

DRAFT REPORT:

Biodiversity Assessment for Area 1099, Rockbank South 2, Victoria

PREPARED FOR:

Growth Areas Authority
June 2012

GA



Ecology and Heritage Partners Pty Ltd

Table of Contents

Executive Summary	7
1 Introduction	16
1.1 Background.....	16
1.2 Scope.....	16
1.3 Objectives.....	16
1.4 Precinct.....	16
2 Methods	18
2.1 Nomenclature.....	18
2.2 Literature and Database Review.....	18
2.3 Field Surveys.....	18
2.3.1 General flora survey.....	18
2.3.2 Indigenous tree assessment.....	19
2.3.3 Targeted flora surveys.....	19
2.3.4 General fauna survey.....	22
2.3.5 Incidental flora and fauna surveys.....	23
2.4 Assessment Qualifications and Limitations.....	24
3 Results	25
3.1 Flora.....	25
3.1.1 Flora species.....	25
3.1.2 Significant flora species and communities.....	25
3.1.3 Best or remaining 50% habitat for rare and threatened flora species.....	26
3.2 Ecological Vegetation Classes.....	28
3.2.1 <i>Lighter soils</i> Plains Grassland (EVC 132_62).....	29
3.2.2 Lignum Swamp (EVC 104).....	29
3.3 Habitat Hectare Assessment.....	29
3.3.1 Remnant patches of native vegetation.....	29
3.3.2 Trees within remnant vegetation.....	29
3.3.3 Scattered trees.....	30
3.4 Fauna.....	30
3.4.1 Fauna species.....	30
3.4.2 Fauna habitats.....	30
3.4.3 Significant fauna species.....	32
3.4.4 Best or remaining 50% habitat for rare and threatened fauna species.....	37
4 Relevant Legislation and Policy	38
4.1 Commonwealth.....	38

4.1.1	Environment Protection and Biodiversity Conservation Act 1999	38
4.1.2	Strategic Impact Assessment (SIAR)	40
4.2	State.....	43
4.2.1	Planning and Environment Act 1987	43
4.2.2	Flora and Fauna Guarantee Act 1988	43
4.2.3	Environment Effects Act 1978	44
4.2.4	Catchment and Land Protection Act 1994	45
4.2.5	Wildlife Act 1975	45
4.2.6	Port Phillip and Westernport Native Vegetation Plan	46
4.2.7	Victoria’s Biodiversity Strategy	46
4.3	Local.....	46
4.3.1	Melton Shire Council	46
5	Potential Impacts and Mitigation Measures	48
5.1	Opportunities to Reduce Potential Impacts.....	48
5.2	Opportunities to Protect and Enhance Regional and Local Biodiversity Values	49
6	Conclusion	50
	Figures	51
	Appendices	61
	References	87
	Tables	
	Table A1.1. Rare or Threatened categories for listed Victorian taxa.....	62
	Table A1.2. Defining Ecological Significance.....	63
	Table A1.3. Defining Site Significance.....	65
	Table A1.4. Defining Vegetation Condition.....	66
	Table A1.5. Defining Habitat Quality.....	67
	Table A2.1.1. Indigenous Flora recorded during the present survey from the precinct.....	68
	* Species occurs within landscape planting.....	69
	Table A2.1.2. Exotic flora recorded during the present survey from the precinct.....	70
	Table A2.2. Significant flora recorded within 10 kilometres of the study area.....	73
	Table A3.1.1. Native fauna species recorded during the present surveys.....	77
	Table A3.1.2. Introduced fauna species recorded during the present surveys.....	78
	Table A3.2. Significant fauna within 10 kilometres of the precinct.....	79
	Figures	
	Figure ES1: Overview of Study Area.....	10
	Figure ES2: Access Information.....	11

Figure ES3: Extent of remnant native vegetation (time stamped)	12
Figure ES4: Conservation Significance	13
Figure ES5: Threatened Flora and Fauna Records	14
Figure ES6: Locations of potential fauna habitat.....	15
Figure 1: Location of the precinct.....	52
Figure 2: Access information for properties within the precinct.....	53
Figure 3: Remnant native vegetation within the precinct.....	54
Figure 4: Location of scattered remnant trees mapped within the precinct.....	55
Figure 5: Conservation significance of vegetation within the precinct.....	56
Figure 6: Location of targeted survey sites within the precinct.....	57
Figure 7: Significant flora records within, and in the near vicinity of the precinct	58
Figure 8: Significant fauna records within, and in the near vicinity of the precinct	59
Figure 9: Potential habitat for significant fauna within the precinct.	60

DRAFT

Acknowledgments

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

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.
- Merryn Kelly, Angela Robb, and Adam Muir (Department of Sustainability and Environment) for ongoing involvement in the project, data validation, and comments on the draft report.
- The Department of Sustainability and Environment for the use of data available on the Flora Information System and Biodiversity Interactive Map.
- Landholders for providing access and information on their properties..

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

Andrew Warnock, Anna O'Brien, Andrea Canzano, Simon Scott, Aaron Organ and Amanda Feetham.

Cover Photo: Remnant patch of Plains Grassland vegetation in the study area (taken by Andrew Warnock, Ecology and Heritage Partners Pty Ltd).

Document Control

Project name	Biodiversity Assessment for Area 1099, Rockbank South 2, Victoria.
Project number	3339
Project manager	Simon Scott, Resource Manager/ Aaron Organ, Director / Principal Ecologist
Report author(s)	Anna O'Brien, Botanist Andrew Warnock, Botanist Andrea Canzano, Zoologist
Report reviewer	Aaron Organ, Director / Principal Ecologist
Other personnel	Marc Freestone, Technical Assistant
Mapping	Amanda Feetham
File name	3339_EHP_Rockbank South 2_DRAFT_22062012

Report version	Comments	Comments updated by:	Date submitted
Draft	Draft Report	AW, AOB, AC	22/06/12

Copyright © Ecology and Heritage Partners Pty Ltd

This document is subject to copyright and may only be used for the purposes for which it was commissioned. The use, or copying, of this document in whole or part without the permission of Ecology and Heritage Partners Pty Ltd is an infringement of copyright.

Disclaimer

Although Ecology and Heritage Partners Pty Ltd have taken all the necessary steps to ensure that an accurate document has been prepared, the company accepts no liability for any damages or loss incurred as a result of reliance placed upon either the report or its content.

EXECUTIVE SUMMARY

Introduction

Ecology and Heritage Partners Pty Ltd was commissioned by the Growth Areas Authority (GAA) to undertake a biodiversity assessment for the 2011/12 Biodiversity Mapping Project, at 'Area 1099' (Rockbank South 2) in the urban fringe of west Melbourne. Area 1099 is located approximately 30 kilometres northwest of the Melbourne CBD, and contains private land that is used for farming (Figure ES1).

The purpose of the Biodiversity Assessments is to identify biodiversity values within the Precinct and provide a report that will be incorporated into the Growth Areas Authority's Precinct Structure Planning process.

Methods

The following resources and databases were reviewed during the project:

- The Victorian Biodiversity Atlas database.
- Department of Sustainability and Environment (DSE) Biodiversity Interactive Maps showing historic and current Ecological Vegetation Classes (EVCs).
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) Protected Matters Search Tool providing matters of National Environmental Significance (NES) (e.g. listed taxa and ecological communities, Ramsar wetlands) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- Planning Schemes Online providing the current zone and overlays.
- Relevant legislation and policies.
- Ecological reports relevant to the study area.

Site assessments were undertaken wherever access was granted (Figure ES2). Biodiversity assessments followed the methodology stipulated within the Request for Tender, and included the following:

- *General flora survey:* The general flora survey was undertaken by assessors at all properties accessed. Assessors traversed the property on foot or in a vehicle, and recorded flora species observed, the extent of patches of vegetation (compared with the DSEs Time Stamped data layer) and potential habitats for significant species.
- *Indigenous tree assessment:* The species, size class, and location of all indigenous trees were recorded as point files into-held PDAs.

- *General fauna survey:* Fauna species observed, and heard, as well as other indicators of their presence e.g. nests, scats, were recorded. The differing habitats for fauna was including potential habitats for significant fauna species was also recorded.
- *Targeted flora survey:* Targeted flora surveys were undertaken across all of DSE's time stamped data in spring and summer. This included botanists walking five metre transects and recording all significant species. Samples of potentially significant species that could not be verified in the field were collected for later identification in the office. Targeted flora species included those set as a minimum requirement within the contract agreement, however, all significant species were recorded during this survey methodology.

Results

Flora

Much of the remnant native vegetation within the precinct has been cleared as a result of previous land use activities (i.e. agriculture). Areas of remnant native vegetation mainly occur as scattered remnants on private property and along roadsides. These areas support Plains Grassland remnants and Lignum Swamp.

One nationally significant flora species, Spiny Rice-flower, was recorded during the current assessment within Griegs Road Reserve. This species is listed as critically endangered under the EPBC Act and listed endangered under the DSE advisory list.

Approximately **10.21 habitat hectares** of remnant vegetation is present within the precinct, including:

- **60.80 habitat hectares** of Very High conservation significance Plains Grassland;
- **1.26 habitat hectares** of High conservation significance Plains Grassland;
- **3.23 habitat hectares** of Very High conservation significance Lignum Swamp; and,
- **0.02 habitat hectares** of High conservation significance Lignum Swamp (Figure ES4).

There were no scattered trees recorded within the study area and no large old trees recorded within remnant vegetation patches.

Fauna

One state significant fauna species, Eastern Great Egret was recorded within the precinct at the time of assessment (Figure ES5). The precinct provides low quality habitats for Golden Sun Moth, Striped Legless Lizard and Growling Grass Frog, although targeted surveys for these species was beyond the scope of this project. It is understood that these will have been

undertaken through sub-regional surveys. The precinct also has low quality habitats for some waterbirds and possibly also Swift Parrot and Plains Wanderer (Figure ES6).

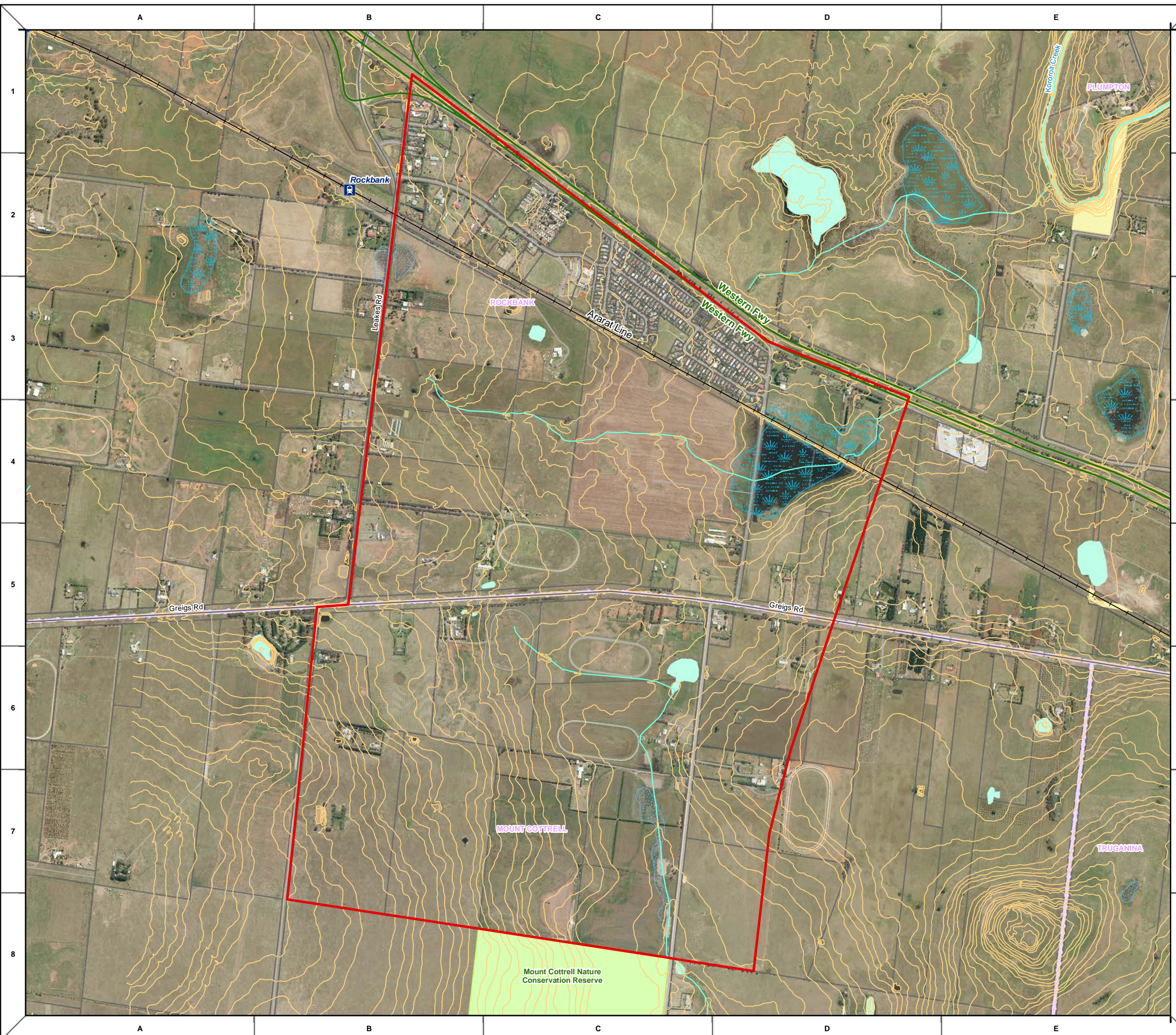
The site supports five broad habitat types: native grasslands, ephemeral drainage line, planted native and introduced trees, artificial waterbodies and introduced pasture grass and crops.

Recommendations

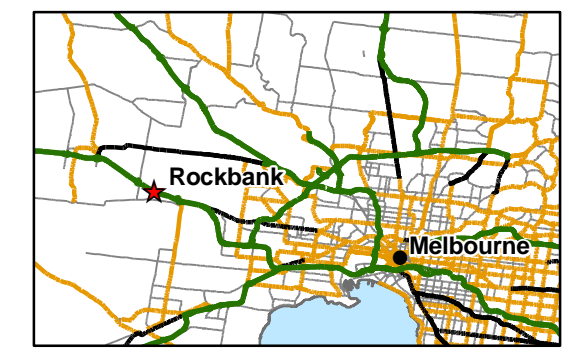
Remnant native vegetation is almost entirely limited to road reserves, and these areas should be retained where possible. Vegetation offsets will be required for the permitted removal of remnant native vegetation, and information detailing areas proposed to be retained and areas to be removed will be outlined in an endorsed Native Vegetation Precinct Plan.

A permit to 'take' native vegetation under the *Flora and Fauna Guarantee Act 1988* will be required for the removal of protected flora located on public land (e.g. road reserves). Animal welfare measures should be undertaken during construction and fauna salvage and translocation is recommended for Growling Grass Frog if habitats are proposed to be disturbed as part of the future development.

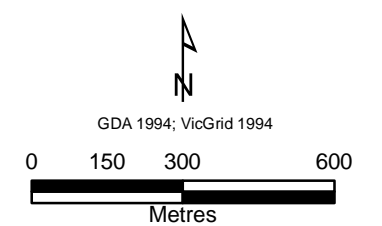
There are opportunities to enhance ecological values within the study area, principally through the regeneration of remnant native vegetation, revegetation with site indigenous species, weed control, and the provision of stormwater treatment wetlands which will provide additional habitat for a range of fauna species.



- ### Legend
- Study Area Boundary
 - Urban Growth Boundary
 - Railway Station
 - Railway
 - Freeway
 - Collector Road
 - Minor Road
 - Contour (1-5m)
 - Minor Watercourse
 - Waterbody
 - Land Subject to Inundation
 - Wetland/Swamp
 - Parks and Reserves
 - Crown Land
 - Localities
 - Property Boundaries



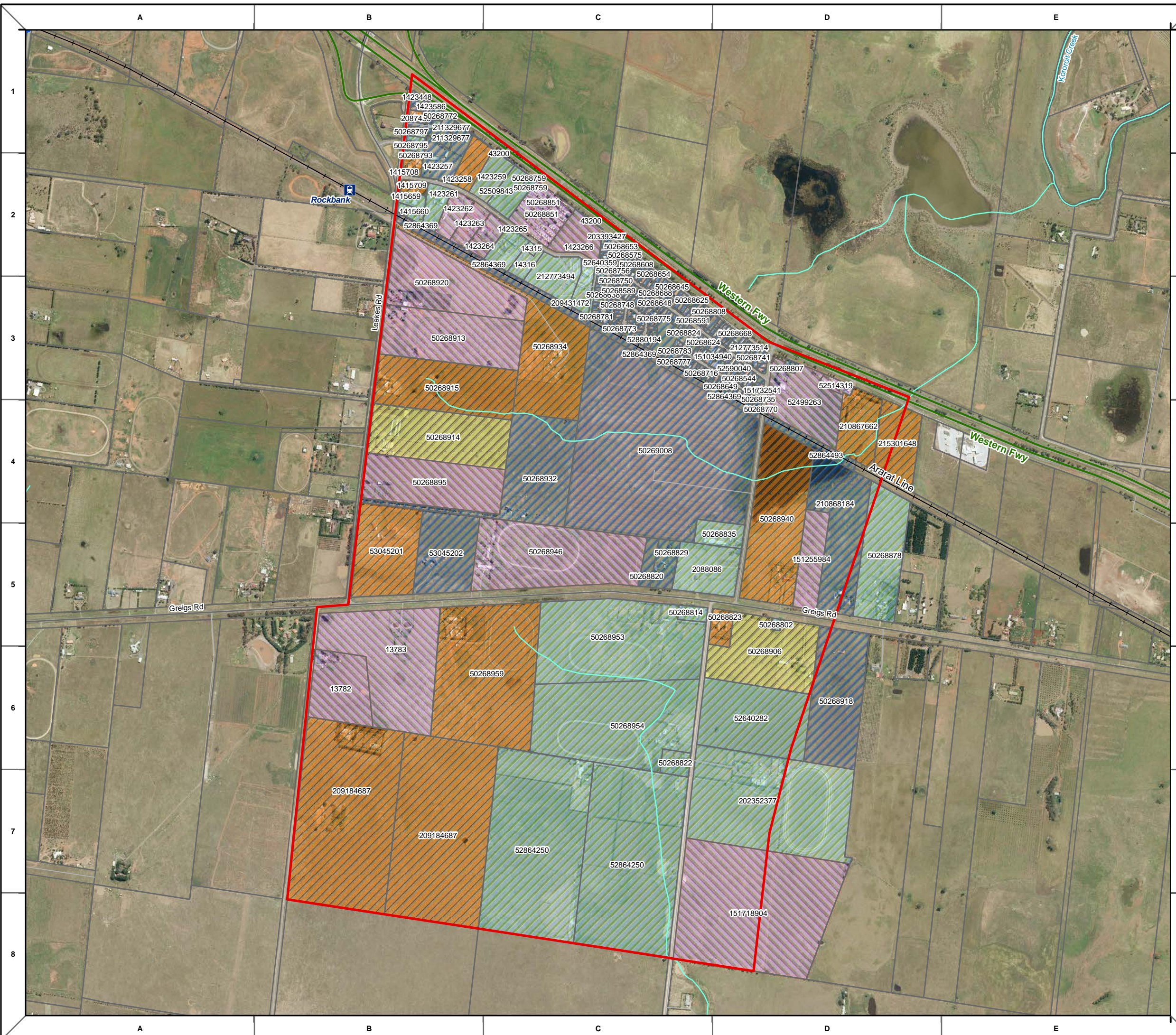
**Overveiw of Study Area
PSP 1099**
Biodiversity Assessment Project
2011/12







1:15,000 when printed @ A3

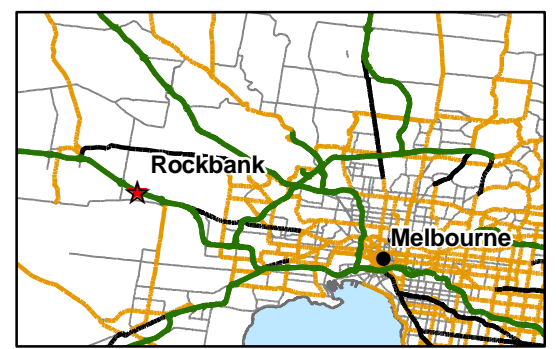
**FIGURE
ES1**

VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, omissions, delays or consequences in the information.
File Path: 3339/1099_ES1_Overview.mxd Issue Date: 13/06/2012

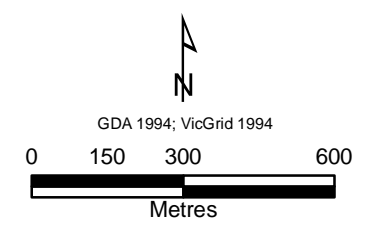


Legend

-  Urban Growth Boundary
-  Study Area Boundary
-  Access Granted
-  Access Unattainable
-  Access Denied
-  Landowner Details not Provided
-  No Survey Needed
-  Railway Station
-  Railway
-  Freeway
-  Collector Road
-  Minor Road
-  Minor Watercourse
-  Property Boundaries



