biodiversity Assessment Reporting 2009/10**





- Legend**
- Urban Growth Boundary
  - Property Boundaries
  - Properties not Assessed
  - StudyBoundary
  - Degraded Treeless Vegetation
  - Non Native Vegetation
- Surveyed EVCs**
- 53, Swamp Scrub
  - 55, Plains Grassy Woodland
  - 83, Swampy Riparian Woodland
  - 136, Sedge Wetland
  - 175, Grassy Woodland
  - 937, Swampy Woodland
- DSE Modelled EVCs**
- 17, Riparian Scrub/Swampy Riparian Woodland Complex
  - 175, Grassy Woodland
  - 897, Plains Grassland/Plains Grassy Woodland Mosaic
  - 937, Swampy Woodland
- Scattered Tree Locations**
- Very Large Old Tree
  - Large Old Tree
  - Medium Old Tree
  - Small Tree

**Extent of Native Vegetation for PSP Area 1**  
**Biodiversity Assessment**  
**Reporting 2009/10**





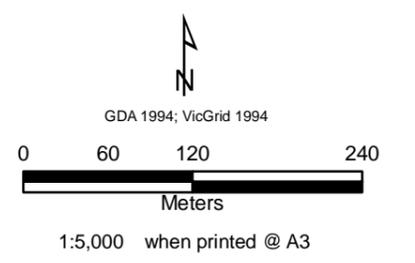
**Legend**

- Urban Growth Boundary
- Study Boundary
- Property Boundaries
- Properties not Assessed
- Degraded Treeless Vegetation
- Non Native Vegetation

**Conservation Significance**

- Very High
- High
- Medium
- Low

**Conservation Significance for PSP Area 1**  
**Biodiversity Assessment Reporting 2009/10**

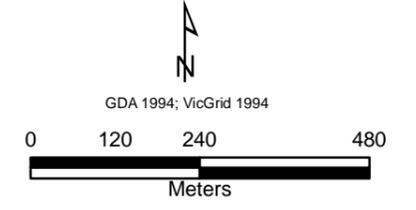




- Legend**
- Urban Growth Boundary
  - Study Boundary
  - Property Boundaries
  - Properties not Assessed
- Database Flora Records**
- Nationally Listed Species
  - State Listed Species
- Assessment Flora Records**
- State Listed Species
  - Nationally Listed Species
- Database Fauna Records**
- Nationally Listed Species
  - State Listed Species
  - DSE Verified Unpublished Records
- Assessment Fauna Records**
- State Listed Species
  - Nationally Listed Species

*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, 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 for PSP Area 1**  
**Biodiversity Assessment Reporting 2009/10**



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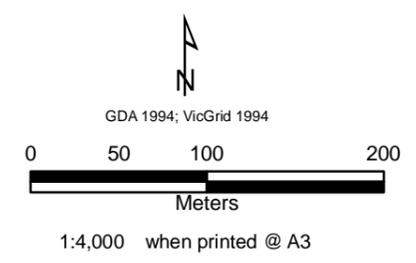
EP Map #: 1621 Study Area 1  
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 Issue Date: 08/10/2010



- Legend**
- Urban Growth Boundary
  - Study Boundary
  - Property Boundaries
  - Properties not Assessed
- Potential Habitat**
- Low-lying Area
  - Northern Dam

<b>Northern Dam</b>
Low Quality Habitat for Growling Grass Frog and Swamp Skink
<b>Low-lying Area</b>
Low Quality Habitat for Growling Grass Frog, Southern Toadlet and Swamp Skink

**Locations of Potential Habitat for PSP Area 1**  
 Biodiversity Assessment Reporting 2009/10



# 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 GAA Biodiversity Mapping Project, at 'Area 1' in the urban fringe of south-east Melbourne. 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 study area, together with targeted flora and fauna surveys. A Net Gain analysis was also undertaken in accordance with Victoria's *Native Vegetation Management – A Framework for Action* (herein referred to as 'the Framework') (NRE 2002) for any remnant patches of native vegetation within the study area.

Targeted flora surveys were undertaken for Maroon Leek-orchid, Grey Billy-buttons, River Swamp Wallaby-grass, Wine-lipped Spider Orchid, Purple Diuris, Pale Swamp Everlasting, Swamp Everlasting, Matted Flax-lily and Veined Spear-grass.

Targeted fauna surveys were undertaken for Swamp Skink, Glossy Grass Skink, Southern Toadlet and Dwarf Galaxias within the study area. A discussion on recommendations and requirements under Commonwealth, State, and local legislation and polices, along with potential impacts and mitigation measures have also been included.

## 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 study area 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 Biodiversity Plan;
- 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 study area; and,
- Ensure that development of the study area complies with legislative requirements regarding the protection of indigenous flora and fauna species and communities.

## 1.3 Study Area

Area 1 (the study area) is located approximately 50 kilometres south-east of the Melbourne CBD, Victoria (Figure 1). The study area covers 41 hectares and consists of 100 properties. It is bound by May Road to the east, residential housing to the north and west, and the Beaconsfield-Berwick main road to the south.

The majority of properties within the study area are privately owned. Areas of public land include the Beaconsfield Primary School and land owned and managed by the Cardinia Shire Council for recreation purposes. The study area has largely been cleared for agricultural purposes, with small isolated areas of remnant native vegetation remaining. Areas of remnant native vegetation non-native vegetation (NNV) and degraded treeless vegetation (DTV) within the study area have been mapped for all properties accessed (Figure 3). Remnant native vegetation within the study area comprises modified examples of Grassy Woodland, Sedge Wetland and Swampy Riparian Woodland.

According to the Department of Sustainability and Environment (DSE) Biodiversity Interactive Map (DSE 2010a) the study area lies within the Gippsland Plain and Highlands Southern Fall bioregions. The Gippsland Plain bioregion extends from Port Phillip Bay in the west to Lakes Entrance in the east, between the southern slopes of the Great Dividing Range and Wilsons Promontory, excluding the Strzelecki Ranges. The Highlands - Southern Fall bioregion extends from Wallan north of Melbourne, to Swifts Creek in the eastern alpine region of Victoria.

The study area lies within the boundaries of the Port Phillip and Westernport Catchment Management Authority (CMA). Under the Cardinia Shire planning scheme the majority of the study area is a Rural Living Zone (RLZ). Public land within the study area is zoned Public Use Zone (PUZ), Public Park and Recreation (PPRZ) and Road Zone (RDZ). There is also a small area of land zoned Residential 1 Zone (R1Z). An Environmental Significance Overlay (ESO) covers half of the study area. BioSites in the near vicinity of the study area are shown below in Table 1 (DSE 2010a).

**Table 1:** BioSites in the near vicinity of the study area (DSE 2010b)

BioSite No.	Name	Size (hectares)	Location	Significance	Attributes
5087	Beaconsfield Flora and Fauna Reserve and surrounds	67.2	800m west of study area, runs along Cardinia Creek	Regional	Acts as wildlife corridor and contains habitat for the nationally significant Dwarf Galaxias <i>Galaxiella pusilla</i> , and state significant Powerful Owl <i>Ninox strenua</i> and Annual Bitter-cress <i>Cardamine paucijuga</i> . Also supports hollow-bearing trees and Grey Clay Drainage-line Herbland-Sedgeland complex.
6889	Cardinia Creek Retarding Basin	52.21	South east of the study area	Regional	Wildlife corridor, historical indigenous site, Grey Clay Drainage-line Herbland-Sedgeland Complex EVC, habitat for Dwarf Galaxias <i>Galaxiella pusilla</i>

## 2 METHODS

---

### 2.1 Nomenclature

Common and scientific names of vascular plants follow the Flora Information System (FIS) (2007) and the Census of Vascular Plants of Victoria (Walsh and Stajsic 2007). Vegetation community names follow the EVC Benchmarks (DSE 2010a).

Terrestrial and vertebrate fauna (mammals, birds, reptiles, amphibians and fish) follow the Atlas of Victorian Wildlife (AVW 2007).

### 2.2 Literature and Database Review

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

- The AVW (2007) and FIS (2007) databases;
- Aquatic Fish Database and 'DSE verified unpublished aquatic records';
- DSE's Biodiversity Interactive Maps showing historic and current EVCs (DSE 2010a);
- Sites of Biological Significance (BioSites) (DSE 2010b)
- 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 *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) (DSEWPC 2010);
- Planning Schemes Online providing the current zone and overlays (DPCD 2010);
- Relevant legislation and policies; and
- Known ecological reports relevant to the study area, including:
  - McGuckin (2010). Dwarf Galaxias survey of the Cardinia Creek Retarding Basin and selected locations in the Cardinia Creek catchment.
  - Ecology Australia Pty Ltd (2010b). Draft Sub-regional Surveys for the Growling Grass Frog *Litoria raniformis*;
  - Practical Ecology Pty Ltd (2010). GAA Subregional Fauna Survey; Southern Brown Bandicoot.

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 completed the mandatory habitat hectare training held by GAA and DSE in August 2009.

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

### 2.3.1 General flora survey

Flora surveys were undertaken on 5, 6, 10 and 11 November 2009. 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 (described in Section 2.3.1) on 5, 6, 10 and 11 November 2009. All patches of remnant native vegetation were compared with historic and current EVC mapping (DSE 2010a), and relevant EVC benchmarks (DSE 2010c), to determine the most likely EVC from which it would have been associated with.

Remnant patches were assessed in accordance with the DSEs habitat hectare assessment methodology (DSE 2004), and the Biodiversity Assessment Project 2009/10 Vegetation Mapping and Condition Assessment Procedures 1.4 (DSE 2009). 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.

### 2.3.3 Targeted flora surveys

Targeted flora surveys were undertaken at all properties which were accessed (Figure 2), and were undertaken in spring and summer depending on the flowering season of the species. Targeted flora surveys were a mandatory requirement under the contract. The following flora species were surveyed during spring on 5, 6, 10 and 11 November 2009:

- 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*

Species targeted during summer surveys on 14, 15 and 16 December, included:

- Swamp Everlasting *Xerochrysum palustre*
- Matted Flax-lily *Dianella amoena*
- Veined Spear Grass *Austrostipa rudis* subsp. *australis*

In each case, the targeted surveys 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).

### 2.3.4 General fauna survey

General fauna assessments were undertaken on 5, 6, 10 and 11 November 2009, concurrently with the general flora surveys (Section 2.3.1). Weather conditions over this period varied. All fauna observed and/or heard were recorded, while the presence of a particular species within the study area 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 and general notes of different habitat types throughout the study area 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.

### 2.3.5 Targeted fauna surveys

Targeted fauna surveys were a mandatory requirement under the contract. This included targeted surveys for the nationally significant Dwarf Galaxias *Galaxiella pusilla*, state significant Swamp Skink *Egernia coventryi* and regionally significant Glossy Grass Skink *Pseudemoia rawlinsoni* which were undertaken over summer, while targeted surveys for Southern Toadlet *Pseudophryne semimarmorata* were undertaken in April (Table 2). The biodiversity assessment did not include targeted surveys of Growling Grass Frog or Southern Brown Bandicoot which were to be addressed through the Sub Regional Surveys (Ecology Australia Pty. Ltd. 2010 and Practical Ecology Pty. Ltd. 2010). The following fauna survey methods were used in an effort to identify targeted species within the study area. The following fauna survey methods were used in an effort to identify targeted species within the study area.

#### 2.3.5.1 Roof tiling

Tile grids were used to survey for ground dwelling reptiles. 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). Grids were laid in areas of habitat that were either suitable or potentially suitable for reptiles (Table 2). Tile grids were assembled in transects or grids to maximise the number of tiles in the potential habitat. Tiles were laid approximately five metres apart. Tiles in each grid were checked four times in mornings or evenings on mild days, at a time when reptiles are typically known to reside under tiles, and not actively foraging.

#### **2.3.5.2 *Elliott trapping***

Elliott (Type A, Elliot Scientific, Upwey, Victoria) trapping was also undertaken in potential habitat for significant fauna species within the study area (Table 2). Trap lines comprising eight Elliott traps, in three locations within the study area were set and checked over a five days. Traps were set each night, checked each morning, left open throughout daylight hours, and then checked again later in the afternoon. Traps were baited with a mixture of peanut butter, rolled oats, and honey, or sardines and flour.

#### **2.3.5.3 *Call playback and active searching***

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. Observers then listen for defined periods, typically 10 minutes, in habitats which were considered likely breeding habitats (i.e. farm dams, ephemeral soaks). In addition, frogs were located by spotlighting with hand held spotlights (see below) around the perimeter of dams.

Active searching for ground dwelling fauna such as reptiles and frogs was undertaken at many sites containing ground debris such as logs, coarse 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 *Aquatic Surveys***

Bait trapping, electrofishing and dip netting were undertaken in an effort to detect significant fish species that may occur within waterbodies and waterways within the study area.

Bait trapping with glow sticks was carried out at the six assessment areas along the drainage line and Toomuc Creek. Eight bait traps were set for each assessment area, totalling 48 traps. These traps were left overnight and checked the next morning.

Electrofishing was undertaken by a suitably qualified assessor. Electrofishing relies on two electrodes which deliver current into the water to stun fish. Fish are then netted and identified to species level, and then released.

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.

### 2.3.6 Summary of targeted fauna surveys

Targeted surveys were undertaken in areas of habitat that have potential to support one or more significant species. Three sites were chosen as part of the targeted surveys (Figure 6):

*Survey Site 1:* Permanent waterbody surrounded by DTV within property 1516419.

*Survey Site 2:* Permanent waterbody with small areas of remnant native vegetation within property 1514384.

*Survey Site 3:* Low-lying, possibly ephemeral area, with areas of remnant native vegetation and non-indigenous eucalyptus within property 50233808.

**Table 2:** Targeted fauna surveys undertaken within the study area.

Target Species	Assessment Area	Survey Technique	Date	Survey Effort per Day/Night	Total Survey Effort
Dwarf Galaxias	Survey Site 1	Bait Trapping	7-Dec-09 to 11-Dec-09	8 bait trap days/nights	8 bait trap days/nights
		Dip Netting		30 minutes dip netting	30 minutes dip netting
	Survey Site 2	Bait Trapping	7-Dec-09 to 11-Dec-09	8 bait trap days/nights	8 bait trap days/nights
		Dip Netting		30 minutes dip netting	30 minutes dip netting
	Survey Site 3	Bait Trapping	7-Dec-09 to 11-Dec-09	8 bait trap days/nights	8 bait trap days/nights
		Dip Netting		30 minutes dip netting	30 minutes dip netting
Glossy Grass Skink and Swamp Skink	Survey Site 1	Elliott Trapping	30-Nov-09 to 11-Dec-09	15 Elliott trap days/nights	75 Elliott trap days/nights
		Tiling	Laid: 3-Nov-09. Checked: 30-Nov-09, 5-Dec-09, 4-Jan-10, 24-May-10	20 tiles	100 tile checks
		Active Searching	30-Nov-09 to 11-Dec-09, 30-Nov-09, 4-Jan-10, 8-Apr-10	10 mins	90 mins
	Survey Site 2	Elliott Trapping	30-Nov-09 to 11-Dec-09	15 Elliott trap days/nights	75 Elliott trap days/nights
		Tiling	Laid: 3-Nov-09. Checked: 30-Nov-09, 5-Dec-09, 4-Jan-10, 24-May-10	20 tiles	100 tile checks
		Active Searching	30-Nov-09 to 11-Dec-09, 30-Nov-09, 4-Jan-10, 8-Apr-10	10 mins	90 mins
	Survey Site 3	Elliott Trapping	30-Nov-09 to 11-Dec-09	15 Elliott trap days/nights	75 Elliott trap days/nights
		Tiling	Laid: 3-Nov-09. Checked: 30-Nov-09, 5-Dec-09, 4-Jan-10, 24-May-10	20 tiles	100 tile checks
		Active Searching	30-Nov-09 to 11-Dec-09, 30-Nov-09, 4-Jan-10, 8-Apr-10	10 mins	90 mins

Target Species	Assessment Area	Survey Technique	Date	Survey Effort per Day/Night	Total Survey Effort
Southern Toadlet	Survey Site 1	Call playback	8-Apr-10 and 24-May-10	90 minutes	180 minutes
		Active Searching	8-Apr-10 and 24-May-11	20 minutes	40 minutes
		Spotlighting	8-Apr-10 and 24-May-12	20 minutes	40 minutes
	Survey Site 2	Call playback	8-Apr-10 and 24-May-13	90 minutes	180 minutes
		Active Searching	8-Apr-10 and 24-May-14	20 minutes	40 minutes
		Spotlighting	8-Apr-10 and 24-May-15	20 minutes	40 minutes
	Survey Site 3	Call playback	8-Apr-10 and 24-May-16	90 minutes	180 minutes
		Active Searching	8-Apr-10 and 24-May-17	20 minutes	40 minutes
		Spotlighting	8-Apr-10 and 24-May-18	20 minutes	40 minutes

### 2.3.7 Incidental flora and fauna surveys

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

### 2.3.8 Summary of Flora and Fauna Survey Effort

A summary of the flora and fauna surveys undertaken over the duration of the project is provided below (Table 3).

