

# **Biodiversity Assessment Report (Native Vegetation) Melton - Wyndham Investigation Area: Section H**

March 2010





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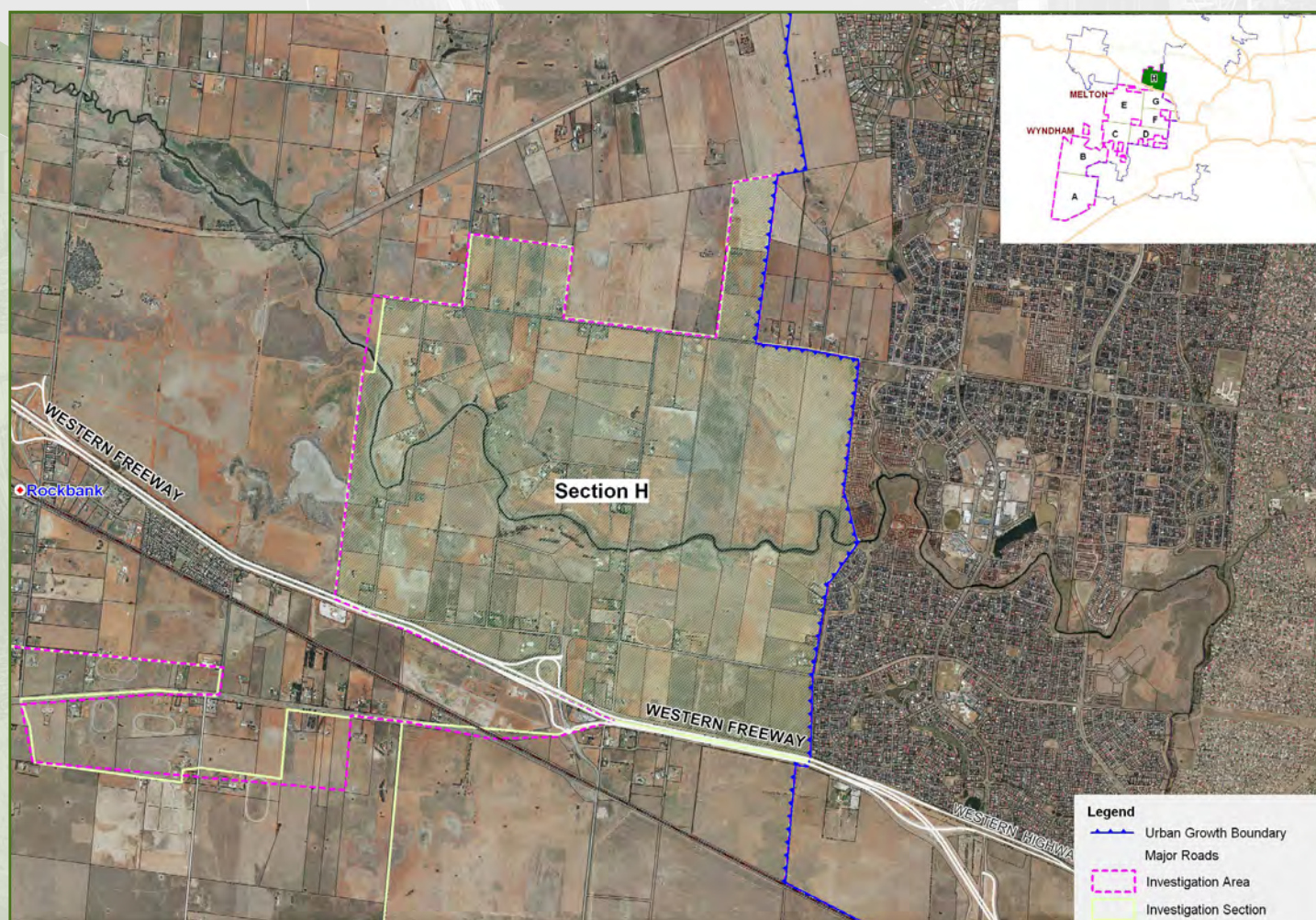
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# Biodiversity Assessment Report (Native Vegetation) Melton - Wyndham Investigation Area: Section H

*Growth Areas Authority*

March 2010



MAP: Melton - Wyndham Investigation Area: Section H



# Biodiversity Assessment Project (Native Vegetation)

## Quality Assurance - Verification Sheet

### Melton-Wyndham Investigation Area: Section H

Document Title	Biodiversity Assessment Report (Native Vegetation)		
Precinct (Name and Number)	Melton - Wyndham Investigation Area: Section H		
Organisation Name	Biosis Research Pty Ltd		
Prepared by	Nicky Forge, Steve Mueck, Daniel Gilmore		
Checked by	Matt Dell		
Project Manager	Nicky Forge,		
Address	38 Bertie Street, Port Melbourne VIC 3207		
Email	<a href="mailto:gaamanagement@biosisresearch.com.au">gaamanagement@biosisresearch.com.au</a>		
Telephone	(03) 9646 9499	Fax	(03) 9646 9242
GAA Contract Manager	Bill Vasiliadis		
ISBN Number	978-1-921747-30-4		

This document is approved for release	Organisation		
	Growth Areas Authority		
	 ..... Director, Policy and Strategy		
	Date: ..... 15 ..... / ..... 01 ..... / ..... 10 .....		
	Department of Sustainability and Environment		
	 ..... Director, Ecosystem Services:		
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		Date	Verifier
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Survey Period	Start	October 2008	Matt Dell
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Vegetation Assessment Surveys completed in accordance with DSE's Vegetation Quality Assessment Manual Version 1.3 (2004)		February 2009	Matt Dell
Mapping completed to agreed standards		June 2009	Matt Dell
Data authenticated by DSE		July 2009	Simon Denby
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- Steve Dunn
- Ken King

### Department of Sustainability and Environment

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- Sheri Burmeister
- Kim Lowe
- Access to ecological databases (Flora Information System, Atlas of Victorian Wildlife)
- Provision of finalised GIS layers

### Biosis Research

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- Tim Wills (GHD) for field assessments of the Melton/Wyndham Investigation Area
- Zoë Hall (GHD) for field assessments of the Melton/Wyndham Investigation Area

## ABBREVIATIONS

AVW	Atlas of Victorian Wildlife – 2007 version
DSE	Department of Sustainability & Environment (formerly NRE)
DPI	Department of Primary Industry (formerly NRE)
EPBC	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EVC	Ecological Vegetation Class
FFG	<i>Flora and Fauna Guarantee Act 1988</i>
FIS	Flora Information System – 2007 version
IUCN	International Union for the Conservation of Nature
NRE	Department of Natural Resources & Environment (now DSE)



# CONTENTS

<b>ACKNOWLEDGMENTS</b> .....	<b>III</b>
<b>ABBREVIATIONS</b> .....	<b>III</b>
<b>CONTENTS</b> .....	<b>IV</b>
<b>BIODIVERSITY REPORT OVERVIEW</b> .....	<b>VI</b>
<b>PART 1</b> .....	<b>VII</b>
1.0 <b>BACKGROUND AND PURPOSE</b> .....	<b>VII</b>
1.1 Project Scope .....	vii
1.2 Amended Project Scope.....	ix
2.0 <b>SPECIFICATIONS AND MANAGEMENT</b> .....	<b>IX</b>
2.1 Tenders and Contractor Selection .....	ix
2.2 Training of Contractors .....	x
2.3 Access and Landowner Communications .....	xi
2.4 Access to Existing Reports/Databases .....	xi
2.5 DSE Quality Assurance Arrangements .....	xii
2.6 Project Governance .....	xii
2.7 Monthly Reporting .....	xii
<b>PART 2</b> .....	<b>XIII</b>
<b>EXECUTIVE SUMMARY</b> .....	<b>XIII</b>
1.0 <b>INTRODUCTION</b> .....	<b>1</b>
1.1 Project Background.....	1
1.2 Aims .....	1
1.3 Section H.....	2
2.0 <b>METHODS</b> .....	<b>3</b>
2.1 Taxonomy .....	3
2.2 Literature and Database Review .....	3
2.3 Vegetation Assessments .....	3
2.4 Reconnaissance Field Survey .....	4
2.5 Mapping .....	5
2.6 Rare or Threatened species.....	5
2.7 Conservation Significance.....	5
2.8 Defining Key Areas .....	6
2.9 Limitations .....	8
3.0 <b>RESULTS</b> .....	<b>11</b>
3.1 Flora Species.....	11
3.2 Ecological Vegetation Classes.....	11
3.3 Scattered Trees .....	14
3.4 Degraded Treeless Vegetation .....	15
3.5 Reconnaissance Level Survey .....	15
3.6 Vegetation Quality Assessment .....	15



3.7	Significant Flora Species .....	17
3.8	Significant Fauna Species .....	18
3.9	Significant Vegetation Communities .....	19
4.0	<b>BIODIVERSITY LEGISLATION AND GOVERNMENT POLICY.....</b>	<b>20</b>
4.1	Commonwealth .....	20
4.2	State .....	22
4.3	Local .....	27
5.0	<b>KEY ECOLOGICAL AREAS.....</b>	<b>29</b>
5.1	Key Ecological Areas .....	29
5.2	Reconnaissance Survey Key Areas.....	30
6.0	<b>CONCLUSIONS .....</b>	<b>32</b>
	<b>FIGURES.....</b>	<b>33</b>
	<b>APPENDICES.....</b>	<b>50</b>
	<b>APPENDIX 1.....</b>	<b>51</b>
	DSE Vegetation Assessment Methodology .....	51
	<b>APPENDIX 2.....</b>	<b>52</b>
	Section H Flora results .....	52
	<b>APPENDIX 3.....</b>	<b>70</b>
	EVC Benchmarks .....	70
	<b>APPENDIX 4.....</b>	<b>81</b>
	Results Summary Tables .....	81
	<b>APPENDIX 5.....</b>	<b>87</b>
	Significant Fauna Results .....	87
	<b>REFERENCES .....</b>	<b>89</b>

## **FIGURES**

Figure 1: Melton/Wyndham Investigation Area and Section H Context Map.....	34
Figure 2: The distribution of native vegetation within Section H .....	35
Figure 3: Site condition scores of Habitat Zones within Section H. ....	40
Figure 4: The conservation significance of Habitat Zones within Section H.....	44
Figure 5: National and state significant flora and fauna records in Section H. ....	49



## BIODIVERSITY REPORT OVERVIEW

This Biodiversity Report provides native vegetation and fauna habitat information on the municipality of Wyndham and the Shire of Melton. The report was prepared by Biosis Research Pty. Ltd. and commissioned by the Growth Areas Authority. Information gathered and presented in this report is intended to inform the preparation of Precinct Structure Plans and Native Vegetation Precinct Plans for this area in the possible future.

The assessment surveys were conducted by Biosis Research between October 2008 and May 2009. The survey methodologies used in preparation of this report are in accordance with guidelines and training provided by the Department of Sustainability and Environment (Victoria). Any limitations to the report or to the application of its findings are outlined in Part 2 - Section 2.9 of this report.



# PART 1

## Synopsis by the Growth Area Authority

### 1.0 BACKGROUND AND PURPOSE

#### 1.1 Project Scope

The Growth Area Authority (GAA) engaged contractors during 2008/2009 to map and assess native vegetation and fauna habitat in designated Precinct Structure Plan areas surrounding Melbourne (Figure 1). The scope and design of this project was developed jointly with the Department of Sustainability and Environment (DSE). The purpose of this mapping and assessing was to:

- Prepare biodiversity reports as essential background input into precinct structure planning at an early stage in the planning process;
- Inform the preparation of precinct structure plans in areas designated for future urban development (in most cases this will also include preparation of a Native Vegetation Precinct Plan)
- The identification of priorities for protection and enhancement of biodiversity including potential reserve areas, biodiversity corridors and areas with potential to provide offsets for vegetation lost as a result of urban development; and
- Long term planning related to infrastructure including liaison with relevant service authorities to ensure their requirements are met over the next 30 to 50 years.

This new approach focuses on achieving the objectives of the Victorian Native Vegetation Framework and planning development within the Urban Growth Zone at a regional level. This approach will improve the clarity and flexibility of native vegetation management, reduce the administrative burden on local government, provide greater certainty for urban development and improve biodiversity outcomes.

The mapping and assessment undertaken as part of this project has been undertaken in sufficient detail and of a sufficient standard to be used for the preparation of Native Vegetation Precinct Plans and Precinct Structure Plans.

The contractors assessed and mapped vegetation outside the existing precinct planning areas inside the Urban Growth Boundary (UGB). Contractors were required to submit a GIS data layer of all site assessments, together with other site



information and observations on a monthly basis. The site assessments included:

- The extent of native and non-native vegetation;
- Mapped polygons of sites / zones;
- Confirmation of the native vegetation type (EVC);
- Native vegetation condition assessment (Habitat Hectares site and landscape context score) and other site attributes including land use, dominant weeds etc.;
- The species, size (small, medium, large) and location of all remnant indigenous trees (either as patches or individual trees when scattered in the landscape);
- The location of all observed rare or threatened plants or observed native flora; and
- The location of all observed rare or threatened native fauna or habitat and land use features for fauna.

The outputs of the Vegetation and Fauna Assessment and Mapping project will include 2 parts, Part A and Part B:

- PART A: Vegetation condition/Rare or Threatened Flora species/Habitat and Land Use Features; and
- PART B: Fauna Surveys

After consideration of the maps, information and records collected in Part A above and existing fauna data and mapping provided by DSE, GAA in consultation with DSE proposed to identify Study Sites for a general assessment of fauna and habitats. This original approach to fauna surveys was amended through negotiation and agreement with DSE to a targeted approach to survey for significant species. The specifications for these surveys are outlined in Appendix 1.

The priority for fauna surveys during 2008 / 2009 was to assess areas associated with the next group of precinct structure plans; including PSP numbers 10, 13, 16, 23, 25, 26, 37, & 40 (total area 6796 hectares).

This report provides a more detailed analysis of the results obtained through the vegetation mapping undertaken by Biosis Research Pty. Ltd. in the Melton/Wyndham Investigation area. To assist in analysis and presentation of the data, the GAA have split the Melton/Wyndham Investigation area into eight key sections based on likely future precinct areas. As such, the results of the vegetation mapping assessment are documented in eight stand-alone reports, each covering a different section of this broader area (Figure 1). This report

focuses on one of these sections: Section H (Figure 1).

## **1.2 Amended Project Scope**

The GAA became aware that the State Government was preparing to commission other major transport infrastructure projects and to plan for the future growth of Melbourne. All these proposed projects were within or in close proximity to the GAA study areas and required assessment and mapping of vegetation and fauna. GAA staff negotiated with the Department's responsible for these projects for them to use the established GAA contract and project arrangements to obtain the vegetation and fauna information for their projects.

Additional PSP areas (PSP number 11 and 4) were contracted to be assessed in 2008 for the extent and quality of native vegetation. PSP 4 was later withdrawn (late Nov 2008) as the surveys had been commissioned by City of Cardinia.

The outputs of the vegetation, fauna assessment and mapping project will also provide some of the vegetation and fauna data for four key Government projects:

1. Investigation to plan for the future growth of Melbourne;
2. Regional Rail Link between West Werribee and Southern Cross via Tarneit and Sunshine;
3. Outer Metropolitan Ring Transport Corridor Reservation Project; and
4. Ensuring critical grasslands are protected as the State Government is committed to the creation of two large areas as grassland protected areas.