Access Information PSP 1099 Biodiversity Assessment Project 2011/12

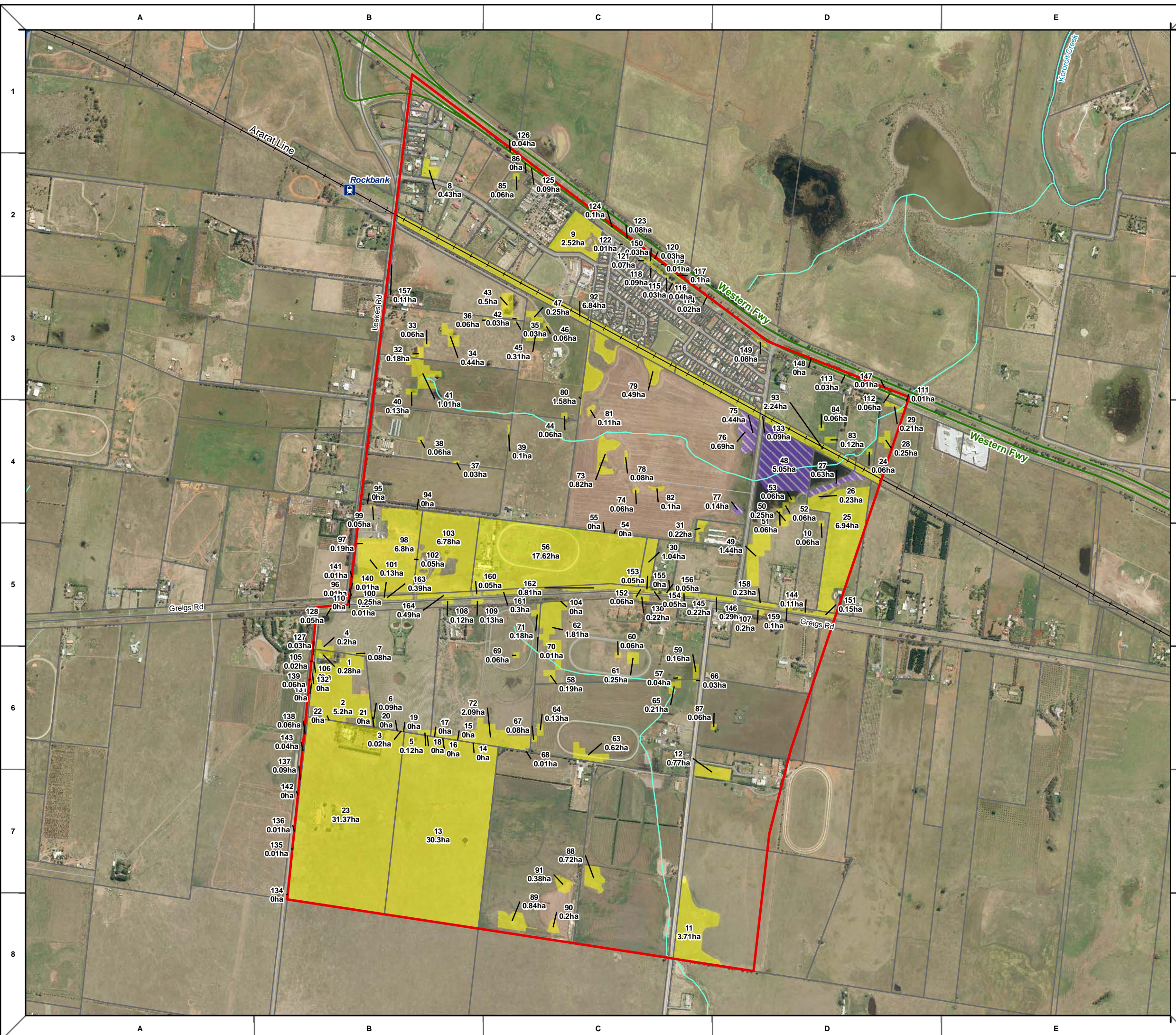


1:15,000 when printed @ A3







**FIGURE
ES2**

VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
3339/1099_ES2_AccessInfo.mxd Issue Date: 29/05/2012



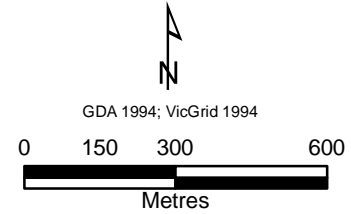
Legend

-  Urban Growth Boundary
-  Study Area Boundary
-  104, Lignum Swamp
-  132, Plains Grassland

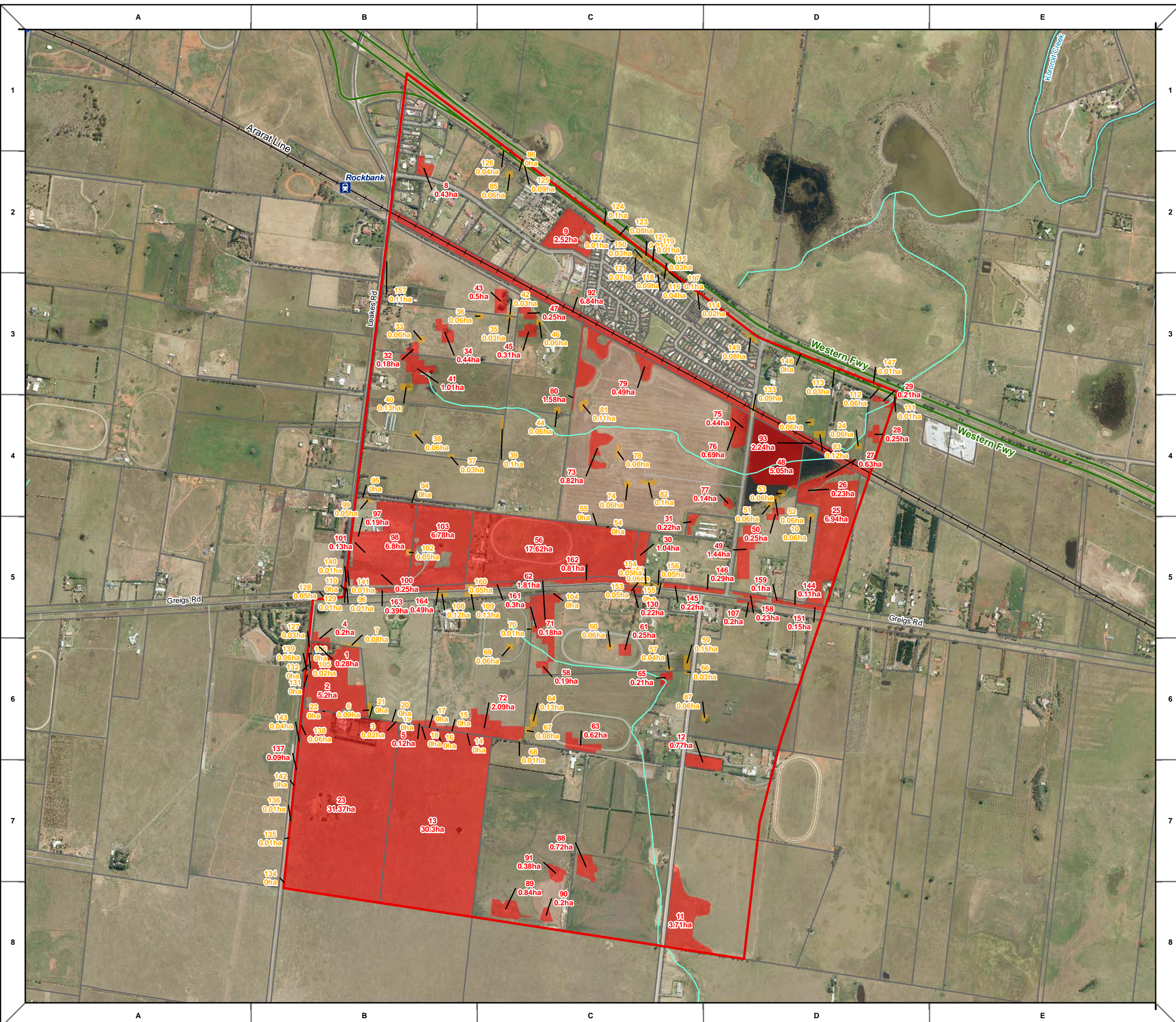
Vegetation mapping based on DSE Time Stamped Data, May 2012.
Please note no Scattered trees were recorded during the assessment.



Extent of Native Vegetation & Scattered Tree Locations PSP 1099 Biodiversity Assessment Project 2011/12



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
File Path: 3339/1099_ES3_Native_Vegetation.mxd Issue Date: 13/06/2012



Legend

- Urban Growth Boundary
- Study Area Boundary

Conservation Significance

- Very High
- High

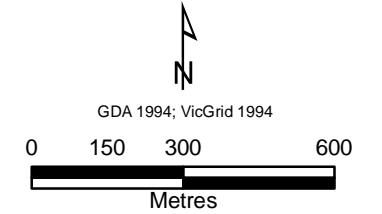
Vegetation mapping based on DSE Time Stamped Data, May 2012.



Conservation Significance

PSP 1099

Biodiversity Assessment Project 2011/12

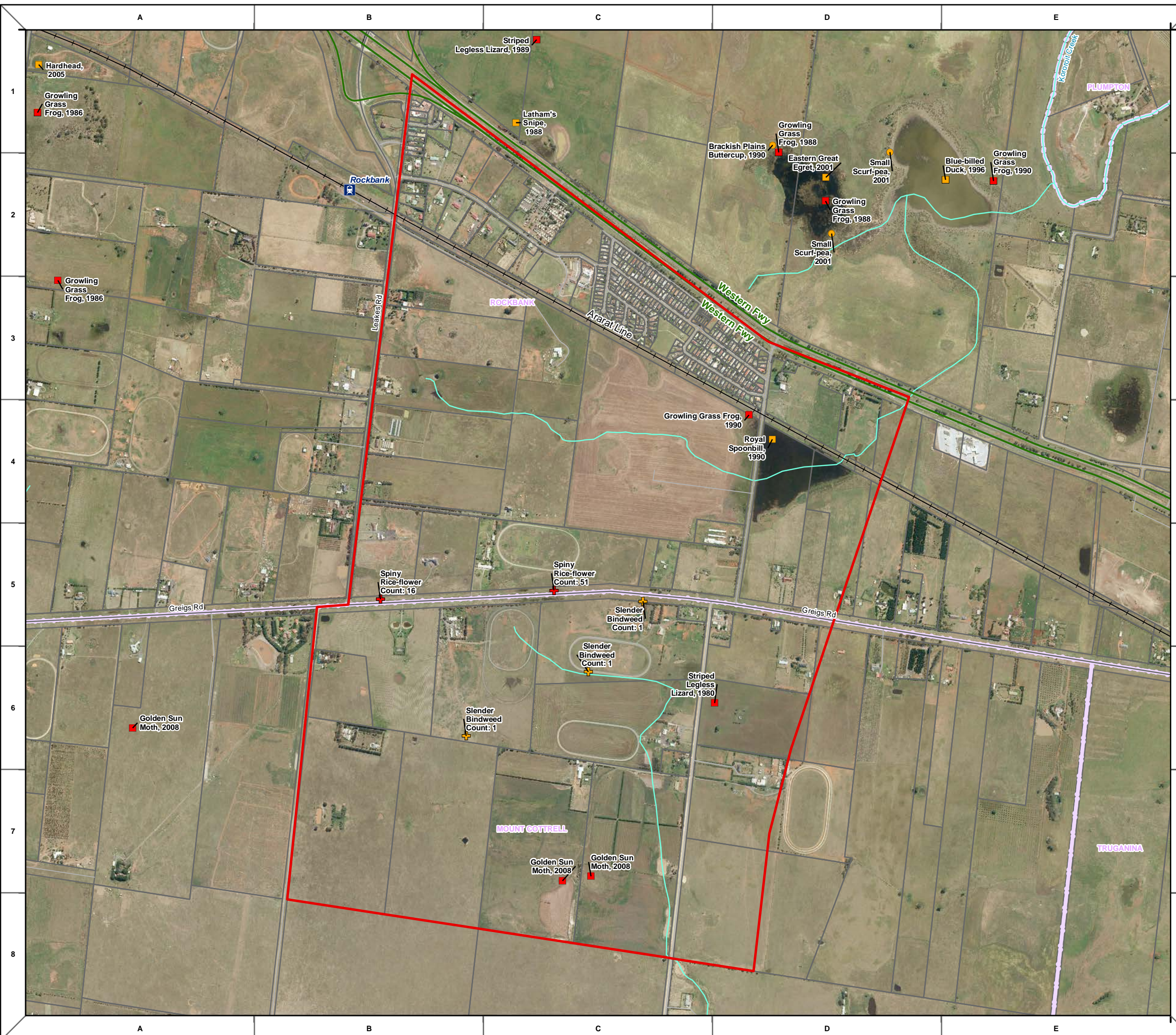


1:15,000 when printed @ A3



FIGURE
ES4

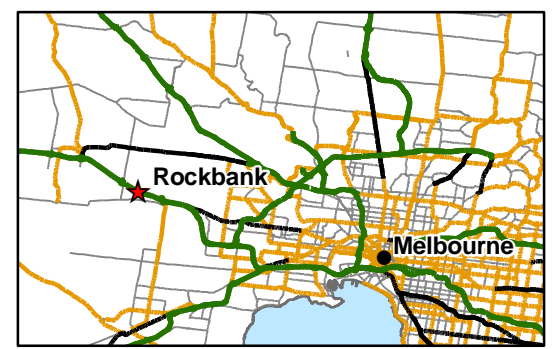
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
File Path: 3339/1099_ES4_Cons_Sig.mxd Issue Date: 13/06/2012



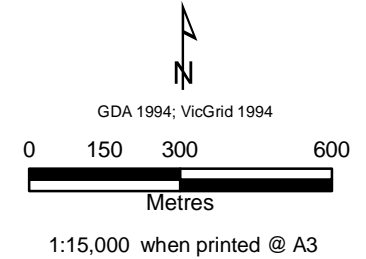
Legend

- Study Area Boundary
- Victorian Biodiversity Atlas Flora Records**
- Nationally Listed Species
- State Listed Species
- Assessment Flora Records**
- + Nationally Listed Species
- + State Listed Species
- Victorian Biodiversity Atlas Fauna Records**
- Nationally Listed Species
- State Listed Species

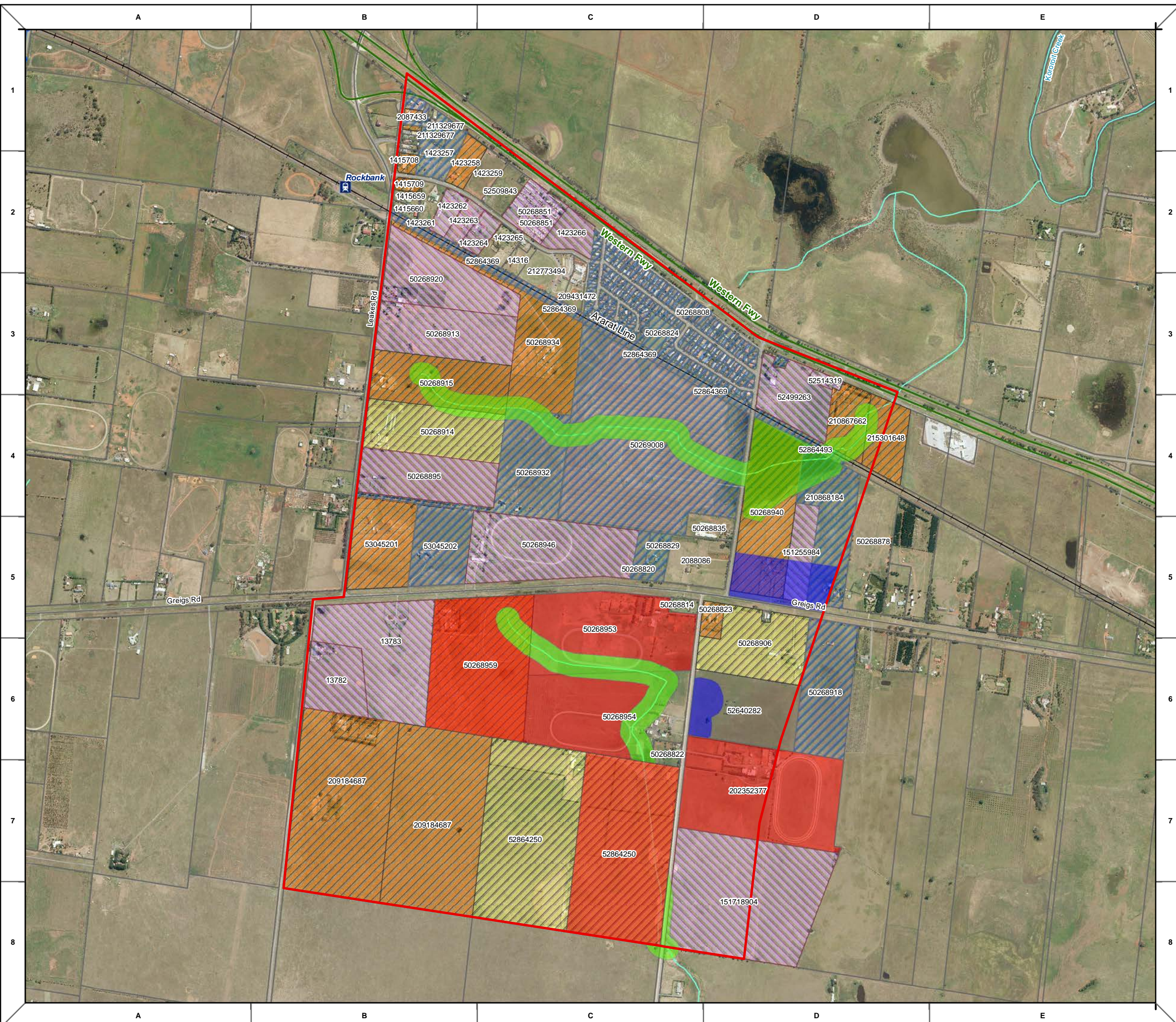
Note: The locations of significant species are based on data available from DSEs FIS database and Victorian Biodiversity Atlas (VBA 2011), the current field investigations and other sources.



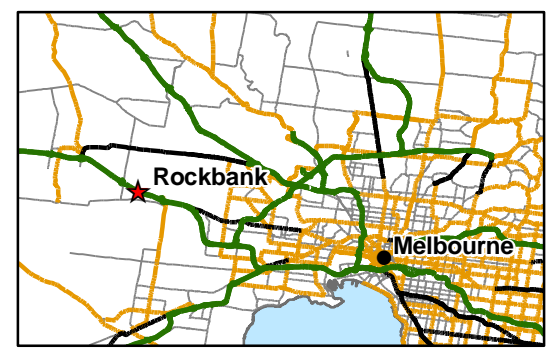
**Threatened Flora & Fauna Records
PSP 1099
Biodiversity Assessment Project
2011/12**



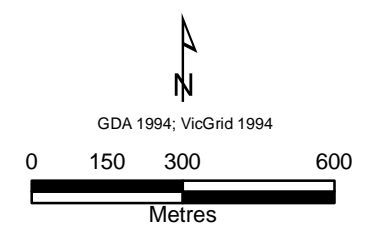
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
File Path: 3339/1099_ES5_Flora_Fauna.mxd Issue Date: 13/06/2012



- Legend**
- Study Area Boundary
 - Urban Growth Boundary
 - Potential Growing Grass Frog Habitat
 - Potential Golden Sun Moth Habitat
 - Potential Striped Legless Lizard Habitat
 - Access Unattainable
 - Access Denied
 - Landowner Details not Provided
 - No Survey Needed



**Potential Habitat
PSP 1099
Biodiversity Assessment Project
2011/12**



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
File Path: 3339/1099_ES6_Potential_Habitat.mxd Issue Date: 29/05/2012

1 INTRODUCTION

1.1 Background

Ecology and Heritage Partners Pty Ltd was commissioned by the Growth Areas Authority (GAA) to undertake a biodiversity assessment as part of the 2011/12 GAA Biodiversity Mapping Project, at 'Area 1099' in the urban fringe west of Melbourne (Figure 1). The purpose of this report is to identify biodiversity values within the Precinct and to inform the planning process.

1.2 Scope

A desktop assessment was undertaken to identify significant flora surveys for species within 10 kilometres of the study area (Appendix 2). A general flora and fauna assessment was completed for each property accessed within the study area. Targeted flora surveys were completed within vegetation 'time stamped' by DSE as vegetation patches. Targeted fauna surveys and habitat hectare assessments were not commissioned as part of this project. The time-stamped vegetation has been used for the habitat hectare calculations presented below.

Information relating to the implications under Commonwealth and State Government legislation, and local environmental polices, along with potential impacts associated with the future development of the study area, and recommended mitigation measures have been included.

1.3 Objectives

The objectives of the project were to:

- Identify, assess and map significant flora, fauna and habitat within the precinct and the level of conservation significance for any species or habitat recorded;
- Collect data at a sufficient detail and standard to enable the development of a Precinct Structure Plan (PSP) and Native Vegetation Precinct Structure Plan (NVPP);
- Provide advice on any works or management measures that may reduce adverse impacts of the development on species known or likely to occur in the precinct; and,
- Ensure that development of the precinct complies with legislative requirements regarding the protection of indigenous flora and fauna species and communities.

1.4 Precinct

Area 1099 (the precinct) is located in Rockbank, approximately 35 kilometres northwest of the Melbourne CBD, Victoria (Figure 1). The precinct covers approximately 500 hectares and consists of 64 properties (Figure 2).

It is bound to the north by the Western Freeway and Private farmland to the east, south and west. All of the properties within the precinct are privately owned. To the north of the Melbourne–Ballarat railway track the majority of the properties are private residential blocks, whilst to the south of the railway the majority of the properties are small farms. The precinct has largely been cleared for agricultural purposes, with areas of remnant native vegetation limited to scattered areas within farmland that have not been cropped/cultivated, and in scattered patches of road reserves along Greigs Road and Downing St. Remnant native vegetation comprises modified examples of Plains Grassland.

According to the Department of Sustainability and Environment’s (DSE’s) Biodiversity Interactive Map (DSE 2012a) the precinct falls within the Victorian Volcanic Plain bioregion. The Victorian Volcanic Plain bioregion extends from Port Phillip Bay in the east to Dartmoor in the west, extending north to the southern slopes of the Great Dividing Range.

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

Three BioSites exist within the precinct (DSE 2012a) (Table 1). BioSites within the vicinity of the precinct include habitat and threatened species of state and regional significance (Table 1).

Table 1: BioSites located within the precinct.

Biosite No.	Name	Size (hectares)	Location	Significance	Attributes
4209	Mt Cottrel East (GrassVPME24)	912.11	Southern portion of precinct within properties 52864250 and 209184687.	State	Western Basalt Plains Grassland, habitat for Striped Legless Lizard <i>Delmar impar</i> , Fat Tailed Dunnart <i>Sminthopsis crassicaudata</i> , Little Button Quail <i>Turnix velox</i> and Red-Chested Buttonquail <i>Turnix torquatus</i>
4621	Troups Road Swamp	15.75	Troups Road North, properties 50269008, 50268940, 210868184, 52499263, 210867662 and 215301648	Regional	Habitat/breeding site for Australasian Bittern <i>Botaurus poiciloptilus</i> , Growling Grass Frog <i>Litoria raniformis</i> , Royal Spoonbill <i>Platalea regia</i> , Common Nardoo <i>Marsilea drummondii</i> , Australasian Shoveler <i>Anas rhynchotis</i> .
4567	Rockbank Rail Reserve 1	0.79	Rockbank rail reserve	Regional	Low Rises Woodland

2 METHODS

2.1 Nomenclature

Common and scientific names of vascular plants follow the Victorian Biodiversity Atlas (DSE 2011a) and the Census of Vascular Plants of Victoria (Walsh and Stajsic 2007). Vegetation community names follow DSE's EVC Benchmarks (DSE 2012b).

Terrestrial and vertebrate fauna (mammals, birds, reptiles, amphibians and fish) follow the Victorian Biodiversity Atlas (VBA) (DSE 2011a).