**Table 3:** Summary of flora and fauna survey effort.

Property Number	General Flora Assessment	Habitat Hectare Assessment	Targeted Flora Assessment			General Fauna Assessment	Targeted Fauna Assessment		
			Spring Species <sup>1</sup>	Summer Species <sup>2</sup>	Winter Species <sup>3</sup>		Dwarf Galaxias	Swamp Skink and Glossy Grass Skink	Southern Toadlet
1516419	6-Nov-09	N/A	6-Nov-09	14-Dec-09	N/A	6-Nov-09	7-Dec to 11-Dec-09	30-Nov to 11-Dec-09	8-Apr-10 24-May-10
1514384	5-Nov-09	5-Nov-09	5-Nov-09	16-Dec-09	N/A	5-Nov-09	7-Dec to 11-Dec-09	30-Nov to 11-Dec-09	8-Apr-10 24-May-10
50233808	6-Nov-09	6-Nov-09	6-Nov-09	15-Dec-09	N/A	6-Nov-09	7-Dec to 11-Dec-09	30-Nov to 11-Dec-09	8-Apr-10 24-May-10
1514380	6-Nov-09	6-Nov-09	6-Nov-09	15-Dec-09	N/A	6-Nov-09	N/A	N/A	N/A
R53073660	11-Nov-09	11-Nov-09	11-Nov-09	15-Dec-09	N/A	11-Nov-09	N/A	N/A	N/A
R209526657	10-Nov-09	10-Nov-09	10-Nov-09	16-Dec-09	N/A	10-Nov-09	N/A	N/A	N/A
202107307	11-Nov-09	N/A	11-Nov-09	16-Dec-09	N/A	11-Nov-09	N/A	N/A	N/A
1516419	5-Nov-09	N/A	5-Nov-09	14-Dec-09	N/A	5-Nov-09	N/A	N/A	N/A
1514390	5-Nov-09	N/A	5-Nov-09	14-Dec-09	N/A	5-Nov-09	N/A	N/A	N/A
1514388	5-Nov-09	N/A	5-Nov-09	14-Dec-09	N/A	5-Nov-09	N/A	N/A	N/A
1516416	5-Nov-09	N/A	5-Nov-09	14-Dec-09	N/A	5-Nov-09	N/A	N/A	N/A
1516414	5-Nov-09	N/A	5-Nov-09	14-Dec-09	N/A	5-Nov-09	N/A	N/A	N/A
1514386	5-Nov-09	N/A	5-Nov-09	14-Dec-09	N/A	5-Nov-09	N/A	N/A	N/A
50233808	6-Nov-09	N/A	6-Nov-09	16-Dec-09	N/A	6-Nov-09	N/A	N/A	N/A
1514385	6-Nov-09	N/A	6-Nov-09	16-Dec-09	N/A	6-Nov-09	N/A	N/A	N/A
1514384	6-Nov-09	N/A	6-Nov-09	16-Dec-09	N/A	6-Nov-09	N/A	N/A	N/A
1514383	6-Nov-09	N/A	6-Nov-09	15-Dec-09	N/A	6-Nov-09	N/A	N/A	N/A
1514381	6-Nov-09	N/A	6-Nov-09	15-Dec-09	N/A	6-Nov-09	N/A	N/A	N/A
50233808	10-Nov-09	N/A	10-Nov-09	16-Dec-09	N/A	10-Nov-09	N/A	N/A	N/A
50233952	10-Nov-09	N/A	10-Nov-09	15-Dec-09	N/A	10-Nov-09	N/A	N/A	N/A

Property Number	General Flora Assessment	Habitat Hectare Assessment	Targeted Flora Assessment			General Fauna Assessment	Targeted Fauna Assessment		
			Spring Species <sup>1</sup>	Summer Species <sup>2</sup>	Winter Species <sup>3</sup>		Dwarf Galaxias	Swamp Skink and Glossy Grass Skink	Southern Toadlet
1518369	10-Nov-09	N/A	10-Nov-09	16-Dec-09	N/A	10-Nov-09	N/A	N/A	N/A
17358240	10-Nov-09	N/A	10-Nov-09	16-Dec-09	N/A	10-Nov-09	N/A	N/A	N/A
1514378	10-Nov-09	N/A	10-Nov-09	14-Dec-09	N/A	10-Nov-09	N/A	N/A	N/A
1514380	10-Nov-09	N/A	10-Nov-09	14-Dec-09	N/A	10-Nov-09	N/A	N/A	N/A
1518379	10-Nov-09	N/A	10-Nov-09	14-Dec-09	N/A	10-Nov-09	N/A	N/A	N/A
1514377	11-Nov-09	N/A	11-Nov-09	14-Dec-09	N/A	11-Nov-09	N/A	N/A	N/A
1518391	11-Nov-09	N/A	11-Nov-09	15-Dec-09	N/A	11-Nov-09	N/A	N/A	N/A
1518392	11-Nov-09	N/A	11-Nov-09	15-Dec-09	N/A	11-Nov-09	N/A	N/A	N/A
1518394	11-Nov-09	N/A	11-Nov-09	16-Dec-09	N/A	11-Nov-09	N/A	N/A	N/A
52881396	11-Nov-09	N/A	11-Nov-09	15-Dec-09	N/A	11-Nov-09	N/A	N/A	N/A
1514381	11-Nov-09	N/A	11-Nov-09	16-Dec-09	N/A	11-Nov-09	N/A	N/A	N/A
52881396	11-Nov-09	N/A	11-Nov-09	16-Dec-09	N/A	11-Nov-09	N/A	N/A	N/A
53073661	11-Nov-09	N/A	11-Nov-09	15-Dec-09	N/A	11-Nov-09	N/A	N/A	N/A

1 Spring species included: Maroon Leek Orchid, Grey Billy Buttons, River Swamp Wallaby Grass, Wine-lipped Spider Orchid, Purple Diuris, and Pale Swamp Everlasting.

2 Summer species included: Swamp Everlasting, Matted Flax-lily, Veined Spear Grass.

## 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 study area. 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 survey meant that 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 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.

Not all properties within the study area were assessed during the field investigations (Figure 2). Six properties were not assessed as landholders could not be contacted by phone, letter dropping, and/or by door-knocking. Five properties were not assessed due to denied access. Properties that weren't accessed include:

- 1514 392 – 16 Glismann Road, Beaconsfield (access denied)
- 1514 391 – 15 Glismann Road, Beaconsfield (access denied)
- 1514 389 – 13 Glismann Road, Beaconsfield (access denied)
- 1514 387- 11 Glismann Road, Beaconsfield (access denied)
- 5307 3660 - O'Neil Road, Beaconsfield (access denied)
- 1516 425 – 13-15 Mahon Road, Beaconsfield (unsuccessful)
- 1514 382 – 6 Glismann Road, Beaconsfield (unsuccessful)
- 1514 379 – 3 Glismann Road, Beaconsfield (unsuccessful)
- 1518 389 – 111-113 Old Princes Highway, Beaconsfield (unsuccessful)
- 209 526 666 – May Road, Beaconsfield (unsuccessful)
- 209 526 657 - May Road, Beaconsfield (unsuccessful)

The reasons that access was not granted included:

- Landholders denying access to protest against the proposed Growth Areas Infrastructure Contribution Scheme tax;
- Could not be contacted (by phone, letter dropping, or by door-knocking); and/or
- Details were not provided for the land parcel and a dwelling was not located on-site.

## 3 RESULTS

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### 3.1 Flora

#### 3.1.1 Flora species

Eighty flora species (30 indigenous, 50 exotics) were recorded within the study area (Appendix 2.1). The study area is highly modified and dominated by exotic vegetation, and this is a result of extensive clearance of remnant native vegetation for agricultural purposes. However, small, highly degraded areas of remnant vegetation are present within the study area (Figure 3).

Indigenous species recorded within the study area include tree species such as Manna Gum *Eucalyptus viminalis*, River Red-gum *Eucalyptus camaldulensis*, Narrow-leaf Peppermint *Eucalyptus radiata*, Bundy *Eucalyptus goniocalyx* and Swamp Gum *Eucalyptus ovata*. Shrubs species included Black Wattle *Acacia mearnsii*, Cherry Ballart *Exocarpos cupressiformis*, Swamp Paperbark *Melaleuca ericifolia* and Tree Violet *Melicytus dentatus*. Herb species included Slender Dock *Rumex brownii*, Grassland Wood-sorrel *Oxalis perennans* and Slender Knotweed *Persicaria decipiens*.

Exotic species recorded include Cocksfoot *Dactylis glomerata*, Barley Grass *Hordeum* spp., Cape Weed *Arctotheca calendula*, Perennial Rye-grass *Lolium perenne* and Toowoomba Canary-grass *Phalaris aquatica*. Other grassy weed species present within the study area include Prairie Grass *Bromus catharticus* and Brown-top Bent *Agrostis capillaris*. Woody weeds included Blackberry *Rubus fruticosus* sp. agg., Radiata Pine *Pinus radiata*, Weeping Willow *Salix babylonica*, and Monterey Cypress *Cupressus macrocarpa*.

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

#### 3.1.2 Significant flora species and communities

Significant flora species documented as occurring within the local area (i.e. a 10 kilometre radius of the study area) are listed below (Appendix 2.2, Figure 7).

Targeted flora surveys for River Swamp Wallaby-grass, Grey Billy-buttons, Maroon Leek-orchid, Wine-lipped Spider Orchid, Purple Diuris, Pale Swamp Everlasting, Swamp Everlasting, Matted Flax-lily and Veined Spear-grass were undertaken within all areas of potentially suitable habitat within the study area (where site access was granted).

#### National

Despite detailed targeted flora surveys during the project no nationally significant flora species were recorded within the study area.

Six nationally significant flora species have previously been recorded within the local area, and one nationally significant flora species is listed as potentially occurring within a 10 kilometre radius of the study area (DSEWPC 2010) (Appendix 2.2).

Based on the results of the literature review and detailed targeted surveys, and the low quality habitat within the study area, it is considered that the nationally significant River Swamp Wallaby-grass *Amphibromus fluitans* has a low likelihood of occurrence in and/or surrounding dams within the study area.

Due to the highly modified nature of the study area, the lack of remnant native vegetation, and the results of the flora surveys, there is a low likelihood of any nationally significant flora species occurring within the study area (Appendix 2.2).

### **State**

No state significant flora species were recorded within the study area during the assessment. Thirty-five state significant flora species have been previously recorded from within the local area (i.e. a 10 kilometre radius of the study area) (Appendix 2.2.). Based on the assessment, Wetland Blown-grass *Lachnagrostis filiformis* var. 2, Grey Spike-sedge *Eleocharis macrobarronii* and Perfoliate Pondweed *Potamogeton perfoliatus* are considered to have a low likelihood of occurrence in low lying, or seasonally inundated areas (e.g. around the edges of farm dams) within the study area. Consistent with nationally significant species, due to the highly modified nature of the study area, the lack of remnant native vegetation, and the results of the flora surveys, there is a low likelihood of any state significant flora species occurring within the study area (Appendix 2.2).

### **Regional and Local**

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

### **Significant Communities**

No vegetation communities listed as threatened under the EPBC Act or *Flora and Fauna Guarantee Act 1988* (FFG Act) are present within the study area. Grassy Woodland (EVC 175) and Swampy Riparian Woodland (EVC 83) are listed as Endangered; and Sedge Wetland (EVC 136) is listed as Vulnerable within the Gippsland Plain bioregion (DSE 2010c). Grassy Woodland is listed as Depleted and Swampy Riparian Woodland is listed as Vulnerable within the Highlands - Southern Fall bioregion. Sedge Wetland is not listed as an EVC within the Highlands – Southern Fall bioregion.

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

Remnant native vegetation within study area is highly modified and provides low quality habitat for flora species.

Consistent with above, no significant flora species were recorded during the assessment, and there is a low likelihood of occurrence for any significant flora species.

Remnant vegetation within the study area is not considered to be either 'Best' or 'Remaining' 50% habitat for threatened flora species with a low likelihood of occurrence. An assessment in accordance with Table 2 in the *Native Vegetation Guide for assessment of referred planning permit applications* (DSE 2007a) is not required for species with a low likelihood of occurrence.

### 3.2 Ecological Vegetation Classes

The bioregional pre-1750 EVC mapping shows that the study area was once covered by Swampy Woodland (EVC 937) and Grassy Woodland (EVC 175) (DSE 2010a). Current EVC mapping shows only isolated occurrences of these EVCs within the study area (DSE 2010a).

The study area lies on the border of the Gippsland Plain and Highlands – Southern Fall bioregions. The Gippsland Plain bioregion includes flat low lying coastal and alluvial plains with gently undulating terrain dominated by barrier dunes and floodplains and swampy flats (DPI 2010). The upper terrain typically supports Lowland Forest. The dunes typically support Heathy Woodland and Damp Sands Herb-rich Woodland EVCs. The fertile floodplains and swamps support Swamp Scrub, Plains Grassy Woodland, Plains Grassy Forest, Plains Grassland and Gilgai Wetland EVCs (DPI 2010).

The Highlands – Southern Fall bioregion is the southerly aspect of the Great Dividing Range. Highlands – Southern Fall consists of uplands with moderate to steep slopes, high plateaus and alluvial flats along the main valleys (DPI 2010). Dominant EVCs within the bioregion include Shrubby Dry Forest and Damp Forest on the upper slopes, with Wet Forest ecosystems dominant in the valleys, and Cool Temperate Rainforest in the most protected gullies. Montane Dry Woodland, Montane Damp Forest and Montane Wet Forest EVCs occur at higher altitudes (DPI 2010).

All vegetation within the study area is within the Gippsland Plain, consistent with the DSE Biodiversity Interactive Mapping (DSE 2010a). This was confirmed during the site assessment, made evident by the topography of alluvial plains and floodplains as well as the EVCs which are typical of the Gippsland Plain, such as Swampy Riparian Woodland, Grassy Woodland and Sedge Wetland.