Only Project No. 2 (above) directly involved existing PSP areas. The results for these projects will be reported in separate reports being prepared for each Project.

## **2.0 SPECIFICATIONS AND MANAGEMENT**

### **2.1 Tenders and Contractor Selection**

The Request for Tender was prepared by Growth Areas Authority jointly with the Department of Sustainability and Environment to ensure that the survey methodologies and all data collected and recorded as part of the project complied with Departmental standards. The Request for Tender was advertised in the Herald – Sun and on the VicTender web site on the 23<sup>rd</sup> July 2008.



The Tenders were assessed against the Evaluation Criteria and four Contracts were awarded on the 26<sup>th</sup> August 2008 for Part A (Vegetation condition/Rare or Threatened Flora species/Habitat attributes and Land Use Features). Two Contracts were also awarded for Part B (Fauna Surveys).

### **2.1.1 Vegetation Condition Assessment and Mapping**

Each contractor used a GPS to map habitat zones (as described in Vegetation Quality Assessment Manual Version 1.3 DSE 2004) within the assigned study sites. Habitat zones were mapped across all vegetation, regardless of whether it was native vegetation.

Contractors also identified the Ecological Vegetation Class (EVC) of each mapped habitat zone and conducted a habitat hectare assessment using 'Habitat Hectares for Arc Pad'. Each contractor recorded land use, other habitat features and dominant weed species at each zone. DSE supplied each contractor with 'Habitat Hectares for Arc Pad' which was used when mapping and undertaking habitat hectare assessments.

Contractors undertook a 30 minute assessment to identify and (using a GPS) record (i) all Victorian rare or threatened species (VROTS) and; (ii) any habitat features for native fauna. A count or estimate of the number of individual VROTS was provided at each recorded point location. DSE provided an assessment sheet for recording habitat and land use features for fauna likely to be present in the study area including hollow logs, tree hollows, litter, rocks and rock walls. This assessment sheet was also made available to load onto PDAs and these land use and habitat attributes were recorded for all properties that have been assessed and mapped.

For scattered trees, contractors identified and recorded the location of all individual indigenous trees encountered within any habitat zone, including the species, diameter at breast height and assessment to determine ecological/ habitat significance.

### **2.1.2 Targeted Fauna Surveys**

No targeted fauna surveys were undertaken by Biosis Research Pty. Ltd. for significant fauna species in these investigation areas.

## **2.2 Training of Contractors**

The GAA and DSE provided a mandatory (3 day) training course in the assessment methods and tools. The dates for this training course were 27, 28 & 29 August 2008. This included Habitat Hectares assessments and mapping (to ensure the method is being applied in a consistent manner), use of the

Habitat Hectares for Arc Pad software, other data collection requirements, OH&S and landowner engagement

Staffs of contractors were trained in field situations in Native Vegetation assessment by DSE using the habitat hectare assessment methodology and the use of hand held GPS devices loaded with Arc View software provided by DSE.

## **2.3 Access and Landowner Communications**

GAA developed procedures for access to properties and protocols for contact with landowners. Contractors were provided with GAA authorised identification documentation to be carried by all staff whilst undertaking field surveys. The GAA assisted in the engagement of landowners in the process and facilitated access to properties to undertake site assessments.

A letter explaining the mapping project and requesting access to properties was sent to each landowner and occupier. Fact sheets explaining precinct structure planning and the vegetation mapping project were also forwarded with the letter to landowners. Land owners were given the choice to make contact with the respective contractor to arrange access to their property. Contractors also spent considerable resources in making contact with land owners and arranging site visits. A small number of landowners refused to provide access to their properties and in some cases the land owner data base did not lead to any contact being made with the land owner or occupier. Contractors provided regular updates as to which landowners had denied the contractor access to their property to conduct a survey.

In cases where access to a property has not been possible, mapping in this report will show the DSE modelled data layer of information and the contractors confirmation of this by a 'drive by' assessment. While this is not ground survey results it provides an indication of likely vegetation and habitat. In some cases, finalisation of the precinct structure plan and /or native vegetation precinct plan will require additional on ground assessment surveys to be undertaken at these properties.

## **2.4 Access to Existing Reports/Databases**

In some parts of the precinct planning areas flora and/or fauna surveys had been previously arranged by landowners, councils or property developers. The GAA, where possible, sought access to these reports and provided a copy to the relevant contractor. DSE staff also provided copies of reports that they knew existed for some of these areas.



Contractors were provided with a copy of or access to the DSE corporate flora and fauna databases e.g. Atlas of Victorian Wildlife / Flora Information System / Aerial photography. Access to landowner and property information was arranged through the DSE and in some cases a contractor was engaged to compile a telephone contact database to enable contractors to contact property owners.

## **2.5 DSE Quality Assurance Arrangements**

Field surveys were undertaken by qualified and experienced botanists and ecologists who had participated in the training provided by the DSE as part of this project. DSE also undertook quality assurance site visits with the contractors to ensure that the assessment methodology was being applied in a consistent manner.

Contractors provided monthly reports to the GAA contract manager including an account of hectares assessed and the data collected. The GAA undertook a check of GIS integrity and then arranged for DSE to check the data for its biological integrity.

Audits of the data files were conducted by DSE to ensure that the records conformed to DSE standards and that all attributes had been recorded accurately. Any deficiencies were reported to each contractor for correction and improvement prior to acceptance of the results and finalisation of payments.

## **2.6 Project Governance**

A Native Vegetation Project Control Group was established by the GAA and the Group initially included the GAA and DSE representatives. The Project Control Group has met regularly since the project commenced.

Representatives of VicRoads and Department of Transport were invited to join the Project Control Group when it was decided that the GAA contracts would be used to undertake the assessment and data gathering for their road and rail project. The Department of Transport also arranged for their project manager (Maunsell AECOM) to attend the meetings.

## **2.7 Monthly Reporting**

Monthly updates and data files were provided on the progress of the assessments along with the contractor's updated project plan to ensure completion of the planned extent of assessment/mapping within the time period provided for the assessment. Initially the assessments were to be completed by the end of December 2008 but the GAA negotiated with contractors to extend the survey deadline into early 2009 to maximise the areas assessed and mapped.

# PART 2

## Flora Assessment and Mapping

Completed by Bioisis Research Pty. Ltd

### EXECUTIVE SUMMARY

Biosis Research was commissioned by the Growth Areas Authority (GAA) to map and assess native vegetation within the Melton/Wyndham Investigation Area west of Melbourne (Figure i). The field assessments were undertaken between October and March on all properties within the Melton/Wyndham Investigation Area where owner permission to access the lands was able to be obtained. Subsequent reconnaissance level surveys to provide additional information were undertaken from public access points (mainly roads) for the remaining properties within the Melton/Wyndham Investigation Area in May 2009.

With a view to analysing and presenting the data captured during these assessments, the GAA have split the Melton/Wyndham Investigation area into eight key sections based on likely future precinct areas. This report covers Section H, which is located in the Melton Shire and is bound to the north by private property south of Beattys Road, to the south by the Western Highway, to the west by private property and to the east by Clarke Road (Figure i).

#### Provision of Access

Section H covers an area of 1233 ha, and of this roughly 666 ha or 54% of private land within Section H was inspected and subject to a habitat hectare assessment (referred to as the Melton/Wyndham Investigation). The remaining 46% of the area was subject to a reconnaissance level field survey only.

#### Ecological Vegetation Classes

Prior to European settlement most of Section H supported the Ecological Vegetation Class (EVC) Plains Grassland (EVC 132), which is listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as the critically endangered community *Natural Temperate Grassland of the Victorian Volcanic Plain*. Despite over two centuries of farming and urban development, remnants of native vegetation are present within Section H.

Four EVCs (one with two communities), *Low-rainfall* Plains Grassland (EVC 132-63), *Heavier-soils* Plains Grassland (EVC 132-61), Escarpment Shrubland (EVC 895), Lignum Swamp (EVC 104) and Creekline Grassy Woodland



(EVC 68), were recorded within Section H during the Melton/Wyndham Investigation.

### Significant Species

One nationally significant flora species, Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens* (critically endangered) was recorded during the current assessment and has been previously recorded in Section H on the FIS database. One additional species, River Swamp Wallaby-grass *Amphibromus fluitans* has been recorded within Section H on the FIS. No nationally significant fauna species were recorded during the current assessment, however two species Striped Legless Lizard *Delma impar* (vulnerable) and Growling Grass Frog *Litoria raniformis* (vulnerable) have been previously recorded from Section H. An important population of Growling Grass Frog occurs along Kororoit Creek within this section.

Two flora species of state significance, Narrow Goodenia *Goodenia macbarronii* and Arching Flax-lily *Dianella* sp. aff. *longifolia* (Benambra), were recorded within Section H during the current assessment. One further species of state significance, Proud Diuris *Diuris X fastidiosa* has been previously recorded within Section H on the FIS. No fauna species of state significance were recorded within Section H during the current assessment, however five species, Brolga *Grus rubicunda*, Red-chested Button Quail *Turnix pyrrhothorax*, Royal Spoonbill *Platalea regia* Eastern Great Egret *Ardea modesta* and Black Falcon *Falco subniger* have records from Section H in the AVW or BA databases.

### Vegetation Quality Assessment (Melton/Wyndham Investigation)

Of the 666 ha within Section H assessed during the Melton/Wyndham Investigation, a total of **156.22 ha** of indigenous vegetation (45 patches) were recorded.

The 156.22 ha of indigenous vegetation present equate to 4.16 habitat hectares of Low-rainfall Plains Grassland, 74.21 habitat hectares of Heavier-Soils Plains Grassland, 0.09 habitat hectares of Escarpment Shrubland, 2.26 habitat hectares of Lignum Swamp and 0.51 habitat hectares of Creekline Grassy Woodland. Therefore, a total of **81.23 habitat hectares** are present within the 666 ha assessed during the Melton/Wyndham investigation.

### Reconnaissance Survey

Approximately 15 blocks (totalling approximately 260 ha) were identified as *Highly Likely Native Vegetation - Grassy* during the reconnaissance survey (Figure 2). Most of these areas were observed to support broad areas of Plains Grassland dominated by Kangaroo Grass and are likely to be mainly

primary grassland of Very High conservation significance. A further 95 hectares (approximately) were identified as *Possible Native Vegetation*. The remaining area (approximately 210 ha) was considered likely to support less than 25% indigenous vegetation projective foliage cover (excluding bare ground). These areas were mapped as *No Native Vegetation* and are likely to be areas of Degraded Treeless Vegetation (Figure ii).

### **Government legislation and policy**

All sections of the Melton/Wyndham Investigation Area (including Section H) support matters of NES which would trigger the EPBC Act. In response to this the GAA has engaged with DEWHA to conduct a strategic assessment process in relation to the entire Melton/Wyndham Investigation Area. At the time of the field assessment and report preparation for the current assessment, the strategic assessment was in the process of being prepared, hence the outcome of the strategic assessment had not been agreed to by the Commonwealth Government.

A planning permit to remove native vegetation would typically be required under the Melton Shire Planning Scheme (Clause 52.17). However, it will be possible that some or all of Section H will be subject to a Native Vegetation Precinct Plan (NVPP) (Clause 52.16) which would negate the need for a permit under Clause 52.17 (or other relevant clause), if removal is in line with the NVPP.

A permit will be required from DSE under the Victorian *Flora and Fauna Guarantee Act 1988* to remove protected flora from public land within Section H.

Potential losses of native vegetation associated with any development of Section H will be subject to the guidelines provided by Victoria's Native Vegetation Management Framework (Net Gain policy).

### **Key Ecological Areas**

Vegetation mapping undertaken during the Melton/Wyndham Investigation identified four Key Ecological Areas (Key Areas) within Section H, totalling approximately 106 ha. These are concentrated in the south-eastern corner of Section H, with scattered sections in the central north of the section (Figure ii).

In addition to ecological values such as presence of significant species and listed communities, these Key Areas provide landscape stepping stones between other remnants of Plains Grassland. They contribute to landscape linkages between larger areas of unassessed vegetation in close proximity to assessed areas, which are also considered likely to support additional areas of these endangered EVCs.

The Key Areas within Section H have been variously modified, however all consist of more than 10 ha of contiguous native vegetation of Very High conservation significance. Ecological Vegetation Classes present include

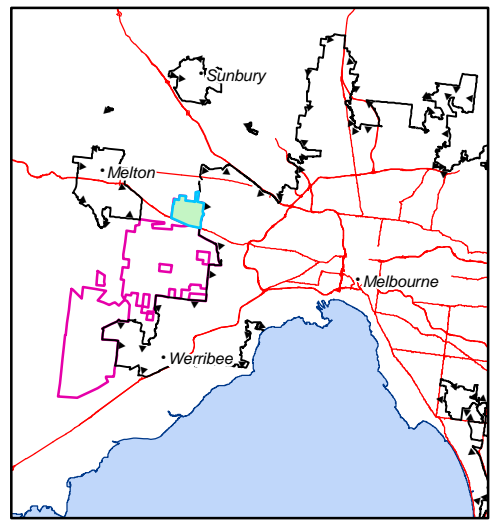
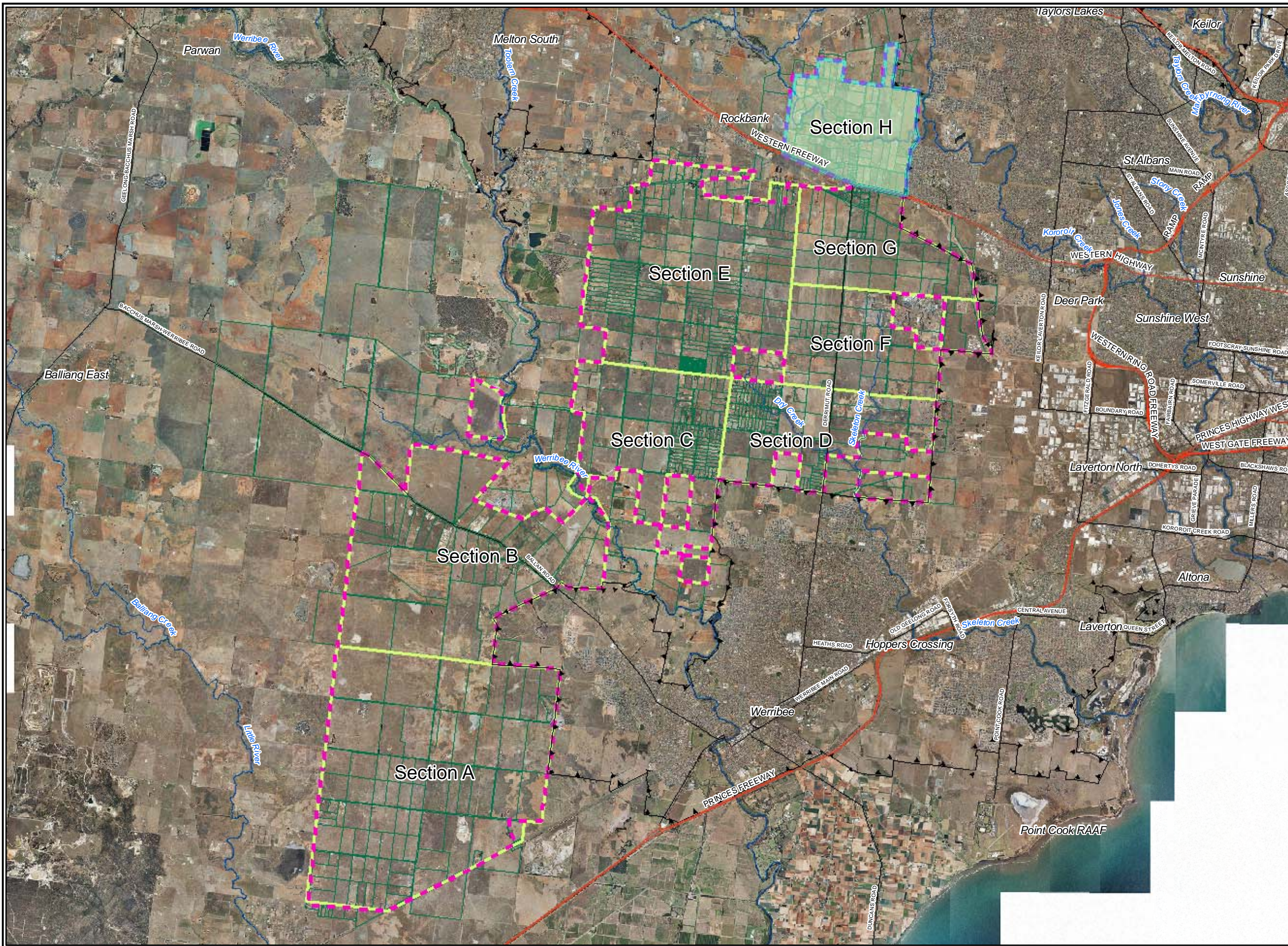


*Low-rainfall* Plains Grassland and *Heavier-soils* Plains Grassland. In addition to ecological values such as presence of significant species and listed communities, these Key Areas provide some of the best examples of Heavier-soils Plains-grassland in the Melton/Wyndham Investigation Area. There are numerous listed threatened species present in these Key Areas and surrounding Management Zones (which are largely made up of Highly Likely Native Vegetation areas known to contain native vegetation values) and provide an excellent example of the critically endangered *Natural Temperate Grassland of the Victorian Volcanic Plain*.