2.2 Literature and Database Review

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

- The Victorian Biodiversity Atlas (DSE 2011a), Atlas of Victorian Wildlife (Viridans 2011a) and Flora Information System (Viridans 2011b) databases;
- The DSE's Biodiversity Interactive Maps showing historic and current EVCs (DSE 2012a);
- Sites of Biological Significance (BioSites) (DSE 2012a).
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) Protected Matters Search Tool which identifies matters of National Environmental Significance (NES) (e.g. listed flora and fauna species and ecological communities, Ramsar wetlands) protected under the EPBC Act (DSEWPC 2012).
- Planning Schemes Online providing the current zone and overlays (DPCD 2012).
- Relevant legislation and policies; and
- Known ecological reports relevant to the precinct.

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

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

2.3 Field Surveys

Vegetation assessments were undertaken by experienced personnel who had current Certificates of Competency in conducting Vegetation Quality Assessments (habitat hectares) from DSE.

A summary of the dates where each of the flora and fauna surveys was undertaken is provided in Section 2.3.2.

2.3.1 General flora survey

Flora surveys were undertaken on 16 November 2011, 18 November 2011, 18 January 2012 and 10 February 2012. 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 Ecological Vegetation Classes (EVCs), remnant trees and significant flora species were recorded and mapped on aerial photographs. Results were later compared with the DSE time stamped data layer.

2.3.2 Indigenous tree assessment

A scattered tree assessment was undertaken concurrently with the general flora survey in November 2011 and February 2012 (Table 2). 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 and the conservation significance of each tree was determined according to the relevant EVC benchmark.

2.3.3 Targeted flora surveys

Targeted flora surveys were undertaken at all properties which were accessed (Figure 2), and were required to be undertaken in spring, summer and winter. The following species were targeted in spring (16 and 18 November 2011):

- Austral Toadflax;
- Basalt Sun Orchid;
- Button Wrinklewort;
- Clover Glycine;
- Large Fruit Fireweed;
- Matted Flax Lily;
- Pale Swamp Everlasting;
- Purple Diuris;
- River Swamp Wallaby Grass;
- Slender Tick Trefoil;
- Small Golden Moths;
- Sunshine Diuris;
- Swamp Fireweed;
- Swollen Swamp Wallaby Grass; and
- Tough Scurf Pea.

Species targeted during summer surveys (18 January and 10 February 2012), included:

- Basalt Peppercreess;
- Basalt Podolepis; and

- Matted Flax-lily.

In addition, Small Milkwort *Comesperma polygaloides*, Swamp Everlasting *Xerochrysum palustre*, Spiny Rice Flower *Pimelea spinescens* subs. *spinescens* and Veined Spear Grass *Austrostipa rudis* subsp. *australis* was also likely to be present in the area, and was recorded if found in addition to any other rare or threatened species not listed above.

In addition, assessors undertook targeted surveys for other significant flora species across DSE's time stamped vegetation areas. This was informed by the desktop assessment, the assessor's knowledge of the species and its habitat requirements. So in effect, the targeted flora assessment is considered appropriate for all significant species that may occur within the time stamped vegetation areas.

Targeted summer surveys were undertaken in areas of suitable habitat for significant flora. The survey assessment date, duration and assessor are provided below (Table 3).

Table 3: Spring targeted flora survey date, duration and assessor.

Property Number*	Assessment Date	Duration	Assessor
50268959	16-Nov-11	9.00am – 11.20am	Anna O'Brien, Andrew Warnock
R50268959	16-Nov-11	11.20am – 11.30am	Anna O'Brien, Andrew Warnock
50268953	16-Nov-11	11.30am – 12.50pm	Anna O'Brien, Andrew Warnock
R50268953	16-Nov-11	12.50pm – 1.00pm	Anna O'Brien, Andrew Warnock
50268954	16-Nov-11	1.00pm – 2.30pm	Anna O'Brien, Andrew Warnock
R50268906	16-Nov-11	2.30pm – 2.40pm	Anna O'Brien, Andrew Warnock
R210868184	16-Nov-11	2.40pm – 2.50pm	Anna O'Brien, Andrew Warnock
R151255984	16-Nov-11	2.50pm – 2.55pm	Anna O'Brien, Andrew Warnock
R50268940	16-Nov-11	2.55pm – 3.20pm	Anna O'Brien, Andrew Warnock
R2088086	16-Nov-11	3.20pm – 3.30pm	Anna O'Brien, Andrew Warnock
R50268829	16-Nov-11	3.30pm – 3.35pm	Anna O'Brien, Andrew Warnock
R50268820	16-Nov-11	3.35pm – 3.40pm	Anna O'Brien, Andrew Warnock
R50268946	16-Nov-11	3.40pm – 3.55pm	Anna O'Brien, Andrew Warnock
R53045202	16-Nov-11	3.55pm – 4.05pm	Anna O'Brien, Andrew Warnock
R53045201	16-Nov-11	4.05pm – 4.15pm	Anna O'Brien, Andrew Warnock
R13783	16-Nov-11	4.15pm – 4.25pm	Anna O'Brien, Andrew Warnock
R13782	16-Nov-11	4.25pm – 4.35pm	Anna O'Brien, Andrew Warnock
R209184687	16-Nov-11	4.35pm – 4.50pm	Anna O'Brien, Andrew Warnock
52499263	16-Nov-11	4.50pm – 5.10pm	Anna O'Brien, Andrew Warnock
Western Hwy	16-Nov-11	5.10pm – 5.45pm	Anna O'Brien, Andrew Warnock
52509843	16-Nov-11	5.45pm – 6.00pm	Anna O'Brien, Andrew Warnock
52640282	18-Nov-11	11.00am – 11.30am	Anna O'Brien

202352377	18-Nov-11	9.30am – 11.00am	Anna O'Brien
-----------	-----------	------------------	--------------

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

DRAFT

Table 4: Summer targeted flora survey date, duration and assessor.

Property Number*	Assessment Date	Duration	Assessor
202352377	18-Jan-12	9.30am – 11.00am	Anna O'Brien, Andrea Canzano
52640282	18-Jan-12	11.00am – 11.30am	Anna O'Brien, Andrea Canzano
50268954	18-Jan-12	11.30am – 1.00pm	Anna O'Brien, Andrea Canzano
50268953	18-Jan-12	1.00pm – 2.30pm	Anna O'Brien, Andrea Canzano
R13783	18-Jan-12	2.30pm – 2.40pm	Anna O'Brien, Andrea Canzano
R13782	18-Jan-12	2.40pm – 2.50pm	Anna O'Brien, Andrea Canzano
R209184687	18-Jan-12	2.50pm – 3.20pm	Anna O'Brien, Andrea Canzano
Western Hwy	18-Jan-12	3.20pm – 3.50pm	Anna O'Brien, Andrea Canzano
52509843	18-Jan-12	3.50pm – 4.00pm	Anna O'Brien, Andrea Canzano
52864250	10-Feb-12	10.00am – 11.30am	Anna O'Brien
R53045201	10-Feb-12	11.30am – 12.00pm	Anna O'Brien
R53045202	10-Feb-12	12.00pm – 12.15pm	Anna O'Brien
R50268946	10-Feb-12	12.15pm – 12.45pm	Anna O'Brien
R50268953	10-Feb-12	12.45pm – 1.00pm	Anna O'Brien
R50268959	10-Feb-12	1.00pm – 1.15pm	Anna O'Brien
R50268820	10-Feb-12	1.15pm – 1.25pm	Anna O'Brien
R50268829	10-Feb-12	1.25pm – 1.35pm	Anna O'Brien
R2088086	10-Feb-12	1.35pm – 1.50pm	Anna O'Brien
R50268940	10-Feb-12	1.50pm – 2.05pm	Anna O'Brien
R151255984	10-Feb-12	2.05pm – 2.15pm	Anna O'Brien
R210868184	10-Feb-12	2.15pm – 2.25pm	Anna O'Brien
R50268906	10-Feb-12	2.25pm – 2.40pm	Anna O'Brien
52499263	10-Feb-12	2.40pm – 3.00pm	Anna O'Brien

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

2.3.4 General fauna survey

General fauna assessments, including habitat assessments were undertaken throughout the flora assessment period, on 18 January 2012. Weather conditions over this period were warm and sunny with a moderate breeze. All fauna observed and/or heard were recorded, while the presence of a particular species within the precinct was also confirmed through indirect evidence such as feathers, scats, scratchings and/or nests. Assessors used binoculars to scan for birds, mammals in hollows, and basking reptiles. Hard rubbish, woody debris and rocks were lifted to locate small ground-dwelling fauna including reptiles and frogs.

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

2.3.5 Incidental flora and fauna surveys

Several site assessments were undertaken within the precinct 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).

DRAFT

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 species that were stipulated within the contract provided by GAA. However, targeted fauna surveys were not required as part of the current contract.

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 some fauna species particularly migratory, transitory or uncommon fauna species may have been absent from habitats at the time of the assessments.

Vegetation assessments were undertaken in November, at a time considered appropriate to undertake targeted flora 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.

Habitat hectare assessments were not undertaken as part of the current project. Habitat scores are based on DSE's time stamped data which was provided as part of our assessments. The best and remaining 50% habitat for rare and threatened fauna species undertaken as part of a habitat hectare assessment has been provided.

In addition, not all properties within the precinct were assessed due to the lack of property access (Figure 2). Either the landowner could not be contacted on the phone numbers provided by GAA, no number was provided, or the landowners refused access.

3 RESULTS

3.1 Flora

3.1.1 Flora species

One hundred and fifty seven flora species (64 indigenous, 93 exotic) were recorded within the precinct (Appendix 2.1). The precinct was highly modified and dominated by exotic vegetation. The precinct has largely been cleared of remnant native vegetation for agricultural purposes, although modified native grassland is present within scattered areas which have not been cropped/cultivated, and in scattered patches of road reserves along Greigs Road and Downing St.

No mature remnant trees were recorded within the precinct; however, Blackwood *Acacia melanoxylon* seedlings were recorded within one parcel. Shrubs included Tree Violet *Melicytus dentatus*, Berry Saltbush *Atriplex semibaccata* and Ruby Saltbush *Enchylaena tomentosa* var. *tomentosa*. Indigenous herb species present include, Common Wallaby-grass *Austrodanthonia caespitosa*, Kneed Spear-grass *Austrostipa bigeniculata*, Lemon Beauty-heads *Calocephalus citreus*, Sheep's Burr *Acaena echinata*, Slender Bindweed *Convolvulus angustissimus* subsp. *omnigracilis*, Blue Devil *Eryngium ovinum* and Woolly New Holland Daisy *Vittadinia gracilis*.

Exotic species recorded include Galenia *Galenia pubescens* var. *pubescens*, Barley Grass *Hordeum vulgare*, Cape Weed *Arctotheca calendula*, Spear Thistle *Cirsium vulgare*, Perennial Rye-grass *Lolium perenne*, Toowoomba Canary-grass *Phalaris aquatica*, Needle-grass *Nassella neesiana* and Serrated Tussock *Nassella trichotoma*. Woody weeds such as African Boxthorn *Lycium ferocissimum* and Sweet Briar *Rosa rubiginosa* were also present.

3.1.2 Significant flora species and communities

Three Biosites are present within the precinct Mount Cottrell East and Troups Road Swamp and Rockbank Rail Reserve (Section 1.3). BioSites within the vicinity of the precinct include habitat and threatened species of state and regional significance (Table 1).

National

One nationally significant flora species, Spiny Rice-flower was recorded during field surveys. Sixty-six individual Spiny Rice-flower plants were recorded within Griegs Road Reserve. Targeted surveys are recommended during the plant's flowering period from April to August to confirm the total number of Spiny Rice-flower plants in the study area.

Four additional nationally significant flora species have previously been recorded from within the local area (10km) (Figure 7; Viridans 2011a). Three additional nationally significant flora

species are listed as potentially occurring within a 10 kilometre radius of the precinct (DSEWPC 2012) (Appendix 2.2) (Figure 5).

Based on the results of the current surveys and literature review and the lack of suitable habitat (i.e. remnant native vegetation) within the precinct, there is a low likelihood for any additional nationally significant flora species to occur within the study area (Appendix 2.2).

State

Apart from Spiny Rice-flower that is also state-listed (discussed above) Slender Bindweed *Convolvulus angustissimus* subsp. *omnigracilis* and Native Peppercress *Lepidium pseudohyssopifolium*, which are poorly known in Victoria, was also recorded within the precinct (Figure 7). Six additional state significant flora species have been previously recorded from within the local area (Viridans 2011a) (Appendix 2.2.). Based on the results of the current surveys, literature review and the lack of suitable habitat (i.e. remnant native vegetation) within the precinct, there is a low likelihood that it or any other state significant flora species occur within the study area (Appendix 2.2).

Regional and Local

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

Significant Communities

One vegetation community listed as threatened under the EPBC Act was recorded within the precinct; Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP). The majority of the native vegetation patches mapped as Plains Grassland (EVC 132_61) was considered NTGVVP. Plains Grassland (EVC 132) is also listed as Endangered within the Victorian Volcanic Plain bioregion. Lignum Swamp (EVC 104) is also predicted to occur within the study area and is also listed as Vulnerable (DSE 2012b).

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

One nationally significant flora species, Spiny Rice-flower, was recorded within the precinct. Based on the current surveys and literature review, there is potential habitat for one state significant flora species; Small Scurf-pea. The habitat assessment for threatened species is provided below (Table 6) (DSE 2007b). Information on whether the study area provides either the 'best 50%' or 'remaining 50%' habitat for threatened species is provided (Table 7).

The habitat assessment in accordance with the *Native Vegetation Guide for assessment of referred planning permit applications* (DSE 2007a) is summarised below (Table 7).

Table 6. Habitat assessment for threatened species.

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

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

Threatened Species or Species' with the Highest Likelihood of Occurrence ¹	Potential Habitat (Remnant Patch No)	Steps Followed	Best or Remaining 50% of Habitat for the Species?	Notes	Conservation Significance Rating Prior to Evaluation	Conservation Significance Rating after Evaluation
Small Scurf-pea	7234, 7230, 7229 (private property: ID no. 50268953)	A - No, D - No	No further consideration	Potential habitat close to drainage lines and dams	Very High	unchanged
	All other vegetation patches	A - No, D - No	No further consideration	No potential habitat	High/Very High	unchanged
Spiny Rice-flower	5A and 2A (Griegs Road)	A – Yes, B – Yes, C - Yes	Best 50% of habitat	Important area for the species. 66 plants recorded in these patches	Very High	Very High
	Downing St and Remaining patches along Griegs Rd	A – No, D – Yes, F - No	Remaining 50% of habitat	Species recorded nearby	High/Very High	Very High
	All other vegetation patches	A - No, D - No	No further consideration	No potential habitat	High/Very High	High/Very High

Note: The assessment is undertaken on the species with the highest likelihood of occurrence.

Plains Grassland and Lignum Swamp vegetation around farm dams and drainage lines provides potential habitat for Small Scurf-pea. Dry Creek runs through four three remnant vegetation patches surveyed during the targeted surveys. These patches were however highly modified and regularly grazed by livestock and no specimens were recorded in this vegetation or any other remnant vegetation during the surveys. Therefore, following steps A to D in table 6 above, all remnant vegetation within the study area is not considered to be the Best or Remaining 50% habitat for Small Scurf-pea.

Spiny Rice-flower was recorded in two patches of Plains Grassland along Greigs Rd (2A and 5A). 66 individual plants in total were recorded in these patches. This is an important population of the species for the bioregion, hence, following steps A, B and C, the vegetation in patches 2A and 5A are considered to be Best 50% of habitat for Spiny Rice-flower.

Other patches of Plains Grassland along Greigs Rd and Downing St were also of similar 'average' condition to patches 2A and 5A, however no Spiny Rice-flower plants were recorded in this vegetation at the time of the targeted surveys. Therefore, following steps A, D and F, this vegetation is currently considered to be Remaining 50% of habitat for Spiny Rice-flower. All other Plains Grassland vegetation in the study area was either of lesser quality and/or being regularly grazed by livestock. Therefore, following steps A and D in table 6 and without carrying out additional targeted surveys, all other Plains Grassland vegetation is currently not considered to be Best or Remaining 50% of habitat for Spiny Rice-flower.

To confirm the presence/absence of Spiny Rice-flower plants in all remnant vegetation patches in the study area, targeted surveys are recommended during the plant's flowering period from April to August.

3.2 Ecological Vegetation Classes

The DSE bioregional pre-1750 EVC mapping shows that the precinct was once covered by Plains Grassland with Plains Grassy Wetland Occurring in seasonally inundated depressions. However, current EVC mapping (DSE 2012a) shows only isolated occurrences of Plains Grassland and Plains Grassy Wetland within the precinct. The DSE Time Stamping Data 2011 (Native Vegetation – Growth Areas) (DSE 2012a) also shows isolated occurrences of Plains Grassland. However, the boundaries of these patches do not coincide with that of the EVC mapping. In addition, Time Stamping Data maps areas of swamp/wetland within the study area as Lignum Swamp (EVC 104) not Plains Grassy Wetland (EVC 125) as indicated by the 2005 EVC mapping layer. The Time Stamping Data was used as the basis for determining EVC types and boundaries within the study area.

Plains Grassland and Lignum Swamp are listed as Endangered within the Victorian Volcanic Plain bioregion (DSE 2012b). The Plains Grassland EVC also corresponds with the EPBC Act listed Natural Temperate Grassland of the Victorian Volcanic Plain.

3.2.1 *Lighter soils* Plains Grassland (EVC 132_62)

Lighter soils Plains Grassland occurs on a freely draining soil types and lighter sedimentary soils (DSE 2012b), and is treeless vegetation with a diverse understorey of grasses and herbs. (DSE 2012b).

Modified patches of Plains Grassland are present throughout the precinct, with most patches being species-poor and surrounded by crops. Spear grasses *Austrostipa* spp. and Wallaby grasses *Austrodanthonia* spp. were generally dominant, however, Kangaroo Grass was dominant in some patches. Most grassland patches had a low diversity of native herbs, generally consisting of Slender Bindweed Sheep's Burr and Beauty-heads *Calocephalus* spp., Blue Devil and Woolly New Holland Daisy.

3.2.2 Lignum Swamp (EVC 104)

Lignum Swamp occurs on inundation-prone heavy grey soils in depressions or floodways in low rainfall areas. It may occur as a shrubland to 3 m tall or open woodland to 15 m tall, with an understorey that can be rich in herbaceous species (DSE 2012b).

Areas of Lignum swamp within the study area were not assessed due to access limitations (Section 2.4).

3.3 Habitat Hectare Assessment

3.3.1 Remnant patches of native vegetation

One hundred and sixty four patches of remnant vegetation are mapped within the study area (Appendix 4.1) (Figure 3). The majority of vegetation is of Very High conservation significance, with a few small patches of High conservation significance.

Overall approximately **10.21 habitat hectares** of remnant vegetation is present within the precinct, including:

- **60.80 habitat hectares** of Very High conservation significance Plains Grassland;
- **1.26 habitat hectares** of High conservation significance Plains Grassland;
- **3.23 habitat hectares** of Very High conservation significance Lignum Swamp; and,
- **0.02 habitat hectares** of High conservation significance Lignum Swamp (Figure ES4).

3.3.2 Trees within remnant vegetation

There were no remnant trees within remnant patches of vegetation in the study area (Figure 4).

3.3.3 Scattered trees

The precinct does not contain any scattered trees (Figure 4).

3.4 Fauna

3.4.1 Fauna species

Twenty nine terrestrial fauna species were recorded within the precinct. This is comprised of 26 birds (19 native and seven exotic), two mammals (both exotic) and one native reptile (Appendix 3.1).

The various landform types in the precinct range from poor to good quality and provide important habitat for a wide range of fauna, especially birds, which were the dominant group recorded in the precinct.

3.4.2 Fauna habitats

The site supports five broad habitat types: native grasslands, lowlying swampland and associated ephemeral drainage line, planted native and introduced trees, artificial waterbodies, and introduced pasture grass and crops (Figure 9).

Native Grasslands (Corresponding EVC: Plains Grassland)

Approximately 147 hectares of vegetation were mapped as Plains Grassland (EVC 132) within the precinct.

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

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

Fauna – These areas are generally isolated and provide habitats to locally common species such as Raven *Corvus* spp. and Australian Magpie, along with introduced species such as Common Starling *Sturnus vulgaris*, House Sparrow *Passer domesticus* which were prevalent in this habitat during the survey. 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. Grassland areas are also likely to provide refuge for native

reptiles and frogs, although no indigenous ground-dwelling mammals are expected to occur in these isolated and degraded areas.

Ephemeral wetland /drainage lines (Corresponding EVCs: Lignum Swamp)

An area of low-lying wetland and associated drainage lines occur within the precinct. It is located as a wedge-shaped landform on Troups Road, south of the Ararat rail line. It is ephemeral in nature, becoming inundated at times of heavy rainfall. The wetland is listed as an important Biosite for various species of waterbirds and frogs (Table 1).

Overall habitat value – The ephemeral drainage lines provide **low** to **moderate** habitat values for fauna, whilst the wetland offers moderate to high quality habitat values (Appendix 1.5). When inundated the drainage line would provide temporary habitat for a variety of species, and possibly provide foraging habitat for migratory waterbirds.

Description – At the time of the assessment, the swampland was wet but not inundated in its entirety. The vegetation along the drainage line comprises exotic pasture, and does not contain aquatic vegetation with little ground debris such as rocks and logs.

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

Planted native and introduced trees

Overall habitat value – Habitat value for planted vegetation and scattered trees is **low** (Appendix 1.5). No mature trees are present within the precinct and none contained hollows, large amounts of shredding bark, or nests which are evidence of higher quality habitat for fauna.

Description – No indigenous trees are present within the precinct. All trees of the trees present across the precinct are planted Australian natives and exotics. They are generally located around houses or along fencelines as windrows. As stated they did not contain features associated with higher quality fauna habitats and were generally isolated with exotic understorey vegetation.

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

carunculata and White-plumed Honeyeater *Lichenostomus penicillatus* were observed foraging in planted windrows.

Artificial waterbodies (Farm Dams) (Corresponding EVC: None)

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

Description – Several artificial waterbodies (i.e. dams) exist within the precinct. They currently support low levels of emergent and submergent aquatic vegetation, with few refuge sites such as logs or rocks present. Almost all appeared to have recently been “cleaned” with spoil near the water edge. The surrounding vegetation comprises introduced pasture grasses and weeds.

Fauna – Waterbirds such as Australian Wood Duck and Pacific Black Duck, and frog species such as Common Froglet and Spotted Marsh Frog are expected to use this habitat. There is low likelihood that these areas provide habitat to for the nationally significant Growling Grass Frog *Litoria raniformis*. However, the State Significant Eastern Great Egret was observed foraging at a poor quality dam in a property on Troups Road South.