Areas of indigenous vegetation within the study area are highly modified, and all patches were less than 0.1 hectares in area (Figure 3). A description of the EVCs within the study area is provided below.

### 3.2.1 Grassy Woodland (EVC 175)

Grassy Woodland consists of open woodland containing eucalypts or she-oaks, with a diverse understorey of grasses and herbs (DSE 2010b). 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 2010b).

Three remnant patches of Grassy Woodland were identified in the northern half of the study area (Figure 3). These remnant patches did not contain any canopy layer, and were dominated by Blackwood and are of poor quality.

### 3.2.2 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 2010b).

One patch of Swampy Riparian Woodland was identified within the northern half of the study area, around targeted fauna survey Site 3. The patch was low quality, and was heavily infested with Blackberry and Weeping Willow. Immature River Red-gums were present, along with Common Reed *Phragmites australis*.

### 3.2.3 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 2010b).

Sedge Wetland occurs within a dam in the north-west of the study area (Figure 3). The patch contains aquatic graminoids such as Rush *Juncus* spp., Slender Knotweed and Common Spike-sedge *Eleocharis acuta*. Patches of Sedge Wetland are weedy, containing Capeweed, Soursob *Oxalis pes caprae*, Curled Dock *Rumex crispus* and Burr Medic *Medicago polymorpha* and lack species diversity.

## 3.3 Habitat Hectare Assessment

### 3.3.1 Patches of remnant native vegetation

Five patches of remnant native vegetation are mapped within the study area (Appendix 4.1) (Figure 3). All remnant patches of native vegetation are of High conservation significance (Figure 5). Approximately **0.02 habitat hectares** of vegetation is present within the study area, comprising:

- **0.01 habitat hectares** of High conservation significance Sedge Wetland; and,
- **0.01 habitat hectares** of High conservation significance Grassy Woodland.

There is also a small patch of Swampy Riparian Woodland present, however this amounted to less than 0.01 habitat hectares.

### 3.3.2 Scattered remnant trees

The study area contains 44 scattered remnant trees including:

- Four Very Large Old Trees (VLOT);
- Six Large Old Trees (LOT);
- Five Medium Old Trees (MOT); and,
- 29 Small Trees (ST) (Appendix 4.2, Figure 4)

Fifteen scattered trees are considered to be of High conservation significance, and 29 scattered trees are considered to be of Low conservation significance (Appendix 4.2).

## 3.4 Fauna

### 3.4.1 Fauna species

Thirty-two terrestrial fauna species were recorded within the study area, comprising two native mammals, one introduced mammal, four native amphibians and 25 birds (19 native, six introduced) (Appendix 3.1).

A high level of terrestrial fauna surveys have previously been undertaken within a 10 kilometre radius of the study area, with over 900 fauna surveys or incidental records of individual species (AVW 2007). From these records, there has been at least 300 individual species documented, with a high number of bird records, and a moderate number of mammals, reptiles and frogs (AVW 2007). Several of these species (i.e. common open country and woodland birds) known to use habitats within the study area (see above).

### 3.4.2 Fauna habitats

The site currently supports four broad habitat types: modified woodland/remnant trees, and artificial waterbodies, planted native and introduced vegetation, and introduced pasture.

#### **Modified Woodland (Corresponding EVC: Grassy Woodland and Swampy Riparian Woodland) and remnant scattered trees**

*Overall habitat value* – Small isolated patches of remnant woodland are of **moderate** habitat value for fauna (Appendix 1.5). These areas are present within property 1514384, R53073660 and R20952666 within the Gippsland Plain bioregion, and are considered to be highly modified. However, these patches may provide temporary habitat and facilitate fauna movement between habitats throughout an otherwise cleared landscape.

*Description* - This habitat type is highly modified with a poor quality understorey and typically lacks a shrub layer/midstorey component (i.e. floristically and structurally deficient).

A small number of remnant trees within the study area support tree hollows of varying size and shape. The vegetation generally lacked ground debris such as logs, rocks and other organic matter. These patches of vegetation are generally isolated, and don't provide linkages to high quality vegetation elsewhere within or beyond the study area.

*Fauna* – A relatively high number of fauna species were observed in this area. Woodland birds observed include Eastern and Crimson Rosellas *Platycercus* spp., Laughing Kookaburra *Dacelo novaeguineae*, Red Wattlebird *Anthochaera carunculata* and Sulphur-crested Cockatoo *Cacatua galerita*, all of which are common species in trees within the local area.

Mammals recorded included Brush-tailed Possum *Trichosurus vulpecula*, which was detected incidentally from scats, and Swamp Rat *Rattus lutreolus* which was trapped in an Elliot trap during targeted fauna surveys. When in flower, remnant woodland trees would provide an important nectar resource for a variety of honeyeaters and lorikeets. These areas may also provide lower quality habitat for other ground dwelling fauna such as reptiles and frogs.

### **Planted Native and Introduced Vegetation (Corresponding EVC: None)**

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

*Description* – Planted native and exotic trees occur as shelterbelts and for ornamental use throughout the study area. Many of these trees are mature and reach a height of up to 20 metres, some support crevices and hollows. The midstorey is largely absent, with an understorey predominantly supporting introduced pasture grasses and bare ground. Low levels of ground debris such as logs, sticks and leave litter occur under these trees. Planted shrubs also occur in residential gardens on most properties.

*Terrestrial fauna* – Many of these trees provide a suitable foraging resource, primarily for a range of locally common birds. Additionally, low growing shrubs are expected to be used by smaller passerine species such as wrens, thornbills and fantails for nesting and foraging purposes, while a range of diurnal raptors (Black-shoulder Kite, Brown Falcon) would use mature trees as vantage points and possibly for nesting.

### **Artificial Waterbodies (Farm Dams) (Corresponding EVC: None)**

*Overall habitat value* – Artificial waterbodies are considered to be of **low** to **moderate** habitat value for fauna (Appendix 1.5).

*Description* – Several artificial waterbodies exist within the study area. They currently support low levels of emergent aquatic vegetation, and generally lack extensive areas of submerged with few refuge sites such as logs or rocks. The surrounding vegetation comprises of introduced pasture grass or modified remnant vegetation.

*Fauna* – Waterbirds such as Australian Wood Duck *Chenonetta jubata* and Pacific Black Duck *Anas superciliosa*, and frog species such as Common Froglet *Crinia signifera* and

Spotted Marsh Frog *Limnodynastes tasmaniensis* were observed using this habitat. In addition, several other waterbirds (e.g. Australasian Grebe *Tachybaptus novaehollandiae*, Little Pied Cormorant *Phalacrocorax melanoleucos*) are likely to use these areas periodically, and waterbodies supporting vegetative cover within and around their margins offer protection for more secretive waterbirds such as crakes, rails and snipe.

There is also suitable foraging habitat for state significant fauna species such as Eastern Great Egret *Ardea modesta* and Royal Spoonbill *Platalea regia*, although given the size and overall quality of waterbodies within the study area, these species are only expected to use this habitat on an occasional basis.

### **Pastures and Crops (Corresponding EVC: None)**

*Overall habitat value* – This habitat is of **low** habitat value for fauna (Appendix 1.5). Ungrazed pasture grasses (up to one metre high) provides habitat for birds adapted to agricultural landscapes and ground dwelling mammals, reptiles and frogs.

*Description* – This habitat occurs throughout much of the study area 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* and House Sparrow *Passer domesticus* were also prevalent in this habitat. Raptors including Brown Falcon *Falco berigora*, Nankeen Kestrel *Falco cenchroides* and Black-shouldered Kite *Elanus axillaris* are likely to search for prey items over these areas.

Although introduced grasses do not provide optimal habitat for fauna, they do provide dispersal opportunities (cover) for reptiles, frogs and other species into more optimal habitats throughout the local area.

### **3.4.3 Significant fauna species**

Terrestrial fauna species derived from respective Commonwealth and State databases as occurring, or having the potential to occur within the study area is provided below (Appendix 3.2). Previous records of significant fauna species within the local area are shown on Figure 8, while potential habitat within the study area for significant fauna species is shown in Figure 9.

No national or state significant fauna species were recorded during the general fauna assessment and during the targeted fauna surveys. National, state and regionally significant fauna species that have been previously recorded within 10 kilometres of the study area, and their likely use of the study area is provided below (Appendix 3.2) (AVW 2007).

While several significant fauna species are documented as occurring within the local area, no fauna species of national or state conservation significance was recorded within the study area during the present assessment.

## National

Eleven nationally significant fauna have previously been recorded within 10 kilometres of the study area (AVW 2007) (Appendix 3.2). These species include:

- Five birds: Australasian Bittern *Botaurus poiciloptilus*, Superb Parrot *Polytelis swainsonii*, Swift Parrot *Lathamus discolor*, Regent Honeyeater *Anthochaera phrygia* and Helmeted Honeyeater *Lichenostomus melanops cassidix* - with the exception of foraging habitat for Swift Parrot, no suitable habitat for all species.
- Three mammals: Spot-tailed Quoll *Dasyurus maculatus*, Southern Brown Bandicoot *Isodon obesulus obesulus* and Grey-headed Flying-fox *Pteropus poliocephalus* - with the exception of foraging habitat for Grey-headed Flying-fox, no suitable habitat for all species.
- Two fish: Dwarf Galaxias *Galaxiella pusilla* and Australian Grayling *Prototroctes maraena* - no suitable habitat for all species.
- One frog: Growling Grass Frog *Litoria raniformis* - low likelihood of occurrence, marginal habitat.

A further four species (not previously documented on the AVW 2007), or habitat for these species, are identified as potentially occurring within a 10 kilometres radius of the study area (DSEWPC 2010) (Appendix 3.2). Sub-regional surveys for Southern Brown Bandicoot (Practical Ecology Pty Ltd 2010) concluded that there is no habitat in the study area for this species, and it is unlikely to occur.

The following descriptions of significant fauna species that have a low likelihood of occurring within the study area, and/or which required further investigation as part of the assessments (i.e. as part of the project brief).

### Growling Grass Frog

Growling Grass Frog is listed as endangered in Victoria (DSE 2007b), 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 developed for the species (Clemann and Gillespie 2010). 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 2006; Hamer and Organ 2008).

Growling Grass Frog has not been previously recorded within the study area (AVW 2007). However, there are a large number of records within the local area, largely south east of the study area near Pakenham and through the former Koo Wee Rup swamp (A. Organ, pers. obs.) (Appendix 3.2). Growling Grass Frog is considered to have a low likelihood of occurrence within the study area for the following reasons:

- The absence of previous records within the study area;
- The lack of suitable habitat characteristics in farm dams (i.e. lack of high levels of emergent, submerged, floating vegetation, and high water quality); and,
- The isolation (lack of habitat connectivity) of waterbodies from permanent waterways and other suitable sites in the local area as a result of the surrounding urbanisation (e.g. roads and residential development).

### **Australian Grayling**

Australian Grayling is a medium sized fish, generally growing to 190 millimetres, however it has been known to grow to 330 millimetres (Backhouse *et al.* 2008). 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.* 2008a).

Most of its life is spent in freshwater, though at least some of its juvenile stage is spent in coastal seas (Backhouse *et al.* 2008a). 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.* 2008a; 2008b). 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.* 2008a).

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 appears that much of the species decline is due to

habitat loss, although recent research suggests that the lack of suitable conditions for breeding is likely to be responsible for population declines across the species range (Allen *et.al.* 2002).

Australian Grayling was not recorded during targeted surveys. While it has previously been recorded within Cardinia Creek, the study area contains no tributaries of Cardinia Creek, and is not within its floodplain (Figure 8). Consequently, due to the absence of a permanent waterway there is no suitable habitat for Australian Grayling within the study area.

### **Dwarf Galaxias**

Dwarf Galaxias is a 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 (~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 (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), that often have a high cover of emergent, submerged and floating vegetation. While they can persist in permanent waterbodies, they are commonly associated with ephemeral pools (connected to permanent waterways), and are thought to be able to aestivate when waterbodies dry up (McDowall 1996).

Dwarf Galaxias was not recorded during targeted fauna surveys. It has previously been recorded within Cardinia Creek (AVW 2007; McGuckin 2010) (Figure 8), and also through the Hallam Valley, several kilometres to the south west of the precinct (AVW 2007; McGuckin 2010). However, the study area contains no tributaries of Cardinia Creek, and is not within its floodplain. Therefore, Dwarf Galaxias is considered unlikely to occur within dams and low-lying areas in the study area (Figures 8 and 9) (Appendix 3.2).

### **State**

Twenty-eight state significant fauna species have previously been documented from the local area (AVW 2007) Appendix 3.2. These species include:

- Three diurnal raptors: Grey Goshawk *Accipiter novaehollandiae*, White-bellied Sea-Eagle *Haliaeetus leucogaster* and Black Falcon *Falco subniger* - all vagrant visitors;
- Three nocturnal raptors: Powerful Owl *Ninox strenua*, Barking Owl *Ninox connivens* and Sooty Owl *Tyto tenebricosa* - no suitable habitat for all species;

- Thirteen wetland associated birds: Lewin's Rail *Lewinia pectoralis*, Baillon's Crake *Porzana pusilla*, Caspian Tern *Hydroprogne caspia*, Common Sandpiper *Actitis hypoleucos*, Royal Spoonbill *Platelea regia*, Little Egret *Egretta garzetta*, Intermediate Egret *Ardea intermedia*, Eastern Great Egret *Ardea modesta*, Australian Shoveler *Anas rhynchos*, Freckled Duck *Stictonetta naevosa*, Hardhead *Aythya australis*, Blue-billed Duck *Oxyura australis* and Musk Duck *Niziura lobata* - occasional use of the study area by some of these species;
- Six woodland associated birds: Major Mitchell's Cockatoo *Lophocroa leadbeateri*, Hooded Robin *Melandodryas cucullata*, Grey-crowned Babbler *Pomatostomus temporalis*, Chesnut-rumped Heathwren *Calamanthus pyrrhopygius*, Speckled Warbler *Pyrrholaemus sagittatus* and Brown Treecreeper *Climacteris picumnus victoriae* - no suitable habitat for all species;
- One reptile: Swamp Skink *Egernia coventryi* - low likelihood of occurrence, marginal habitat;
- One amphibian: Southern Toadlet *Pseuophryne semimarmorata* - unlikely, marginal habitat; and,
- One invertebrate: Dandenong Freshwater Amphipod *Austrogammarus australis* - no suitable habitat.

Some wetland associated birds may use artificial waterbodies (farm dams) within the study area. Royal Spoonbill and Eastern Great Egret have a moderate likelihood to visit artificial wetlands for foraging purposes. In addition, given the presence of marginal habitat, Swamp Skink has a low likelihood of occurrence within the study area. There is no suitable habitat and/or other state significant species listed above are not likely to use the study area as residents, or visitors on a regular basis (i.e. no important habitat present).

The following are descriptions of species included in targeted surveys, or state significant species that have a low to moderate likelihood of occurring within the study area.

### **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 is associated with forest, woodland, shrubland and heathland environments (A. Organ, pers. obs.). 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 (A. Organ, pers. obs.).