## Conclusions

The areas assessed within Section H as part of the Melton/Wyndham Investigation contain a significant area of native vegetation, comprising the endangered EVCs *Low-rainfall* Plains Grassland, *Heavier-soils* Plains Grassland, Escarpment Shrubland, Creekline Grassy Woodland and Lignum Swamp, as well as the EPBC Act listed ecological community *Natural Temperate Grassland of the Victorian Volcanic Plain*. Four Key Ecological Areas of Very High conservation significance have been identified within Section H, based on their conservation significance, size, habitat for threatened species and habitat connectivity values. Some of these areas are considered to provide the best quality examples of Heavier-soils Plains Grassland within the Melton/Wyndham Investigation Area. Identification of these Key Areas provides opportunities for the precinct planning process to consider and implement the 3-step process of avoid, minimise and offset.





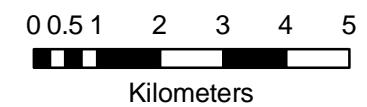
**Legend**

- Section H
- Urban Growth Boundary
- Melton/Wyndham Investigation Area
- Section boundary
- Parcels

**Figure i: Location of Section H within the Melton/Wyndham Investigation Area.**

Date: 2 June 2009  
 Checked by: NHF  
 Drawn by: SKM  
 File number: 7813

Location: ...7813\Mapping\Section H\7813 Section H Fig i.mxd



Biosis Research Pty. Ltd.  
 38 Bertie Street  
 (PO Box 489)  
 Port Melbourne  
 VICTORIA 3207

Offices also in:  
 Ballarat, Sydney,  
 Wollongong, Queanbeyan, Wangaratta



# 1.0 INTRODUCTION

## 1.1 Project Background

Biosis Research Pty. Ltd. was commissioned by the Growth Areas Authority (GAA) to map and assess native vegetation within the Melton/Wyndham Investigation Area west of Melbourne (Figure 1). The purpose of this mapping was to inform the preparation of precinct structure plans in areas designated for future urban development.

The biodiversity information collected as part of our investigations will be used to inform the Government's review of the Urban Growth Boundary (UGB) and Urban Growth Zone (UGZ) to the west of Melbourne.

In March 2009, Biosis Research produced the *Background Technical Report 2c: Biodiversity; Assessment of the Investigation Area in Melbourne's West*. This report covered two main areas known as the Melton Desktop Area (east of Melton, west of Sydenham, south of Mount Kororoit and north of Mount Atkinson) and the Vegetation Assessment Areas (incorporates the Melton/Wyndham Investigation Area shown in Figure 1 as well as an additional area to the west). Biosis Research (2009) referred to these areas collectively as the GAA Investigation Area. The report aimed to assess biodiversity constraints in the GAA Investigation Area and provide broad-scale recommendations for areas of retention priority.

The current report aims to provide a more detailed analysis of the results obtained through the vegetation mapping undertaken by Biosis Research in the Melton/Wyndham Investigation area. To assist in analysis and presentation of the data, the GAA have split the Melton/Wyndham Investigation area into eight key sections based on likely future precinct areas. As such, the results of the vegetation mapping assessment are documented in eight stand-alone reports, each covering a different section of this broader area (Figure 1). This report focuses on one of these sections: Section H (Figure 1).

## 1.2 Aims

The objectives of the study are to:

- Document the biodiversity values within each section of the Melton/Wyndham Investigation Area identified by the vegetation mapping project;
- Analyse the data to determine key areas of vegetation/habitat; and



- Present the habitat hectare and large old tree data collected.

These objectives will be achieved by:

- Providing a consolidated species list of flora and fauna recorded during the mapping project and augment these with database records provided by database searches within 5 km of each section;
- Mapping Ecological Vegetation Classes (EVCs) using field data collected from the Melton/Wyndham Investigation Area;
- Assigning a conservation significance to all patches of native vegetation, as per Appendix 3 of the Native Vegetation Framework (NRE 2002 – the Framework);
- Identifying the limitations of the current assessment.

## 1.3 Section H

Section H is located at the north eastern end of the broader Melton/Wyndham Investigation Area on the western fringe of Melbourne (Figure 1). Section H covers an area of 1233 ha and is within the Victorian Volcanic Plain bioregion. It is bounded to the north by private property south of Beattys Road, to the south by the Western Highway, by private property to the west and by Clarke Road to the east. It includes no major roads, but is dissected by Kororoit Creek and associated tributaries.

The topography is generally flat to gently undulating, resulting from lava flows of the late Tertiary–early Quaternary periods (Collie Margules 1990).

## 2.0 METHODS

### 2.1 Taxonomy

Common and scientific names for flora and fauna follow the Flora Information System (FIS 2007 version) and the Atlas of Victorian Wildlife (AVW 2007 version) which are curated by DSE.

Classification of native vegetation in Victoria follows a typology developed by DSE in which Ecological Vegetation Classes (EVCs) are the primary level of classification. An EVC contains one or more plant (floristic) communities, and represents a grouping of broadly similar environments ([www.dse.vic.gov.au](http://www.dse.vic.gov.au)).

### 2.2 Literature and Database Review

Information in the FIS and AVW databases was reviewed and a search of the Birds Australia database (1998–2008) was undertaken. The Department of the Environment, Water, Heritage and the Arts (DEWHA) online database for the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act Protected Matters Search Tool, hereafter referred to as the DEWHA database) was searched. The current distribution (2005) and 1750 EVCs (DSE mapping of native vegetation present at these dates) present within each section of the Melton/Wyndham Investigation Area and their bioregional conservation status was reviewed ([www.dse.vic.gov.au](http://www.dse.vic.gov.au)).

### 2.3 Vegetation Assessments

Field assessments were undertaken on 7, 9, 16, 20, 27–31 October 2008; 3, 6, 14, 18 November 2008; 13, 20, 22 January 2009 and 18 February 2009 (17 days). Some additional days between this period were spent undertaking reconnaissance of the study area and other field tasks required for planning and quality assurance of data being collected in the field.

The presence of native vegetation within the Melton/Wyndham Investigation Area (including Section H) was determined by field inspection. Access details for private property within these areas were provided by the GAA. Where possible, land owners were contacted and permission obtained to inspect each property. Initially no inspections were conducted without land owner approval and roughly **620 ha** of land were inspected in this manner. However, where access was denied, right to forced access was obtained in some instances and about **46 ha** were accessed in this manner. In total, therefore, roughly **666 ha** (54% of private land within Section H) were inspected and subject to a habitat

hectare assessment.

The vegetation of each property within the Melton/Wyndham Investigation Area was inspected by vehicle and on foot by up to three teams of two botanists between October 2008 and February 2009. Where access was denied or contact was unable to be made with the listed owner of a parcel of land, incidental observations were made from all available access points including where permitted access was available. During reconnaissance level surveys undertaken in May 2009, these observations were recorded in four main categories: highly likely native vegetation, possible native vegetation, wetland habitat or no native vegetation (See Section 2.4 for more detail).

The inspection of each property where access was permitted focused on delineating the extent of areas definable as a patch of native vegetation. A patch is defined by DSE (2007a) as an area where at least 25% of the total understorey plant cover is native (excluding bare ground). For each patch identified, a habitat hectare assessment was conducted and habitat score calculated. A summary of this method is provided in Appendix 1.

All areas that did not meet the 25% threshold were mapped as Degraded Treeless Vegetation. Typically this included cropped sites, cultivated areas sown with exotic pasture species and other areas dominated by introduced species. Seasonal wetlands are an exception to this as they are not generally dominated by native species when dry. Seasonally inundated wetlands are allocated a default habitat score as outlined by DSE (2007a). Vegetation quality was assessed within each accessed property using a standard method contained in a manual published by the Department of Sustainability and Environment (DSE 2004).

Indigenous canopy trees were also assessed and mapped in accordance with the Framework (NRE 2002). For scattered trees, contractors identified and recorded the location of all individual indigenous trees encountered within any habitat zone, including the species, diameter at breast height and assessment to determine ecological/ habitat significance

## **2.4 Reconnaissance Field Survey**

A number of properties within Section H were not accessed during the Melton/Wyndham Investigation because of lack of available access, namely due to denial of access by landowners that were able to be contacted or incorrect contact details for remaining landowners. The presence of native vegetation within areas that were not able to be accessed was subsequently assessed using limited on-ground (reconnaissance) field survey informed by DSE's Native Vegetation Modelling (NVE 2005), mapping data from previous Biosis Research

assessments and other available reports, together with an analysis of recent aerial photography (January 2008).

Reconnaissance field survey for the Melton/Wyndham Investigation Area (including Section H) was carried out over three days in May 2009, in order to fill in knowledge gaps. Access was limited to roadsides.

The likely occurrence of native vegetation within these unsurveyed areas was split into one of six categories:

- *Highly Likely Native Vegetation - Grassy*
- *Highly Likely Native Vegetation - Structurally Modified*
- *Highly Likely Native Vegetation - Woody*
- *Possible Native Vegetation*
- *Wetland Habitat*
- *No Native Vegetation*

## 2.5 Mapping

Mapping data collected are displayed at a scale of 1:10,000. While all areas of native vegetation were considered in line with the DSE requirements for this project, no minimum area of native vegetation to be mapped was defined. Patches of native vegetation were delineated at the discretion of field staff to define the location of any significant features.

## 2.6 Rare or Threatened species

Information on any populations of rare or threatened species (FIS 2007, DSE 2007b) observed during property site inspections were also recorded during the Melton/Wyndham Investigation field assessments. Data collected included a GPS waypoint, estimated distribution and estimated population size. However, no systematic survey was conducted for any threatened species.

## 2.7 Conservation Significance

The Framework (NRE 2002) defines conservation significance (Very High, High, Medium and Low) that relates to the bioregional level only. The primary measure used for determining the conservation significance of a patch of native vegetation as defined by the Framework is the Habitat Score. As all EVCs within the broader Melton/Wyndham Investigation Area (including Section H) are rated as endangered (except for Cane Grass Wetland EVC 291 which is rated as vulnerable) all patches of native vegetation within the Melton/Wyndham



Investigation Area are rated to be at least of High conservation significance. Any patches with a Habitat Score of 40/100 or more have Very High conservation significance.

DSE have stipulated that consultants should utilise the Landscape Context Modelling Data layer (NV2005\_QUAL\_CSDL DSE 2003) provided in the Biodiversity Interactive Map 2.0 (<http://nremap-sc.nre.vic.gov.au/MapShare.v2/imf.jsp?site=bim> external) to assign landscape scores for each patch of native vegetation within the Melton/Wyndham Investigation Area. The legend in the Biodiversity Interactive Map qualifies the dataset by stating that “*datasets must be used with care, given their modelled nature. They are designed for use at a large scale (1:25,000 to 1:100,000) and are not intended to be used at a site or property scale*”. To ensure that the Habitat Score for each patch could accurately be applied to determine conservation significance landscape scores were reviewed on a patch scale and revised where appropriate based on ground-truthed knowledge.

The second measure used for determining the conservation significance of a patch of native vegetation as defined by the Framework is the presence of the best 50% of habitat for a threatened species (NRE 2002: Appendix 3). Criteria for determining the presence of such habitat are described by DSE (2007a: Table 2). Where a patch of native vegetation was not determined to be of Very High conservation significance based on its condition, all available data on the presence of threatened species were used to determine if that patch represented the best 50% of habitat for a threatened species.

A third measure used for determining the conservation significance of a patch of native vegetation as defined by the Framework is the presence of other attributes as defined by NRE (2002: Appendix 3). Where a patch of native vegetation was not already determined as Very High conservation significance because of its condition or the presence of the best 50% of threatened species habitat, the site was assessed for the presence of these other attributes.

## 2.8 Defining Key Areas

The future proposed land use within Section H may result in significant impacts to existing biodiversity values by (amongst other factors):

- the permanent removal of some native species and their habitats;
- the division of native species populations into genetically and geographically isolated smaller populations;
- changes to wildlife behaviour;

- disturbance to soil; and
- landscape level changes to water supply, movement and quality.

A number of aspects were considered when determining how Key Areas within the Melton/Wyndham Investigation Area should be defined. It is important that biodiversity values within Key Areas should be viable in the long term and that more mobile species, particularly rare or threatened species should have access to a network of suitable environments connected through a series of habitat corridors. Designation of Key Areas based on these concepts will minimise the risks of extinction during extreme environmental conditions such as fire and drought, or in association with future climate change.

The Victorian Volcanic Plain supports nationally significant values such as Natural Temperate Grasslands, Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens* and Golden Sun Moth *Synemon plana* (listed as critically endangered), Grassland Earless Dragon *Tympanocryptis pinguicolla* and Swift Parrot *Lathamus discolor* (listed as endangered), Striped Legless Lizard *Delma impar*, Plains-wanderer *Pedionomus torquatus*, Australian Painted Snipe *Rostratula australis*, Large-fruit Fireweed *Senecio macrocarpus*, River Swamp Wallaby-grass *Amphibromus fluitans* and Growling Grass Frog *Litoria raniformis*. These values should remain a conservation focus of ecological reserves within the region.