Introduced pasture grass and crops (Corresponding EVC: None)

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

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

Fauna – Few native species are known to use this habitat, and these include birds adapted to modified habitats such as Raven, Straw-necked Ibis *Threskiornis spinicollis*, Australian Magpie and Galah *Eolophus roseicapilla*. Introduced species such as Common Starling, House Sparrow were also prevalent in this habitat during the site surveys. Raptors including Brown Falcon, Nankeen Kestrel and Black-shouldered Kite 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 precinct is provided below (Appendix

3.2). No nationally significant fauna species were recorded during the present assessment, although one state significant fauna species, Eastern Great Egret was recorded in the PSP during the current survey. It is possible that an additional five nationally significant species and eight state significant species may occur within the study area as residents or on an infrequent basis. These are discussed in greater detail below.

National

Twelve nationally significant fauna have previously been recorded in the local area, within 10 kilometres of the precinct (Viridans 2011b) (Appendix 3.2). These species include:

- Seven birds: Australasian Bittern *Botaurus poiciloptilus* (no suitable habitat), Plains Wanderer *Pedionomus torquatus* (low likelihood of occurrence), Australian Painted Snipe *Rostratula benghalensis australis* (no suitable habitat), Superb Parrot *Polytelis swainsonii* (no habitat), Swift Parrot *Lathamus discolor* (rare visitor), orange bellied Parrot *Neophema chrysogaster* (no habitat) and Regent Honeyeater *Anthochaera phrygia* (no suitable habitat);
- Two reptiles Striped Legless Lizard (low likelihood of occurrence) and Grassland Earless Dragon (unlikely to occur)
- One frog: Growling Grass Frog (moderate likelihood of occurrence); and
- One invertebrate: Golden Sun Moth *Synemon plana* (low likelihood of occurrence).

A further six species (not previously documented on the VBA) have been identified as potentially occurring in the study area (DSEWPC 2012). These include Spot-tailed Quoll *Dasyurus maculatus*, New Holland Mouse *Pseudomys novaehollandiae*, Grey-headed Flying-fox *Pteropus poliocephalus*, Fairy Tern *Sternula nereis*, Australian Grayling *Prototroctes maraena* and Dwarf Galaxias *Galaxiella pusilla*. None of these species are likely to reside or regularly occur within the precinct due to the absence of suitable habitat, although Grey-headed Flying-fox may use flowering eucalypts within the precincts on an occasional basis (Appendix 3.2).

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

Swift Parrot

This species is vulnerable in Australia, endangered in Victoria, and is listed on the *Flora and Fauna Guarantee Act 1988* (FFG Act). This slim, medium-sized parrot breeds in Tasmania from September to April and then migrates to the mainland during April (Emison *et al* 1987). On mainland Australia, Swift Parrots prefer to inhabit dry open eucalypt forests and woodlands, especially box-ironbark forests. However, it has also been often recorded in urban areas, including parks, gardens, street trees and golf courses (Higgins 1999).

Swift Parrot may opportunistically forage in flowering eucalypts within the precinct. However, the trees are not expected to provide important or limiting habitat for the species.

Plains Wanderer

This species is vulnerable in Australia (ANZECC 1995), endangered in Victoria (DNRE 1999) and is listed on the FFG Act. This cryptic bird was once distributed widely across native grassland areas but now rarely occurs in the Melbourne area. It now appears to be occur mostly in grassland areas to the north of the state (e.g. Terrick Terrick National Park). It appears to be confined to areas where the topsoil has been eroded to expose a red clay subsoil which does not support dense pastural growth under any conditions, requiring well spaced tussocks, with the majority less than five centimetres tall (Baker-Gabb 1998). The small amount of vegetation that is a bit taller is important for concealment of the birds.

Habitat observed throughout the precinct did not meet the habitat requirements and areas of Plains Grassland within the precinct have only a low likelihood of providing habitat for Plains Wanderer. The species is only a vagrant to grassland remnants around Melbourne, with recent accounts of the species several kilometres north-west of Werribee.

Striped Legless Lizard

This species is vulnerable in Australia (ANZECC 1995), endangered in Victoria (DNRE 1999) and is listed on the FFG Act. This reptile was once widely distributed across the native grassland areas of Victoria and before European settlement was most likely quite a common species across the Victorian Volcanic Plains. Subsequent loss and modification of native grassland areas through agricultural practices and other development have reduced the available habitat for this species substantially. Most of its known Victorian sites have a scattering of lightly embedded rocks (Haddon 1995). As many as half of the known locations of this lizard are within areas that are grazed by introduced herbivores, although the intensity of grazing they can withstand is unknown (Haddon 1995). It is not recorded from ploughed pastural lands or forest areas, but is occasionally recorded from grassy woodlands (Haddon 1995).

Pastures and cropped areas are therefore unlikely to provide habitat to Striped Legless Lizard. There is a low likelihood of the species persisting in the degraded and isolated patches of Plains Grassland within the precinct.

Growling Grass Frog

Growling Grass Frog is listed as endangered in Victoria (DSE 2007a), is listed under the FFG Act, and vulnerable under the EBPC Act (DSEWPC 2012).

A draft Flora and Fauna Guarantee Action Statement (Robertson 2003) and a draft National Recovery Plan have been developed for the species (Clemann in prep.). 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 (Viridans 2011b; Mahony 1999; Organ pers. obs.).

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

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

Sub-regional surveys for this species have been conducted (Ecology Australia 2010 and Ecology and Heritage Partners in prep.). During these investigations, Growling Grass Frogs were recorded in the Western Wetlands, approximately 500 metres from the northern boundary of the Precinct. Another record occurs along the rail alignment, immediately west of Troups Road South. A Conservation Management Plan for Growling Grass Frog is likely to be required as part of the PSP process.

Golden Sun Moth

The Golden Sun Moth was once widespread in south-eastern Australia corresponding with the distribution of native temperate grasslands. Clearing for agriculture and urban development, and degradation by weed invasion and grazing means that the remaining moth habitat persists only in small parcels and is highly fragmented. Recent surveys have found that it is more widespread than previously thought within grasslands surrounding Melbourne, as well as interstate.

The biology of the Golden Sun Moth is poorly known, as is the case for the majority of invertebrate species. Their preferred habitat is reportedly within areas with few or no trees and a grass-layer where the cover of wallaby-grass *Austrodanthonia* spp. normally exceeds 40%. Male flight is low, to about a metre above the ground, fast and can be prolonged, but they are generally not recorded flying more than 100 metres from suitable habitat (Clarke and O'Dwyer 2000). Females are poor fliers, apparently walking between tussocks to lay eggs.

Small, disjunct populations are vulnerable as there is little likelihood of recolonisation in the event of a local extinction.

Golden Sun Moth may occur in areas of Plains Grassland within the precinct where indigenous vegetation cover exceeds 25%. Other areas of pastures and crops are unlikely to contain this species. Sub-regional surveys for this species have been conducted and the results of these surveys will dictate further management and offsets associated with the removal of any known habitat for the species within the precinct.

State

Twenty eight state significant fauna species have previously been documented from the local area (DSE 2011a), and the likely use of the precinct by these species is provided in Appendix 3.2. These species include:

- Three diurnal raptors: White-bellied Sea Eagle *Haliaeetus leucogaster*, Grey Goshawk *Accipiter novaehollandiae novaehollandiae* and Black Falcon *Falco subniger*;
- Three nocturnal raptors: Powerful Owl *Ninox strenua*, Barking Owl *Ninox connivens connivens* and Masked Owl *Tyto novaehollandiae novaehollandiae*;
- Twelve wetland associated birds: Royal Spoonbill *Platalea regia*, Eastern Great Egret *Ardea modesta*, Australasian Shoveler *Anas rhynchotis*, Hardhead *Aythya australis*, Musk Duck *Biziura lobata*, Freckled Duck *Stictonetta naevosa*, Intermediate Egret *Ardea intermedia*, Blue-billed Duck *Oxyura australis*, Brolga *Grus rubicunda*, Lewin's Rail *Lewinia pectoralis pectoralis*, Baillon's Crake *Porzana pusilla palustris* and Common Sandpiper *Actitis hypoleucos*;
- Nine woodland associated birds: Major Mitchell's Cockatoo *Lophocroa leadbeateri*, Bush-stone Curlew *Burhinus grallarius*, Red-chested Button-quail *Turnix pyrrhothorax*, Painted Honeyeater *Grantiella picta*, Hooded Robin *Melanodryas cucullata cucullata*, Speckled Warbler *Chthonicola sagittata*, Grey-crowned Babbler *Pomatostomus temporalis*, Brown Treecreeper *Climacteris picumnus victoriae*, Crested Bellbird *Oreoica gutturalis gutturalis* and Diamond Firetail *Stagonopleura guttata*.
- One amphibian: Brown Toadlet *Pseudophryne bibronii*.

Of these, Eastern Great Egret and Royal Spoonbill have been recorded in the precinct and may continue to visit the precinct for foraging. However, none are likely to breed within the precinct and none are likely to occur on a regular basis.

Regional and local

Sixteen regionally significant fauna species have been previously recorded within the local area (DSE 2011a). Due to the high level of modification of habitat across the precinct, the likelihood of occurrence for other regionally significant fauna species is considered low. All other native fauna (primarily common open country birds) are of local significance, as they are not listed as rare or threatened on a national, state and regional level.

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

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

The threatened fauna species and remnant patches which may contain habitat for these species as well as the determination on the best or remaining habitat for these species is provided below (Table 8).

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

Potential Habitat (Property/Remnant Patch No)	Threatened Species or Species' with the Highest Likelihood of Occurrence ¹	Steps Followed	Best or Remaining 50% of Habitat for the Species?	Notes	Conservation Significance Rating Prior to this Evaluation	Conservation Significance Rating after this Evaluation
50226044 – 2A, 3A, 5A, 6A, 7A, 9A, 11A, 12A, 14A, 15A, 16A, 19A. 60670 – 1A, 2A, 3A R60670 – 1A, 4A, 7A 2111105835 – 5A 52551617 – 3A, 4A, 5A, 6A, 8A, 10A 14895 – 1A, 4A, 5A, 5B, 6A, 7A, 8A, 9A,	Striped Legless Lizard, Golden Sun Moth, Plains Wanderer	A, D, F	Remaining 50%	Potential to occur	High	High

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

Therefore, following steps A, D and F within Table 2 in *Native Vegetation Guide for assessment of referred planning permit applications* (DSE 2006), Plains Grassland within the precinct is considered to be Remaining 50% habitat for threatened fauna species.

4 RELEVANT LEGISLATION AND POLICY

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

4.1 Commonwealth

4.1.1 *Environment Protection and Biodiversity Conservation Act 1999*

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

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

Ramsar Wetlands of International Significance

There are no Ramsar listed wetlands within the precinct. One Ramsar wetland occurs over 20 kilometres downstream of the study area, Port Phillip Bay (Western Shoreline) and Bellarine. However, it is unlikely that any future development within the precinct will impact on this Ramsar wetland.

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 threatened species.

Flora – One flora species, Spiny Rice-flower, listed under the EPBC Act was recorded during the assessment. Four additional species have been recorded within a ten kilometre radius of

the study area and three additional nationally significant flora species are listed as having potential habitat within a five kilometre radius of the precinct (DSEWPC 2012).

Due to the level of modification of vegetation within the study area, it is unlikely that any additional nationally significant flora species occur within the study area.

Fauna – No fauna species listed under the EPBC Act were recorded during the assessment, although targeted surveys were not conducted for Growling Grass Frog, Striped Legless Lizard, Plains Wanderer, Swift Parrot and Golden Sun Moth. These species have a low likelihood of occurrence and it is understood that these species will be considered at the precinct level.

Plain Wanderer has a low likelihood of occurrence within the precinct, and Swift Parrot may occur on an infrequent basis. Further assessment for these two species is not recommended and it is unlikely that future development of the precinct will have a significant impact on either of these species.

Swift Parrot is likely to fly across the study area on a frequent basis on route up to core foraging habitat in central and north eastern Victoria.

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

Listed Migratory and Marine Species

No listed migratory or marine species were recorded, and the use of the precinct by these species is considered to be low at best. A significant biosite, Troups Road Swamp, occurs within the north eastern section of the precinct. Latham's Snipe may use vegetation fringing waterbodies and waterways as habitat on an irregular basis.

Commonwealth Marine Area and Nuclear Actions

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

Implications and Recommendations

One EPBC Act-listed flora species, Spiny Rice-flower was recorded during the current surveys. No EPBC Act-listed fauna species were recorded during the current surveys. It is understood that surveys for Golden Sun Moth and Growling Grass Frog are being conducted at a sub-regional scale, and the consideration of these surveys will be included as part of the PSP process. Further targeted surveys for EPBC Act-listed flora and fauna species is not recommended.

An agreement under the Strategic Assessment provision of the EPBC Act (Section 146(1) Agreement, Part 10 Strategic Assessment (EPBC Act)) was made between the Commonwealth of Australia and the State of Victoria on 16 June 2009. The Strategic Assessment allows the State and Commonwealth to approve issues of common interest. All species of NES that may be significantly impacted by future development are covered by the Strategic Impact Assessment (SIAR) (DSE 2010a) and a Part 9 approval is not recommended for the proposed development of this precinct.

4.1.2 Strategic Impact Assessment (SIAR)

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

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

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

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

- Flora species:
 - Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*; and,
 - Matted Flax-lily *Dianella amoena*.
- Fauna species:
 - Golden Sun Moth *Synemon plana*;
 - Striped Legless Lizard *Delma impar*;
 - Southern Brown Bandicoot *Isodon obesulus obesulus*;

- Growling Grass Frog *Litoria raniformis*; and,
- Migratory species.
- Vegetation communities:
 - Natural Temperate Grassland of the Victorian Volcanic Plain; and,
 - Grassy Eucalypt Woodland of the Victorian Volcanic Plain.

Implications

Spiny Rice Flower was recorded in native vegetation patches 2A and 5A. Prescriptions developed under the SIAR state that if Spiny Rice-flower is recorded at a site, habitat within the whole parcel in which it is recorded will be designated as ‘confirmed’. Clearing of native vegetation along Greigs Road, Rockbank, may not occur until there is:

‘protection across the relevant bioregion (through appropriate management) of at least 80 per cent of the total area of places where ‘high contribution to species persistence’ and ‘confirmed habitat’ intersect,

If the 80 per cent of ‘protected confirmed high contribution habitat’ has not been reached, clearing may only be permitted in the following circumstances:

1. If the clearance is unavoidable for the provision of infrastructure of state significance; or
2. If the native vegetation that could be otherwise retained within the land parcel contains >25 per cent cover of high threat perennial grassy weeds and the population of Spiny Rice-flower is less than 200 plants; or
3. If the vegetation removal will impact on no more than 20 per cent of the Spiny Rice-flower plants within a land parcel that supports at least 200 Spiny Rice-flower plants; or
4. If the vegetation removal will impact on no more than 50 Spiny Rice-flower plants within a land parcel that supports more than five and less than 200 plants; or
5. If there are no more than five Spiny Rice-flower plants within the land parcel.

As the 80 per cent of ‘protected confirmed high contribution habitat’ has not been reached, 66 Spiny Rice-flower plants were recorded along Greigs Road, and they were recorded in remnant patches that contained <25 per cent high threat perennial grasses, only circumstances 1 and 4 potentially apply.

To confirm the total number of Spiny Rice-flower plants in the study area and each land parcel, targeted surveys are recommended during the plant’s flowering period from April to August. Once total numbers are confirmed, the appropriate prescriptions can be applied.

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

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

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

The SIAR prescriptions for Golden Sun Moth is as follows:

- If clearing of high contribution habitat is permitted (that is, native vegetation which displays high contribution to species existence intersects with confirmed habitat) then an offset site that contains GSM must be found and secured prior to development being approved;
- Prior to clearing of medium contribution habitat (that is, areas of non-native vegetation within well-connected GSM habitat), an equivalent area of native vegetation known to support GSM must be found and secured; and,
- Prior to clearing of low contribution habitat (that is) the proponent must commission surveys and confirm the presence of GSM habitat outside the Urban Growth Boundary equivalent to that proposed to be cleared.

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

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

4.2 State

4.2.1 *Planning and Environment Act 1987*

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

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

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

Implications and Recommendations

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

4.2.2 *Flora and Fauna Guarantee Act 1988*

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

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

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

Flora – A *Flora and Fauna Guarantee Act 1988* (FFG Act) permit is required for the removal of protected species located on areas of public land (i.e. within road reserves), including any of the Asteraceae (Daisies), all orchids, ferns (excluding Bracken) and Acacia species (excluding *Acacia dealbata*, *Acacia decurrens*, *Acacia implexa*, *Acacia melanoxylon* and *Acacia paradoxa*). A Protected Flora Licence or Permit to disturb protected native plants is generally not required on private property. As several daisies and Acacia species were recorded within the study area, an FFG Act permit will be required.

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

Fauna – Forty fauna species listed as threatened under the FFG Act have previously been recorded from within the local area (i.e. within a five kilometre radius of the study area) (Appendix 3.2). The habitat quality for these species is low, and there is only a low likelihood of occurrence for ground-dwelling fauna, and birds are only expected to visit the precinct on an infrequent or occasional basis.

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

Implications and Recommendations

An FFG Act permit will be required for the removal of protected species under the Act, as protected species were recorded during the field assessment.

4.2.3 Environment Effects Act 1978

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

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

Implications and Recommendations

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

4.2.4 Catchment and Land Protection Act 1994

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

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

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

Implications and Recommendations

Based on the recent flora surveys a total of seven noxious weed species were recorded within the precinct (Table A2.1.2). Landowners are responsible to control any infestation of noxious weeds that may become established within the precinct.

4.2.5 Wildlife Act 1975

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

The *Wildlife Act 1975* has the following objectives:

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

Implications and Recommendations

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

4.2.6 Port Phillip and Westernport Native Vegetation Plan

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

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

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

Implications and Recommendations

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

4.2.7 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 Melton Shire Council

Under the Melton Shire Council planning scheme the majority of the study area is Urban Growth Zone (UGZ), with areas of Rural Conservation Zone, Road Zone – Schedule 1 (RDZ1), Public Park and Recreation Zone (PPRZ), Green Wedge Zone (GWZ), Public Use Zone – Transport, Low Density Residential Zone (LDRZ), Residential 1 Zone (R1Z) and Urban Floodway Zone (UFZ). Some areas of the study area are subject to a Significant Landscape Overlay – Schedule 1, Environmental Significance Overlay – Schedule 1, Environmental Significance Overlay – Schedule 2 and Environmental Significance Overlay – Schedule 3. The study area lies within the Urban Growth Boundary (UGB).

Implications and Recommendations

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

DRAFT

5 POTENTIAL IMPACTS AND MITIGATION MEASURES

Potential impacts caused by future development of the precinct include:

- The loss of:
 - 60.80 habitat hectares of Very High conservation significance Plains Grassland;
 - 1.26 habitat hectares of High conservation significance Plains Grassland;
 - 3.23 habitat hectares of Very High conservation significance Lignum Swamp; and,
 - 0.02 habitat hectares of High conservation significance Lignum Swamp.
- The removal of potential habitats for nationally significant species including Striped Legless Lizard, Golden Sun Moth, Plains Wanderer, Swift Parrot (all have a low likelihood of occurrence given the lack of suitable habitat), along with the state significant Eastern Great Egret and Royal Spoonbill.
- The removal of the remaining grasslands which are expected to provide habitat for native reptiles and frogs;
- The removal of dams and drainage lines within the precinct which provide habitat for native frogs and other locally common fauna species;
- The removal of pastures which provide low quality habitat for native birds and reptiles; and
- The removal of non-indigenous trees that provide temporary roosting and foraging habitat for native arboreal mammals, bats and birds.

5.1 Opportunities to Reduce Potential Impacts

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

- Retention and management of remnant native vegetation where appropriate;
- Prepare a Revegetation Plan(s) which outlines measures to improve the cover of native vegetation, mimic the EVCs what would have originally occurred within the precinct;
- If required, prepare a Conservation Management Plan (CMP) to retain and enhance the quality of habitat for significant flora and fauna which may occur within the precinct;
- Ensure silt fences and appropriate run-off control measures are implemented to avoid

impacts to amphibian habitat along the drainage line in the south-western portion of the study area;

- Prepare a Weed Management Plan that aims to eradicate or control weeds appropriately to minimise the spread of material into, within, and beyond the precinct;
- Prepare a Pest Animal Management Plan. This should target foxes and feral cats which prey on native fauna along with rabbits, hares which will graze on planted vegetation and reduce vegetation cover for native fauna;
- Incorporate Water Sensitive Urban Design into future housing developments in the precinct;
- A zoologist or wildlife handler should be present at the time of tree removal to salvage any fauna using trees, and if deemed appropriate, translocate the specimen(s) to a suitable site in the local area.

5.2 Opportunities to Protect and Enhance Regional and Local Biodiversity Values

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

- The control of noxious weeds and environmental weeds within the precinct such as Scotch Thistle, Artichoke Thistle, African Boxthorn, Sweet Briar, Blackberry and Gorse which will spread beyond the precinct. This should be undertaken in accordance with a Revegetation Plan to avoid removing weeds which may currently provide habitat to native fauna (e.g. Blackberry which may provide habitat to Southern Brown Bandicoot or trees which provide habitat to arboreal mammals including bats);
- The preparation of a NVPP which identifies areas to be retained and areas to be removed;
- Offset the losses of habitats in accordance with the prescriptions detailed under the SIAR (DSE 2010a).

6 CONCLUSION

The precinct is highly modified, and the majority of the precinct has been cleared for agriculture and is dominated by exotic vegetation. Remnant native vegetation within the precinct comprises two EVCs, Plains Grassland (EVC 132_62) and Lignum Swamp (EVC 104).

There are approximately **65.32 habitat hectares** of remnant vegetation present within the precinct. This includes **62.06 habitat hectares** of Plains Grassland and **3.25 habitat hectares** of Sedge Wetland. There are no trees within remnant patches, or scattered trees within the study area.

Seven nationally significant and seven state significant flora species have been previously recorded within the local area. Based on the current assessment, the study area supports a population of Spiny Rice-flower. The likelihood of significant populations of other national and state significant flora species occurring within the precinct is considered low.