Southern Toadlet was not recorded during the general and targeted fauna surveys. Fifty-seven records (most recent 1981) of Southern Toadlet occur within 10 kilometres of the study area. However, there are no documented records of this species within the study area (AVW 2007) (Appendix 3.2). Given the historic land clearance across the entire study area (including drainage lines), the lack of woodland habitat, and the fact that Southern Toadlet was not recorded during the targeted surveys undertaken in April and May 2010 (i.e. at a time when the species was known to be calling at other sites outside of the study area), the study area is unlikely to support an extant population of this species.

### **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 (2007). 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 is associated with a range of habitats, most notably in densely vegetated freshwater swamps and watercourses, wet heaths, sedgeland (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 consisted of dense ground cover, up to two metres, with sparse to no overstorey (Clemann 2006; Ecology Partners 2009).

The study area is within the known range of the species and was targeted for assessment. There is one historical record for Swamp Skink within 10 kilometres of the study area (AVW 2007), however the species was not detected during the current assessment.

The perimeter of artificial waterbodies provides low quality habitat for Swamp Skink, and there is a low likelihood of this species occurring within the study area.

### **Waterbirds**

Several waterbirds (Eastern Great Egret, Hardhead, Australasian Shoveler, Baillon's Crake and Royal Spoonbill) may occasionally use waterbodies within the study area for foraging and other activities (Appendix 3.2). However, there is no suitable breeding habitat within the

study area for any of these species. Other state significant waterbirds (e.g. Blue-billed Duck) may use wetland habitats within the study area as visitors on rare occasions (Appendix 3.2).

### **Regional and Local**

No regionally significant fauna were recorded during the present assessment. Ten regionally significant fauna species have been previously recorded within the local area (AVW 2007). There are 14 documented records of Latham's Snipe within the local area (AVW 2007), and this species may occasionally forage in low-lying, seasonally inundated areas within the study area. There is also a low likelihood for Glossy Grass Skink to occur in dense vegetation fringing dams within the study area. Due to the high level of modification of habitat within the study area, the use of the study area by other regionally significant fauna species (principally birds) is considered low. All other native fauna (primarily common open country birds) are of local significance, as they are not listed as rare or threatened on a national, state and regional level.

### **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).

The species 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). It 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).

The study area is within the known range of the species, and as such, a targeted survey for this species was undertaken as part of the fauna investigations. However, there have been no documented records of Glossy Grass Skink within the local area (AVW 2007). Although targeted surveys (active searching, roof tiling) were undertaken for this species in potentially suitable habitat, the species was not recorded during the current assessments. The perimeter of artificial waterbodies provides low quality habitat for Glossy Grass Skink, and therefore there is a low likelihood of this species occurring within the study area.

### **3.4.4 Best or remaining 50% habitat for rare and threatened fauna species**

The habitat assessment that has been undertaken in accordance with the *Native Vegetation Guide for assessment of referred planning permit applications* (DSE 2007a) is summarised below (Table 4).

**Table 4.** Habitat assessment for threatened fauna 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

Threatened fauna species and remnant native vegetation that may support habitat for these species, along with the determination on the best or remaining habitat for these species is provided below (Table 5).

**Table 5.** Habitat assessment for threatened species within properties accessed for the study area.

Potential Habitat (Remnant Patch No)	Threatened Species or Species' with the Highest Likelihood of Occurrence <sup>1</sup>	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
1514380 - 2A 50233808 – 2A (Sedge Wetland)	Eastern Great Egret, Royal Spoonbill, Latham's Snipe	A, D, F	Remaining 50%	Moderately likely to occur	Medium	High

<sup>1</sup> The assessment is undertaken on the species or species' with the highest likelihood of occurrence as a resident, or most regular occurrence if it is a mobile fauna species. Ecology Partners Pty Ltd does not intend to assess species' with a lower likelihood of occurrence as they are unlikely to alter the outcome of the assessment.

It is considered that Sedge Wetland provides suitable habitat for state significant Eastern Great Egret, Royal Spoonbill and Latham's Snipe. Therefore, following steps A, D and F in Table 2 in *Native Vegetation Guide for assessment of referred planning permit applications* (DSE 2006), Sedge Wetland within the study area is considered Remaining 50% habitat for these species.

## 4 RELEVANT LEGISLATION AND POLICY

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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 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:

- World Heritage properties
- National heritage places
- Ramsar wetlands of international significance
- Threatened species and ecological communities
- Migratory and marine species
- Commonwealth marine area
- Nuclear actions (including uranium mining)
- Ramsar Wetlands of International Significance

#### **Ramsar Wetlands of International Significance**

There are no Ramsar listed wetlands within the study area; however the study area is close to Cardinia Creek flows into the Port Phillip and Western Port Ramsar Wetland site, which is located within 20 kilometres of the study area. As with other nearby developments, it is expected that practical mitigation measures (e.g. appropriate stormwater treatment) can be undertaken to minimise potential impacts on this Ramsar site.

#### **Listed Flora and Fauna Species and Ecological Communities**

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

*Flora* – No flora species listed under the EPBC Act were recorded during the assessment. Seven species have the potential to occur within a 10 kilometre radius of the study area (DSEWPC 2010) (Appendix 2.2).

River Swamp Wallaby-grass has a low likelihood of occurrence within and around the perimeter of artificial waterbodies in the study area. Due to the modification of vegetation within the study area, it is unlikely that any other nationally significant flora species occur.

*Fauna* – No fauna species listed under the EPBC Act were recorded during the assessment. Eleven listed species have previously been recorded in the local area (AVW 2007), and an additional four species or their habitats are predicted to occur in the local area (DSEWPC 2010) (Appendix 3.2). Based on the survey results, the lack of high quality habitat, and the absence of previous records of Growling Grass Frog and Dwarf Galaxias within the study area, there is a very low likelihood that either of these species occur within the study area. Similarly, there is no important habitat for any other EPBC Act-listed fauna within the study area.

*Communities* – Remnant native vegetation within the study area does not form part of any ecological communities listed under the EPBC Act.

### **Listed Migratory and Marine Species**

Several migratory and marine species have been recorded from the local area (AVW). However, there is no important wetland or marine habitats within the study area, and therefore the study area is unlikely to support an ecologically significant population of any migratory and/or marine species.

### **Commonwealth Marine Area and Nuclear Actions**

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

### **Implications and Recommendations**

No EPBC Act-listed flora or fauna species were recorded during the current assessments and targeted surveys. As such, due to the low habitat quality within the study area, there is a low likelihood of occurrence of EPBC Act-listed species, and ecological communities within the study area.

## **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 on a site of more than 0.4 hectares, unless:

- The application is exempt under the schedule to Clause 52.17; or
- A Native Vegetation Precinct Plan (NVPP) applies.

Clause 52.16 applies to land where a NVPP, corresponding to that land, is incorporated into the local planning 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. Although a NVPP can stand alone, it typically forms part of a PSP. The purpose of a NVPP is to protect and conserve native vegetation to reduce the impacts associated with future development, to provide habitat for flora and fauna species, and to enable other areas of native vegetation to be removed in accordance with the NVPP. The NVPP may require specified works to be undertaken or specified payments to be made to offset the removal, destruction or lopping of remnant native vegetation. Where a NVPP is incorporated and listed in the schedule to clause 52.17 Native Vegetation, no permit is required under c52.17.

Planning schemes may contain other provisions in relation to the removal of native vegetation. A permit to remove destroy or lop vegetation may still be required under an applicable overlay, such as an environmental significance overlay (ESO) depending on the requirements of the schedule to that overlay. However, planning overlays are often removed during the PSP.

### **Implications and Recommendations**

A planning permit is currently required from Cardinia Shire Council to clear/disturb native vegetation within the study area. However, once the NVPP has been prepared and is an incorporated document under the 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* - Eight flora species listed as threatened under the FFG Act have been recorded within a 10-kilometre radius of the study area (FIS 2007) (Appendix 2.2).

*Vegetation Communities* – No FFG Act listed communities are located within the study area.

*Fauna* – Thirty-one fauna species listed as threatened under the FFG Act have previously been recorded from within the local area (i.e. within a 10 kilometre radius of the study area) (Appendix 3.2). There is suitable habitat for a small number of waterbirds (e.g. Royal Spoonbill, Eastern Great Egret) may occasionally use habitats within the study area.

There is a low likelihood for Swamp Skink to occur within the study area.

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

### **Implications and Recommendations**

Based on the results of the literature review and the detailed site surveys, no FFG Act-listed flora and fauna species are known to occur within the study area. However, there is suitable habitat within the study area for a small number of FFG Act-listed waterbirds (e.g. Eastern Great Egret and Baillon's Crake).

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

#### **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.

### **Recommendations and Implications**

It is unlikely that an EES will be required for future development of the study area.

#### **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**

At least five noxious weeds were recorded within the study area during site assessments (Appendix 2.1). Land owners are responsible to control any infestation of noxious weeds that may become established within the study area.

#### **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.

### **Recommendation**

While a permit will be required for removal of habitat within the study area, this could be in the form of a permit to remove native vegetation under the *Planning and Environment Act 1987*. Consequently, a separate permit to remove fauna for this project is unlikely to be required.

#### **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 Victoria Planning Provisions ("VPPs"). In 2002, the Victorian Government released Victoria's Native Vegetation Management – A Framework for Action (NRE 2002) ("the Framework"), which establishes a 'strategic direction for the protection, enhancement and revegetation of native vegetation across the State'.

Amendment (VC19) to Victoria's Planning Provisions introduced the Framework in July 2003 as an incorporated document for all Victorian Planning Schemes. Clauses 11 and 15.09 in the

State Planning Policy Framework provide the framework for considering native vegetation issues in the planning system.

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

The Framework states that the primary goal is to achieve:

‘a reversal, across the entire landscape, of the long-term decline in the extent and quality of native vegetation, leading to a Net Gain’ (NRE 2002).

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

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

1. To avoid adverse impacts, particularly through vegetation clearance.
2. If impacts cannot be avoided, to minimise impacts through appropriate consideration in planning processes and expert input to project design or management.
3. Identify appropriate offset options.

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

Habitat hectare assessments have been undertaken on remnant patches of vegetation within the study area (Attachment 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.

#### **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 Cardinia Shire Council**

Under the Cardinia Shire planning scheme the majority of the study area is a Rural Living Zone (RLZ). Public land within the study area is zoned Public Use Zone (PUZ), Public Park and Recreation (PPRZ) and Road Zone (RDZ). There is also a small area of land zoned Residential 1 Zone (R1Z). An Environmental Significance Overlay (ESO) covers approximately half of the study area.

### **Implications and Recommendations**

Once the NVPP has been prepared and the Beaconsfield PSP is incorporated into the Cardinia Shire Council planning scheme, this will preclude the requirement for a planning permit to clear or remove remnant native vegetation.

## 5 POTENTIAL IMPACTS AND MITIGATION MEASURES

---

Potential impacts caused by future development of the study area include:

- The loss of
  - 0.01 habitat hectares of Sedge Wetland;
  - 0.01 habitat hectares of Grassy Woodland;
  - A small patch of Swampy Riparian Woodland that amounted to less than 0.01 habitat hectares; and
  - Scattered trees within the study area.
- The loss of low quality habitat for the state significant Eastern Great Egret, Royal Spoonbill, and regionally significant Latham's Snipe;
- The loss of pastures which provide low quality habitat for native birds and reptiles, and native mammals such as Bush Rat or Swamp Rat;
- Waterbodies which provide habitat for common species of frog and potentially fish species.
- The further fragmentation of remnant vegetation and loss of linkages between habitats, particularly for arboreal mammals.

### 5.1 Opportunities to Reduce Potential Impacts

Any proposed works have the potential to impact (direct and/or indirect) on indigenous flora and fauna species recorded within the study area. Measures to mitigate/ameliorate impacts of the proposed works upon the ecological values in the study area include:

- Fencing around areas of ecological value (i.e. remnant trees and vegetation, dams) containing known flora and fauna habitat;
- Ensure silt fences and appropriate run-off control measures are implemented to avoid impacts to fish and amphibian habitat if future development occurs near waterbodies;
- Eradicate or control weeds appropriately to minimise the spread of material into, within and outside of the study area;
- The development of Construction Environmental Management Plans that include measures to avoid and minimise impacts to flora and fauna species, and associated habitats during construction, to ensure where possible that ecological values are not adversely impacted; 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.

## 5.2 Opportunities to Protect and Enhance Biodiversity Values

Habitat within the study area is highly fragmented, and remnant patches of vegetation are small and typically isolated from other large consolidated areas of remnant native vegetation. Where possible, opportunities to enhance biodiversity values within the study area include:

- Allowing the natural regeneration of remnant native vegetation;
- The revegetation of appropriate areas (i.e. within existing patches of remnant native vegetation or connected to areas proposed to be retained), with site indigenous flora species that are appropriate for revegetation, and that are associated with the former EVCs; and,
- The control of noxious weeds (e.g. Scotch Thistle, Blackberry, Fennel and Bridal Creeper), particularly in areas of remnant native vegetation proposed to be retained.

## 6 CONCLUSION

---

The study area is highly modified and dominated by exotic vegetation. Remnant native vegetation within the study area comprises three EVCs, including Swampy Riparian Woodland, Sedge Wetland and Grassy Woodland. The study area currently supports four broad habitat types: modified woodland/remnant trees, and artificial waterbodies, planted native and introduced vegetation, and introduced pasture and crops.

There are approximately **0.02 habitat hectares** of remnant vegetation present within the study area. This includes **0.01 habitat hectares** of Sedge Wetland, **0.01 habitat hectares** of Grassy Woodland and a small patch of Swampy Riparian Woodland that amounted to less than 0.01 habitat hectares.

There are 44 scattered trees within the study area. These comprise very large, large, medium and small trees, which are of High and Low conservation significance. If any scattered trees within the study area are proposed to be removed, there is a requirement to offset these trees in accordance with ‘the Framework’ and Port Phillip and Westernport Native Vegetation Plan (PPWCMA 2006).

No national or state significant flora species or habitats were recorded within the study area during the assessment. There are six nationally significant and 35 state significant flora species that have been previously recorded within the local area. Based on available information (i.e. the literature review, results of the field surveys), there is a low likelihood that nationally significant River Swamp Wallaby-grass, and state significant Wetland Blown-grass and Perfoliate Pondweed occur within the study area. In addition, it is considered unlikely that any other national and state significant flora species occur within the study area.

No national or state significant fauna species were recorded during the general and detailed targeted surveys. Eleven nationally significant and 28 state significant fauna species have been previously recorded within the local area. Based on habitat conditions present, state significant Eastern Great Egret, Hardhead, Australasian Shoveler, Baillon’s Crake and Royal Spoonbill, and regionally significant Latham’s Snipe may occasionally use wetland habitats within the study area. There is a very low likelihood of the nationally significant Dwarf Galaxias and Growling Grass Frog, and state significant Swamp Skink occurring within the study area.

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

A permit from the Cardinia Shire Council is currently required for removal of native vegetation within the study area. However, once the NVPP has been prepared and the PSP is incorporated into the local planning scheme, this will preclude the requirement for a planning permit to clear or remove remnant native vegetation.

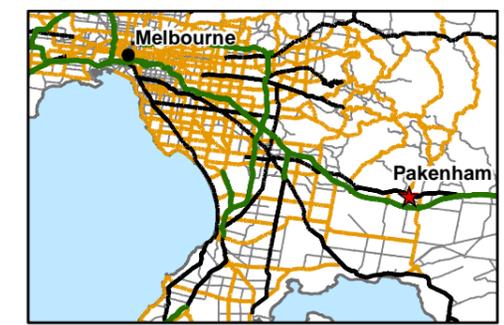
There are opportunities to enhance ecological values within the study area, principally through allowing the regeneration of native vegetation, revegetation and weed control. There are also opportunities to create additional fauna habitat such as wetlands.