With the above concepts in mind, Key Areas within the Melton/Wyndham Investigation Area were defined using the following criteria:

- Large areas (more than 10 ha) of contiguous native vegetation of Very High conservation significance;
- Areas providing habitat connectivity as either corridors or stepping stones; and
- Smaller areas (less than 10 ha) with a Site Condition score of >50 or areas that support significant populations of threatened species.

This assessment of Key Areas applies only to areas that have been subject to on-ground mapping and habitat hectare assessments as part of the original Melton/Wyndham Investigation. Areas within Section G where on-ground access was unable to be obtained have been subject to reconnaissance level surveys only, and have been excluded from the assessment of Key Areas as outlined above. It must be noted that patches of native vegetation that would meet the Key Area criteria are almost certainly present within these areas. In considering these areas decision makers should refer to the results of the reconnaissance level surveys (Figure 6) and Biosis Research (2009) which will provide some indication of likely Key Areas within the reconnaissance survey

sites.

## 2.9 Limitations

The following limitations apply to the current assessment:

1. Section H covers an area of approximately 1233 ha. Access was obtained for about 666 ha and this area was subject to site inspection and a habitat hectare assessment where relevant. The remaining 567 ha (46% of Section H) was primarily subject to a reconnaissance level assessment using existing information, aerial photo interpretation and limited ground truthing. Ground truthing was restricted to viewing areas from public access points (primarily roads). A full assessment of the ecological values of these areas was not conducted. However, this assessment can be used to identify sites that require further field assessment to satisfy environmental legislation and policy requirements.
2. The classification of native vegetation within sections of the Melton/Wyndham Investigation Area as *highly likely*, *possible* or *no native vegetation* is in relation to 'native vegetation' as per the definition of a remnant patch or scattered trees by DSE (2007a). It does not imply that sites mapped as having no native vegetation contain no scattered indigenous species, rather, that any native vegetation present is likely to be below the thresholds for assessment as a patch of native vegetation as prescribed under the Framework (NRE 2002).
3. The Melton/Wyndham Investigation Area was assessed using current DSE standards (DSE 2004). However, defining remnants (patches) of the EVC Plains Grassland using the Native Vegetation Framework (DSE 2007) does not necessarily correlate with the definition of the EPBC Act listed community *Natural Temperate Grassland of the Victorian Volcanic Plain* (NTGVVP). While the two definitions for this community generally correspond well, there are instances where grassy vegetation does not qualify as a patch of Plains Grassland, but does meet the condition thresholds for NTGVVP. While the listing of NTGVVP indicates its intent to protect the better quality examples of this community, the definition provided by EPBC Act Policy Statement 3.8 is very broad. Therefore, some areas of Degraded Treeless Vegetation within the Melton/Wyndham Investigation Area may qualify as the EPBC Act listed community. These unmapped areas of grassland were generally of lower quality examples of this community resulting from the recolonisation of cultivated sites.
4. It is important to note that significant species, both flora and fauna, can occur in areas that are not considered to support patches of native vegetation.

Examples of such species include the nationally significant Golden Sun Moth, Striped Legless Lizard, Growling Grass Frog and Spiny Rice-flower. In some circumstances, areas not definable as a patch of native vegetation can support substantial populations of these species. It is therefore important to recognise that areas of non-native vegetation may still contain biodiversity values.

5. Additional limitations are as follows:

- The assessment includes only vascular flora (ferns, conifers, flowering plants) and terrestrial vertebrate fauna (birds, mammals, reptiles, frogs), with the exception of Golden Sun Moth, which was recorded when observed. Non-vascular flora (e.g. mosses, liverworts) were not sampled although their presence is noted as part of the cover of native species in the definition of a patch.
- Note that this assessment did not include any formal fauna survey and the significance assessments provided rely on incidental observations of significant fauna and existing database records. Subsequent fauna assessments could increase the conservation significance of areas not already rated to be of Very High conservation significance.
- The presence of threatened flora and fauna were noted where they were encountered. However, such observations are likely to underestimate the distribution of these species, many of which are cryptic or only seasonally visible. Seasonal targeted surveys for threatened flora and fauna species should be conducted within relatively intact areas of native vegetation before any decisions are made as to their presence, absence or population size.
- Comprehensive flora species lists were not compiled for each property visited. While plants observed in patches of native vegetation were recorded, the objective of the assessments was to complete habitat hectare assessments, which are based on presence and cover of plant lifeforms, rather than species information. As such, some species have been recorded to genus level only.
- The assessment was conducted over a range of seasonal conditions which included both optimal and sub-optimal times for survey. As such the majority of seasonally visible species are likely to have been overlooked with a single site visit.
- Field mapping is conducted using hand-held (uncorrected) GPS units and aerial photo interpretation. The accuracy of this mapping is therefore subject to the accuracy of the GPS units (manufacturer states



+/- 15m but generally +/-2 to 5 metres) and dependent on the limitations of aerial photo resolution, rectification and registration. As such, these points should not be relied on for survey grade design purposes.

- Agricultural areas are often heavily grazed making detection and/or identification of certain species, and estimation of life form cover difficult.
- Data from other assessments are generally available from the species records (including threatened species) and defined area species lists submitted by Biosis Research and other consultants to the FIS and AVW on a regular basis. Data collected post 2007 by other consultants will not be in the database currently available to consultants which subscribe to this database.
- The presence or absence of significant native vegetation described in other reports is generally relatively old and/or is otherwise superseded by the site inspections associated with this assessment. In that context a review of the more broadly available literature covering areas of land within Section H is not seen as critical to this assessment. However, a review of literature relating to the GAA investigation areas (including Section H) can be found in Biosis Research (2009).

## 3.0 RESULTS

### 3.1 Flora Species

#### 3.1.1 Records within Section H

A total of 167 (100 indigenous and 67 introduced) plant species have been recorded from Section H (Appendix 2, Table A2.1) during the Melton/Wyndham Investigation (current assessment). The FIS contains existing records of 130 (67 indigenous species and 63 introduced) plant species within Section H. Some, but not all of these existing species were recorded during the current assessment. In total, 16 existing indigenous records were not observed during the current assessment; however an additional 50 indigenous species were recorded. Two of these additional species Narrow Goodenia *Goodenia macbarronii* and Arching Flax-lily *Dianella* sp. aff. *longifolia* (Benambra), are of State significance. Planted species have not been recorded unless they are spreading (naturalised).

#### 3.1.2 Database records

The FIS contains records of a total of 600 plant species (335 indigenous and 265 introduced) from within 5 km of Section H (Appendix 2, Table A2.2). The DEWHA database also predicts the occurrence of, or suitable habitat for an additional three listed flora species (Curly Sedge *Carex tasmanica*, Small Golden Moths *Diuris basaltica* and Maroon Leek-orchid *Prasophyllum frenchii*) within 5 km of the study area. There is no suitable habitat, or habitat is poorly represented for these species within Section H for Curly Sedge and Maroon Leek-orchid, however habitat is well represented for Small Golden Moths (Appendix 2, Table A2.3).

### 3.2 Ecological Vegetation Classes

A total of 13 EVCs (one with two communities) were recorded within the Melton/Wyndham Investigation Area:

- Plains Grassy Woodland (EVC 55)
- Floodplain Riparian Woodland (EVC 56)
- Creekline Grassy Woodland (EVC 68)
- Lignum Swamp (EVC 104)
- Plains Grassy Wetland (EVC 125)
- Heavier-soils Plains Grassland (EVC 132\_61)
- Low-rainfall Plains Grassland (EVC 132\_63)
- Cane Grass Wetland (EVC 291)

- Plains Sedgy Wetland(EVC 647)
- Stony Knoll Shrubland (EVC 649)
- Creekline Tussock Grassland (EVC 654)
- Brackish Wetland (EVC 656)
- Plains Woodland (EVC 803)
- Escarpment Shrubland (EVC 895)

DSE mapping of 1750 vegetation (a 1:100,000 scale map of vegetation as at this date) models the majority of Section H as previously supporting Plains Grassland (EVC 132) with small areas of Plains Grassy Wetland (EVC 125) and Lignum Swamp (EVC 104). The DSE 2005 EVC vegetation mapping indicates that substantial sections of the study area have been cleared but extensive areas of Plains Grassland remain within the eastern part of section H.

Section H contains a more fertile example of the Victorian Volcanic Plain vegetation in the region. This is driven by deeper more fertile soils and increased annual rainfall. The region is dominated by the drainage line of Kororoit Creek dissecting a rocky plain, with several high quality examples of Plains Grassland present. The rocky nature of this region has resulted in an historically low intensity levels of land use and as such a range of federally and state listed species are likely to be found in section H including the federally listed species Matted Flax-lily *Dianella amoena*, Button Wrinklewort *Rutidosia leptorhynchoidea* in addition to the recorded Spiny Rice-flower.

Four EVCs (one with two communities) were recorded within Section H during the Melton/Wyndham Investigation:

- Low-rainfall Plains Grassland (EVC 132-63);
- Heavier soils Plains Grassland (EVC 132-61);
- Creekline Grassy Woodland (EVC 068);
- Escarpment Shrubland (EVC 895); and
- Lignum Swamp (EVC 104).

The following general descriptions are based on data collected during this assessment.

### 3.2.1 Low-rainfall Plains Grassland

A total of 8.25 ha (4 patches) of Low-rainfall Plains Grassland was mapped in Section H. This EVC is present on cracking basalt soils in areas that receive less than 500 mm annual rainfall. The vegetation present commonly includes grass species such as, Kneed Spear-grass *Austrostipa bigeniculata*, Rough Spear-grass *Austrostipa scabra*, Rigid Panic *Whalleya proluta* and Brown-back Wallaby-grass *Austrodanthonia duttoniana*. Other common species present include Grassland Wood-sorrel *Oxalis perennans*, Lemon Beauty-heads *Calocephalus*

*citreus*, Wingless Blue-bush *Maireana enchylaenoides* and Berry Saltbush *Atriplex semibaccata*.

Introduced weed species commonly found in this EVC include Wimmera Rye-grass *Lolium rigidum*, Onion Grass *Romulea rosea*, Cat's Ear *Hypochoeris radicata*, Buck's Horn Plantain *Plantago coronopus* and scattered Chilean Needle-grass *Nassella neesiana* and Serrated Tussock *Nassella trichotoma*.

### 3.2.2 Heavier-soils Plains Grassland

A total of 140.05 ha (25 patches) of Heavier-soils Plains Grassland was mapped in Section H. This EVC occurs on deeper more fertile soils which are less subject to summer drought stress. As a result they are commonly dominated by the summer growing grass species such as Kangaroo Grass *Themeda triandra*. Examples of this EVC in Section H are relatively species rich and contain species often associated with better quality example of Plains Grassland including Scaly Buttons *Leptorhynchus squamatus*, Common everlasting *Chrysocephalum apiculatum* s.l, Spiny Rice-flower, Lemon Beauty-heads, Blue Devil *Eryngium ovinum* and Cut-leaf Goodenia *Goodenia pinnatifida*.

Introduced weed species commonly found in this EVC include Wimmera Rye-grass, Onion Grass, Cat's Ear, Buck's Horn Plantain and scattered Chilean Needle-grass, Serrated Tussock and Cocksfoot *Dactylis glomerata*.

### 3.2.3 Escarpment Shrubland

A total of 0.19 hectares (4 patches) of Escarpment Shrubland was mapped in Section H. This EVC occurs on escarpments associated with the incutting of the Kororoit creek drainage system. The tallest stratum in this example of the EVC is the shrub layer. Common shrub species include Tree Violet *Melicytus dentata*, Black Wattle *Acacia mearnsii*, Hedge Wattle *Acacia paradoxa*, Sweet Bursaria *Bursaria spinosa* and Sticky Hop-bush *Dodoanea viscosa*.

The ground layer consists of a few grasses and herbs such as Stiped Wallaby-grass *Austrodanthonia racemosa* var. *racemosa*, Weeping Grass *Microlaena stipoides*, Kidney-weed *Dichondra repens*, Kangaroo Grass and Nodding Saltbush *Einadia nutans* subsp. *nutans*.

Typical weeds include African Box-thorn *Lycium ferocissimum*, Horehound *Marrubium vulgare*, Serrated Tussock and Perennial Rye-grass *Lolium perenne*.

### 3.2.4 Creekline Grassy Woodland



A total of 2.27 hectares (7 patches) of Creekline Grassy Woodland were mapped in Section H. Much of the eucalypt canopy has been removed or modified within this EVC which still contains an occasional scattered shrub layer over a mostly grassy/sedgy to herbaceous ground layer. It occurs on low-gradient ephemeral to intermittent drainage lines, typically on fertile colluvial/alluvial soils, on a wide range of suitably fertile geological substrates. These minor drainage lines can include a range of graminoid and herbaceous species tolerant of waterlogged soils, and are presumed to have sometimes resembled a linear wetland or system of interconnected small ponds.

The overstorey is occasionally dominated by Red Gum *Eucalyptus camaldulensis*. However this is generally depleted. The ground layer is dense with grasses and sedges, most commonly Common Reed *Phragmites australis* and Marsh Club-sedge *Bolboschoenus medianus*.

Weeds typically present in Creekline Grassy Woodland include Sweet Briar *Rubus rubiginosa*, Blackberry *Rubus fruticosus* spp. agg., *Paspalum dilatatum*, Curled Dock *Rumex crispus* and Twiggy Turnip *Brassica fruticosa*.

### 3.2.5 Lignum Swamp

A total of 5.46 hectares (5 patches) of Lignum Swamp were mapped in Section H. This EVC occurs on heavy grey clays, waterlogged for much of the year but also experiencing periods of extreme dryness. It is typically dominated by an open to moderately dense shrubland of Tangled Lignum *Muehlenbeckia florulenta* with a variable understorey depending on the length and frequency of inundation and the levels of salinity.

An overstorey is absent in this section. The ground layer species include Common Tussock-grass *Poa labillardierei*, Common Nardoo *Marsilea drummondii* and Common Woodruff *Asperula conferta*.

Typical weeds include Spear Thistle *Cirsium vulgare*, Common Sow-thistle *Sonchus oleraceus*, Ox-tongue *Helminthotheca echioides*, and Serrated Tussock.

## 3.3 Scattered Trees

Outside patches of native vegetation (previous section), 1 very large, 3 large, 0 medium and 1 small locally indigenous canopy trees are present in Section H within the areas assessed as part of the Melton/Wyndham Investigation (Appendix 4, Table A4.2).

The scattered trees present within Section H are remnants of Creekline Grassy Woodland. Areas of scattered trees have been mapped as scattered tree polygons

(Figure 2). Based on these polygons, there are 0.18 hectares containing scattered trees within Section H.

Further survey of areas not accessed as part of the Melton/Wyndham investigation may reveal the presence of scattered Large Old Trees which should be considered in line with the requirements of the Framework (NRE 2002).

### 3.4 Degraded Treeless Vegetation

Degraded Treeless Vegetation is primarily composed of highly disturbed agricultural land consisting of predominantly introduced vegetation. It mainly consists of areas used for cereal crop production and as such is dominated by typical crop weed species.

Section H supports 510.64 ha of Degraded Treeless Vegetation in areas mapped during the Melton/Wyndham Investigation. These areas generally contain large amounts of bare ground with the vegetation dominated by a mix of introduced annual grasses and other herbs. Common species include Spear Thistle, Artichoke Thistle *Cynara cardunculus*, Wimmera Rye-grass, Squirrel-tail Fescue *Vulpia bromoides* and Buck's-horn Plantain.