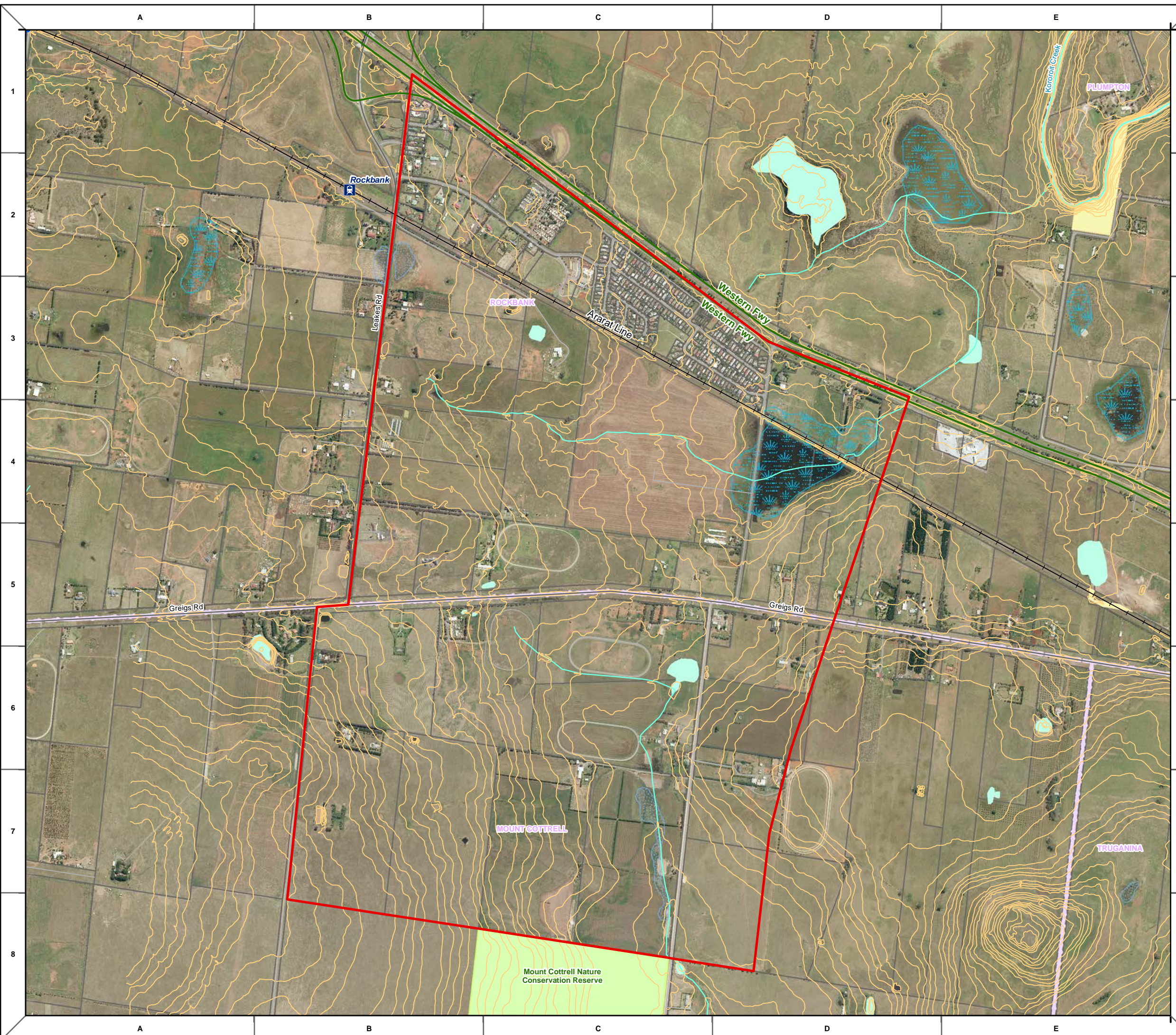
The site supports five broad habitat types: native grasslands, lowlying swampland and associated ephemeral drainage line, planted native and introduced trees, artificial waterbodies, and introduced pasture grass and crops.

There were no nationally significant fauna species recorded during the assessment. There was one state significant bird recorded on a property within the precinct. The habitat quality for significant fauna is low due to its highly modified nature. Some waterbirds, Swift Parrot and Grey-headed Flying-fox may use habitat opportunistically. There is a low likelihood that resident Growling Grass Frog, Striped Legless Lizard, Golden Sun Moth, and Plains Wanderer may also occur within the precinct.

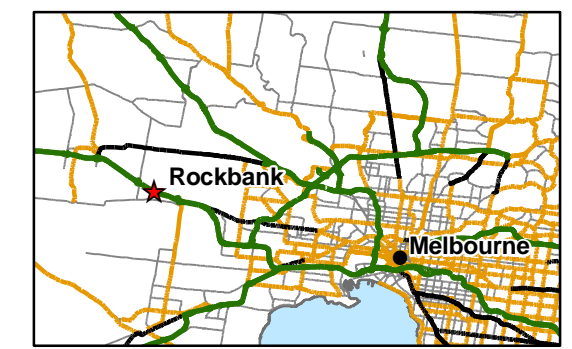
There are opportunities to enhance ecological values within the precinct, principally through protection of native vegetation and areas of fauna habitat, and allowing the regeneration of native vegetation, as well as undertaking revegetation and weed control. Such activities should be undertaken in accordance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

FIGURES

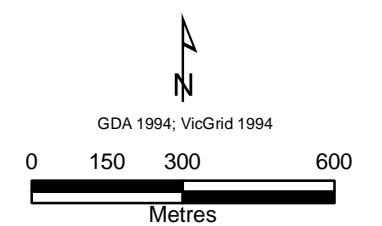
DRAFT



- ### Legend
- Study Area Boundary
 - Urban Growth Boundary
 - Railway Station
 - Railway
 - Freeway
 - Collector Road
 - Minor Road
 - Contour (1-5m)
 - Minor Watercourse
 - Waterbody
 - Land Subject to Inundation
 - Wetland/Swamp
 - Parks and Reserves
 - Crown Land
 - Localities
 - Property Boundaries



**Overveiw of Study Area
PSP 1099**
Biodiversity Assessment Project
2011/12

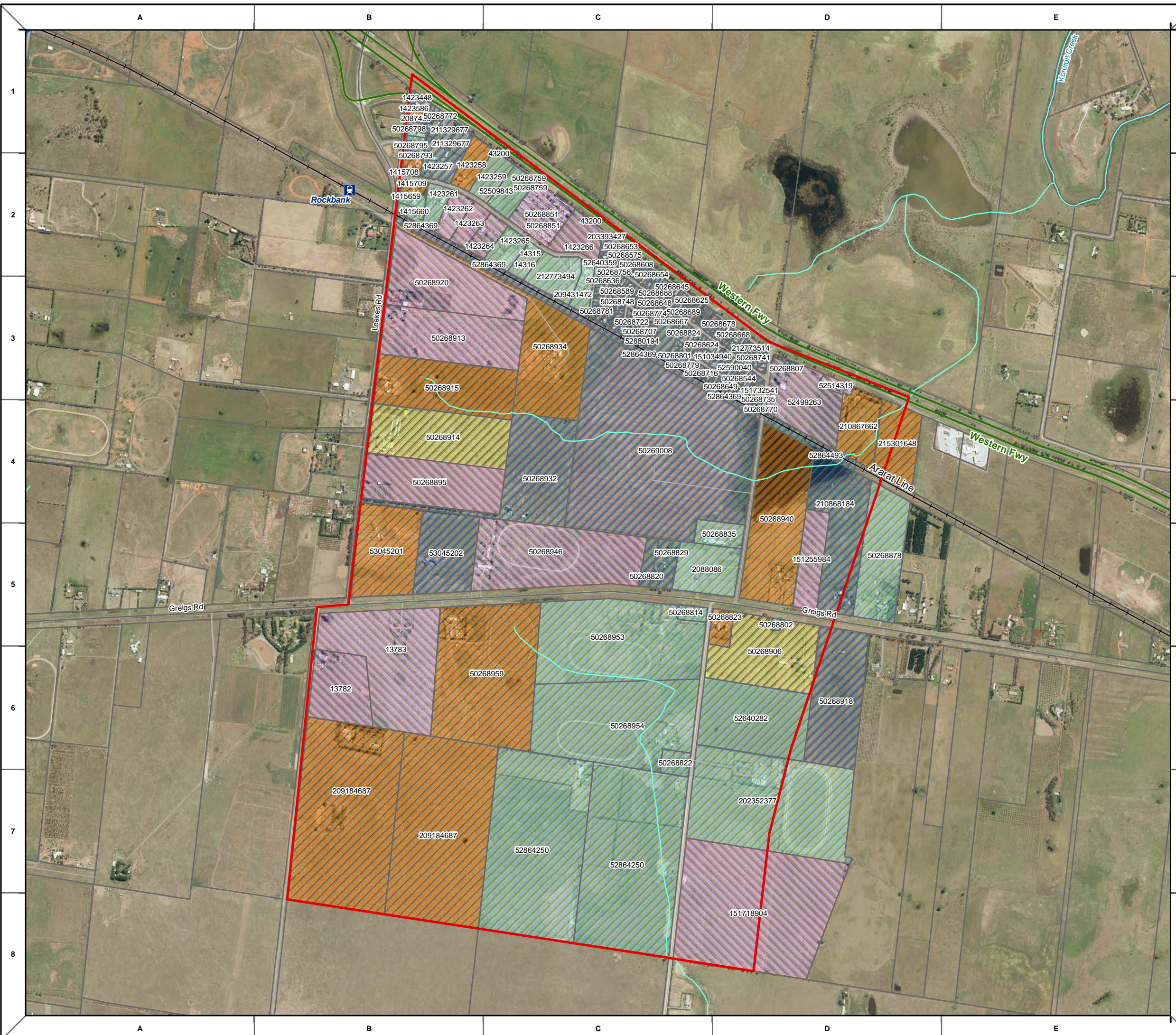


1:15,000 when printed @ A3

















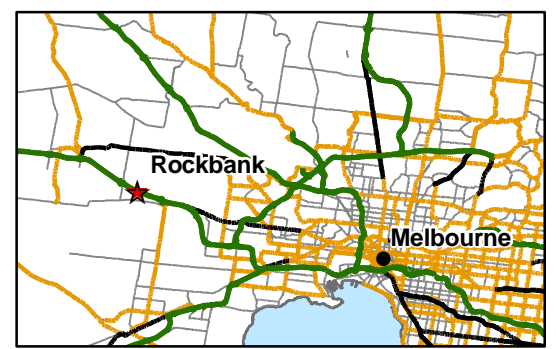
**FIGURE
1**

VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
File Path: 3339/1099_Fig01_Overview.mxd Issue Date: 13/06/2012

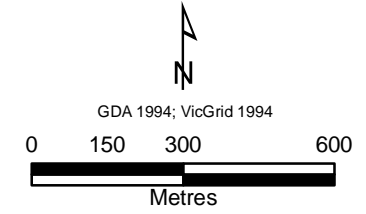


Legend

-  Urban Growth Boundary
-  Study Area Boundary
-  Access Granted
-  Access Unattainable
-  Access Denied
-  Landowner Details not Provided
-  No Survey Needed
-  Railway Station
-  Railway
-  Freeway
-  Collector Road
-  Minor Road
-  Minor Watercourse
-  Property Boundaries



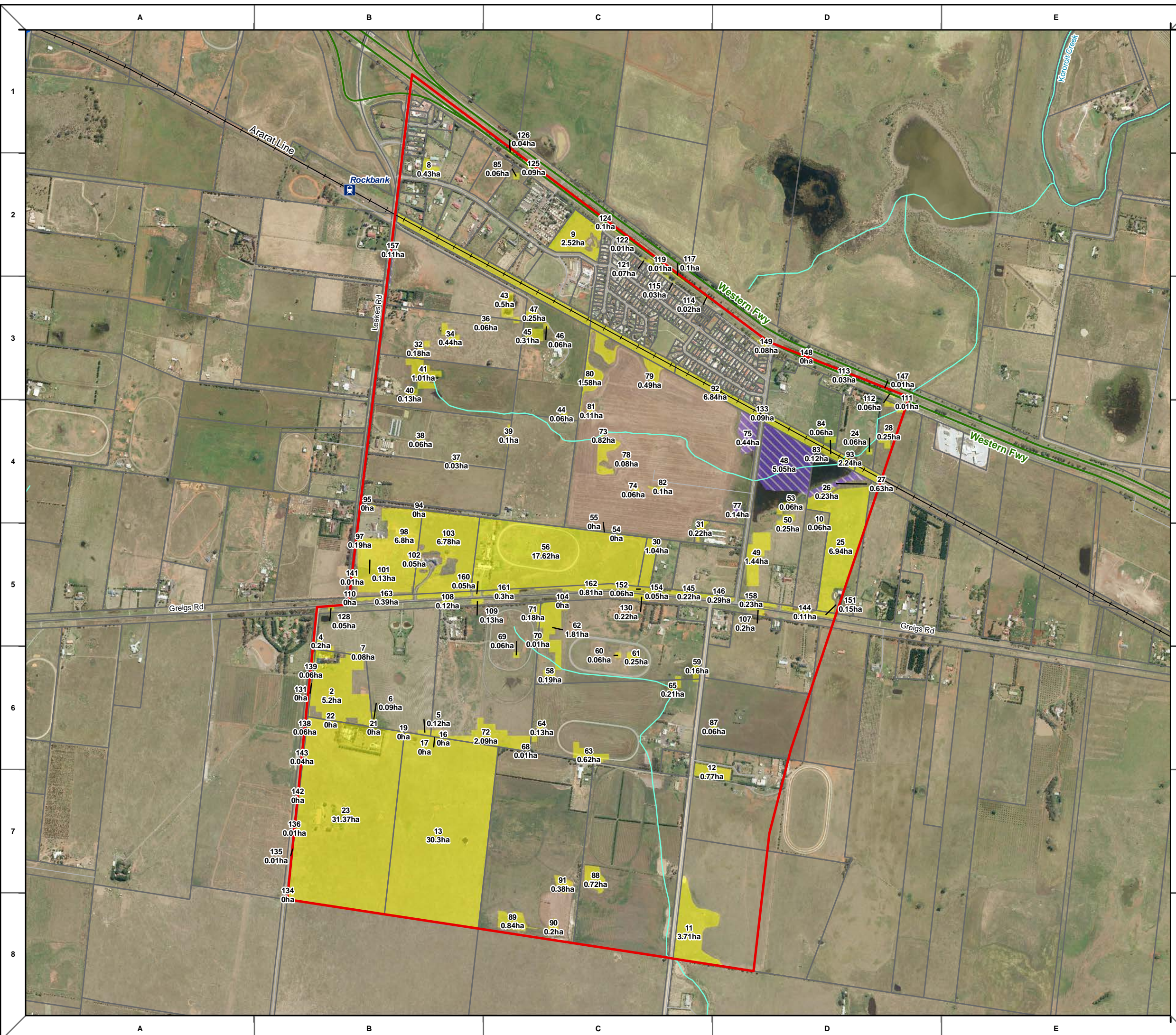
Access Information PSP 1099 Biodiversity Assessment Project 2011/12







1:15,000 when printed @ A3


FIGURE
2

VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
3339/1099_Fig02_AccessInfo.mxd Issue Date: 15/06/2012



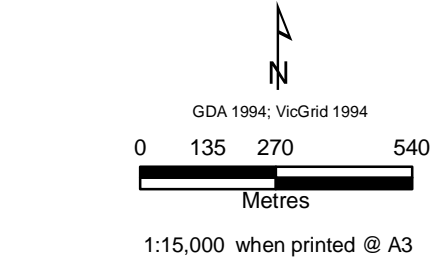
Legend

-  Urban Growth Boundary
-  Study Area Boundary
-  104, Lignum Swamp
-  132, Plains Grassland

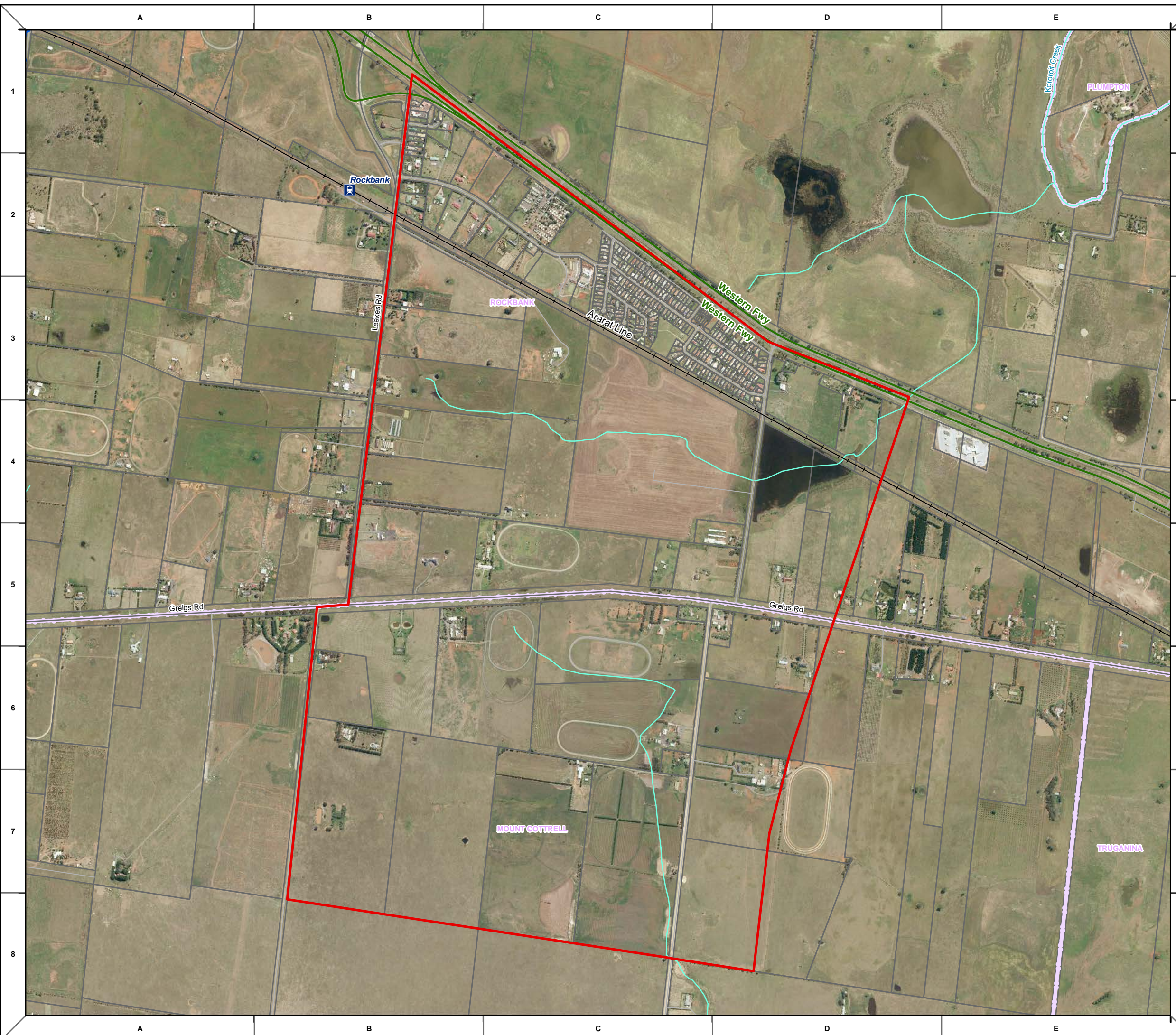
Vegetation mapping based on DSE Time Stamped Data, May 2012.





Extent of Native Vegetation PSP 1099 Biodiversity Assessment Project 2011/12



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
File Path: 3339/1099_Fig03_Native_Vegetation.mxd Issue Date: 15/06/2012



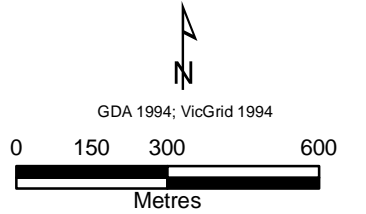
Legend

-  Urban Growth Boundary
-  Study Area Boundary

Please note no Scattered trees were recorded during the assessment.