## FIGURES

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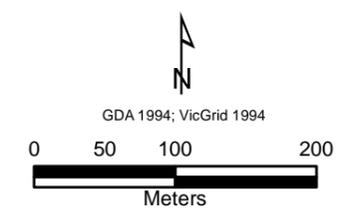


- ### Legend
-  Urban Growth Boundary
  -  Study Boundary
  -  Railway Station
  -  Railway
  -  Freeway
  -  Highway
  -  Arterial Road
  -  Major Road
  -  Minor Road
  -  Elevation Contours (10m)
  -  Watercourses
  -  Waterbodies
  -  Parks and Recreation



### Location & Overview of PSP Area 1

#### Biodiversity Assessment Reporting 2009/10



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EP Map #: 1621 Study Area 1  
File Path: 1621\_Fig01\_SiteLocation\_06Oct10.mxd  
Issue Date: 06/10/2010



**Legend**

- Urban Growth Boundary
- Study Boundary

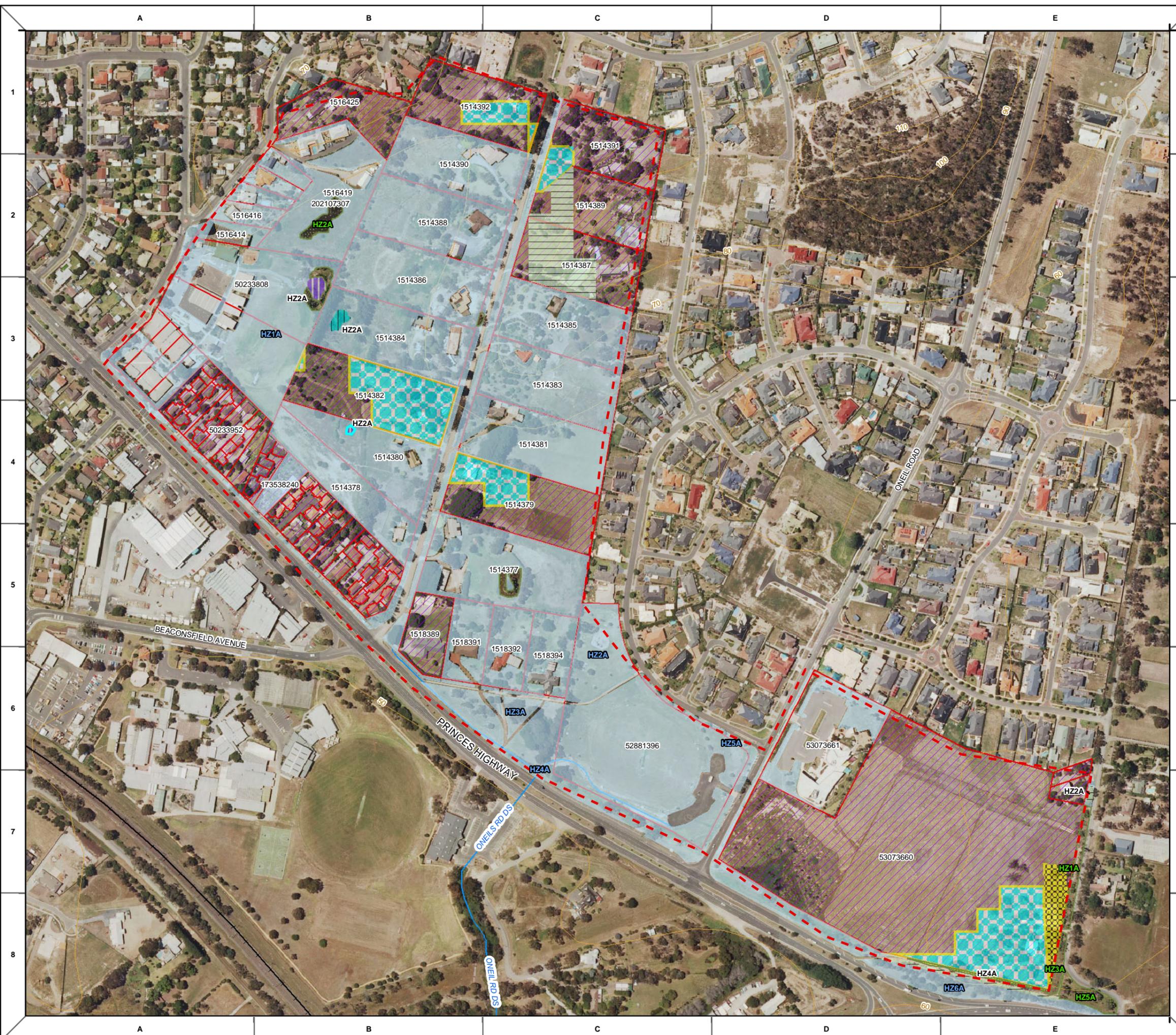
**Access Status**

- Property Assessed
- Access Denied
- Unsuccessful - Unable to contact Landowner
- Assessment Not Required - Residential Block

**Access Information for PSP Area 1**  
 Biodiversity Assessment Reporting 2009/10

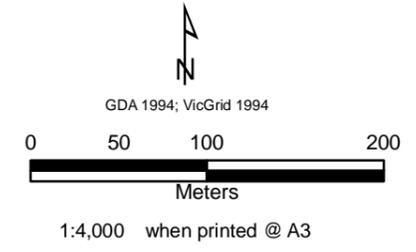
GDA 1994; VicGrid 1994  
  
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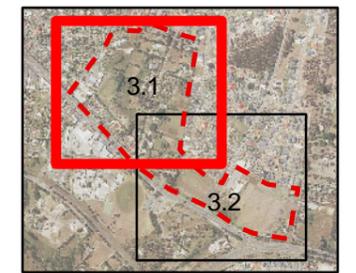
- Legend**
- Urban Growth Boundary
  - Study Boundary
  - Property Boundaries
  - Properties not Assessed
  - Degraded Treeless Vegetation
  - Non Native Vegetation
- Surveyed EVCs**
- 53, Swamp Scrub
  - 55, Plains Grassy Woodland
  - 83, Swampy Riparian Woodland
  - 136, Sedge Wetland
  - 175, Grassy Woodland
  - 937, Swampy Woodland
- DSE Modelled EVCs**
- 17, Riparian Scrub/Swampy Riparian Woodland Complex
  - 175, Grassy Woodland
  - 897, Plains Grassland/Plains Grassy Woodland Mosaic
  - 937, Swampy Woodland

**Extent of Native Vegetation Summary for PSP Area 1**  
 Biodiversity Assessment Reporting 2009/10

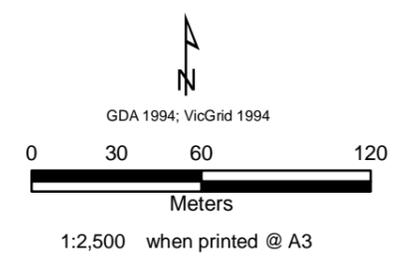




- Legend**
- Urban Growth Boundary
  - Property Boundaries
  - Properties not Assessed
  - Study Boundary
  - Degraded Treeless Vegetation
  - Non Native Vegetation
- Surveyed EVCs**
- 53, Swamp Scrub
  - 55, Plains Grassy Woodland
  - 83, Swampy Riparian Woodland
  - 136, Sedge Wetland
  - 175, Grassy Woodland
  - 937, Swampy Woodland
- DSE Modelled EVCs**
- 17, Riparian Scrub/Swampy Riparian Woodland Complex
  - 175, Grassy Woodland
  - 897, Plains Grassland/Plains Grassy Woodland Mosaic
  - 937, Swampy Woodland



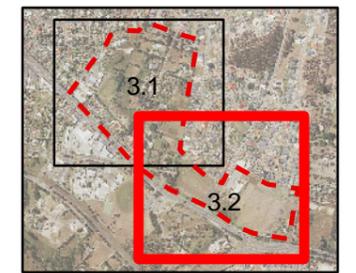
**Extent of Native Vegetation for PSP Area 1**  
**Biodiversity Assessment**  
**Reporting 2009/10**



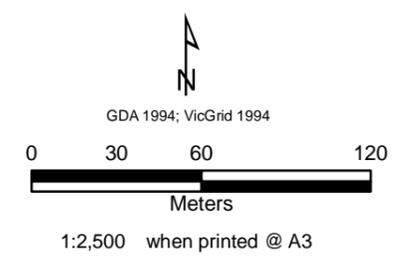
EP Map #: 1621 Study Area 1  
 File Path: 1621\_Fig03\_NativeVeg\_06Oct10.mxd  
 Issue Date: 06/10/2010



- Legend**
- Urban Growth Boundary
  - Property Boundaries
  - Properties not Assessed
  - Study Boundary
  - Degraded Treeless Vegetation
  - Non Native Vegetation
- Surveyed EVCs**
- 53, Swamp Scrub
  - 55, Plains Grassy Woodland
  - 83, Swampy Riparian Woodland
  - 136, Sedge Wetland
  - 175, Grassy Woodland
  - 937, Swampy Woodland
- DSE Modelled EVCs**
- 17, Riparian Scrub/Swampy Riparian Woodland Complex
  - 175, Grassy Woodland
  - 897, Plains Grassland/Plains Grassy Woodland Mosaic
  - 937, Swampy Woodland



**Extent of Native Vegetation for PSP Area 1 Biodiversity Assessment Reporting 2009/10**



EP Map #: 1621 Study Area 1  
File Path: 1621\_Fig03\_NativeVeg\_06Oct10.mxd  
Issue Date: 06/10/2010



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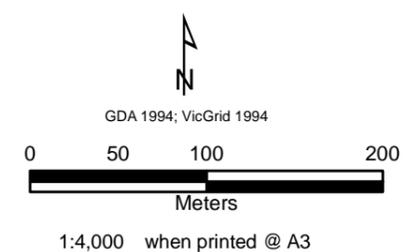
-  Urban Growth Boundary
-  Study Boundary
-  Property Boundaries
-  Properties not Assessed

**Scattered Tree Locations**

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

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

**Scattered Tree Locations  
 Summary for PSP Area 1  
 Biodiversity Assessment  
 Reporting 2009/10**





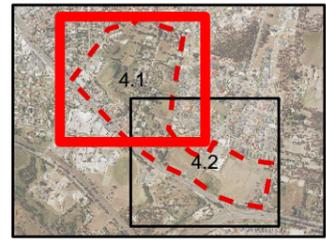
**Legend**

- Urban Growth Boundary
- StudyBoundary
- Property Boundaries
- Properties not Assessed

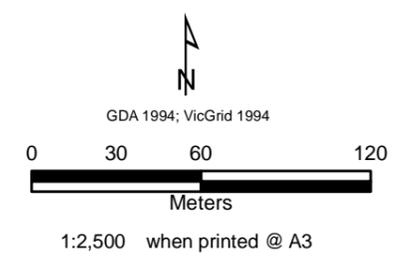
**Scattered Tree Locations**

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

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

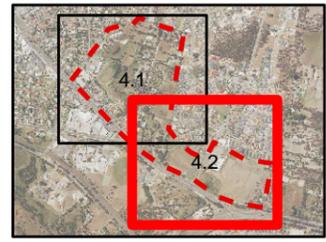


**Scattered Tree Locations  
for PSP Area 1**  
 Biodiversity Assessment  
 Reporting 2009/10

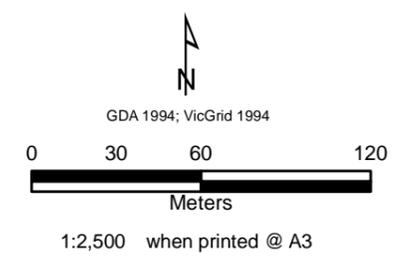




- ### Legend
-  Urban Growth Boundary
  -  Study Boundary
  -  Property Boundaries
  -  Properties not Assessed
- ### Scattered Tree Locations
-  Very Large Old Tree
  -  Large Old Tree
  -  Medium Old Tree
  -  Small Tree
- Ec = Eucalyptus camaldulensis  
 Eo = Eucalyptus ovata  
 Er = Eucalyptus radiata  
 Ev = Eucalyptus viminalis



**Scattered Tree Locations for PSP Area 1**  
 Biodiversity Assessment Reporting 2009/10





**Legend**

-  Urban Growth Boundary
-  Study Boundary
-  Property Boundaries
-  Properties not Assessed
-  Degraded Treeless Vegetation
-  Non Native Vegetation

**Conservation Significance**

-  Very High
-  High
-  Medium
-  Low

**Conservation Significance for Summary PSP Area 1**  
**Biodiversity Assessment Reporting 2009/10**

N

GDA 1994; VicGrid 1994

0    55    110    220

Meters

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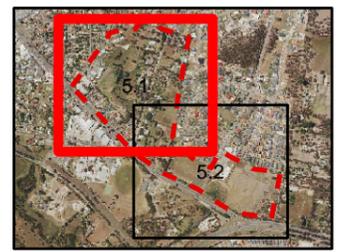


**Legend**

-  Urban Growth Boundary
-  Study Boundary
-  Property Boundaries
-  Properties not Assessed
-  Degraded Treeless Vegetation
-  Non Native Vegetation

**Conservation Significance**

-  Very High
-  High
-  Medium
-  Low



**Conservation Significance for PSP Area 1**  
**Biodiversity Assessment Reporting 2009/10**

  
 GDA 1994; VicGrid 1994  
  
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 Meters  
 1:2,550 when printed @ A3

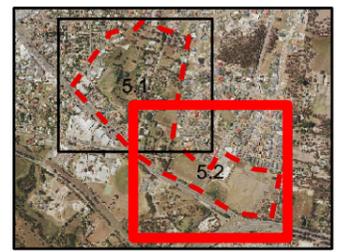


**Legend**

-  Urban Growth Boundary
-  Study Boundary
-  Property Boundaries
-  Properties not Assessed
-  Degraded Treeless Vegetation
-  Non Native Vegetation

**Conservation Significance**

-  Very High
-  High
-  Medium
-  Low



**Conservation Significance for PSP Area 1**  
**Biodiversity Assessment Reporting 2009/10**

N  
 GDA 1994; VicGrid 1994



Meters

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EP Map #: 1621 Study Area 1  
 File Path: 1621\_Fig05\_ConsSig\_08Oct10.mxd  
 Issue Date: 08/10/2010



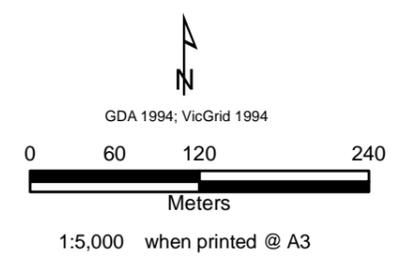
### Legend

-  Urban Growth Boundary
-  Study Boundary
-  Property Boundaries
- Properties not Assessed**
-  Properties not Assessed
-  Targeted Flora and Fauna Surveys Completed
-  Location of Fauna Survey Sights

Assessment Sites 1, 2 & 3  
 -8 Bait Trap Nights  
 -20 mins Dip Netting  
 -10 mins Electrofishing  
 -40 Elliott Trap days/nights  
 -10 tiles checked 3 times