Low quantities and cover of indigenous grasses and other herbs including Common Wallaby-grass *Austrodanthonia caespitosa*, Bristly Wallaby-grass *A. setacea*, Brown-back Wallaby-grass, Grassland Wood-sorrel, Slender Dock *Rumex brownii* and Berry Saltbush are present within this vegetation, however do not meet the thresholds to be defined as a patch of native vegetation under the Native Vegetation Framework (NRE 2002).

### 3.5 Reconnaissance Level Survey

Approximately 15 blocks (totalling approximately 260 ha) were identified as *Highly Likely Native Vegetation - Grassy* during the reconnaissance survey (Figure 2). Most of these areas were observed to support broad areas of Plains Grassland dominated by Kangaroo Grass and are likely to be mainly primary grassland of Very High conservation significance. A further 95 hectares (approximately) were identified as *Possible Native Vegetation*. The remaining area (approximately 210 ha) was considered likely to support less than 25% indigenous vegetation projective foliage cover (excluding bare ground). These areas were mapped as *No Native Vegetation* and are likely to be areas of Degraded Treeless Vegetation.

### 3.6 Vegetation Quality Assessment

The benchmark for each EVC recorded within Section H is provided in

## Appendix 3.

### 3.6.1 Vegetation in Patches

A total of 45 habitat zones (or indigenous vegetation polygons) were identified within Section H (Figure 2). Assessment criteria, scores and the overall habitat score for properties assessed, are presented in Appendix 4. Site condition scores, giving an overview of vegetation quality, are mapped in Figure 3.

Because Plains Grassland, Escarpment Shrubland and Lignum Swamp are or can be treeless, the site condition scores of these EVCs are standardised (as appropriate) to maintain the relative weighting of site condition and landscape scores (DSE 2004).

Section H contains a total of 156.22 ha of indigenous habitat zones within properties subject to assessment, which comprises **81.23 habitat hectares**. This is comprised of 4.16 habitat hectares of Low-rainfall Plains Grassland, 74.21 habitat hectares of Heavier-Soils Plains Grassland, 0.09 habitat hectares of Escarpment Shrubland, 2.26 habitat hectares of Lignum Swamp and 0.51 habitat hectares of Creekline Grassy Woodland.

No Large Old Trees were recorded in patches of native vegetation within Section H.

#### Conservation significance

The conservation significance of each polygon of native vegetation within Section H is shown in Appendix 4. Section H supports 129.91 ha (72.96 habitat hectares) of Very High conservation significance and 26.31 ha (8.27 habitat hectares) of High conservation significance vegetation (Figure 4).

### 3.6.2 Scattered Trees

As outlined in Section 3.3, a total of 1 very large, 3 large, 0 medium and 1 small locally indigenous scattered canopy trees were mapped within Section H (Appendix 4, Table A4.2). Scattered tree polygons and point locations of very large and large old trees are shown on Figure 2.

#### Conservation significance

Scattered old trees are assigned the lowest conservation significance category appropriate to the EVC to which they originally belonged, unless there are threatened species or other attributes that increase their rating (DSE 2007a p11). As remnants of Creekline Grassy Woodland provide the Best 50% of habitat for Growling Grass Frog (Kororoit Creek population), the scattered trees

within the study area have Very High conservation significance. The conservation significance of scattered tree polygons is mapped in Figure 4 and directly relates to the scattered trees conservation significance of the scattered trees contained within the polygon.

Scattered small trees within the study area are assigned a conservation significance of 'low' as there are no threatened species or other attributes that increase their rating (DSE 2007a p11).

### 3.7 Significant Flora Species

The locations of all significant flora species records (including database records) within Section H are shown on Figure 5.

#### 3.7.1 Nationally Significant Species

One flora species listed under the EPBC Act - Spiny Rice-flower - was recorded in Section H during the current assessment. This species had also been previously recorded in Section H on the FIS database. One additional species, River Swamp Wallaby-grass *Amphibromus fluitans* has been recorded within Section H on the FIS.

The FIS database contains records of five additional species of national conservation significance from within 5 km of Section H (Appendix 2). None of these species were recorded during the current assessment or in the study area on the FIS. However, four of these species (Matted Flax-lily, Sunshine Diuris *Diuris fragrantissima*, Button Wrinklewort and Large-headed Fireweed are considered to have a High likelihood of occurrence in the study area based on the habitat present. The remaining species, Clover Glycine *Glycine latrobeana* is considered to have a Medium likelihood of occurrence (Appendix 2).

The DEWHA database predicts the occurrence of, or suitable habitat for three additional species listed under the EPBC Act, Curly Sedge, Small Golden Moths and Maroon Leek-orchid. There is no suitable habitat, or habitat is poorly represented for Curly Sedge and Maroon Leek-orchid, however Small Golden Moths is considered to have a high likelihood of occurrence based on available habitat within Section H (Appendix 2).

#### 3.7.2 State Significant Species

One flora species of state significance listed under the FFG Act - Narrow Goodenia - was recorded within Section H during the current assessment. No existing records of FFG listed species are present in Section H on the FIS. One additional flora species of State Significance (DSE Advisory List), Arching Flax-lily was also identified during the current assessment and one species,

Proud Diuris *Diuris X fastidiosa* has been previously recorded within Section H on the FIS (Appendix 2).

The FIS database contains records of 14 additional species of state conservation significance from the local area (within 5 km). Due to the presence of a range of EVCs, 13 of these species (Buloke *Allocasuarina leuhmannii*, Heath Spear-grass *Austrostipa exilis*, Small Milkwort *Comesperma polygaloides*, Tough Scurf-pea *Cullen tenax*, Small Scurf-pea *Cullen parvum*, Swamp Diuris *Diuris palustris*, Austral Crane's-bill *Geranium solanderi* var. *solanderi*, Pale Swamp Everlasting *Helichrysum* aff. *rutidolepis* (Lowland Swamps), Pale Plover-daisy *Leiocarpa leptolepis*, Brackish Plains Buttercup *Ranunculus diminutus*, Fragrant Saltbush *Rhagodia parabolica*, Branching Groundsel *Senecio cunninghamii* var. *cunninghamii* and Rye Beetle-grass *Tripogon loliiformis*) are considered to have a high likelihood of occurrence based on habitat present within Section H (Appendix 2).

Some of these species, specifically the orchids Small Golden Moths and Swamp Diuris have no recent or very few records (in total) in the vicinity of the study area on the FIS. However because these species require specific conditions to emerge, are visible for only short periods of time, and are sometimes cryptic, the likelihood of occurrence within Section H is still considered to be high.

The remaining species, Bell-flower Hyacinth-orchid *Dipodium campanulatum* is considered to have a medium likelihood of occurrence based on available habitat.

## 3.8 Significant Fauna Species

The locations of all significant fauna species records (including database records) within Section H are shown on Figure 4.

### 3.8.1 Nationally Significant Species

No fauna species listed under the EPBC Act were recorded in Section H during the current assessment

The AVW has records of Striped Legless Lizard *Delma impar* (vulnerable) and Growling Grass Frog *Litoria raniformis* (vulnerable) from Section H. An important population of the latter species occurs along Kororoit Creek within Section H. The Golden Sun Moth *Synemon plana* (critically endangered) has a high likelihood of occurrence in Section H and may be found in areas of Plains Grassland and even areas of grassy Degraded Treeless Vegetation.

Eleven fauna species of national significance have been recorded from the local area in the AVW and/or BA database or are predicted to occur on the DEWHA database. These species are considered to have a medium to negligible likelihood of occurrence based on the habitat present (Appendix 5).



### 3.8.2 State Significant Species

No fauna species of state significance were recorded within Section H during the current assessment (Appendix 5).

Five species, Brolga *Grus rubicunda*, Red-chested Button Quail *Turnix pyrrhorostris*, Royal Spoonbill *Platalea regia* Eastern Great Egret *Ardea modesta* and Black Falcon *Falco subniger* have records from Section H in the AVW or BA databases. The record for Brolga dates back to 1846 and it is there is therefore a low likelihood that this species would use the study area. Remnant Plains Grassland in Section H provides good habitat for Red-chested Button-quail and Black Falcon and Kororoit Creek and its associated wetlands provide good habitat for the two waterbirds.

Eight species of state conservation significance are recorded from the local area in the AVW and/or BA database or are predicted to occur on the DEWHA database. Of these species, seven species (all waterbirds) are considered to have a high likelihood of occurrence based on available habitat within Section H (Kororoit Creek) (Appendix 5). The habitat is considered poorly represented or not present for the remaining species, White-bellied Sea-Eagle *Haliaeetus leucogaster*.

## 3.9 Significant Vegetation Communities

Section H contains the EPBC listed ecological community *Natural Temperate Grassland of the Victorian Volcanic Plain* (critically endangered). The Australian Government Policy Statement 3.8 indicates that the community is present within the western suburbs of Melbourne and extends to Hamilton in western rural Victoria, and follows most closely the floristics of Plains Grassland (EVC 132) and Creekline Tussock Grassland (EVC 654). Creekline Tussock Grassland has not been mapped during the current assessment within Section H, however Plains Grassland (likely to be the EPBC ecological community in most instances) is widely distributed within Section H (Figure 2).

The Western (Basalt) Plains Grassland Community is listed under the FFG Act 1988. The description contained within the relevant FFG Action Statement equates the community to Plains Grassland (EVC 132) present within the area bounded by the Plenty River (Melbourne) to the east, Hamilton to the west, Beaufort to the north and Colac to the south. Therefore, all Plains Grassland mapped within Section H (Figure 2) is also considered to be the Western (Basalt) Plains Grassland Community.

All EVCs recorded in Section H are endangered in the Victorian Volcanic Plain bioregion.

## 4.0 BIODIVERSITY LEGISLATION AND GOVERNMENT POLICY

Biodiversity legislation and government policy that is relevant to the Melton/Wyndham Investigation Area, including Section H, is discussed below.

### 4.1 Commonwealth

#### 4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) applies to developments and associated activities that have the potential to significantly impact on matters protected under the Act.

Under the Act, unless exempt, actions require approval from the Australian Government Minister for Environment, Heritage and the Arts (the Minister) if they are likely to significantly impact on a ‘matter of national environmental significance’. There are currently seven matters of national environmental significance (NES):

- World Heritage properties;
- National Heritage places;
- nationally listed threatened species and ecological communities;
- listed migratory species;
- Ramsar wetlands of international importance;
- Commonwealth marine areas; and
- nuclear actions (including uranium mining).

The EPBC Act also applies to the environment in general if actions are taken on Commonwealth land, or if actions that are taken outside Commonwealth land will impact on the environment on Commonwealth land.

Any person proposing to take an action that may, or will, have a significant impact on a matter of national environmental significance must refer the action to the Minister for determination as to whether the action is a ‘controlled action’ or is not approved. ‘Significant impacts’ are defined in *EPBC Act Policy Statement 1.1 Significant Impact Guidelines: Matters of National Environmental Significance* (DEH 2006).

## NES matters relevant to Section H

There are three matters of national significance that are of relevance to the proposed development:

- listed threatened species and ecological communities;
- listed migratory species; and
- wetlands of international importance (Ramsar sites).

These are summarised below.

### *Listed threatened species and/or ecological communities*

*Ecological communities:* One listed ecological community, Natural *Temperate Grassland of the Victorian Volcanic Plain*, occurs within the study area.

*Listed flora species:* Flora species listed under the Act are discussed in Section 3.6 and listed in Appendix 2. In summary, one listed species, Spiny Rice-flower was recorded in Section H during the current assessment, and an additional listed species River Swamp Wallaby-grass has been previously recorded within Section H on the FIS (Figure 5). Habitat is also moderately well represented or well represented within Section H for five additional species: Matted Flax-lily, Small Golden Moths, Sunshine Diuris, Button Wrinklewort and Large-headed Fireweed. There are two existing records of Spiny Rice-flower on the FIS, and one additional record identified during the Melton/Wyndham Investigation within Section H. There is one existing record of River Swamp Wallaby-grass within the section. However, the presence and extent of any population(s) of these species, including Spiny Rice-flower, is uncertain as no areas within Section H have been systematically searched for listed species.

*Listed fauna species:* Fauna species listed under the Act are discussed in Section 4.8 and listed in Appendix 5. In summary two listed species, Striped Legless Lizard and Growling Grass Frog have been recorded within Section H and Kororoit Creek within Section H supports an important population of the latter species (Figure 4). Although not recorded, the Golden Sun Moth has a high likelihood of occurring in native and potentially exotic grassland habitat in Section H.

Other nationally significant fauna species listed on various databases are considered to have a medium–negligible likelihood of occurrence in Section H based on available habitat. There has been no systematic targeted survey for any listed species with Section H so the size and extent of populations of these species is not known.

***Listed migratory species***

The list of migratory species under the EPBC Act is a compilation of species listed under four international conventions: China-Australia Migratory Bird Agreement (CAMBA), Japan-Australia Migratory Bird Agreement (JAMBA), Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA) and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

Species listed under the 'migratory' provisions of the EPBC Act are listed in Appendix 5 and summarised below:

- Three species have been recorded within Section H by the AVW and/or BA database.
- Eight species are recorded from the local area (AVW and/or BA database).
- Eight additional species are predicted to occur, or their habitat is predicted to occur, within 5 km of the study area (DEWHA database).

While some of these species would be expected to use the study area on occasions, and some of them may do so regularly or may be resident, it does not provide important habitat for an ecologically significant proportion of any of these species.

***Wetlands of International Importance (Ramsar sites)***

The study area is identified by the DEWHA database as being within the catchment of a Wetland of International Significance (Ramsar site): Port Phillip Bay (western shoreline) and Bellarine Peninsula. However, the study area does not drain directly into this wetland and development in this region is not likely to result in a significant impact to a Ramsar wetland.

**Implications Section H**

All sections of the Melton/Wyndham Investigation Area (including Section H) support matters of NES which would trigger the EPBC Act. In response to this the GAA has engaged with DEWHA to conduct a strategic assessment process to address changes to the Melbourne Urban Growth Boundary.

**4.2 State****4.2.1 Flora and Fauna Guarantee Act 1988**

The FFG Act is the key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes.

A permit is required from DSE to 'take' protected flora species from public land. Taking protected flora from private land requires the permission of the landowner and not DSE unless the land is declared 'critical habitat'. Most native vegetation contains some protected flora species.

Protected flora are native plants or communities of native plants that have legal protection under the FFG Act. The protected flora list has three sources:

- plant taxa (species, subspecies or varieties) listed as threatened;
- plant taxa belonging to communities listed as threatened; and
- plant taxa which are not threatened but require protection for other reasons.

Some species which are attractive or highly sought after, such as orchids and grass-trees, are protected so that removal of these species from the wild can be controlled. Not all of these species are rare in the wild or highly significant. Protection includes living (e.g. flowers, seeds, shoots, roots) and non-living (e.g. bark, leaves, other litter) plant material (DSE website).

A permit is also required for the taking, trading or keeping of fish that are members of taxa or communities of flora and fauna on the Threatened List. The controls mean that authorisation under the FFG Act is required to catch, possess, keep or sell listed fish (DSE website).

### **Implications for Section H**

Much of land in Section H is privately owned and is not declared 'critical habitat'. Therefore a permit to 'take' listed flora and fauna species is not required under the FFG Act on these lands.