Location of Scattered Trees
PSP 1099
Biodiversity Assessment Project
2011/12

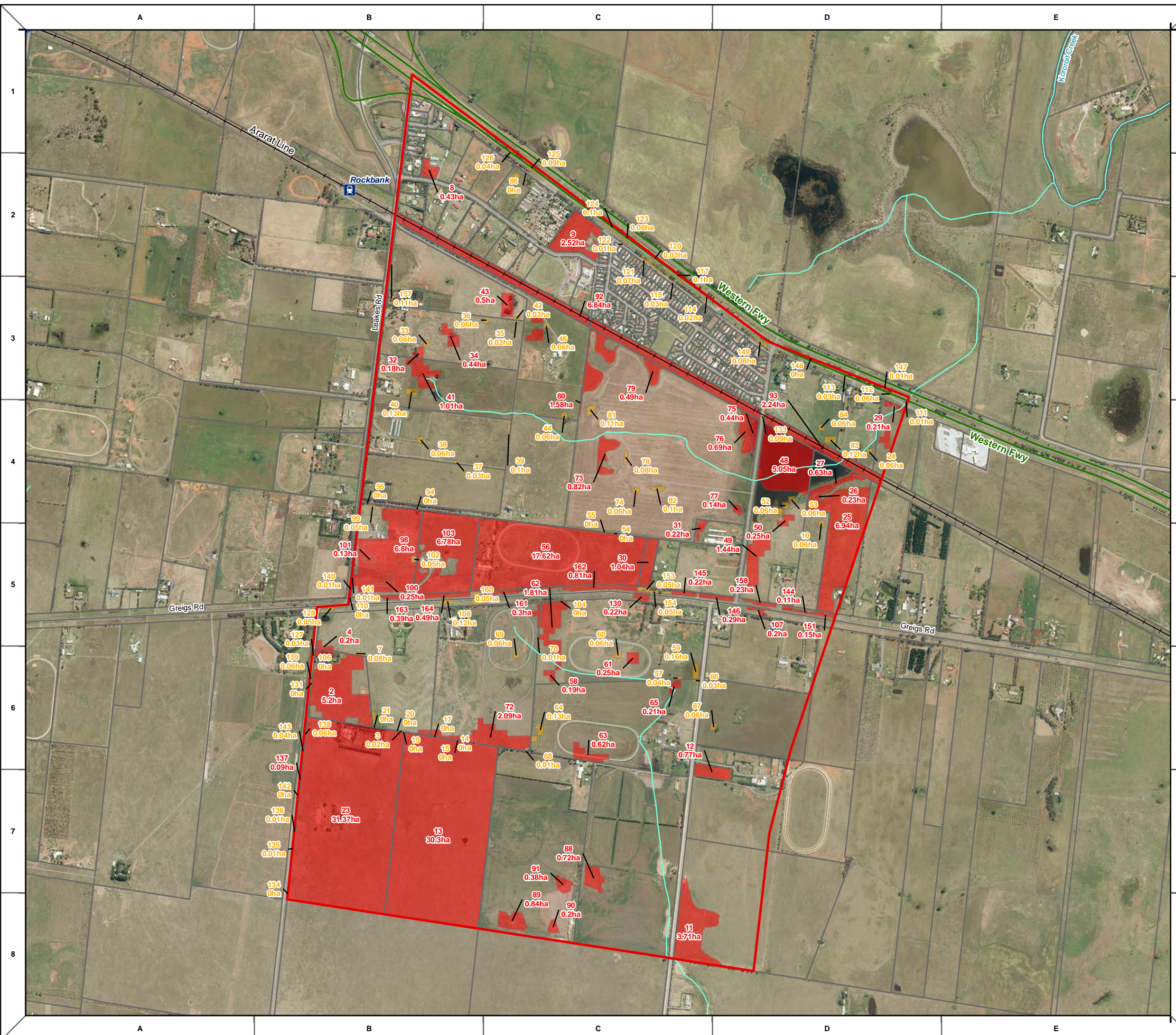


1:15,000 when printed @ A3



FIGURE
4

VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
 File Path: 3339/1099_Fig04_Scattered_Trees.mxd Issue Date: 13/06/2012



Legend

Urban Growth Boundary

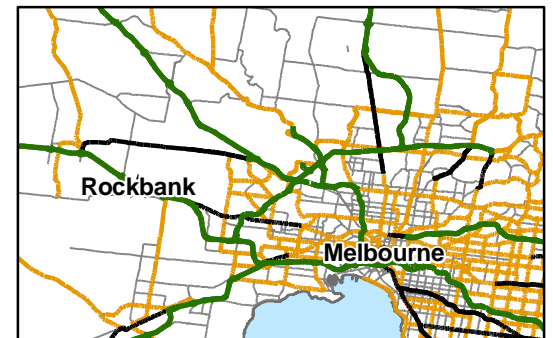
Study Area Boundary

Conservation Significance

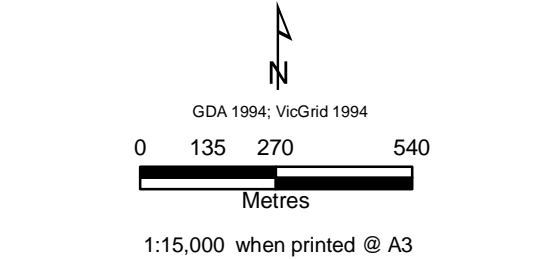
Very High

High

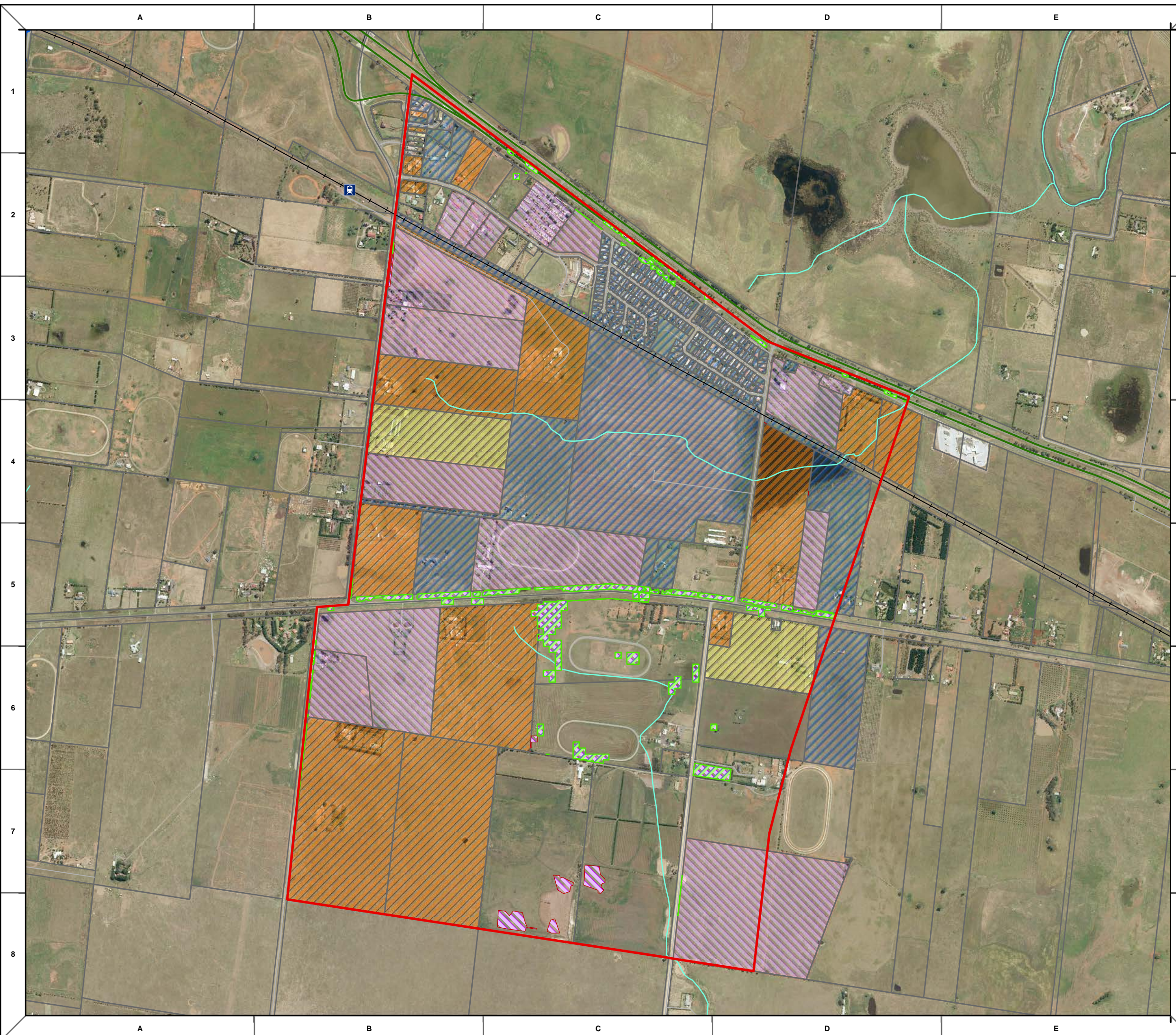
Vegetation mapping based on DSE Time Stamped Data, May 2012.
Please note no Scattered trees were recorded during the assessment.



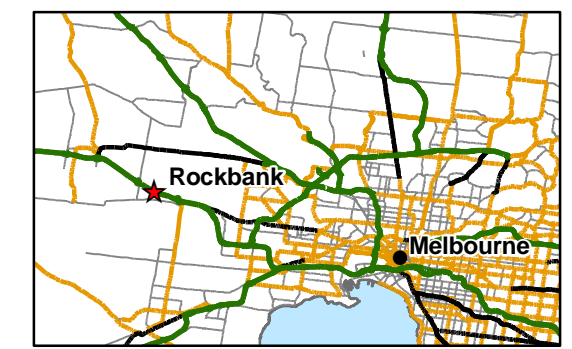
Conservation Significance PSP 1099 Biodiversity Assessment Project 2011/12



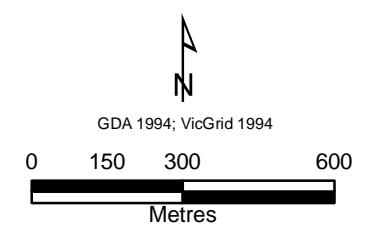
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
File Path: 3339/1099_Fig05_Cons_Sig.mxd Issue Date: 15/06/2012



- ### Legend
- Study Area Boundary
 - Urban Growth Boundary
 - Targeted Spring Surveys
 - Targeted Summer Surveys
 - Access Unattainable
 - Access Denied
 - Landowner Details not Provided
 - No Survey Needed



**Targeted Surveys
PSP 1099**
Biodiversity Assessment Project
2011/12

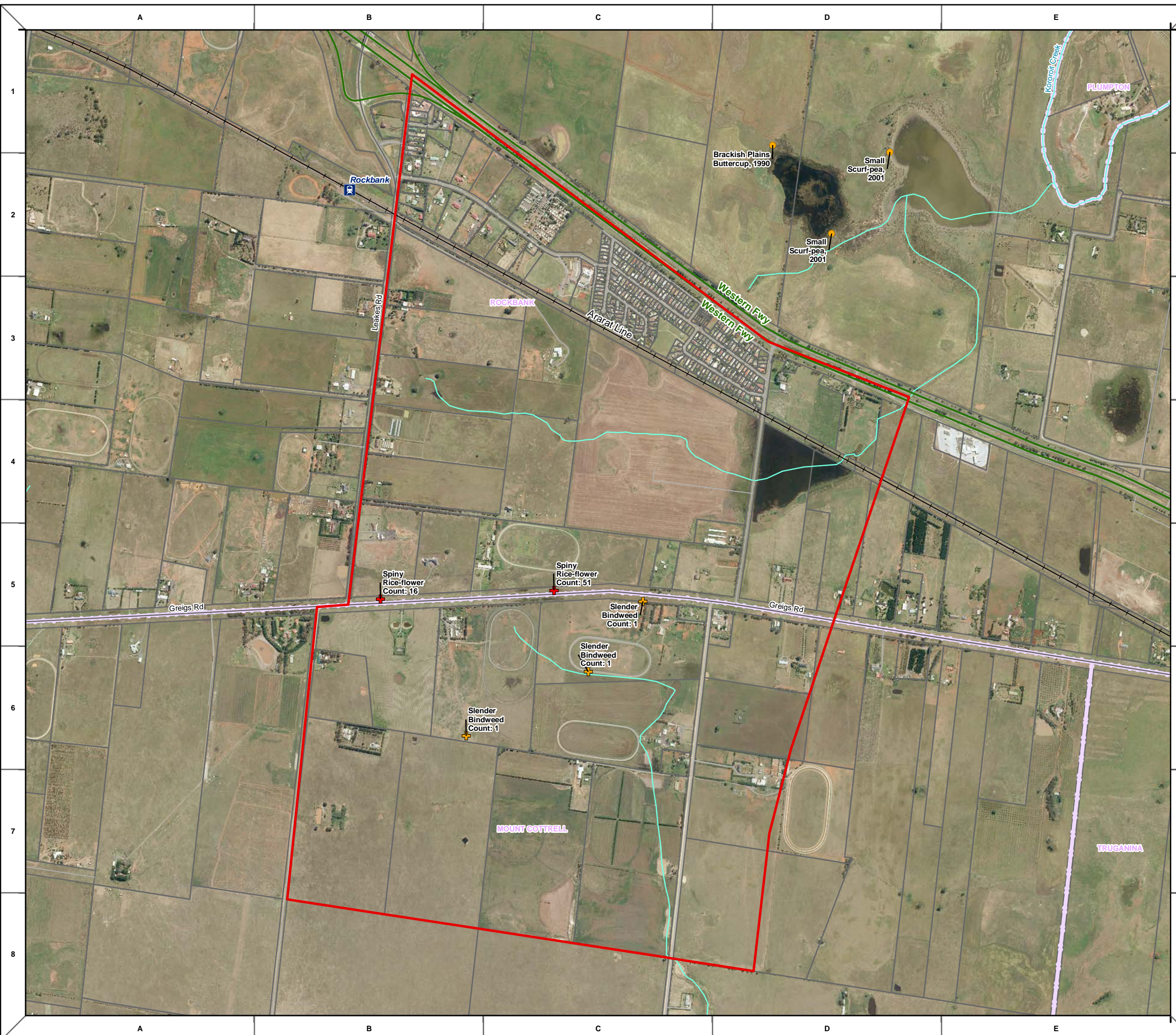


1:15,000 when printed @ A3



**FIGURE
6**

VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
File Path: 3339/1099_Fig06_Targeted_Surveys.mxd Issue Date: 15/06/2012



Legend

Study Area Boundary

**Victorian Biodiversity Atlas
Flora Records**

- Nationally Listed Species
- State Listed Species

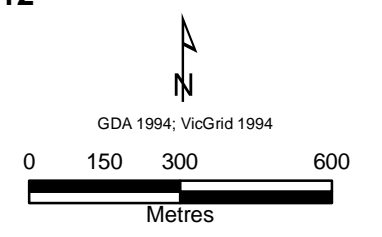
Assessment Flora Records

- + Nationally Listed Species
- + State Listed Species

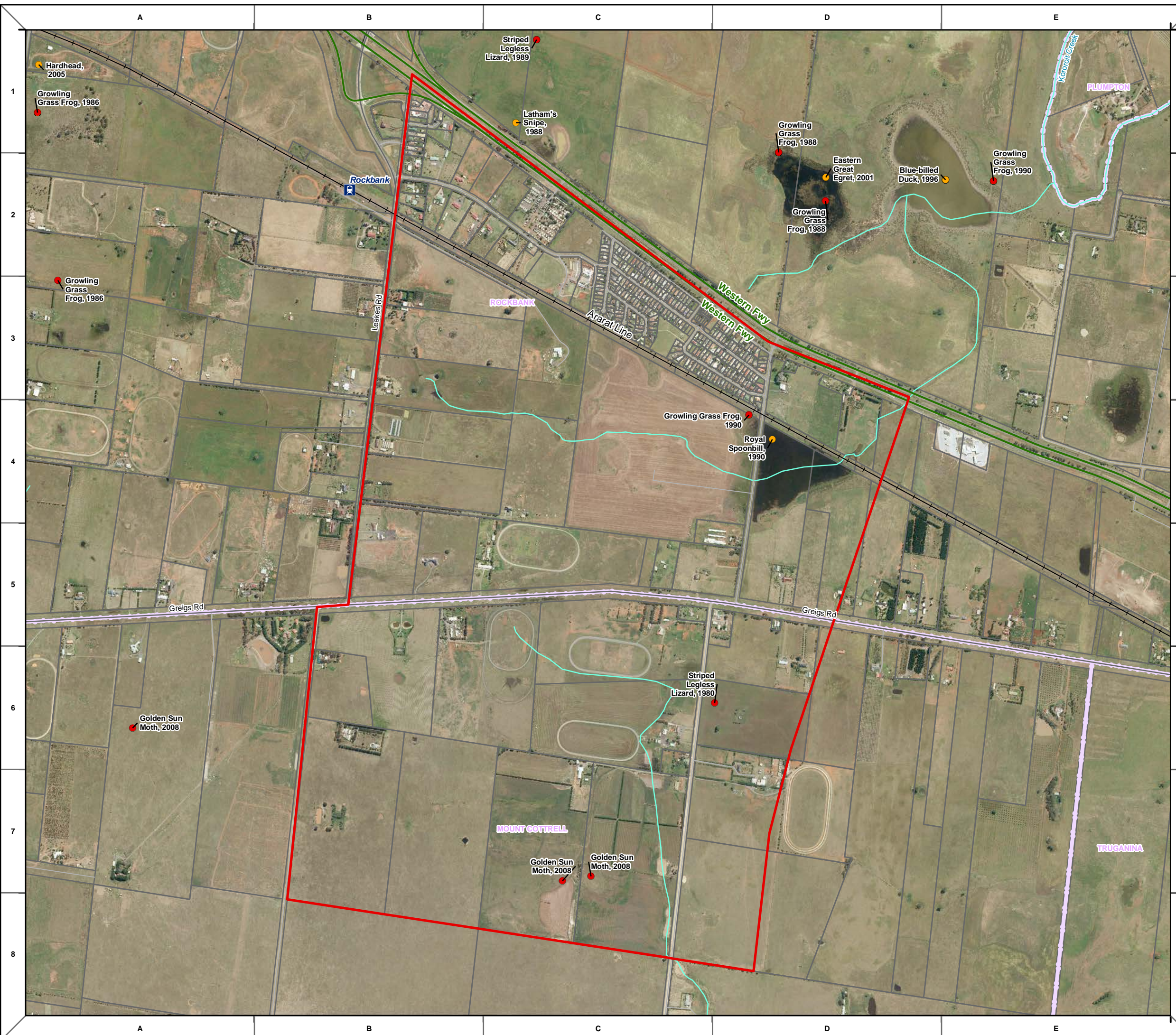
Note: The locations of significant flora species are based on data available from DSEs FIS database and Victorian Biodiversity Atlas (VBA 2010), the current field investigations and other sources.



**Threatened Flora
Records
PSP 1099
Biodiversity Assessment Project
2011/12**



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
File Path: 3339/1099_Fig07_Flora_Fauna.mxd Issue Date: 13/06/2012



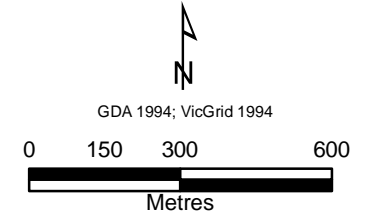
Legend

- Study Area Boundary
- Victorian Biodiversity Atlas Fauna Records**
- Nationally Listed Species
- State Listed Species

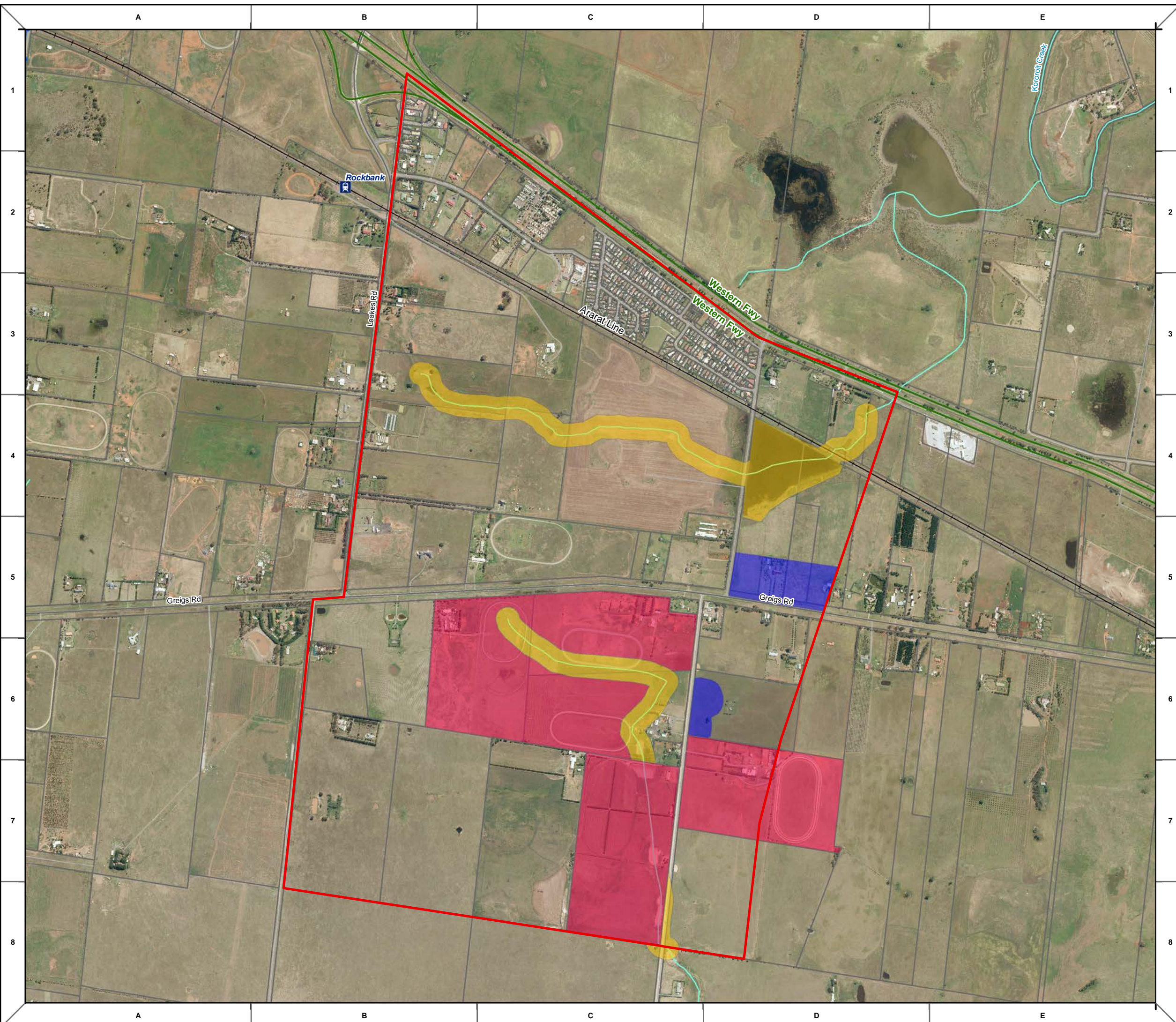
Note: The locations of significant fauna species are based on data available from DSEs AVW database and Victorian Biodiversity Atlas (VBA 2011), the current field investigations and other sources. It is possible that additional fauna species of conservation significance have been recorded within the local area but are not shown



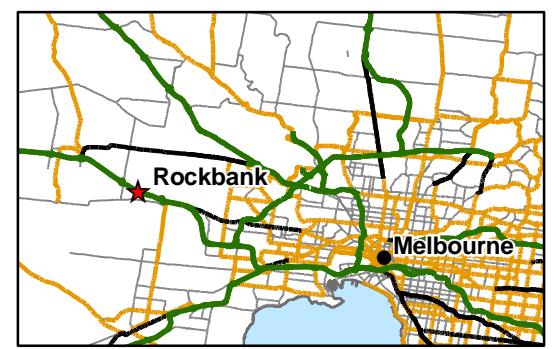
Threatened Fauna Records PSP 1099 Biodiversity Assessment Project 2011/12



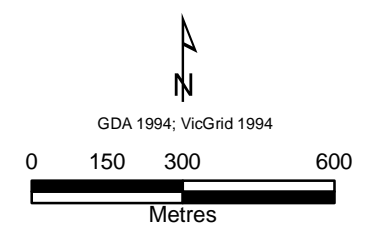
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
File Path: 3339/1099_Fig08_Fauna.mxd Issue Date: 15/06/2012



- Legend**
- Study Area Boundary
 - Urban Growth Boundary
 - Potential Growing Grass Frog Habitat
 - Potential Golden Sun Moth Habitat
 - Potential Striped Legless Lizard Habitat



**Potential Habitat
PSP 1099**
Biodiversity Assessment Project
2011/12



1:15,000 when printed @ A3



**FIGURE
9**

VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
File Path: 3339/1099_Fig09_Potential_Habitat.mxd Issue Date: 15/06/2012

APPENDICES

DRAFT

Appendix 1 – Significance Assessment

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

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

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

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

A1.2. Defining Ecological Significance

Table A1.2. Defining Ecological Significance.