### Location of Targeted Surveys for Threatened Flora and Fauna for PSP Area 1

#### Biodiversity Assessment Reporting 2009/10



EP Map #: 1621 Study Area 1  
 File Path: 1621\_Fig06\_TargetedSurveys\_08Oct10.mxd  
 Issue Date: 08/10/2010





**Legend**

- Urban Growth Boundary
- Study Boundary
- Property Boundaries
- Properties not Assessed

**Database Fauna Records**

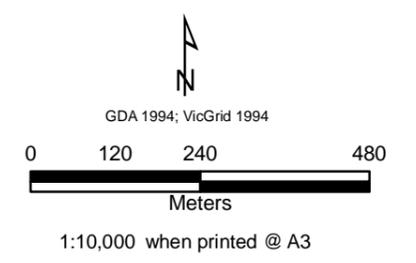
- Nationally Listed Species
- State Listed Species
- DSE Verified Unpublished Records

**Assessment Fauna Records**

- State Listed Species
- Nationally Listed Species

*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, 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 Fauna Records for PSP Area 1**  
**Biodiversity Assessment Reporting 2009/10**

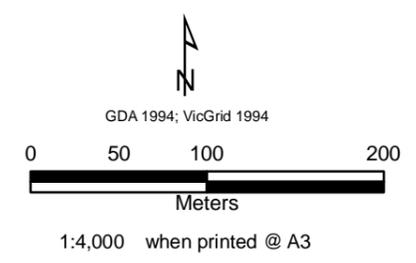




- Legend**
- Urban Growth Boundary
  - Study Boundary
  - Property Boundaries
  - Properties not Assessed
- Potential Habitat**
- Low-lying Area
  - Northern Dam

<b>Northern Dam</b>
Low Quality Habitat for Growling Grass Frog and Swamp Skink
<b>Low-lying Area</b>
Low Quality Habitat for Growling Grass Frog, Southern Toadlet and Swamp Skink

**Locations of Potential Habitat for PSP Area 1**  
 Biodiversity Assessment Reporting 2009/10



EP Map #: 1621 Study Area 1  
 File Path: 1621\_Fig09\_PotentialHabitat\_07Oct10.mxd  
 Issue Date: 07/10/2010

# APPENDICES

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## 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
<b>CONSERVATION STATUS IN AUSTRALIA</b> (Based on the EPBC Act 1999, Briggs and Leigh 1996*)
<b>EX</b> - Extinct: Extinct is when there is no reasonable doubt that the last individual of the species has died.
<b>CR</b> - Critically Endangered: A species is critically endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.
<b>EN</b> - 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.
<b>VU</b> - 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.
<b>R*</b> - Rare: A species is rare but overall is not currently considered critically endangered, endangered or vulnerable.
<b>K*</b> - Poorly Known: A species is suspected, but not definitely known, to belong to any of the categories extinct, critically endangered, endangered, vulnerable or rare.
<b>CONSERVATION STATUS IN VICTORIA</b> (Based on DSE 2005, DSE 2007b, FIS)
<b>x</b> - 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.
<b>e</b> - Endangered in Victoria: at risk of disappearing from the wild state if present land use and other causal factors continue to operate.
<b>v</b> - 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.
<b>r</b> - 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.
<b>k</b> - 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	
<b>NATIONAL SIGNIFICANCE</b>	
<b>Flora</b>	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 <i>Rare or Threatened Australian Plants</i> (Briggs and Leigh 1996).
<b>Fauna</b>	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 <i>et al.</i> 1996), bats (Duncan <i>et al.</i> 1999), birds (Garnett and Crowley 2000), reptiles (Cogger <i>et al.</i> 1993), and amphibians (Tyler 1997).
	Species that have not been included on the EPBC Act but listed as significance according to the <i>IUCN 2009 Red List of Threatened Species</i> (IUCN 2009).
<b>Communities</b>	Vegetation communities considered critically endangered, endangered or vulnerable under the EPBC Act and considering vegetation condition.
<b>STATE SIGNIFICANCE</b>	
<b>Flora</b>	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 <i>Advisory List of Rare or Threatened Plants in Victoria, 2007</i> (DSE 2007b).
	Flora listed as poorly known in Australia in <i>Rare or Threatened Australian Plants</i> (Briggs and Leigh 1996).
<b>Fauna</b>	Threatened taxon listed under Schedule 2 of the FFG Act.
	Fauna listed as extinct, critically endangered, endangered and vulnerable on the State Government's <i>Advisory List of Threatened Vertebrate Fauna in Victoria - 2007</i> (DSE 2007b).
	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 <i>et al.</i> 1996), bats (Duncan <i>et al.</i> 1999), birds (Garnett and Crowley 2000), reptiles (Cogger <i>et al.</i> 1993), and amphibians (Tyler 1997).

<b>Criteria for defining Ecological Significance</b>	
<b>Communities</b>	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.
<b>REGIONAL SIGNIFICANCE</b>	
<b>Flora</b>	Flora considered rare in any regional native vegetation plan for a particular bioregion.
	Flora considered rare by the author for a particular bioregion.
<b>Fauna</b>	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 <i>Threatened Vertebrate Fauna in Victoria - 2007</i> (DSE 2007b).
<b>Communities</b>	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.
<b>LOCAL SIGNIFICANCE</b>	
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 study area

Table A1.3. Defining Site Significance.

Criteria for defining Site Significance
<b>NATIONAL SIGNIFICANCE</b>
<p><b>A site is of National significance if:</b></p> <ul style="list-style-type: none"> <li>- 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.</li> <li>- 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.</li> <li>- it is known to support, or has a high probability of supporting taxon listed as 'Vulnerable' under National Action Plans.</li> <li>- 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.</li> <li>- 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.</li> <li>- 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).</li> </ul>
<b>STATE SIGNIFICANCE</b>
<p><b>A site is of State significance if:</b></p> <ul style="list-style-type: none"> <li>- 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.</li> <li>- it regularly supports, or has a high probability of regularly supporting (i.e. high habitat quality) taxon listed as 'Vulnerable', 'Near threatened', 'Data Deficient' or 'Insufficiently Known' in Victoria (DSE 2005, 2007b), or species listed as 'Data Deficient' or 'Insufficiently Known' under National Action Plans.</li> <li>- it contains an area, or part thereof designated as 'critical habitat' under the FFG Act.</li> <li>- it supports, or likely to support a high proportion of any Victorian flora and fauna taxa.</li> <li>- it contains high quality, intact vegetation/habitat supporting a high species richness and diversity in a particular Bioregion.</li> <li>- 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.</li> </ul>

Criteria for defining Site Significance
<b>REGIONAL SIGNIFICANCE</b>
<p><b>A site is of Regional significance if:</b></p> <ul style="list-style-type: none"> <li>- it regularly supports, or has a high probability of regularly supporting regionally significant fauna as defined in Table 1.2.</li> <li>- it contains a large population (i.e. greater than 1%) of flora considered rare in any regional native vegetation plan for a particular bioregion.</li> <li>- it supports a fauna population with a disjunct distribution, or a particular taxon that has an unusual ecological or biogeographical occurrence.</li> <li>- 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.</li> </ul>
<b>LOCAL SIGNIFICANCE</b>
<p><b>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:</b></p> <ul style="list-style-type: none"> <li>- an area which supports indigenous flora species and/or a remnant EVC, and habitats used by locally significant fauna species.</li> <li>- 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.</li> </ul>

## A1.4. Defining Vegetation Condition

Table A1.4. Defining Vegetation Condition.

Criteria for defining Vegetation Condition
<p><b>Good condition</b> - 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.</p>
<p><b>Moderate condition</b> - 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.</p>
<p><b>Poor condition</b> - Vegetation dominated by introduced species, but supports low levels of indigenous species present, in the canopy, shrub layer or ground cover.</p>

## 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.

<b>Criteria for defining Habitat Quality</b>
<b>HIGH QUALITY</b>
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.
<b>MODERATE QUALITY</b>
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.
<b>LOW QUALITY</b>
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 (November 2009) from the study area.

Life form	Scientific name	Common name	Conservation Status			Regional
			EPBC	DSE	FFG	
Tree	Allocasuarinaceae					
	<i>Allocasuarina</i> sp.	She oak	-	-	-	-
	Mimosaceae					
	<i>Acacia mearnsii</i>	Black wattle	-	-	-	-
	<i>Acacia melanoxylon</i>	Blackwood	-	-	-	-
	Myrtaceae					
	<i>Eucalyptus camaldulensis</i>	River Red Gum	-	-	-	-
	<i>Eucalyptus goniocalyx</i>	Bundy	-	-	-	-
	<i>Eucalyptus obliqua</i>	Messmate Stringybark	-	-	-	-
	<i>Eucalyptus ovata</i>	Swamp Gum	-	-	-	-
	<i>Eucalyptus radiata</i>	Narrow-leaf Peppermint	-	-	-	-
	<i>Eucalyptus viminalis</i>	Manna Gum	-	-	-	-
	Santalaceae					
<i>Exocarpus cupressiformis</i>	Cherry Ballart	-	-	-	-	
Shrub	Asteraceae					
	<i>Cassinia</i> sp.	Cassinia	-	-	P	-
	Myrtaceae					
	<i>Melaleuca ericifolia</i>	Swamp Paperbark	-	-	-	-
	Violaceae					
<i>Melicytus dentatus</i>	Tree Violet	-	-	-	-	
Herb/ Forb	Oxalidaceae					
	<i>Oxalis perennans</i>	Grassland Wood-sorrel	-	-	-	-
	Polygonaceae					
	<i>Persicaria decipiens</i>	Slender Knotweed	-	-	-	-
<i>Rumex brownii</i>	Slender Dock	-	-	-	-	
Graminoid (grass-like plant)	Poaceae					
	<i>Austrodanthonia setaceae</i>	Wallaby grass	-	-	-	-
	<i>Austrodanthonia</i> sp.	Wallaby grass	-	-	-	-
	<i>Austrostipa</i> sp.	Spear grass	-	-	-	-
	<i>Microlaena stipodes</i> var. <i>stipoides</i>	Weeping Grass	-	-	-	-
	<i>Phragmites australis</i>	Common Reed	-	-	-	-
	<i>Poa labillardierei</i>	Common Tussock-grass	-	-	-	-
	<i>Themeda triandra</i>	Kangaroo Grass	-	-	-	-
	Typhaceae					
	<i>Typha</i> sp.	Cumbungi sp.	-	-	-	-
	Xanthorrhoeaceae					
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	-	-	-	-	

Life form	Scientific name	Common name	Conservation Status			Regional
			EPBC	DSE	FFG	
Rushes / Sedges	<b>Cyperaceae</b>					
	<i>Eleocharis acuta</i>	Common Spike-sedge	-	-	-	-
	<b>Juncaceae</b>					
	<i>Juncus</i> sp.	Rush	-	-	-	-
	<b>Juncaginaceae</b>					
	<i>Triglochin procera</i>	Water Ribbons	-	-	-	-
Ferns	<b>Azollaceae</b>					
	<i>Azolla filiculoides</i>	Pacific Azolla	-	-	-	-

Table A2.1.2. Introduced flora recorded during the present survey (November 2009) from the study area.

Life form	Scientific name	Common name	Listed Status		
			EPBC	DSE	FFG
<b>NON-INDIGENOUS NATIVE SPECIES</b>			<b>EPBC</b>	<b>DSE</b>	<b>FFG</b>
Tree	<b>Mimosaceae</b>				
	<i>Acacia baileyana</i>	Cootamundra Wattle	-	-	-
	<b>Myrtaceae</b>				
	<i>Eucalyptus cladocalyx</i>	Sugar Gum	-	-	-
	<i>Eucalyptus globulus</i>	Southern Blue Gum	-	-	-
	<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	-	-	-
Shrub	<b>Pittosporaceae</b>				
	<i>Pittosporum undulatum</i>	Sweet Pittosporum	-	-	-
	<b>Myrtaceae</b>				
	<i>Callistemon</i> sp.	Bottlebrush	-	-	-
	<i>Melaleuca armillaris</i>	Giant Honey-myrtle	-	-	-
<b>EXOTIC SPECIES</b>			<b>CALP ACT LISTED WEEDS</b>		
Tree	<b>Agavaceae</b>				
	<i>Pinus radiata</i>	Radiata Pine		-	
	<b>Cupressaceae</b>				
	<i>Cupressus macrocarpa</i>	Monterey Cypress		-	
	<b>Fagaceae</b>				
	<i>Quercus robur</i>	English Oak		-	
	<b>Salicaceae</b>				
	<i>Populus</i> sp.	Poplar		-	
	<i>Salix babylonica</i>	Weeping Willow		-	
Shrub	<b>Rosaceae</b>				
	<i>Rubus fruticosus</i> spp. agg.	Blackberry		✓	
Herb/Forb	<b>Apiaceae</b>				
	<i>Foeniculum vulgare</i>	Fennel		✓	
	<b>Asparagaceae</b>				
	<i>Asparagus asparagoides</i>	Bridal Creeper		✓	

Life form	Scientific name	Common name	Listed Status	
	<b>Asteraceae</b>			
	<i>Arctotheca calendula</i>	Cape Weed	-	
	<i>Hypochaeris radicata</i>	Cat's ear	-	
	<i>Onopordum acanthium</i> subsp. <i>acanthium</i>	Scotch Thistle	✓	
	<i>Senecio</i> sp.	Groundsel	-	
	<i>Sonchus oleraceus</i>	Sow thistle	-	
	<b>Brassicaceae</b>			
	<i>Brassica</i> sp.	Mustard	-	
	<b>Fabaceae</b>			
	<i>Medicago polymorpha</i>	Burr Medic	-	
	<i>Trifolium repens</i>	Clover	-	
	<b>Iridaceae</b>			
	<i>Watsonia</i> sp.	Watsonia	-	
	<b>Malvaceae</b>			
	<i>Malva nicaeensis</i>	Mallow of Nice	-	
	<i>Malva parvifolia</i>	Small-flower Mallow	-	
	<b>Oxalidaceae</b>			
	<i>Oxalis pes-caprae</i>	Soursob	✓	
	<b>Plantaginaceae</b>			
	<i>Plantago coronopus</i>	Buck's-horn Plantain	-	
	<i>Plantago lanceolata</i>	Ribwort	-	
	<i>Rumex crispus</i>	Curled dock	-	
	<b>Rubiaceae</b>			
	<i>Galium aparine</i>	Cleavers	-	
	Graminoid (grass-like plant)	<b>Iridaceae</b>		
		<i>Romulea rosea</i> var. <i>australis</i>	Onion grass	-
<b>Poaceae</b>				
<i>Agrostis capillaris</i>		Brown-top Bent	-	
<i>Anthoxanthum odoratum</i>		Sweet Vernal-grass	-	
<i>Briza maxima</i>		Quaking Grass	-	
<i>Bromus catharticus</i>		Prairie Grass	-	
<i>Bromus diandrus</i>		Great Brome	-	
<i>Cortaderia selloana</i>		Silver Pampas-grass	-	
<i>Cynodon dactylon</i>		Couch	-	
<i>Dactylis glomerata</i>		Cocksfoot	-	
<i>Ehrharta erecta</i>		Panic Veldt-grass	-	
<i>Ehrharta longiflora</i>		Annual Veldt-grass	-	
<i>Holcus lanatus</i>		Yorkshire fog	-	
<i>Hordeum leporinum</i>		Barley grass	-	
<i>Lolium perenne</i>		Perennial Rye Grass	-	
<i>Paspalum dilatatum</i>		Paspalum	-	
<i>Pennisetum clandestinum</i>		Kikuyu	-	
<i>Phalaris aquatica</i>		Toowoomba Canary grass	-	
<i>Sporobolus africanus</i>		Rat-tail Grass	-	