One threatened community, Western (Basalt) Plains Grassland Community, is present within Section H. This community is mapped as Plains Grassland (EVC 132) on Figure 2.

Areas of Section H that are public land require a permit from DSE under the FFG Act to remove listed species. Listed threatened and protected species recorded in Section H during the current assessment are identified in Appendix 2, Table A2.1. All species part of the Western (Basalt) Plains Grassland Community are also protected under the Act.

Precinct planning for the Melton/Wyndham Investigation Area should have regard to the Action Statements prepared under the FFG Act for:

- |                    |                       |
|--------------------|-----------------------|
| • Plains-wanderer  | • Freckled Duck       |
| • Blue-billed Duck | • Eastern Great Egret |

- Growling Grass Frog
- Striped Legless Lizard
- Golden Sun Moth
- Grassland Earless Dragon
- Maroon Leek-orchid
- Sunshine Diuris
- Large-fruit Groundsel
- Button Wrinklewort
- Small Milkwort
- Small Scurf-pea
- Curly Sedge
- Narrow Goodenia
- Pale Plover-daisy
- Western (Basalt) Plains Grassland

#### 4.2.2 Victorian Planning Provisions

A planning permit may be required to remove, destroy or lop native vegetation under the relevant local government planning scheme (e.g. Clause 52.17) unless exemptions in a clause apply or if the removal, destruction or lopping of vegetation is in accordance with a Native Vegetation Precinct Plan (Clause 52.16) that has been incorporated into the planning scheme. A Native Vegetation Precinct Plan may form part of a Precinct Structure Plan and may also determine whether exemptions to the requirement of a permit under Clause 52.16-4 apply.

#### Implications for Section H

It is possible that some or all of Section H will be the subject of a Native Vegetation Precinct Plan, drawing on information collected by this and other ecological surveys. Such a plan would identify which areas of native vegetation are to be retained and which are permitted to be cleared and offset.

#### 4.2.3 Native Vegetation Management Framework

The Native Vegetation Management Framework (the Framework) is State Government policy for the protection, enhancement and revegetation of native vegetation in Victoria (NRE 2002). Native vegetation provisions were introduced to all planning schemes in 1989 and the Framework was incorporated into the Victoria Planning Provisions in 2003. The primary goal of the Framework is:

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

In association with the regional Native Vegetation Plans, the Framework provides decision-making tools for native vegetation management.

Where an application is made to remove native vegetation, a proponent for a



development must explain the steps that have been taken to:

- Avoid the removal of native vegetation, where possible.
- Minimise the removal of native vegetation.
- Appropriately offset the loss of native vegetation, if required.

A proponent for a development must demonstrate that the option to avoid and minimise vegetation clearance has been fully explored before considering offsets.

An offset may be achieved by improvements in the quality or extent of native vegetation in a selected 'offset area', either within a project area or off-site. An area that is revegetated and protected or set aside for natural regeneration may provide some, or all, of the required offset. The conservation significance of vegetation to be removed is also taken into account when offsets are determined.

This assessment identifies what level of offset would be prescribed if all the native vegetation within the Section was cleared and what offsets would be prescribed if the Key Areas identified were retained but all other native vegetation was permitted to be cleared.

Offsets are typically generated by managing an area of remnant vegetation on private land. Active ecological management of such areas will generally yield a gain in habitat score of 20 % (approximately) over the nominated 10 years.

### **Implications for Section H**

An assessment of the net gain implications of the above development scenarios is discussed in Appendix 6.

#### **4.2.4 Wildlife Act 1975 and associated Regulations**

The *Wildlife Act 1975* is the primary legislation in Victoria providing for protection and management of wildlife. For the purposes of the Act, wildlife means indigenous vertebrate species (except those declared as pest animals), invertebrate species listed under the FFG Act, and some introduced game species.

The Wildlife Regulations 2002 of the Act prescribe penalties for the purposes of the Wildlife Act. These include penalties for persons who wilfully damage, disturb or destroy any wildlife habitat without appropriate authorisation (Section 9 of the Wildlife Regulations 2002). Authorisation for habitat removal may be obtained under the Wildlife Act; through a licence granted under the *Forests Act 1958*; or under any other Act.

Authorisation to destroy or possess wildlife may be required under Sections 41– 47 of the *Wildlife Act 1975*. Permits under the Act may be needed where it is expected that wildlife will need to be destroyed or moved.

### **Implications for Section H**

A permit will be required for removal of habitat at the site. It may be that removal of habitat will be covered by a permit to remove native vegetation, therefore a separate permit under the Wildlife Act would not be required.

If construction activities are likely to result in the death of wildlife or the need to move wildlife short distances, permits will be required.

#### **4.2.5 Port Phillip and Westernport Native Vegetation Plan**

This document (PPWCMA 2006) has been prepared to develop a strategic and co-ordinated approach to the management of native vegetation within the region. The plan is designed to complement the Native Vegetation Management Framework and contains specific information and objectives relating to the region. The information in the plan is centred on four strategic directions:

- Retain the quantity of native vegetation by minimising clearing;
- Protect native vegetation with reservation and management agreements;
- Maintain and improve the quality of native vegetation; and
- Increase the quantity of native vegetation.

Responses and offset requirements for clearing native vegetation are outlined in Appendix 3.4 of the document (PPWCMA 2006: pg 52).

### **Implications for Section H**

The objectives of the Native Vegetation Plan are similar to those of the Native Vegetation Management Framework and should be met if the three step approach to achieving a Net Gain outcome is followed.

Offsets for unavoidable tree losses that are not covered by the Framework replacement ratios are calculated using the Port Phillip and Westernport Native Vegetation Plan.

#### **4.2.6 Environment Protection Act 1970: State Environmental Protection Policy (Waters of Victoria) 2003**

This policy provides a legal framework for state and local government agencies,

businesses and communities to work together to protect and rehabilitate Victoria's surface water environments.

Beneficial uses of this channel need to be protected. Uses to be protected include:

- Maintenance of natural aquatic ecosystems and aquatic wildlife.
- Passage of indigenous fish.
- Maintenance of indigenous riparian vegetation.
- Water based recreation.
- Commercial and recreational use of edible fish and crustacea.
- Agricultural water supply.
- Other commercial purposes.

Impacts to surface water quality must not exceed water quality objectives specified to protect beneficial uses. Relevant clauses must be adhered to. Of particular relevance are:

- 43 - surface water management and works.
- 53 - vegetation protection and rehabilitation.
- 56 - construction activities.

### **Implications for Section H**

Construction managers need to monitor affected surface waters to assess if beneficial uses are being protected. The GAA may need to consult with EPA and the relevant catchment management authority with regard to establishing appropriate water quality objectives and monitoring requirements.

## **4.3 Local**

### **4.3.1 Local Government Planning Scheme (City of Melton)**

There is an Environmental Significance Overlay Schedule 1 (ESO1) covering two portions of land in Section H: the Clarke Road Grasslands north of the Western Highway, and land east of Deanside Drive and west of Grey Drive, also north of the Western Highway. In addition, an ESO2 covers the land below the break of slope leading down to Kororoit Creek (<http://www.dse.vic.gov.au/planningschemes/>).

### **Implications for Section H**

Impacts on these areas will need to consider the objectives of the overlays and a permit will be required to impact on any native vegetation.

## 5.0 KEY ECOLOGICAL AREAS

### 5.1 Key Ecological Areas

The Key Ecological Areas (Key Areas) within Section H are presented in Figure 6. The Key Areas have been identified based on the methodology outlined in Section 2.8.

Vegetation mapping undertaken during the Melton/Wyndham Investigation identified four Key Areas within Section H. These are concentrated in the south-eastern corner of Section H, with scattered sections in the central north of the section. The following table identifies Key Areas within Section H (Figure 6):

Key Area #	Habitas ID #	Habitat Zone #	EVC
1	1423518	1A	Heavier-soils PG
	1423517	1A	Heavier-soils PG
	1420135	3A	Heavier-soils PG
	1420134	1A	Heavier-soils PG
	1420134	1B	Heavier-soils PG
	172421804	1A	Heavier-soils PG
	1423523	1A	Heavier-soils PG
	1417254	1A	Low-rainfall PG
	1417254	1B	Low-rainfall PG
2	50268960	1A	Heavier-soils PG
	50268960	1B	Heavier-soils PG
3	1421004	2A	Heavier-soils PG
4	1421000	1A	Heavier-soils PG

In addition to ecological values such as presence of significant species and listed communities, these Key Areas provide some of the best examples of Heavier-soils Plains-grassland in the Melton/Wyndham Investigation Area. There are numerous listed threatened species present in these Key Areas and surrounding management zones (which are largely made up of Highly Likely Native Vegetation areas known to contain native vegetation values) and they provide excellent examples of the critically endangered *Natural Temperate Grassland of the Victorian Volcanic Plain*.

Key Area 1 is a large area (minimum 60 ha) containing primary grassland. This Key Area is contiguous with surrounding areas of known high value Plains Grassland, including the site generally referred to as the Clarke Road Grassland, which were not assessed as part of the Melton/Wyndham Investigation.

These areas would certainly meet the Key Area criteria if detailed assessment had been undertaken and have therefore been identified as Management Zones to provide a truer indication of the overall extent of Key Area 1. The grassland throughout this area is dominated by Kangaroo Grass with a high diversity of other indigenous herbs including Lemon Beauty-heads Cotton Fireweed *Senecio quadridentatus*, Narrow Plantain *Plantago gaudichaudii*, Plains Stackhousia *Stackhousia subterranean*, the nationally listed Spiny Rice-flower and the FFG Act listed Narrow Goodenia. Key Area 1 and the adjacent Management Zones contain some of the highest value Heavier-soil Plains Grassland remnants in the Melton/Wyndham Investigation Area.

Key Area 2 contains two habitat zones (approximately 10 hectares) of Heavier-soils Plains Grassland vegetation. The larger of these has had the larger rocks removed although it still contains a high quality example of this EVC. The smaller habitat zone contains an excellent example of this EVC and is the only zone in which native annual forbs were observed during the investigation. This Key Area contains a range of native herbs Lemon Beauty-heads, Common Everlasting *Chrysocephalum apiculatum*, Smooth Rice-flower *Pimelea glauca*, Curved Rice-flower *Pimelea curviflora*, Narrow Plantain, Plains Stackhousia, Scaly Button *Leptorhynchus squamatus* and the nationally listed Spiny Rice-flower.

Key Area 3 supports primary grassland (approximately 13 ha) which is still dominated by Kangaroo Grass. Although few herbaceous species were identified during the assessment, this area is likely to contain habitat for a range of threatened species. It has a relatively low level of weed cover with few high threat weeds present.

Key Area 4 contains a single habitat zone (approximately 23 hectares) of Heavier-soils Plains Grassland vegetation. This habitat zone contains an excellent example of this EVC and a diverse range of native herbs and geophytes were observed during the investigation. This Key Area contains a range of native herbs Lemon Beauty-heads, Common Everlasting, Cut-leaf Goodenia *Goodenia pinnatifida*, Chocolate Lily *Arthropodium strictum*, Narrow Plantain, Plains Stackhousia, Scaly Buttons and the nationally listed Spiny Rice-flower.

## 5.2 Reconnaissance Survey Key Areas

The assessment of Key Areas above applies only to properties that have been subject to on-ground mapping and habitat hectare assessments as part of the original Melton/Wyndham Investigation. The reconnaissance surveys undertaken on areas where on-ground access was not available provide an indication of the broader amount of native vegetation present. It must be noted that some of these patches would also meet the criteria for delineation as a Key



Area. Decision makers should refer to Biosis Research (2009) which will provide some indication of likely Key Areas within the reconnaissance survey sites.

All areas identified as Highly Likely Native Vegetation to the east of Sinclairs Road are known to contain high quality native vegetation and will be highly likely to be of Very High conservation significance. The other areas identified as Highly Likely Native Vegetation are not as well known although they contain areas which are likely to be mainly primary grassland or ephemeral wetland EVCs such as Lignum Swamp of Very High conservation significance.

## 6.0 CONCLUSIONS

The areas assessed within Section H as part of the Melton/Wyndham Investigation contain a significant area of native vegetation, comprised of the endangered EVCs *Low-rainfall* Plains Grassland (8.25 ha), *Heavier-soils* Plains Grassland (140.05 ha), Escarpment Shrubland (0.19 ha), Creekline Grassy Woodland (2.27 ha) and Lignum Swamp (5.46 ha). The majority of Plains Grassland within this area is also likely to meet the criteria for the EPBC Act listed ecological community *Natural Temperate Grassland of the Victorian Volcanic Plain* (critically endangered) and the Western (Basalt) Plains Grassland Community listed under the FFG Act. In addition, the area provides valuable habitat for nationally significant species Spiny Rice-flower, River Swamp Wallaby-grass, Growling Grass Frog, Striped Legless Lizard and Golden Sun Moth (most of which have been previously recorded in Section H). A number of state significant species have also been recorded within the section, or have potential to occur. Within areas not subject to assessment during the Melton/Wyndham Investigation, a further 262 ha (approx.) within Section H were identified as *highly likely native vegetation – grassy* during the reconnaissance surveys. Some of these areas are known to have high value native vegetation present, such as the area known as the Clarke Road Grassland.

Of the 156 ha of native vegetation mapped in Section H during the Melton/Wyndham Investigation, approximately 106 ha have been identified as part of Key Ecological Areas. Four Key Ecological Areas have been identified based on their conservation significance, size, habitat for threatened species and habitat connectivity values. Key Area 1 is contiguous with surrounding areas of known high value Plains Grassland, including the Clarke Road Grassland. These areas have been identified as Management Zones adjacent to Key Area 1 to provide a truer indication of the overall extent of the Key Area. It must be noted that other areas not assessed during the Melton/Wyndham Investigation would also meet the criteria for delineation as a Key Area. Decision makers should refer to Biosis Research (2009) which will provide some indication of additional likely Key Areas within the reconnaissance survey sites.

Identification of these Key Areas within Section H provides opportunities for the precinct planning process to consider and implement the Net Gain 3-step process of avoid, minimise and offset.