Criteria for defining Ecological Significance	
NATIONAL SIGNIFICANCE	
Flora	National conservation status is based on the EPBC Act list of taxa considered threatened in Australia (i.e. extinct, critically endangered, endangered, vulnerable).
	Flora listed as rare in Australia in <i>Rare or Threatened Australian Plants</i> (Briggs and Leigh 1996).
Fauna	National conservation status is based on the EPBC Act list of taxa considered threatened in Australia (i.e. Extinct, Critically Endangered, Endangered, Vulnerable).
	Fauna listed as Extinct, Critically Endangered, Endangered, Vulnerable, or Rare under National Action Plans for terrestrial taxon prepared for the DSEWPC: 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), amphibians (Tyler 1997) and butterflies (Sands and New 2002).
	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).
Communities	Vegetation communities considered critically endangered, endangered or vulnerable under the EPBC Act and considering vegetation condition.
STATE SIGNIFICANCE	
Flora	Threatened taxa listed under the provisions of the FFG Act.
	Flora listed as extinct, endangered, vulnerable or rare in Victoria in the DSE Flora Information System (most recent Version).
	Flora listed in the State Government's <i>Advisory List of Rare or Threatened Plants in Victoria, 2005</i> (DSE 2005).
	Flora listed as poorly known in Australia in <i>Rare or Threatened Australian Plants</i> (Briggs and Leigh 1996).
Fauna	Threatened taxon listed under Schedule 2 of the FFG Act.
	Fauna listed as Extinct, Critically Endangered, Endangered and Vulnerable on the State Government's <i>Advisory List of Threatened Vertebrate Fauna in Victoria - 2007</i> (DSE 2007b).
	Listed as Lower Risk (Near Threatened, Conservation Dependent or Least concern) or Data Deficient under National Action Plans for terrestrial species prepared for the DSEWPC: threatened marsupials and monotremes (Maxwell <i>et al.</i> 1996), bats (Duncan <i>et al.</i> 1999), birds (Garnett and Crowley 2000), reptiles (Cogger <i>et al.</i> 1993), amphibians (Tyler 1997) and butterflies (Sands and New 2002).

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

A1.3 Defining Site Significance

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

National: Australia

State: Victoria

Regional: Victorian Volcanic bioregion

Local: Within 10 kilometres surrounding the precinct

Table A1.3. Defining Site Significance.

Criteria for defining Site Significance
NATIONAL SIGNIFICANCE
<p>A site is of National significance if:</p> <ul style="list-style-type: none"> - 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 DSEWPC. - It regularly supports, or has a high probability of supporting, an 'important population' as defined under the EPBC Act of one or more nationally 'vulnerable' flora and fauna taxon. - It is known to support, or has a high probability of supporting taxon listed as 'Vulnerable' under National Action Plans. - It is known to regularly support a large proportion (i.e. greater than 1%) of a population of a taxon listed as 'Conservation Dependent' under the EPBC Act and/or listed as Rare or Lower Risk (near threatened, conservation dependent or least concern) under National Action Plans. - It contains an area, or part thereof designated as 'critical habitat' under the EPBC Act, or if the site is listed under the Register of National Estate compiled by the Australian Heritage Commission. - It is a site which forms part of, or is connected to a larger area(s) of remnant native vegetation or habitat of national conservation significance such as most National Park, and/or a Ramsar Wetland(s).
STATE SIGNIFICANCE
<p>A site is of State significance if:</p> <ul style="list-style-type: none"> - It occasionally (i.e. every 1 to 5 years) supports, or has suitable habitat to support taxon listed as 'Critically Endangered' or 'Endangered' under the EPBC Act and/or under National Action Plans. - It regularly supports, or has a high probability of regularly supporting (i.e. high habitat quality) taxon listed as 'Vulnerable', 'Near threatened', 'Data Deficient' or 'Insufficiently Known' in Victoria (DSE 2005, 2007b), or species listed as 'Data Deficient' or 'Insufficiently Known' under National Action Plans. - It contains an area, or part thereof designated as 'critical habitat' under the FFG Act. - It supports, or likely to support a high proportion of any Victorian flora and fauna taxa. - It contains high quality, intact vegetation/habitat supporting a high species richness and diversity in a particular bioregion. - It is a site which forms part of, or connected to a larger area(s) of remnant native vegetation or habitat of state conservation significance such as most State Parks and/or Flora and Fauna Reserves.

Criteria for defining Site Significance
REGIONAL SIGNIFICANCE
<p>A site is of Regional significance if:</p> <ul style="list-style-type: none"> - It regularly supports, or has a high probability of regularly supporting regionally significant fauna as defined in Table 1.2. - It contains a large population (i.e. greater than 1% or 5%) of flora considered rare in any regional native vegetation plan for a particular bioregion. - It supports a fauna population with a disjunct distribution, or a particular taxon that has an unusual ecological or biogeographical occurrence. - It is a site which forms part of, or is connected to a larger area(s) of remnant native vegetation or habitat of regional conservation significance such as most Regional Parks and/or Flora and Fauna Reserves.
LOCAL SIGNIFICANCE
<p>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:</p> <ul style="list-style-type: none"> - An area which supports indigenous flora species and/or a remnant EVC, and habitats used by locally significant fauna species. - An area which currently acts, or has the potential to act as a wildlife corridor linking other areas of higher conservation significance and facilitating fauna movement throughout the landscape.

A1.4. Defining Vegetation Condition

Table A1.4. Defining Vegetation Condition.

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

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

Appendix 2.1 – Flora survey results

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

Life form	Scientific Name	Common Name	Conservation Status			Regional
			EPBC	DSE	FFG	
Tree	Mimosaceae					
	<i>Acacia melanoxylon</i>	Blackwood	-	-	-	-
	Myrtaceae					
	<i>Eucalyptus camaldulensis</i> *	River Red-gum	-	-	-	-
Shrub	Chenopodiaceae					
	<i>Atriplex semibaccata</i>	Berry Saltbush	-	-	-	✓
	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	Ruby Saltbush	-	-	-	-
	<i>Maireana decalvans</i>	Black Cotton-bush	-	-	-	-
	<i>Maireana enchylaenoides</i>	Wingless Bluebush	-	-	-	-
	<i>Sclerolaena muricata</i> var. <i>villosa</i>	Grey Roly-poly	-	-	-	✓
	Thymelaeaceae					
	<i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	C	e		
	Violaceae					
	<i>Melicytus dentatus</i> s.s.	Tree Violet	-	-	-	✓
Herb / Forb	Apiaceae					
	<i>Eryngium ovinum</i>	Blue Devil	-	-	-	-
	Asteraceae					
	<i>Calocephalus citreus</i>	Lemon Beauty-heads	-	-	L	-
	<i>Calocephalus lacteus</i>	Milky Beauty-heads	-	-	L	✓
	<i>Euchiton involucratus</i> s.l.	Common Cudweed	-	-	-	-
	<i>Pseudognaphalium luteoalbum</i>	Jersey Cudweed	-	-	L	✓
	<i>Senecio quadridentatus</i>	Cotton Fireweed	-	-	L	✓
	<i>Vittadinia gracilis</i>	Woolly New Holland Daisy	-	-	L	✓
	Brassicaceae					
	<i>Lepidium pseudohyssopifolium</i>	Native Peppercross	-	k	-	-
	Campanulaceae					
	<i>Wahlenbergia multicaulis</i>	Branching Bluebell	-	-	-	✓
	<i>Wahlenbergia</i> spp.	Bluebell	-	-	-	-
	Convolvulaceae					
	<i>Convolvulus angustissimus</i> subsp. <i>omnigracilis</i>	Slender Bindweed	-	k	-	✓
	<i>Hypericum gramineum</i>	Small St John's Wort	-	-	-	-
	Lythraceae					
	<i>Lythrum hyssopifolia</i>	Small Loosestrife	-	-	-	-
	Marsileaceae					
<i>Marsilea drummondii</i>	Common Nardoo	-	-	-	-	
Onagraceae						
<i>Epilobium billardierianum</i>	Variable Willow-herb	-	-	-	-	

	Portulacaceae						
	<i>Portulaca oleracea</i>	Common Purslane					
	Rosaceae						
	<i>Acaena echinata</i>	Sheep's Burr					
	Rubiaceae						
	<i>Asperula conferta</i>	Common Woodruff	-	-	-	-	
	Poaceae						
	<i>Amphibromus nervosus</i>	Common Swamp Wallaby-grass	-	-	-	-	
Graminoid (Grass-like plant)	<i>Austrodanthonia caespitosa</i>	Common Wallaby-grass	-	-	-	-	
	<i>Austrodanthonia duttoniana</i>	Brown-back Wallaby-grass	-	-	-	-	
	<i>Austrodanthonia racemosa</i> var. <i>racemosa</i>	Slender Wallaby-grass	-	-	-	-	
	<i>Austrodanthonia setacea</i>	Bristly Wallaby-grass	-	-	-	-	
	<i>Austrostipa bigeniculata</i>	Kneed Spear-grass	-	-	-	-	
	<i>Austrostipa blackii</i>	Crested Spear-grass	-	-	-	✓	
	<i>Austrostipa rudis</i> subsp. <i>rudis</i>	Veined Spear-grass	-	-	-	✓	
	<i>Bothriochloa macra</i>	Red-leg Grass	-	-	-	-	
	<i>Chloris truncata</i>	Windmill Grass	-	-	-	-	
	<i>Cynodon dactylon</i>	Couch	-	-	-	-	
	<i>Lachnagrostis filiformis</i>	Common Blown-grass	-	-	-	-	
	<i>Poa labillardierei</i>	Common Tussock-grass	-	-	-	-	
	<i>Themeda triandra</i>	Kangaroo Grass	-	-	-	-	
	<i>Walwhalleya proluta</i>	Rigid Panic	-	-	-	-	
		Cyperaceae					
		<i>Carex</i> spp.	Sedge	-	-	-	-
	Rushes / Sedges	<i>Eleocharis acuta</i>	Common Spike-sedge	-	-	-	-
		Juncaceae					
<i>Juncus procerus</i>		Tall Rush	-	-	-	✓	
<i>Juncus subsecundus</i>		Finger Rush	-	-	-	-	

* Species occurs within landscape planting

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

Life Form	Scientific name	Common name	Listed Status		
			EPBC	DSE	FFG
NON-INDEGENOUS NATIVE SPECIES			EPBC	DSE	FFG
Shrub	Myrtaceae				
	<i>Melaleuca armillaris subsp. armillaris</i>	Giant Honey-myrtle	-	r	-
	Scrophulariaceae				
	<i>Myoporum insulare</i>	Common Boobialla	-	-	-
EXOTIC SCPECIES			CALP ACT LISTED WEEDS		
Tree	Pinaceae				
	<i>Pinus radiata</i>	Radiata Pine		-	
	Anacardiaceae				
	<i>Schinus molle</i>	Pepper Tree		-	
	Cupressaceae				
	<i>Cupressus macrocarpa</i>	Monterey Cypress		-	
	<i>Cupressus sp.</i>	Cypress		-	
Shrub	Rosaceae				
	<i>Malus sp.</i>	Apple		-	
	Aizoaceae				
	<i>Galenia pubescens var. pubescens</i>	Galenia		-	
	Chenopodiaceae				
	<i>Chenopodium album</i>	Fat Hen		-	
	Rosaceae				
	<i>Rosa rubiginosa</i>	Sweet Briar		✓	
Herb / Forb	Solanaceae				
	<i>Lycium ferocissimum</i>	African Box-thorn		✓	
	<i>Solanum nigrum s.s.</i>	Black Nightshade		-	
	<i>Solanum linnaeanum</i>	Apple of Sodom		-	
	Apiaceae				
	<i>Foeniculum vulgare</i>	Fennel		✓	
	Alliaceae				
	<i>Allium spp.</i>	Garlic		-	
	Asteraceae				
	<i>Arctotheca calendula</i>	Cape Weed		-	
	<i>Cirsium vulgare</i>	Spear Thistle		✓	
<i>Conyza bonariensis</i>	Flaxleaf Fleabane		-		
<i>Conyza sumatrensis</i>	Tall Fleabane		-		
<i>Cynara cardunculus</i>	Artichoke Thistle		✓		
<i>Gamochaeta purpurea s.l.</i>	Purple Cudweed		-		
<i>Gazania spp.</i>	Gazania		-		
<i>Helianthus spp.</i>	Sunflower		-		
<i>Helminthotheca echioides</i>	Ox-tongue		-		

	<i>Lactuca serriola</i>	Prickly Lettuce	-
	<i>Onopordum acanthium subsp. acanthium</i>	Scotch Thistle	✓
	<i>Scolymus hispanicus</i>	Golden Thistle	✓
	<i>Sonchus oleraceus</i>	Common Sow-thistle	-
	<i>Xanthium spinosum</i>	Bathurst Burr	✓
	Boraginaceae		
	<i>Echium plantagineum</i>	Paterson's Curse	✓
	Brassicaceae		
	<i>Brassica spp.</i>	Turnip	-
	<i>Brassica X juncea</i>	Indian Mustard	-
	<i>Lepidium africanum</i>	Common Peppergrass	-
	Cactaceae		
	<i>Opuntia spp.</i>	Prickly Pear	-
	Caryophyllaceae		
	<i>Cerastium fontanum subsp. vulgare</i>	Common Mouse-ear Chickweed	-
	Clusiaceae		
	<i>Hypericum perforatum subsp. veronense</i>	St John's Wort	-
	Fabaceae		
	<i>Medicago polymorpha</i>	Burr Medic	-
	<i>Trifolium repens var. repens</i>	White Clover	-
	<i>Trifolium spp.</i>	Clover	-
	<i>Trifolium subterraneum</i>	Subterranean Clover	-
	<i>Vicia sativa</i>	Common Vetch	-
	Gentianaceae		
	<i>Centaurium erythraea</i>	Common Centaury	-
	Lamiaceae		
	<i>Marrubium vulgare</i>	Horehound	✓
	<i>Salvia verbenaca</i>	Wild Sage	-
	Malvaceae		
	<i>Malva spp.</i>	Mallow	-
	<i>Malva nicaeensis</i>	Mallow of Nice	-
	<i>Modiola caroliniana</i>	Red-flower Mallow	-
	Oxalidaceae		
	<i>Oxalis pes-caprae</i>	Soursob	-
	Polygonaceae		
	<i>Rumex conglomeratus</i>	Clustered Dock	-
	Veronicaceae		
	<i>Plantago coronopus subsp. coronopus</i>	Buck's-horn Plantain	-
	<i>Plantago lanceolata</i>	Ribwort	-
Graminoid (Grass-like plant)	Iridaceae		
	<i>Romulea rosea</i>	Onion Grass	-
	Poaceae		
	<i>Pinus radiata</i>	Radiata Pine	-

<i>Avena barbata</i>	Bearded Oat	-
<i>Briza minor</i>	Lesser Quaking-grass	-
<i>Bromus catharticus</i>	Prairie Grass	-
<i>Bromus hordeaceus</i> subsp. <i>hordeaceus</i>	Soft Brome	-
<i>Dactylis glomerata</i>	Cocksfoot	-
<i>Hordeum vulgare</i> s.l.	Barley	-
<i>Lolium perenne</i>	Perennial Rye-grass	-
<i>Nassella hyalina</i>	Cane Needle-grass	-
<i>Nassella neesiana</i>	Chilean Needle-grass	-
<i>Nassella trichotoma</i>	Serrated Tussock	✓
<i>Paspalum dilatatum</i>	Paspalum	-
<i>Paspalum distichum</i>	Water Couch	-
<i>Phalaris aquatica</i>	Toowoomba Canary-grass	-
<i>Vulpia myuros</i>	Squirrel-tail Fescue	-

DRAFT

Appendix 2.2 – Flora database results

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

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

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

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

Lifeform	Scientific name	Common name	Last documented record (VBA)	Total # of documented records (VBA)	EPBC	DSE	FFG	Detected during current survey	Likely occurrence within the precinct and reasoning for likelihood	Habitat description
NATIONAL SIGNIFICANCE										
Graminoid	<i>#Amphibromus fluitans</i>	River Swamp Wallaby-grass	-	-	VU	-	-		3	Permanent wetlands, swamps and dams

Lifeform	Scientific name	Common name	Last documented record (VBA)	Total # of documented records (VBA)	EPBC	DSE	FFG	Detected during current survey	Likely occurrence within the precinct and reasoning for likelihood	Habitat description
Graminoid	# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	v	L		3	Slightly saline drainage lines, or soaks and marshes on basalt soils
Herb/Forb	# <i>Diuris basaltica</i>	Small Golden Moths	1906	1	EN	v	L		4	Herb-rich native grasslands on heavy basalt soils
Herb/Forb	# <i>Glycine latrobeana</i>	Clover Glycine	1995	1	VU	v	L		3	Native grasslands and grassy woodlands
Shrub	# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	2008	102	CR	e	L	Recorded	1: Present within Greigs Road road reserve	Native grasslands and grassy woodlands
Herb/Forb	# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	-	-	EN	e	L		5	In or around coastal swamps
Herb/Forb	# <i>Rutidosia leptorhynchoides</i>	Button Wrinklewort	1982	6	EN	e	L		3	Native grasslands and grassy woodlands
Herb/Forb	# <i>Senecio macrocarpus</i>	Large-headed Fireweed	2004	12	VU	e	L		3	Basalt plains grassland
STATE SIGNIFICANCE										
Tree	<i>Allocasuarina luehmannii</i>	Buloke	1996	3	-	-	L		5	Woodland on non-calcareous soils
Parasite	<i>Amyema linophylla</i> subsp. <i>orientale</i>	Buloke Mistletoe	2005	9	-	-	-		5	Buloke trees

Lifeform	Scientific name	Common name	Last documented record (VBA)	Total # of documented records (VBA)	EPBC	DSE	FFG	Detected during current survey	Likely occurrence within the precinct and reasoning for likelihood	Habitat description
Graminoid	<i>Austrostipa exilis</i>	Heath Spear-grass	1995	6	-	-	-		5	Woodland with Grey Box or Buloke
Graminoid	<i>Austrostipa hemipogon</i>	Half-bearded Spear-grass	2006	2	-	-	-		3	Grasslands and Grassy Woodlands
Herb/Forb	<i>Cullen parvum</i>	Small Scurf-pea	2006	12	-	e	L		2	Grasslands and grassy woodlands, on rich alluvial or basalt soils
Herb/Forb	<i>Cullen tenax</i>	Tough Scurf-pea	2002	7	-	e	L		3	Grasslands and grassy woodlands, on rich alluvial or basalt soils
Graminoid	<i>Dianella sp. aff. longifolia (Benambra)</i>	Arching Flax-lily	2006	9	-	v	-		3	Grasslands and Grassy Woodlands
Herb/Forb	<i>Geranium solanderi var. solanderi s.s.</i>	Austral Crane's-bill	2005	3	-	-	-		3	Grasslands and Grassy Woodlands
Herb/Forb	<i>Helichrysum aff. rutidolepis (Lowland Swamps)</i>	Pale Swamp Everlasting	1986	1	-	v	-		5	Moist areas of open forest and woodland
Herb/Forb	<i>Nicotiana suaveolens</i>	Austral Tobacco	2002	16	-	r	-		5	Creek banks, rocky slopes
Herb/Forb	<i>Ranunculus diminutus</i>	Brackish Plains Buttercup	1990	1	-	-	-		4	Grasslands and Grassy Woodlands
Shrub	<i>Rhagodia parabolica</i>	Fragrant Saltbush	2007	15	-	r	-		5	Steep rocky slopes and broad ridges, in sandy or clay soils, tolerant of saline conditions

Lifeform	Scientific name	Common name	Last documented record (VBA)	Total # of documented records (VBA)	EPBC	DSE	FFG	Detected during current survey	Likely occurrence within the precinct and reasoning for likelihood	Habitat description
Graminoid	<i>Tripogon loliformis</i>	Rye Beetle-grass	1995	11	-	r	-		5	Plains Grassland and Woodland

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

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

Taxonomic order: Alphabetical.