## Appendix 2.2 – Flora database results

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

**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

Lifeform	Scientific Name	Common Name	Total number of documented records (FIS)	EPBC Act	DSE 2005	FFG Act	Detected During Current Survey	Likely occurrence within the study area and reasoning for likelihood	Habitat description
<b>NATIONAL SIGNIFICANCE</b>									
Graminoid	# <i>Amphibromus fluitans</i>	River Swamp Wallaby-grass	7	VU	-	-	-	Low. May persist in dams and sedge wetland vegetation on properties 50233808 and 1514380.	Permanent swamps, wetlands & dams
Herb/Forb	# <i>Caladenia fragrantissima</i> subsp. <i>orientalis</i>	Cream Spider-orchid	-	EN	e	L	-	Unlikely, no habitat in the study area	Coastal heath & heathy woodland
Graminoid	# <i>Dianella amoena</i>	Matted Flax-lily	1	EN	e	L	-	Unlikely. Patch of grassy woodland too degraded to support MFL	Lowland grasslands & grassy woodlands

Lifeform	Scientific Name	Common Name	Total number of documented records (FIS)	EPBC Act	DSE 2005	FFG Act	Detected During Current Survey	Likely occurrence within the study area and reasoning for likelihood	Habitat description
Herb/Forb	# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	5	EN	e	L	-	Unlikely, no habitat within study area, persists adjacent to Cardinia creek to west of study area	In or around coastal swamps
Herb/Forb	# <i>Thelymitra epipactoides</i>	Metallic Sun-orchid	1	EN	e	L	-	Unlikely, no habitat, Grassy Woodland habitat too degraded	Mainly coastal in fertile loams; scrubby heath or swampy areas
Herb/Forb	# <i>Xerochrysum palustre</i>	Swamp Everlasting	2	VU	v	L	-	Unlikely, habitat within low lying areas and dams too degraded	Swamps and wetlands in lowland areas
Herb/Forb	<i>Senecio psilocarpus</i>	Swamp Fireweed	1	VU	v	-	-	Unlikely, habitat within low lying areas and dams too degraded	Swampy or peaty lowland areas
<b>STATE SIGNIFICANCE</b>									
Shrub	<i>Acacia howittii</i>	Sticky Wattle	2	-	r	-	-	Unlikely, no habitat	Moist forest south-east Vic
Herb/Forb	<i>Bossiaea cordigera</i>	Wiry Bossiaea	1	-	r	-	-	Unlikely, no habitat	Moist, well-drained soils
Herb/Forb	<i>Burnettia cuneata</i>	Lizard Orchid	1	-	r	-	-	Unlikely, no habitat	Waterlogged, acidic low nutrient soils dominated by <i>Melaleuca squarrosa</i>
Herb/Forb	<i>Caladenia aurantiaca</i>	Orange-tip Finger-orchid	2	-	r	-	-	Unlikely, no habitat	Damp coastal to near-coastal heath or open woodlands
Herb/Forb	<i>Caladenia flavovirens</i>	Summer Spider-orchid	1	-	r	-	-	Unlikely, no habitat	Sheltered ridges & slopes in high altitude open forest with grassy understorey
Shrub	<i>Cardamine tenuifolia</i>	Slender Bitter-cress	1	-	k	-	-	Unlikely, no habitat	Swamps and stream/riparian zones
Graminoid	<i>Carex alsophila</i>	Forest Sedge	2	-	r	-	-	Unlikely, no habitat	Mountain gullies and swamps
Graminoid	<i>Cladium procerum</i>	Leafy Twig-sedge	1	-	r	-	-	Unlikely, no habitat	Lake and wetland margins, along streams in waterlogged soils
Herb/Forb	<i>Corybas aconitiflorus</i>	Spurred Helmet-orchid	3	-	r	-	-	Unlikely, no habitat	Colonies in sheltered positions, in damp sand under ferns or shrubs
Herb/Forb	<i>Diuris punctata</i> var. <i>punctata</i>	Purple Diuris	5	-	v	L	-	Unlikely, Grassy Woodland habitat too degraded	Grassy woodlands & grasslands

Lifeform	Scientific Name	Common Name	Total number of documented records (FIS)	EPBC Act	DSE 2005	FFG Act	Detected During Current Survey	Likely occurrence within the study area and reasoning for likelihood	Habitat description
Tree	<i>Eucalyptus yarraensis</i>	Yarra Gum	1	-	r	-	-	Unlikely, no habitat	Moist woodland, southern Vic.
Herb/Forb	<i>Corunastylis ciliata</i>	Fringed Midge-orchid	2	-	k	-	-	Unlikely, no habitat	Moist forest, woodlands and coastal scrubs
Shrub	<i>Olearia asterotricha</i>	Rough Daisy-bush	3	-	r	-	-	Unlikely, no habitat	Moist forest and swampy heathland
Graminoid	<i>Leionema bilobum</i>	Notched Leionema	1	-	r	-	-	Unlikely, no habitat	Wet and damp forests
Herb/Forb	<i>Potamogeton perfoliatus s.l.</i>	Perfoliate Pondweed	1	-	k	-	-	Low, small chance it persists in artificial waterbodies and low lying areas	Flowing fresh creeks & rivers; sandy, stony or muddy substrate
Herb/Forb	<i>Prasophyllum lindleyanum</i>	Green Leek-orchid	4	-	v	-	-	Unlikely, no habitat	Variety of habitats
Fern	<i>Pteris comans</i>	Netted brake	1	-	r	-	-	Unlikely, no habitat	Seepages, stream banks and damp flats in shady forests
Herb/Forb	<i>Pterostylis grandiflora</i>	Cobra Greenhood	12	-	r	-	-	Unlikely, no habitat	Near-coastal, moist shady slopes in open forest
Herb/Forb	<i>Pterostylis X ingens</i>	Sharp Greenhood	3	-	r	-	-	Unlikely, no habitat	Moist areas in open forest
Herb/Forb	<i>Pterostylis truncata</i>	Brittle Greenhood	1	-	e	L	-	Unlikely, no habitat	No Habitat
Shrub	<i>Tetradlea stenocarpa</i>	Long Pink-bells	1	-	r	-	-	Unlikely, no habitat	Damp forests and woodlands, often in modified habitats
Herb/Forb	<i>Thelymitra X macmillanii</i>	Crimson Sun-orchid	1	-	v	-	-	Unlikely, no habitat	No Habitat
Herb/Forb	<i>Caladenia oenochila</i>	Wine-lipped Spider-orchid	21	-	v	-	-	Unlikely, no habitat	Moist open grassy forest or woodland in shaded areas
Graminoid	<i>Lachnagrostis filiformis var. 2</i>	Wetland Blown-grass	1	-	k	-	-	Low, chance it persists in fringing vegetation of artificial waterbodies or low lying areas	Wetlands, dams and grassy swamp areas
Graminoid	<i>Lachnagrostis punicea subsp. filifolia</i>	Purple Blown-grass	5	-	r	L	-	Unlikely, no habitat	Wetlands, dams and grassy swamp areas
Shrub	<i>Goodia lotifolia var. pubescens</i>	Silky Golden-tip	1	-	r	-	-	Unlikely, no habitat	No Habitat
Herb/Forb	<i>Craspedia canens</i>	Grey Billy-buttons	7	-	e	L	-	Unlikely, habitat too degraded	Wetlands and swampy grasslands

Lifeform	Scientific Name	Common Name	Total number of documented records (FIS)	EPBC Act	DSE 2005	FFG Act	Detected During Current Survey	Likely occurrence within the study area and reasoning for likelihood	Habitat description
Herb/Forb	<i>Helichrysum aff. rutidolepis</i> (Lowland Swamps)	Pale Swamp Everlasting	4	-	v	-	-	Unlikely, habitat too degraded	Moist areas of open forest and woodland
Herb/Forb	<i>Microseris sp. 1</i>	Plains Yam-daisy	1	-	v	-	-	Unlikely, no habitat	Moist depressions of basalt plains
Graminoid	<i>Eleocharis macbarronii</i>	Grey Spike-sedge	2	-	k	-	-	Low, chance it persists in fringing vegetation of artificial waterbodies or low lying areas	Drainage lines of heavy clay soils, often inundated
Herb/Forb	<i>Pterostylis tasmanica</i>	Southern Plume-orchid	1	-	k	-	-	Unlikely, no habitat	Coastal heath and heathy woodland
Herb/Forb	<i>Prasophyllum pyriforme s.s.</i>	Silurian Leek-orchid	1	-	e	-	-	Unlikely, no habitat	Rocky outcrops to heath to open forest
Graminoid	<i>Austrostipa rudis subsp. australis</i>	Veined Spear-grass	2	-	r	-	-	Unlikely, Grassy Woodland habitat too degraded	Open forest on sandy or sandstone derived soils
Tree	<i>Eucalyptus fulgens</i>	Green Scentbark	6	-	r	-	-	Unlikely. Recorded within local area, but study area too modified	Grassy woodland in south-east Vic
Tree	<i>Eucalyptus X studleyensis</i>	Studley Park Gum	3	-	e	-	-	Unlikely, Grassy Woodland habitat too degraded	Grassy woodland

Source: DSE Atlas of Victorian Wildlife (AVW 2007); DSEWPC Protected Matters Search Tool

## Appendix 3.1 – Fauna results

**Table A3.1.1.** Native fauna recorded during the present survey (November, December 2009), and previously recorded within 10 kilometres of the study area.

Type of Record:

H – Heard

S – Seen

I – Incidental (identified from feathers, bones or scats, etc)

T - Trapped

Scientific name	Common name	Conservation Status			Regional	Type of Record
		EPBC	DSE	FFG		
<b>BIRDS</b>						
<i>Chenonetta jubata</i>	Australian Wood Duck	-	-	-	-	S
<i>Threskiornis spinicollis</i>	Straw-necked Ibis	-	-	-	-	S
<i>Anas superciliosa</i>	Pacific Black Duck	-	-	-	-	S
<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-Cockatoo	-	-	-	-	S
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	-	-	-	-	S
<i>Cracticus torquatus</i>	Grey Butcherbird	-	-	-	-	S
<i>Corvus mellori</i>	Little Raven	-	-	-	-	S
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	-	-	-	-	H
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	-	-	-	-	S
<i>Eolophus roseicapilla</i>	Galah	-	-	-	-	S
<i>Corvus mellori</i>	Little Raven	-	-	-	-	S
<i>Platycercus elegans elegans</i>	Crimson Rosella	-	-	-	-	S
<i>Hirundo neoxena</i>	Welcome Swallow	-	-	-	-	S
<i>Rhipidura leucophrys</i>	Willie Wagtail	-	-	-	-	S
<i>Grallina cyanoleuca</i>	Magpie-lark	-	-	-	-	S
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	-	-	-	-	S
<i>Manorina melanocephala</i>	Noisy Miner	-	-	-	-	S
<i>Anthochaera carunculata</i>	Red Wattlebird	-	-	-	-	S

Scientific name	Common name	Conservation Status			Regional	Type of Record
		EPBC	DSE	FFG		
<i>Gymnorhina tibicen</i>	Australian Magpie	-	-	-	-	S
<b>MAMMALS</b>						
<i>Rattus lutreolus</i>	Swamp Rat	-	-	-	-	T
<i>Trichosurus vulpecula</i>	Common Brushtail Possum	-	-	-	-	I
<b>AMPHIBIANS</b>						
<i>Limnodynastes peronii</i>	Striped Marsh Frog	-	-	-	-	H
<i>Limnodynastes tasmaniensis</i>	Spotted Marsh Frog	-	-	-	-	H
<i>Crinia signifera</i>	Common Froglet	-	-	-	-	H
<i>Litoria ewingii</i>	Southern Brown Tree Frog	-	-	-	-	H

Source: DSE Atlas of Victorian Wildlife (2007)

**Table A3.1.2.** Introduced fauna recorded during the present survey (November, December 2009), and previously recorded within 10 kilometres of the study area.

Scientific name	Common name	Type of Record
<b>BIRDS</b>		
<i>Streptopelia chinensis</i>	Spotted Turtle-Dove	S
<i>Turdus merula</i>	Common Blackbird	S
<i>Alauda arvensis</i>	European Skylark	S
<i>Passer domesticus</i>	House Sparrow	S
<i>Acridotheres tristis</i>	Common Myna	S
<i>Sturnus vulgaris</i>	Common Starling	S
<b>MAMMALS</b>		
<i>Cat</i>	<i>Felis catus</i>	S

Source: DSE Atlas of Victorian Wildlife (2007)

## Appendix 3.2 – Significant fauna species

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

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 2007b)

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

I Invalid or ineligible for listing under the 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 study area	Likelihood reasoning	Habitat description
<b>NATIONAL SIGNIFICANCE</b>										
Australasian Bittern	<i>Botaurus poiciloptilus</i>	2001	1	-	EN	L	VU	Unlikely	No habitat	Densely vegetated freshwater lakes, wetlands & swamps
Superb Parrot	<i>Polytelis swainsonii</i>	-	1	VU	EN	L	VU	Unlikely	No habitat	Riverine forests & woodland
#Swift Parrot	<i>Lathamus discolor</i>	1998	4	EN	EN	L	EN	Fly over	No important foraging habitat	Ironbark Forests & woodlands
# Regent Honeyeater	<i>Anthochaera phrygia</i>	1972	1	EN	CR	L	EN	Unlikely	No habitat	No habitat

Common Name	Scientific Name	Last documented record	Total # of records	EPBC Act	DSE (2007)	FFG ACT	National Action Plan	Likely occurrence in study area	Likelihood reasoning	Habitat description
Helmeted Honeyeater	<i>Lichenostomus melanops cassidix</i>	1983	3	EN	CR	L	CR	Unlikely	No habitat	Eucalypt forest & woodland
# Spot-tailed Quoll	<i>Dasyurus maculatus</i>	2003	1	EN	EN	L	VU	Unlikely	No habitat	Forest (wet & dry sclerophyll), rainforests
Southern Brown Bandicoot	<i>Isoodon obesulus obesulus</i>	1985	2	EN	NT	L	NT	Unlikely	No habitat	Heathy forest, Swamp Scrub, drainage lines, roadside vegetation
# Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	2003	1	VU	VU	L	VU	Occasional fly over	Marginal habitat	Lowland rainforest, woodland, agricultural land & suburbs
# Growling Grass Frog	<i>Litoria raniformis</i>	2006	52	VU	EN	L	VU	Low/unlikely	Lack of key habitat attributes and habitat connectivity	Permanent or semi-permanent waterways, wetlands & waterbodies
# Australian Grayling	<i>Prototroctes maraena</i>	1985	2	VU	VU	L	VU	Unlikely	No habitat	Coastal rivers & streams south east of GDR
# Dwarf Galaxias	<i>Galaxiella pusilla</i>	1999	9	VU	VU	L	VU	Low	Low likelihood in dams or low lying areas	Still-slow flowing waters with abundant macrophytes
# Australian Painted Snipe	<i>Rostratula australis</i>	-	-	VU	CR	L	VU	Unlikely	Very low quality wetland habitat	Flooded Saltmarsh, shallow freshwater swamps
# Golden Sun Moth	<i>Synemon plana</i>	-	-	CR	EN	L		Unlikely	No habitat	Remnant & modified grasslands
# Long-nosed Potoroo	<i>Potorous tridactylus</i>	-	-	VU	EN	L	VU	Unlikely	No habitat	Wet forest and wet scrub on sandy soils, with dense understorey
# Smoky Mouse	<i>Pseudomys fumeus</i>	-	-	EN	CR	L	RA	Unlikely	No habitat	Sclerophyll forest; heath & tussock grass understorey; coastal heath
<b>STATE SIGNIFICANCE</b>										
Lewin's Rail	<i>Lewinia pectoralis</i>	1988	4	-	VU	L	NT	Unlikely	No habitat	Vegetated swamp; coastal Saltmarsh; swampy streams; tidal creeks
Baillon's Crake	<i>Porzana pusilla</i>	1980	2	-	VU	L	-	Unlikely	Farm dams	Freshwater wetlands; well vegetated floodwaters
Caspian Tern	<i>Hydroprogne caspia</i>	1990	1	-	NT	L	-	Unlikely	No habitat	Coastal bays & estuaries & large, brackish inland lakes
Common Sandpiper	<i>Actitis hypoleucos</i>	1972	1	-	VU	-	-	Unlikely	No habitat	Mudflats in estuaries, muddy shores, occasionally inland lakes