# FIGURES

**Figure 1: Melton/Wyndham Investigation Area and Section H Context Map**

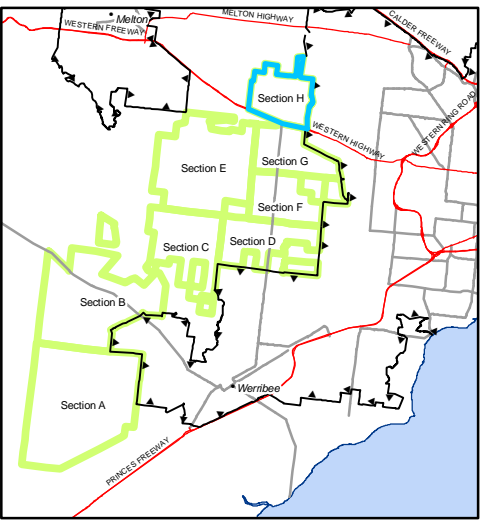
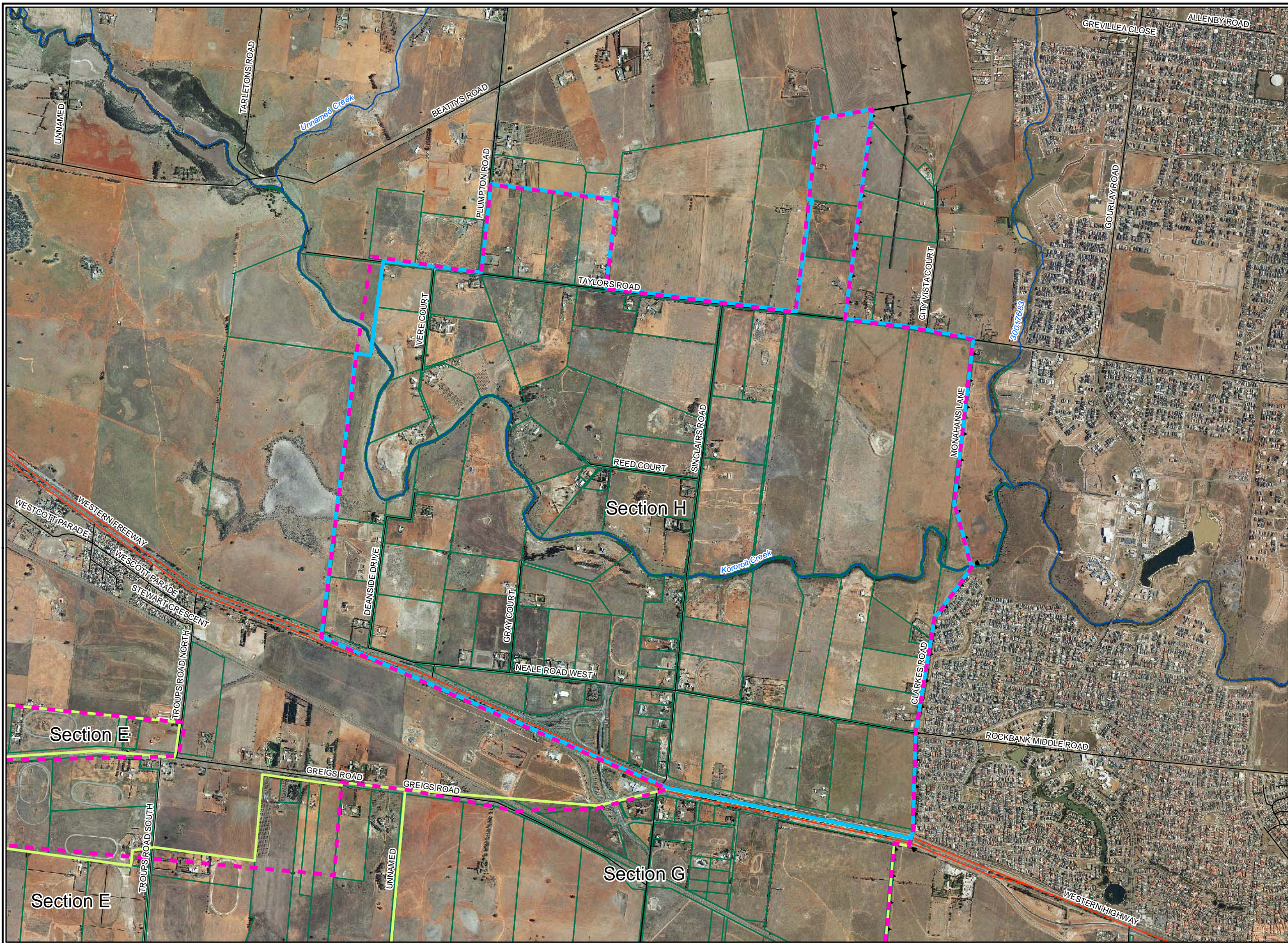
**Figure 2: The distribution of native vegetation within Section H**

**Figure 3: Site condition scores of Habitat Zones within Section H**

**Figure 4: The conservation significance of Habitat Zones within Section H**

**Figure 5: National and state significant flora and fauna records in Section H**





### Legend

- Section H
- Section boundary
- Melton/Wyndham Investigation Area
- Urban Growth Boundary
- Parcels



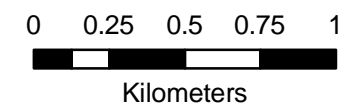
Biosis Research Pty. Ltd.  
38 Bertie Street  
(PO Box 489)  
Port Melbourne  
VICTORIA 3207

Offices also in:  
Ballarat, Sydney,  
Wollongong, Queanbeyan, Wangaratta

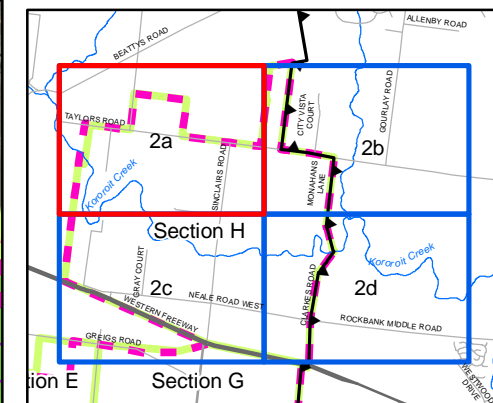
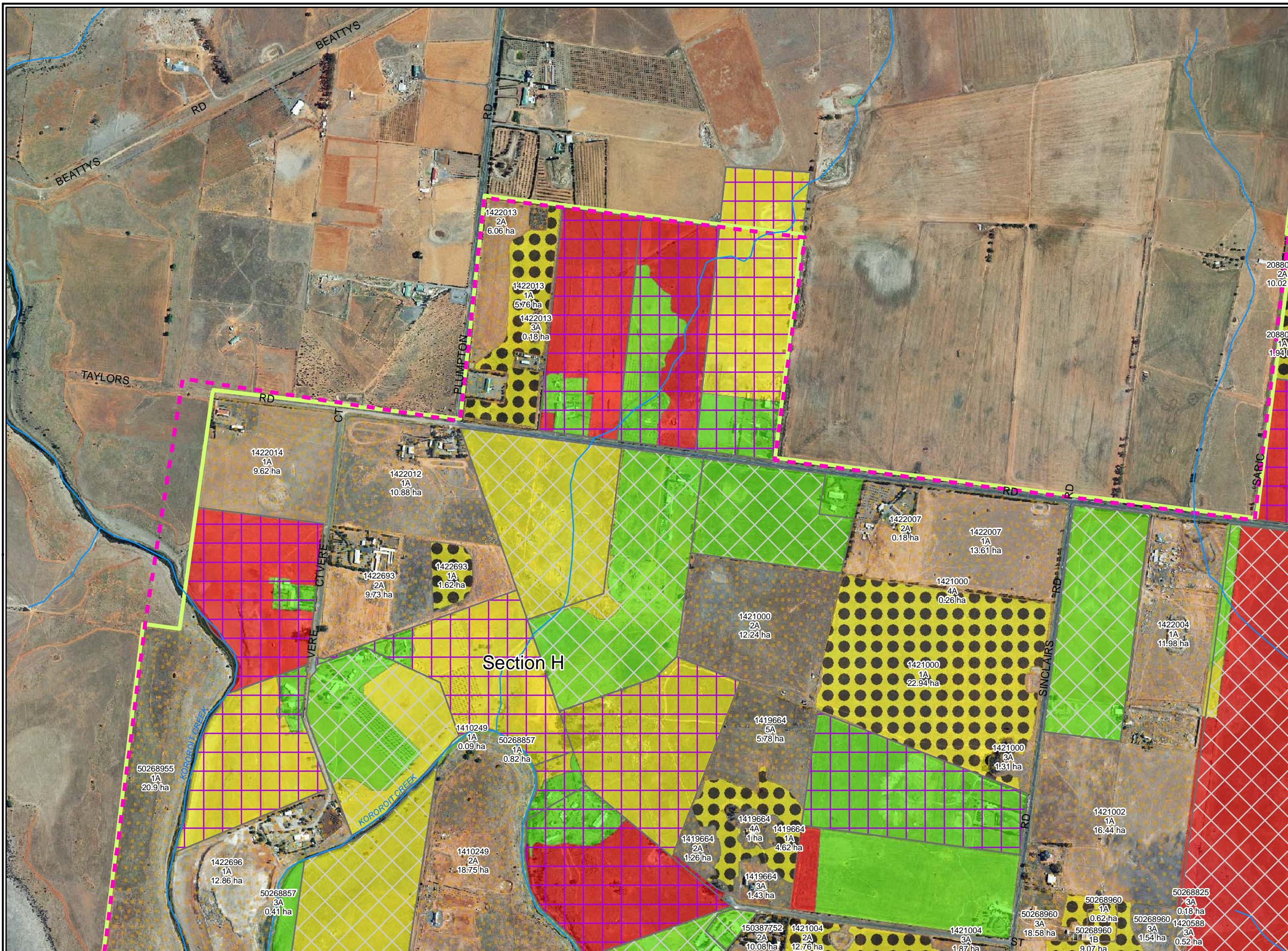
**Figure 1: Location of Section H within the Melton/Wyndham Investigation Area.**

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Drawn by: SKM  
File number: 7813

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## Legend

### EVC

- 104 Lignum Swamp
- 132\_61 Heavier-soils Plains Grassland
- 132\_63 Low-rainfall Plains Grassland
- 68 Creekline Grassy Woodland
- 895 Escarpment Shrubland
- Degraded Treeless Vegetation

### Scattered Trees

- Very Large Old Tree
- Large Old Tree
- Scattered Trees polygons

### Reconnaissance Survey

- Highly Likely Native Vegetation - Grassy
- Possible Native Vegetation
- No Native Vegetation
- Urban Growth Boundary

- Section boundary
- Melton/Wyndham Investigation Area

### Access status for properties not assessed

- Access Denied
- Access unable to be obtained

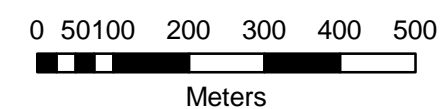


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38 Bertie Street  
(PO Box 489)  
Port Melbourne  
VICTORIA 3207

**Figure 2a: Native Vegetation, Section H.**

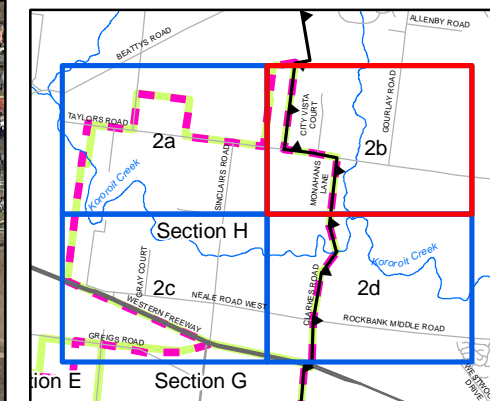
Date: 5 June 2009  
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File number: 7813

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Wollongong, Queanbeyan, Wangaratta





## Legend

### EVC

- 104 Lignum Swamp
- 132\_61 Heavier-soils Plains Grassland
- 132\_63 Low-rainfall Plains Grassland
- 68 Creekline Grassy Woodland
- 895 Escarpment Shrubland
- Degraded Treeless Vegetation

### Scattered Trees

- Very Large Old Tree
- Large Old Tree
- Scattered Trees polygons

### Reconnaissance Survey

- Highly Likely Native Vegetation - Grassy
- Possible Native Vegetation
- No Native Vegetation
- Urban Growth Boundary

- Section boundary
- Melton/Wyndham Investigation Area

### Access status for properties not assessed

- Access Denied
- Access unable to be obtained

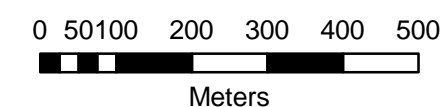


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**Figure 2b: Native Vegetation, Section H.**

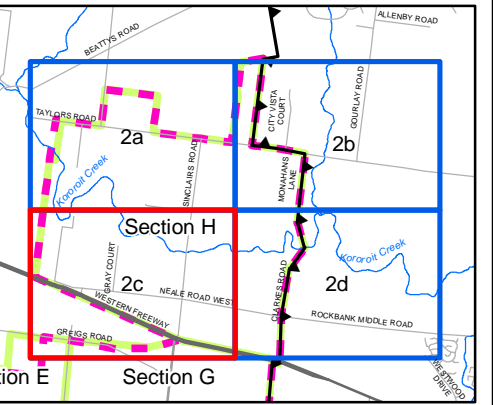
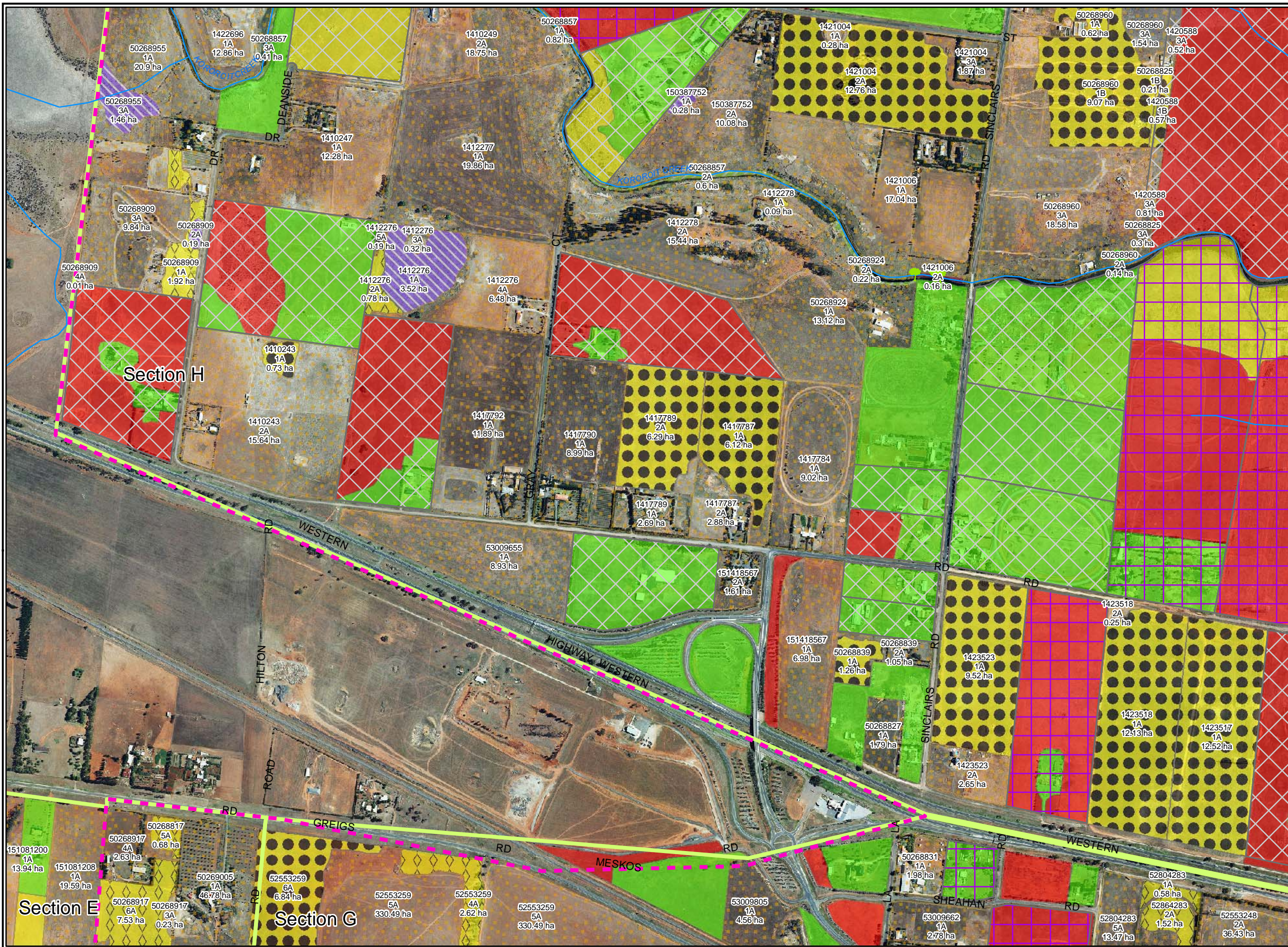
Date: 5 June 2009  
Checked by: NHF  
Drawn by: SKM  
File number: 7813