DRAFT

Appendix 3.1 – Fauna results

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

Type of Record:

H – Heard

S – Seen

Common name	Scientific name	Conservation Status			Regional	Type of Record
		EPBC	FFG	DSE		
BIRDS						
Stubble Quail	<i>Coturnix pectoralis</i>					H
Pacific Black Duck	<i>Anas superciliosa</i>					S
Little Pied Cormorant	<i>Microcarbo melanoleucos</i>					S
White-necked Heron	<i>Ardea pacifica</i>					S
Eastern Great Egret	<i>Ardea modesta</i>					S
White-faced Heron	<i>Egretta novaehollandiae</i>					S
Straw-necked Ibis	<i>Threskiornis spinicollis</i>					S
Black-shouldered Kite	<i>Elanus axillaris</i>					S
Wedge-tailed Eagle	<i>Aquila audax</i>					S
Welcome Swallow	<i>Petrochelidon neoxena</i>					S
Superb Fairy-wren	<i>Malurus cyaneus</i>					S
Brown Thornbill	<i>Acanthiza pusilla</i>					S
White-plumed Honeyeater	<i>Lichenostomus penicillatus</i>					S
Red Wattlebird	<i>Anthochaera carunculata</i>					S
Crested Pigeon	<i>Ocyphaps lophotes</i>					S
Australian Magpie	<i>Gymnorhina tibicen</i>					S
Willie Wagtail	<i>Rhipidura leucophrys</i>					S
Little Raven	<i>Corvus mellori</i>					S
Golden-headed Cisticola	<i>Cisticola exilis</i>					S
REPTILES						
Common Blue-tongued Lizard	<i>Tiliqua scincoides</i>					I

Source: DSE Victorian Biodiversity Atlas (DSE 2011)

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

Type of Record:

S – Seen

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

Scientific name	Common name	Type of Record
BIRDS		
<i>Streptopelia chinensis</i>	Spotted Dove	S
<i>Alauda arvensis</i>	European Skylark	S
<i>Columba livia</i>	Rock Dove	S
<i>Carduelis carduelis</i>	European Goldfinch	S
<i>Passer domesticus</i>	House Sparrow	S
<i>Acridotheres tristis</i>	Common Myna	S
<i>Sturnus vulgaris</i>	Common Starling	S
MAMMALS		
<i>Oryctolagus cuniculus</i>	European Rabbit	S
<i>Vulpes vulpes</i>	Red Fox	I

DRAFT

Appendix 3.2 – Significant fauna species

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

Sources used to determine species status:

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

Species status:

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

Common name	Scientific name	Last documented record	Total # of documented records	EPBC Act	DSE (2007)	FFG Act	National Action Plan	Present Survey	Likely occurrence in Precinct	Likelihood Reasoning	Habitat Description
NATIONAL SIGNIFICANCE											
# Spot-tailed Quoll	<i>Dasyurus maculatus</i>	-	-	EN	EN	L	VU	-	Unlikely	No habitat	Forest (wet and dry sclerophyll), rainforests, Red Gum forests, coastal heath and scrub
# New Holland Mouse	<i>Pseudomys novaehollandiae</i>	-	-	VU	VU	L	-	-	Unlikely	No habitat	Dry coastal heath and sclerophyll forest with little shrub or ground cover

Common name	Scientific name	Last documented record	Total # of documented records	EPBC Act	DSE (2007)	FFG Act	National Action Plan	Present Survey	Likely occurrence in Precinct	Likelihood Reasoning	Habitat Description
# Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	-	-	VU	VU	L	VU	-	Low	May forage on flowering eucalypts	Forests, rainforests, sclerophyll vegetation usually near water or in mangroves
#Australasian Bittern	<i>Botaurus poiciloptilus</i>	1973	1	EN	EN	L	VU	-	Unlikely	No habitat	Large, permanent waterbodies
Plains-wanderer	<i>Pedionomus torquatus</i>	1979	8	VU	CR	L	EN	-	Low	No previous records for species in precinct or local area	Native grassland, cereals and stubble
#Australian Painted Snipe	<i>Rostratula benghalensis australis</i>	1977	1	VU	CR	L	VU	-	Unlikely	Lack of good quality, extensive habitat	Shallow, inland wetlands
# Fairy Tern	<i>Sternula nereis</i>	-	-	VU	EN	L	-	-	Unlikely	No habitat	Coastal areas and estuaries
Superb Parrot	<i>Polytelis swainsonii</i>	1870	1	VU	EN	L	VU	-	Unlikely	No habitat	River red gum riparian woodland, forages in box woodland
#Swift Parrot	<i>Lathamus discolor</i>	2008	5	EN	EN	L	EN	-	Low	May opportunistically forage in flowering eucalypts	Dry sclerophyll forest and woodland, suburban parks and flowering fruit trees
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	1977	1	CR	CR	L	CR	-	Unlikely	No habitat	Open forest, coastal saltmarsh, damp grasslands
#Regent Honeyeater	<i>Anthochaera phrygia</i>	1933	3	EN	CR	L	EN	-	Unlikely	No habitat	Forests and woodlands, particularly in flowering trees and mistletoe
#Striped Legless Lizard	<i>Delma impar</i>	2008	53	VU	EN	L	VU	-	Low	Low quality grassland habitat	Native grassland, and unimproved pasture in rocky areas

Common name	Scientific name	Last documented record	Total # of documented records	EPBC Act	DSE (2007)	FFG Act	National Action Plan	Present Survey	Likely occurrence in Precinct	Likelihood Reasoning	Habitat Description
#Grassland Earless Dragon	<i>Tympanocryptis pinguicolla</i>	1960	1	EN	CR	L	VU	-	Unlikely	Low quality grassland habitat	Rocky native grasslands with sparse or absent tree and shrub cover, uncultivated paddocks
#Growling Grass Frog	<i>Litoria raniformis</i>	2007	202	VU	EN	L	VU	-	Moderate	May use lowlying swampland for foraging. Recent records exist north of Western Fwy	Permanent or semi-permanent waterways, wetlands and waterbodies
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	-	Unlikely	No suitable habitat	Coastal rivers and streams south east of Great Dividing Range
# Dwarf Galaxias	<i>Galaxiella pusilla</i>	-	-	VU	VU	L	VU	-	Unlikely	No suitable habitat	Still-slow flowing waters with abundant macrophytes
Macquarie Perch	<i>Macquaria australasica</i>	1930	4	EN	EN	L	DD	-	Unlikely	No suitable habitat	Large, deep rivers with abundant in stream structure. Largely confined to Murray-Darling Basins with some translocated self-sustaining populations elsewhere
#Golden Sun Moth	<i>Synemon plana</i>	2008	7	CR	CR	L	-	-	Low	Areas of habitat are small and fragmented. Areas of existing records have since been cultivated	Remnant and modified grasslands
STATE SIGNIFICANCE											

Common name	Scientific name	Last documented record	Total # of documented records	EPBC Act	DSE (2007)	FFG Act	National Action Plan	Present Survey	Likely occurrence in Precinct	Likelihood Reasoning	Habitat Description
Musk Duck	<i>Biziura lobata</i>	2006	21	-	VU	-	-	-	Low	May opportunistically use waterbodies in Precinct	Deep, permanent lakes and swamps, occasionally saline wetlands
Freckled Duck	<i>Stictonetta naevosa</i>	1991	3	-	EN	L	-	-	Low	May opportunistically use waterbodies in Precinct	Permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree
Australasian Shoveler	<i>Anas rhynchos</i>	2006	26	-	VU	-	-	-	Low	May opportunistically use waterbodies in Precinct	Large, permanent waterbodies
Hardhead	<i>Aythya australis</i>	2006	27	-	VU	-	-	-	Low	May opportunistically use waterbodies in Precinct	Large, permanent waterbodies
Blue-billed Duck	<i>Oxyura australis</i>	2006	13	-	EN	L	-	-	Low	May opportunistically use waterbodies in Precinct	Large, permanent waterbodies
Eastern Great Egret	<i>Ardea modesta</i>	2001	18	-	VU	L	-	S	High	One individual seen foraging in low quality dam on Troups Road South	Large permanent waterbodies and vegetation drainage lines
Intermediate Egret	<i>Ardea intermedia</i>	1980	3	-	CR	L	-	-	Low	May opportunistically use waterbodies in Precinct	Freshwater wetlands and intertidal mudflats

Common name	Scientific name	Last documented record	Total # of documented records	EPBC Act	DSE (2007)	FFG Act	National Action Plan	Present Survey	Likely occurrence in Precinct	Likelihood Reasoning	Habitat Description
Royal Spoonbill	<i>Platalea regia</i>	2006	13	-	VU	-	-	-	Moderate	Record exists in lignum swampland. May opportunistically forage in inundated areas	Large permanent waterbodies
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	2008	4	-	VU	L	-	-	Unlikely	No suitable habitat	Forested coasts and forested margins of inland waterways
Grey Goshawk	<i>Accipiter novaehollandiae novaehollandiae</i>	2006	1	-	VU	L	-	-	Unlikely	No suitable habitat	Forested areas, particularly coastal closed forests
Black Falcon	<i>Falco subniger</i>	2000	3	-	VU	-	-	-	Low	May opportunistically forage over grasslands	All habitats are suitable for potential foraging or roosting purposes
Brolga	<i>Grus rubicunda</i>	1989	2	-	VU	L	-	-	Unlikely	No suitable habitat	Ephemeral wetlands, saltmarsh, open grasslands, crops
Lewin's Rail	<i>Lewinia pectoralis pectoralis</i>	1889	1	-	VU	L	NT	-	Unlikely	No suitable habitat	Vegetated swamp; coastal Saltmarsh; swampy streams; tidal creeks
Baillon's Crane	<i>Porzana pusilla palustris</i>	1977	2	-	VU	L	-	-	Unlikely	No suitable habitat	Vegetated freshwater and brackish swamps
Major Mitchell's Cockatoo	<i>Lophocroa leadbeateri</i>	2004	1	-	VU	L	-	-	Unlikely	No suitable habitat	Malle, mulga, Murray Pine, she-oak
Bush Stone-curlew	<i>Burhinus grallarius</i>	1889	1	-	EN	L	NT	-	Unlikely	No suitable habitat	Open woodland, often near beaches
Common Sandpiper	<i>Actitis hypoleucos</i>	1990	1	-	VU	-	-	-	Unlikely	No suitable habitat	Vegetated swamp, coastal saltmarshes, tidal mudflat
Red-chested Button-quail	<i>Turnix pyrrhоторax</i>	1990	4	-	VU	L	-	-	Unlikely	No suitable habitat	Grassland

Common name	Scientific name	Last documented record	Total # of documented records	EPBC Act	DSE (2007)	FFG Act	National Action Plan	Present Survey	Likely occurrence in Precinct	Likelihood Reasoning	Habitat Description
Powerful Owl	<i>Ninox strenua</i>	1972	2	-	VU	L	-	-	Unlikely	No suitable habitat	Woodland, open sclerophyll forest, tall open wet forest and rainforest, can occur in fragmented landscapes
Barking Owl	<i>Ninox connivens connivens</i>	1986	3	-	EN	L	NT	-	Unlikely	No suitable habitat	Open forest, woodland or scrub
Masked Owl	<i>Tyto novaehollandiae novaehollandiae</i>	1989	1	-	EN	L	NT	-	Unlikely	No suitable habitat	Forest, woodland, mature trees for nesting
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2008	36	-	NT	-	NT	-	Unlikely	No suitable habitat	Lowland dry woodland and wooded farmland
Speckled Warbler	<i>Chthonicola sagittatus</i>	2007	16	-	VU	L	NT	-	Unlikely	No suitable habitat	Dry sclerophyll forest and woodland
Grey-crowned Babbler	<i>Pomatostomus temporalis temporalis</i>	1987	5	-	EN	L	NT	-	Unlikely	No suitable habitat	Dry forests and woodland; wooded farmland associated with river floodplains
Crested Bellbird	<i>Oreoica gutturalis gutturalis</i>	1988	3	-	NT	L	NT	-	Unlikely	No suitable habitat	Low, dry inland woodland and scrub
Hooded Robin	<i>Melanodryas cucullata cucullata</i>	1988	8	-	NT	L	NT	-	Unlikely	No suitable habitat	Open eucalypt woodland, with presence of acacia spp.
Diamond Firetail	<i>Stagonopleura guttata</i>	2008	32	-	VU	L	NT	-	Unlikely	No suitable habitat	Open forest, woodland, orchards, parks and gardens
Brown Toadlet	<i>Pseudophryne bibronii</i>	2004	3	-	EN	L	DD	-	Unlikely	No suitable habitat	Moist ground layer in dry or wet sclerophyll forest; roadside gutters; small creeks
REGIONAL SIGNIFICANCE											

Common name	Scientific name	Last documented record	Total # of documented records	EPBC Act	DSE (2007)	FFG Act	National Action Plan	Present Survey	Likely occurrence in Precinct	Likelihood Reasoning	Habitat Description
Fat-tailed Dunnart	<i>Sminthopsis crassicaudata</i>	1990	9	-	NT	-	-	-	Low	Lack of suitable habitat and previous records	A variety of habitats, including grassland, gibber plain, saltbush plains, claypans, pasture
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	1933	2	-	NT	I	-	-	Unlikely	No suitable habitat	Wet and dry eucalypt forest, subalpine woodland, coastal banksia woodland and wet heath
Brown Quail	<i>Coturnix ypsilophora australis</i>	1990	5	-	NT	-	-	-	Low	May forage within preferred habitat throughout the precinct on occasions	Grassy and sedgy flats, agricultural crops; swamps
Cape Barren Goose	<i>Cereopsis novaehollandiae</i>	1999	4	-	NT	-	-	-	Unlikely	No suitable habitat	Small offshore grassland islands, improved pastures
Pied Cormorant	<i>Phalacrocorax varius</i>	2006	3	-	NT	-	-	-	Unlikely	No suitable habitat	Large freshwater and saline wetlands; tidal bays along coast
Nankeen Night Heron	<i>Nycticorax caledonicus hillii</i>	1996	8	-	NT	-	-	-	Low	May forage opportunistically within the precinct	Well vegetated wetlands, shallow river margins, mangroves, floodplains, swamps, parks and gardens
Spotted Harrier	<i>Circus assimilis</i>	2007	5	-	NT	-	-	-	Unlikely	No suitable habitat	Open woodland country
Latham's Snipe	<i>Gallinago hardwickii</i>	1997	8	-	NT	-	-	-	Low	May occasionally forage in swampland during optimum conditions	Vegetated swamps; pools/ditches in heath or herblands; grasslands

Common name	Scientific name	Last documented record	Total # of documented records	EPBC Act	DSE (2007)	FFG Act	National Action Plan	Present Survey	Likely occurrence in Precinct	Likelihood Reasoning	Habitat Description
Pectoral Sandpiper	<i>Calidris melanotos</i>	1990	1	-	NT	-	-	-	Unlikely	No suitable habitat	Grassy or lightly vegetated coastal and inland swamps
Little Button-quail	<i>Turnix velox</i>	1974	1	-	NT	-	-	-	Unlikely	No suitable habitat	Dry, arid woodland and grassland
Australian Pratincole	<i>Stiltia isabella</i>	1990	1	-	NT	-	-	-	Unlikely	No suitable habitat	Semi-arid open plains
Whiskered Tern	<i>Chlidonias hybridus javanicus</i>	1990	4	-	NT	-	-	-	Unlikely	No suitable habitat	Shallow freshwater wetlands with emergent vegetation, flooded saltmarsh, estuaries
Black-eared Cuckoo	<i>Chrysococcyx osculans</i>	1988	3	-	NT	-	-	-	Unlikely	No suitable habitat	Arid and semi arid woodland and scrub, mallee and mulga
Black-chinned Honeyeater	<i>Melithripterus gularis gularis</i>	1988	8	-	NT	-	-	-	Unlikely	No suitable habitat	Open woodland, tall scrub, riverine woodland
Spotted Quail-thrush	<i>Cinclusoma punctatum</i>	1968	2	-	NT	-	-	-	Unlikely	No suitable habitat	Sclerophyll forest, favouring leaf-littered rocky ridges with short grass tussocks
River Blackfish	<i>Gadopsis marmoratus</i>	1988	1	-	DD	-	-	-	Unlikely	No suitable habitat	Diverse range of stream types, abundant in-stream cover, including timber and macrophytes

Sources: DSE Victorian Biodiversity Atlas (DSE 2011); DSEWPC Protected Matters Search Tool ([DSEWPC 2011](#)); Atlas of Victorian Birds (Emison *et.al.* 1987); Mammals of Victoria (Menkhorst 1995); and, Reptiles and Amphibians (Cogger 1996).

REFERENCES

DRAFT

References

- Allen, G.R., Midgley, S.H. and Allen, M. 2002. Field Guide to Freshwater Fishes of Australia. Western Australian Museum, Western Australia.
- Anstis, M. 2002. *Tadpoles of South-eastern Australia: A Guide with Keys*. New Holland Publishers (Australia), Sydney.
- Backhouse, G., Jackson, J. and O'Connor, J. 2008. *Background and Implementation Information for the Australian Grayling *Prototroctes maraena* National Recovery Plan*. Department of Sustainability and Environment, Melbourne.
- Barker, J., Grigg, G.C. and Tyler, M.J. 1995. *A field guide to Australian Frogs*. Surrey Beatty and Sons, Chipping Norton, New South Wales.
- Beardsell 1997. The NEROC Report. Sites of faunal and habitat significance in North East Melbourne. Nillumbik Shire Council.
- Birdline 2011. Birdline Victoria – Recent Sightings. <http://www.ereamaea.com/>. Sponsored by Birds Australia.
- Briggs and Lee 1996. Rare or Threatened Australian Plants. 1995 Revised Edn. CSIRO Publishing, Collingwood.
- Genetic variability and population structure of the endangered golden sun moth, *Synemon plana*. *Biological Conservation* **92**: 371–381.
- Cogger, H.G., Cameron, E.E., Sadlier, R.A. and Egglar, P. 1993. *The Action Plan for Australian Reptiles*. Australia Nature Conservation Age.
- Cogger, H. 1996. Reptiles and Amphibians of Australia. Reed Books, Sydney.
- DEC 2005. Southern Bell Frog *Litoria raniformis* Recovery Plan, draft for public comment. Department of Environment and Conservation, Hurstville, New South Wales.
- DSEWPC 2012. *Environment Protection and Biodiversity Act 1999* Protected Matters Search Tool. Available URL: <http://www.environment.gov.au/erin/ert/epbc/index.html>. The Department of Sustainability, Environment, Water, Population and Communities.
- DPCD 2012. Planning Schemes Online. Department of Planning and Community Development: <http://www.dse.vic.gov.au/planningschemes/>
- DPIW 2006. *Threatened Species Section. Recovery Plan: Tasmanian Galaxiidae 2006-2010*. Department of Primary Industries and Water, Hobart, Tasmania.
- DSE 2004. *Vegetation quality assessment manual: Guidelines for applying the habitat hectares scoring method*. Biodiversity and Natural Resources Division, Department of Sustainability and Environment, Victoria.
- DSE 2005. *Advisory List of Rare or Threatened Plants in Victoria - 2005*. Department of Sustainability and Environment, Victoria, East Melbourne, Victoria.
- DSE 2007a. *Advisory List of Threatened Vertebrate Fauna in Victoria*. Department of Sustainability and Environment, Victoria
- DSE 2007b. *Native Vegetation. Guide for assessment of referred planning permit applications*, April 2007. Department of Sustainability and Environment, Victoria, East Melbourne, Victoria.

- DSE 2010a. Strategic Impact Assessment Report. Department of Sustainability and Environment, Victoria, East Melbourne, Victoria.
- DSE 2010b. Biodiversity Precinct Structure Planning Kit. Department of Sustainability and Environment, Victoria, East Melbourne, Victoria.
- DSE 2011a. Victorian Biodiversity Atlas. Sourced from: 'VBA_FAUNA25', 'VBA_FAUNA100', 'VBA_FLORA25', 'VBA_FLORA100' August 2010 © The State of Victoria, Department of Sustainability and Environment.
- DSE 2011b. Biodiversity Conservation Strategy for Melbourne's Growth Areas – Draft for Public Consultation. The Department of Sustainability and Environment, Melbourne, November 2011.
- DSE 2011b. Salvage and Translocation of Striped Legless Lizard in the urban growth area of Melbourne: Strategic Approach. The Department of Sustainability and Environment, Melbourne, March 2011.
- DSE 2012a. Biodiversity Interactive Mapping. www.dse.vic.gov.au
- DSE 2012b. EVC Benchmarks, Victorian Volcanic Plain Bioregion. www.dse.vic.gov.au
- Duncan, A., Baker, G.B. and Montgomery, N. 1999. *The Action Plan for Australian Bats*. Environment Australia, Canberra.
- Ecology Australia Pty Ltd 2010. Sub-regional surveys for the Growling Grass Frog. Unpublished report for Growth Areas Authority by Ecology Australia Pty. Ltd., Fairfield.
- Emison, W.B., Beardsell, C.M., Norman, F.I., Loyn, R.H. and Bennett, S.C. 1987. *Atlas of Victorian Birds*. Department of Conservation, Forests and Lands and the Royal Australasian Ornithologists Union, Melbourne.
- Garnett, S. and Crowley, G. 2000. *The Action Plan for Australian Birds*. Environment Australia, Canberra.
- Greer, A.E. 1989. *The biology and Evolution of Australian Lizards*. Surrey Beatty and Sons, Sydney, Australia.
- Haddon, S 1995. *Distribution, population habitat estimates, and habitat requirements of the Striped Legless Lizard Delma impar Delma impar*. Report to the Australian Nature Conservation Agency, Canberra. Department of Conservation and Natural Resources: Melbourne.
- Hamer, A.J and Organ, A. 2008. Aspects of the ecology and conservation of the Growling Grass Frog *Litoria raniformis* in an urban-fringe environment, southern Victoria. Proceedings of the Biology and Conservation of Bell Frogs Conference. *Australian Zoologist* **34(3)**: 414–425.
- Hero, J.M., Littlejohn, M. and Marantelli, G. 1991. *Frogwatch Field Guide to Victorian Frogs*. Department of Conservation and Environment, East Melbourne.
- IUCN 2009. *2009 IUCN Red List of Threatened Animals*. International Union for the Conservation of Nature and Natural Resources, Geneva.
- Littlejohn, M.J. 1963. *Frogs of the Melbourne area*. Victorian Naturalist 79: P 296-304.
- Littlejohn, M.J. 1982. *Amphibians of Victoria*. Victorian Yearbook 85: P1-11

- Mahony, M.J. 1999. *Review of the declines and disappearances within the bell frog species group (Litoria aurea species group) in Australia*. In: *Declines and Disappearances of Australian Frogs*. Ed. by A. Campbell, Environment Australia, Canberra.
- Marchant S and Higgins P J 1990. *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 1 Ratites to Ducks*. Oxford University Press, Melbourne.
- Marchant S and Higgins P J 1993. *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 2 Raptors to Lapwings*. Oxford University Press, Melbourne
- Maxwell, S., Burbidge, A. and Morris, K. 1996. *Action Plan for Australian Marsupials and Monotremes*. IUCN Species Survival Commission.
- McDowall, R.M. 1996 (Ed.) *Freshwater Fishes of South-eastern Australia*. Reed Pty. Ltd, Sydney.
- Menkhorst P. and Knight F. 2004. *A Field Guide to the Mammals of Victoria*. Second edition. Oxford University Press, Melbourne.
- Menkhorst, P.W. 1999. *Mammals of Victoria; Distribution, ecology and conservation*. Oxford University Press, Australia.
- Morecombe, M. 2000. *Field Guide to Australian Birds*. Steve Parish Publishing, Archfield, Queensland.
- MOV 2011. Museum of Victoria - Victorian Butterfly Database [online], Available URL: <http://museumvictoria.com.au/bioinformatics/butter/>
- NRE 1997. *Victoria's Biodiversity – Directions in Management*. Department of Natural Resources and Environment, Victoria.
- NRE 2002. *Victoria's Native Vegetation Management: A Framework for Action*. Department of Natural Resources and Environment, Victoria.
- PPWCMA 2006. *Port Phillip and Westernport Native Vegetation Plan*. Port Phillip and Westernport Catchment Management Authority, Victoria.
- Robertson, P. 2003. *Draft Flora and Fauna Guarantee Action Statement for the Growling Grass Frog, Litoria raniformis*. Department of Sustainability and Environment, Victoria.
- Robinson, M. 2000. *A Field Guide to Frogs of Australia*. Reed New Holland, Sydney.
- Timewell, C. 2003. *Pakenham Bypass: Survey for the Warty Bell Frog Litoria raniformis, Pakenham and surrounds, Victoria*. Unpublished report for VicRoads by Biosis Research Pty Ltd, Port Melbourne.
- Tyler, M.J. 1997. *The Action Plan for Australian Frogs*. Environment Australia, Canberra.
- Viridans 2011a. *Flora Information System (FIS)*. Department of Sustainability and Environment, Victoria, East Melbourne, Victoria.
- Viridans 2011b. *Atlas of Victorian Wildlife (AVW)*. Department of Sustainability and Environment, Victoria, East Melbourne, Victoria.
- Walsh, N.G. and Entwisle, T.J. 1994. *Flora of Victoria, Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons*. Royal Botanic Gardens, Melbourne.
- Walsh, N.G. and Entwisle, T.J. 1996. *Flora of Victoria, Volume 3: Dicotyledons; Winteraceae to Myrtaceae*. Royal Botanic Gardens, Melbourne.

- Walsh, N.G. and Entwisle, T.J. 1999. *Flora of Victoria, Volume 4: Dicotyledons; Cornaceae to Asteraceae*. Royal Botanic Gardens, Melbourne.
- Walsh, N.G. and Stajsic, V. 2007. *A Census of the Vascular Plants of Victoria 8th Edition*. Royal Botanic Gardens, Melbourne.

DRAFT