Common Name	Scientific Name	Last documented record	Total # of records	EPBC Act	DSE (2007)	FFG ACT	National Action Plan	Likely occurrence in study area	Likelihood reasoning	Habitat description
Royal Spoonbill	<i>Platalea regia</i>	2005	7	-	VU	-	-	Low	May forage in dams and low-lying areas	Freshwater & saline wetlands, intertidal mudflats along coast
Little Egret	<i>Egretta garzetta</i>	1972	1	-	EN	L	-	Unlikely	No habitat	Wetlands; tidal flats; estuaries; inland lakes; swamps & rivers
Intermediate Egret	<i>Ardea intermedia</i>	0	1	-	CR	L	-	Unlikely	No habitat	Grassy inland wetlands; flooded pasture or grasslands
Eastern Great Egret	<i>Ardea modesta</i>	2001	7	-	VU	L	-	Low	May forage in dams	Wetlands; tidal flats; estuaries; inland lakes; swamps & rivers
Australasian Shoveler	<i>Anas rhynchos</i>	2005	12	-	VU	-	-	Low	May forage in dams	Large, permanent lakes, some saline, freshwater swamps
Freckled Duck	<i>Stictonetta naevosa</i>	2002	1	-	EN	L	-	Unlikely	No habitat	Open freshwater or brackish wetlands
Hardhead	<i>Aythya australis</i>	2005	15	-	VU	-	-	Low	May forage in dams	Deep, permanent open freshwater wetlands
Blue-billed Duck	<i>Oxyura australis</i>	2002	16	-	EN	L	-	Low	May forage in dams	Deep, permanent, heavily vegetated wetlands
Musk Duck	<i>Biziura lobata</i>	2000	10	-	VU	-	-	Unlikely	No habitat	Deep, permanent lakes & swamps, occasionally saline wetlands
Grey Goshawk	<i>Accipiter novaehollandiae</i>	0	1	-	VU	L	-	Low (vagrant visitor)	Marginal habitat	Otway wet forests; also forests & woodlands
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	1997	6	-	VU	L	-	Low (vagrant visitor)	No habitat	Coastal islands, lakes, some inland rivers and lakes
Black Falcon	<i>Falco subniger</i>	1979	1	-	VU	-	-	Low (vagrant visitor)	Outside of the species core range	Fly over croplands; grasslands & wooded farmland
Barking Owl	<i>Ninox connivens</i>	1999	2	-	EN	L	NT	Unlikely	No habitat	Dry woodlands, wooded farmlands & dry forests along Murray River
Powerful Owl	<i>Ninox strenua</i>	2003	11	-	VU	L	-	Low (vagrant visitor)	No extensive forest or woodland habitat	Foothill & coastal forests; also mountain forest & box-ironbark woodlands
Sooty Owl	<i>Tyto tenebricosa</i>	1992	2	-	VU	L	-	Unlikely	No habitat	Wet Mountain Grey Gum; rainforest; Mountain Ash forest
Major Mitchell's Cockatoo	<i>Lophocroa leadbeateri</i>	1979	1	-	VU	L	NT	Unlikely	No habitat	Woodland (Slender Cypress pine & Box-buloke) & adjacent

Common Name	Scientific Name	Last documented record	Total # of records	EPBC Act	DSE (2007)	FFG ACT	National Action Plan	Likely occurrence in study area	Likelihood reasoning	Habitat description
										mallee scrub
Hooded Robin	<i>Melanodryas cucullata</i>	1985	2	-	NT	L	NT	Unlikely	No habitat	Semi-arid mallee scrub, cypress pine woodland/ mallee heaths and box-ironbark forest
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>	1988	1	-	EN	L	NT	Unlikely	No habitat	Dry forests & woodland; wooded farmland associated with river floodplains
Chestnut-rumped Heathwren	<i>Calamanthus pyrrhopygius</i>	1972	1	-	VU	L	-	Unlikely	No habitat	Heathland with dense undergrowth
Speckled Warbler	<i>Pyrrholaemus sagittatus</i>	1972	1	-	VU	L	NT	Unlikely	No habitat	Box-ironbark / Peppermint woodland; dry woodland & wooded farmland
Brown Treecreeper	<i>Climacteris picumnus victoriae</i>	2000	1	-	NT	-	NT	Unlikely	No habitat	Lowland dry woodland and wooded farmland
Swamp Skink	<i>Egernia coventryi</i>	1999	1	-	VU	L	-	Low	Marginal habitat	Vegetated swamps; creeklines; wet heaths
Southern Toadlet	<i>Pseudophryne semimarmorata</i>	1981	57	-	VU	-	-	Unlikely	No habitat	Moist ground layer in dry or wet sclerophyll forest; roadside gutters; small creeks
Dandenong Freshwater Amphipod	<i>Austrogammarus australis</i>	1911	1	-	VU	L	-	Unlikely	No habitat	Shaded leaf litter at the bottom of small creeks
<b>REGIONAL SIGNIFICANCE</b>										
Brown Quail	<i>Coturnix ypsilophora</i>	2003	2	-	NT	-	-	Unlikely	No habitat	Grassy & sedgy flats, agricultural crops; swamps
Pied Cormorant	<i>Phalacrocorax varius</i>	1997	5	-	NT	-	-	Unlikely	No habitat	Large freshwater & saline wetlands; tidal bays along coast
Whiskered Tern	<i>Chlidonias hybridus</i>	2004	1	-	NT	-	-	Unlikely	No habitat	Shallow freshwater swamps; fresh or brackish lakes; large rivers; sewage lagoons.
Pacific Gull	<i>Larus pacificus pacificus</i>	2006	1	-	NT	-	-	Unlikely	No habitat	Coastal; intertidal mudflats; estuaries.
Latham's Snipe	<i>Gallinago hardwickii</i>	2005	14	-	NT	-	-	Low	May forage in dams on properties 50233808 and 1514380	Vegetated swamps; pools/ditches in heath or herblands; grasslands

Common Name	Scientific Name	Last documented record	Total # of records	EPBC Act	DSE (2007)	FFG ACT	National Action Plan	Likely occurrence in study area	Likelihood reasoning	Habitat description
Nankeen Night Heron	<i>Nycticorax caledonicus</i>	1979	3	-	NT	-	-	Low	May use inundated areas periodically	Vegetated wetlands, river margins, mangroves, swamps
Spotted Harrier	<i>Circus assimilis</i>	2004	2	-	NT	-	-	Unlikely	No habitat	Wetland margins; farmlands; grasslands & dry woodlands
Black-eared Cuckoo	<i>Chrysococcyx osculans</i>	1979	2	-	NT	-	-	Unlikely	No habitat	Mallee scrub; dry woodland and box-ironbark forest
Spotted Quail-thrush	<i>Cinclosoma punctatum</i>	2000	2	-	NT	-	-	Unlikely	No habitat	Dry, grassy or rocky forests & woodlands and coastal forests
Broad-toothed Rat	<i>Mastacomys fuscus</i>	1993	1	-	NT	-	-	Unlikely	No habitat	Alpine sedges & Heathland; wet sedge forest
River Blackfish	<i>Gadopsis marmoratus</i>	1981	1		DD			Unlikely	No habitat	Slow-moving waterways preferably containing instream cover, rock or debris.

Source: DSE Atlas of Victorian Wildlife (AVW 2007); DSEWPC Protected Matters Search Tool (DSEWPC 2010)

## Appendix 4.1 – Net Gain Table

Table A4.1. Habitat hectare analysis of remnant patches of vegetation within the study area.

Habitat Zone			1	2	3	4	5
Map Reference			Fig 3.1 B4	Fig 3.1 C6	Fig 3.2 D7	Fig 3.2 E5	Fig 3.1 B4
PFI			1514384	1514380	R53073660	R209526657	50233808
Site ID			2	2	4	2	2
Zone ID			A	A	A	A	A
EVC Name (Initials)			SRW	Swet	GW	GW	Swet
EVC Number			GipP0083	GipP0136	GipP0175	GipP0175	GipP0136
Total Area of Habitat Zone (ha)			0.03	0.01	0.07	0.01	0.04
		<b>Max Score</b>	<b>Score</b>	<b>Score</b>	<b>Score</b>	<b>Score</b>	<b>Score</b>
Site Condition	Large Old Trees	10	0	n/a	0	0	n/a
	Canopy Cover	5	0	n/a	0	0	n/a
	Lack of Weeds	15	0	0	2	4	6
	Understorey	25	5	15	5	5	5
	Recruitment	10	1	0	0	0	0
	Organic Litter	5	0	0	0	3	0
	Logs	5	0	n/a	0	0	n/a
	<b>Total Score</b>	<b>75</b>	<b>6</b>	<b>15</b>	<b>7</b>	<b>12</b>	<b>11</b>
Standardiser	n/a	n/a	1.36	n/a	n/a	1.36	
Landscape Score	25	4	2	2	2	5	
Habitat Score#	100	10	22.4	9	14	19.96	
Habitat Score as above = #/100		0.1	0.22	0.09	0.14	0.20	
Habitat Hectares		<b>0.00</b>	<b>0.00</b>	<b>0.01</b>	<b>0.00</b>	<b>0.01</b>	
Bioregion		GipP	GipP	GipP	GipP	GipP	
EVC Conservation Status		E	VU	E	E	E	
Conservation Significance	Conservation Status x Habitat Score		High	Medium	High	High	High
	Threatened Species Rating		n/a	High	n/a	n/a	High
	Other Site Attribute Rating		n/a	n/a	n/a	n/a	n/a
	Overall Conservation Significance (highest rating)		<b>High</b>	<b>High</b>	<b>High</b>	<b>High</b>	<b>High</b>
No. of Large Old trees in each Habitat Zone		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	

**Notes:** PFI = Property identification number, SRW = Swampy Riparian Woodland, GW = Grassy Woodland, Sedge Wetland = Sedge Wetland, GipP = Gippsland Plain.

## Appendix 4.2 – Scattered Tree Table

Table A4.2. Habitat hectare analysis of remnant patches of vegetation within the study area.

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)
50233808	1	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2532812.015	2383546.524	Fig 4.1 B5
	2	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2532826.429	2383633.214	Fig 4.1 B4
1514390	1	<i>Eucalyptus</i> sp.	Eucalypt	LOT	GipPlain	High	2533066.318	2383787.039	Fig 4.1 D2
	2	<i>Eucalyptus</i> sp.	Eucalypt	LOT	GipPlain	High	2533064.894	2383778.479	Fig 4.1 D2
	3	<i>Eucalyptus</i> sp.	Eucalypt	LOT	GipPlain	High	2533061.497	2383770.168	Fig 4.1 D2
	4	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2533060.777	2383762.197	Fig 4.1 D2
	5	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2533060.214	2383760.275	Fig 4.1 D2
	6	<i>Eucalyptus</i> sp.	Eucalypt	VLOT	GipPlain	High	2533021.738	2383745.461	Fig 4.1 D2
1514388	1	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2532986.603	2383696.079	Fig 4.1 C3
1514386	1	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2532925.248	2383691.877	Fig 4.1 C3
	2	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2532913.920	2383697.972	Fig 4.1 C3
	3	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2532878.954	2383694.076	Fig 4.1 C3
	4	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2532875.267	2383680.824	Fig 4.1 C3
	5	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2533004.399	2383652.195	Fig 4.1 C3
1514384	1	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2532949.422	2383548.518	Fig 4.1 C4
	2	<i>Eucalyptus</i> sp.	Eucalypt	LOT	GipPlain	High	2532932.509	2383563.070	Fig 4.1 C4
	3	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2532911.567	2383598.469	Fig 4.1 C4
R15144382	1	<i>Eucalyptus</i> sp.	Eucalypt	VLOT	GipPlain	High	2532989.020	2383503.111	Fig 4.1 C5
	2	<i>Eucalyptus</i> sp.	Eucalypt	VLOT	GipPlain	High	2532993.360	2383513.139	Fig 4.1 C5
1514380	1	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2532952.435	2383411.199	Fig 4.1 C6
	2	<i>Eucalyptus</i> sp.	Eucalypt	MOT	GipPlain	High	2532942.721	2383388.890	Fig 4.1 C6
	3	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2532942.498	2383384.192	Fig 4.1 C7
	4	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2532920.396	2383459.278	Fig 4.1 C6
	5	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2532960.425	2383419.215	Fig 4.1 C6
52881396	1	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2533307.955	2383103.614	Fig 4.2 C5
1514385	1	<i>Eucalyptus</i> sp.	Eucalypt	MOT	GipPlain	High	2533129.884	2383584.065	Fig 4.1 D4

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)
	2	<i>Eucalyptus</i> sp.	Eucalypt	VLOT	GipPlain	High	2533161.547	2383570.508	Fig 4.1 D4
	3	<i>Eucalyptus</i> sp.	Eucalypt	MOT	GipPlain	High	2533161.504	2383559.501	Fig 4.1 D4
	4	<i>Eucalyptus</i> sp.	Eucalypt	MOT	GipPlain	High	2533171.198	2383558.352	Fig 4.1 D4
R52881396	1	<i>Eucalyptus</i> sp.	Eucalypt	LOT	GipPlain	High	2533036.241	2383176.862	Fig 4.2 A4
	2	<i>Eucalyptus</i> sp.	Eucalypt	LOT	GipPlain	High	2533070.570	2383160.964	Fig 4.2 A4
R53073660	1	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2533693.447	2383041.463	Fig 4.2 E5
	2	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2533695.519	2383040.326	Fig 4.2 E5
	3	<i>Eucalyptus</i> sp.	Eucalypt	MOT	GipPlain	High	2533693.185	2383020.096	Fig 4.2 E6
	4	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2533690.525	2383003.066	Fig 4.2 E6
	5	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2533686.685	2382993.408	Fig 4.2 E6
	6	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2533686.665	2382984.911	Fig 4.2 E6
	7	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2533680.951	2382958.863	Fig 4.2 E6
	8	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2533676.968	2382942.573	Fig 4.2 E6
	9	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2533341.886	2382958.809	Fig 4.2 C6
	10	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2533670.021	2382851.736	Fig 4.2 E7
	11	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2533669.828	2382857.890	Fig 4.2 E7
	12	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2533670.389	2382866.426	Fig 4.2 E7
	13	<i>Eucalyptus</i> sp.	Eucalypt	ST	GipPlain	Low	2533671.869	2382877.880	Fig 4.2 E7

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