Location: ...7813\Mapping\Section H\7813 Section H Fig 2.mxd



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### Legend

#### EVC

- 104 Lignum Swamp
- 132\_61 Heavier-soils Plains Grassland
- 132\_63 Low-rainfall Plains Grassland
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#### Reconnaissance Survey

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- No Native Vegetation

- Urban Growth Boundary

- Section boundary

- Melton/Wyndham Investigation Area

#### Access status for properties not assessed

- Access Denied
- Access unable to be obtained

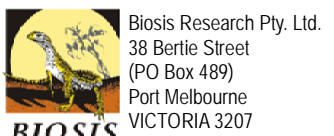
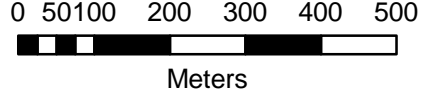


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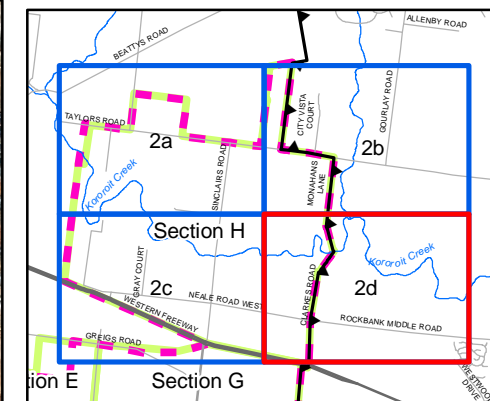
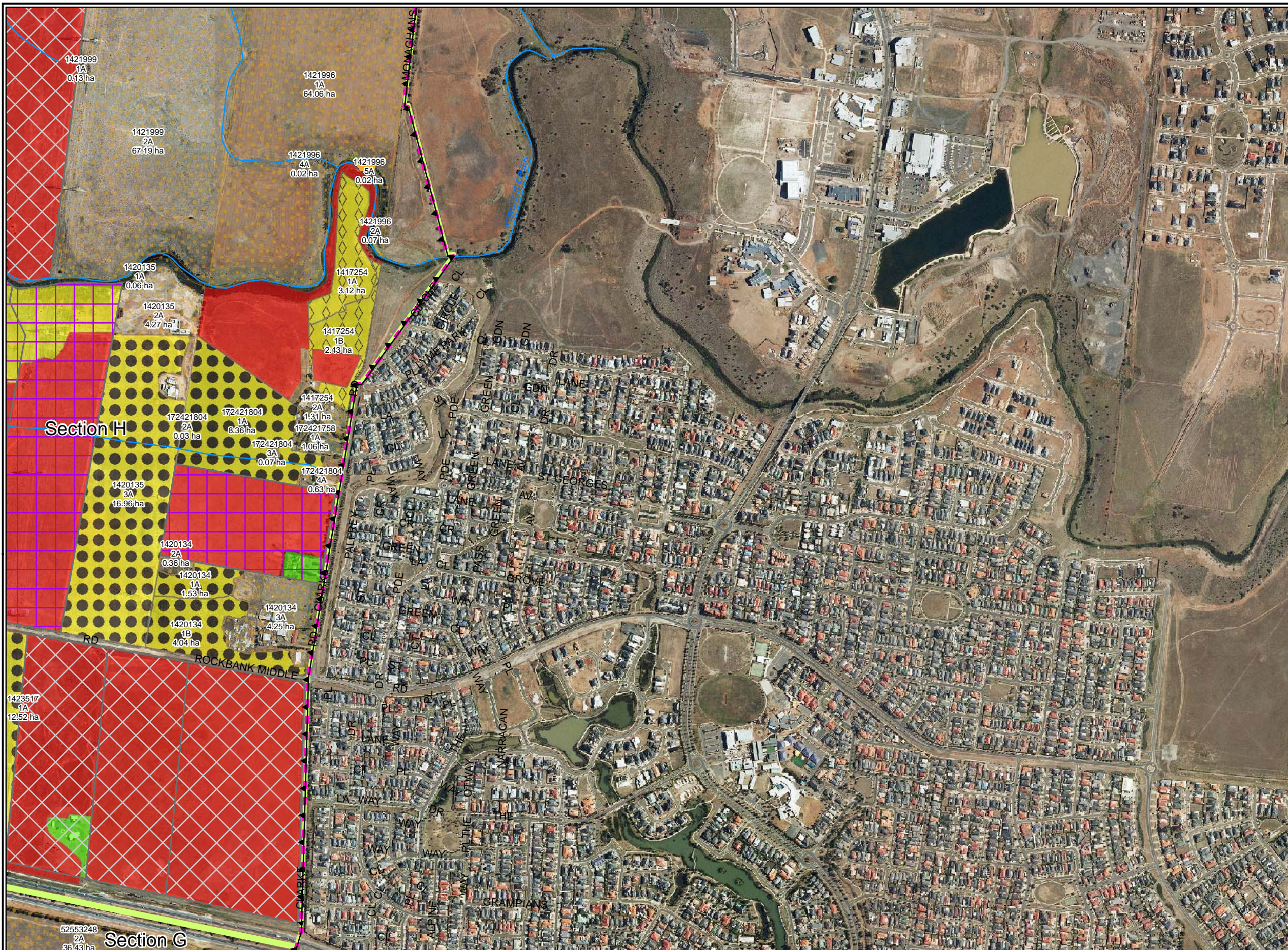
Date: 5 June 2009  
Checked by: NHF  
Drawn by: SKM  
File number: 7813

Location: ...7813\Mapping\Section H\7813 Section H Fig 2.mxd



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## Legend

### EVC

- 104 Lignum Swamp
- 132\_61 Heavier-soils Plains Grassland
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- Section boundary
- Melton/Wyndham Investigation Area

### Access status for properties not assessed

- Access Denied
- Access unable to be obtained



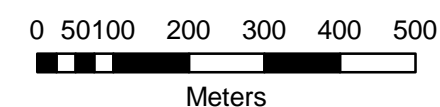
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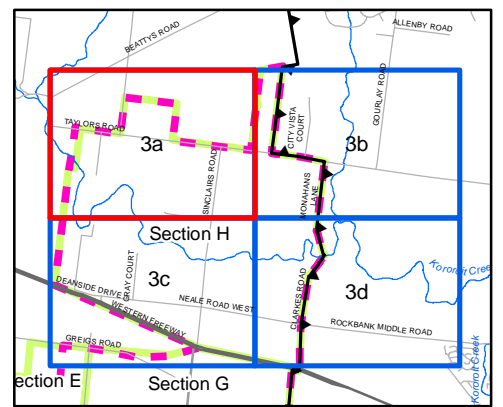
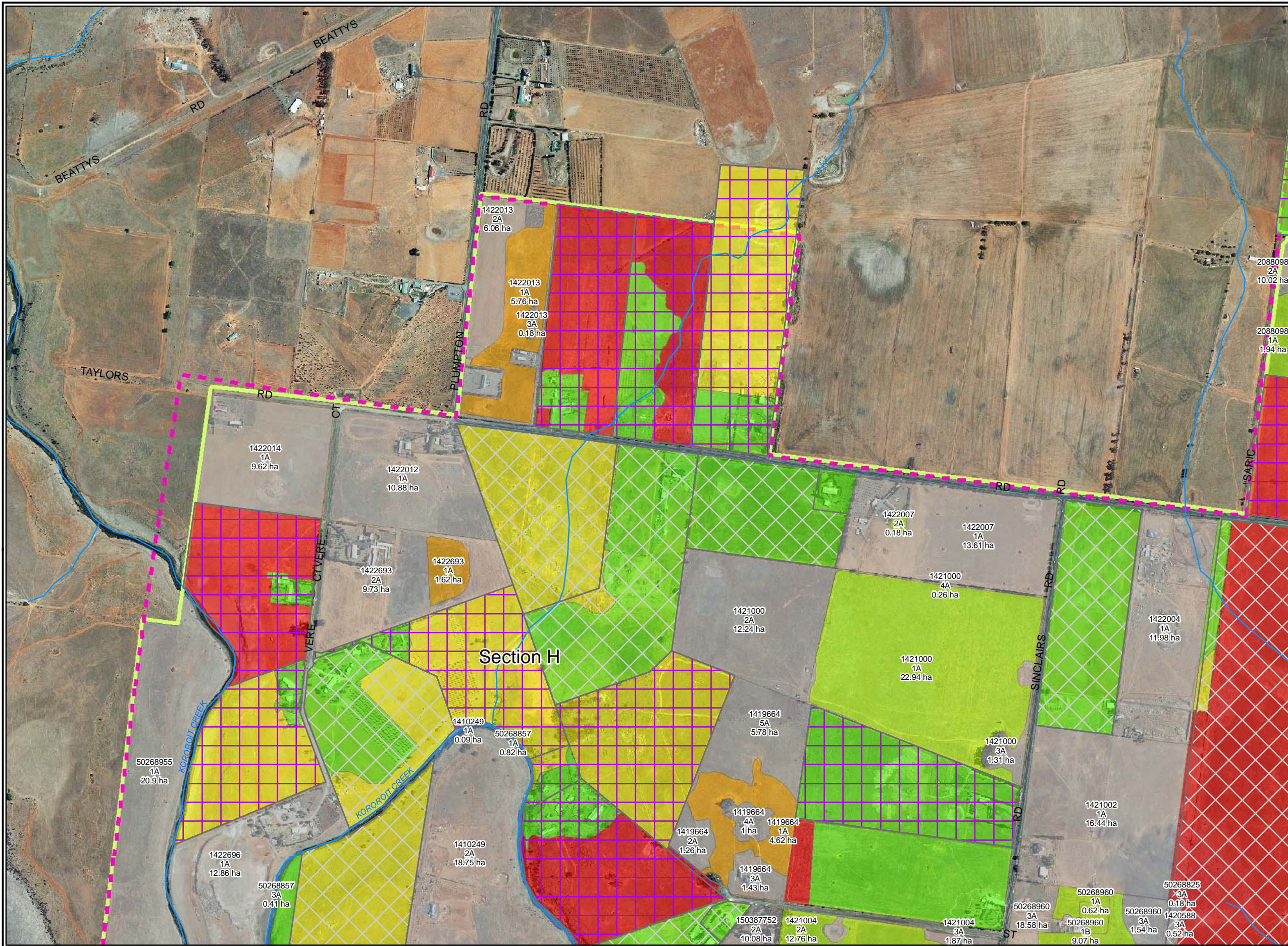
**Figure 2d: Native Vegetation, Section H.**

Date: 5 June 2009  
Checked by: NHF  
Drawn by: SKM  
File number: 7813

Location: ...7813\Mapping\Section H\7813 Section H Fig 2.mxd







### Legend

#### Site Condition Score

- Degraded Treeless Vegetation
- 1 to 20
- 20 to 30
- 30 to 75

#### Reconnaissance Survey

- Highly Likely Native Vegetation - Grassy
- Possible Native Vegetation
- No Native Vegetation

- Urban Growth Boundary

- Section boundary

- Melton/Wyndham Investigation Area

#### Access status for properties not assessed

- Access Denied
- Access unable to be obtained



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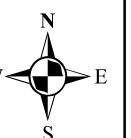
Offices also in:  
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**Figure 3a: Vegetation quality of habitat zones and results of reconnaissance survey, Section H.**

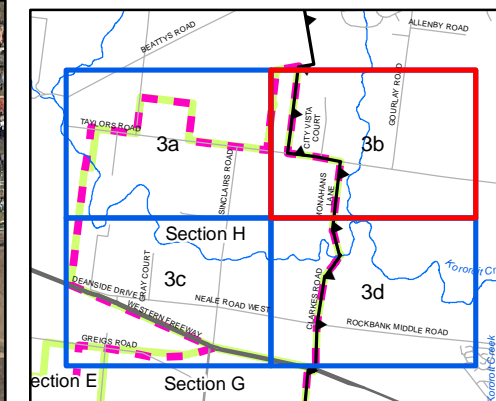
Date: 5 June 2009  
Checked by: NHF  
Drawn by: SKM  
File number: 7813

Location: ...7813\Mapping\Section H\7813 Section H Fig 3.mxd

0 50 100 200 300 400 500  
Meters







### Legend

#### Site Condition Score

- Degraded Treeless Vegetation
- 1 to 20
- 20 to 30
- 30 to 75

#### Reconnaissance Survey

- Highly Likely Native Vegetation - Grassy
- Possible Native Vegetation
- No Native Vegetation

- Urban Growth Boundary

- Section boundary

- Melton/Wyndham Investigation Area

#### Access status for properties not assessed

- Access Denied
- Access unable to be obtained

**Figure 3b: Vegetation quality of habitat zones and results of reconnaissance survey, Section H.**

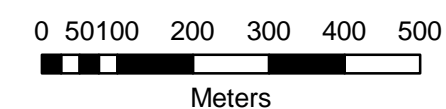


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Checked by: NHF  
Drawn by: SKM  
File number: 7813

Location: ...7813\Mapping\Section H\7813 Section H Fig 3.mxd

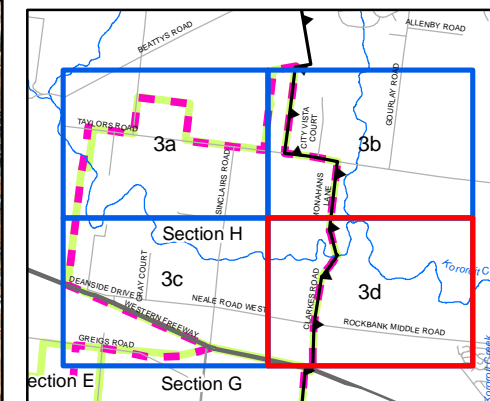
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### Legend

#### Site Condition Score

- Degraded Treeless Vegetation
- 1 to 20
- 20 to 30
- 30 to 75

#### Reconnaissance Survey

- Highly Likely Native Vegetation - Grassy
- Possible Native Vegetation
- No Native Vegetation

- Urban Growth Boundary

- Section boundary

- Melton/Wyndham Investigation Area

#### Access status for properties not assessed

- Access Denied
- Access unable to be obtained

Figure 3d: Vegetation quality of habitat zones and results of reconnaissance survey, Section H.

Date: 5 June 2009  
Checked by: NHF  
Drawn by: SKM  
File number: 7813

Location: ...7813\Mapping\Section H\7813 Section H Fig 3.mxd

0 50 100 200 300 400 500  
Meters



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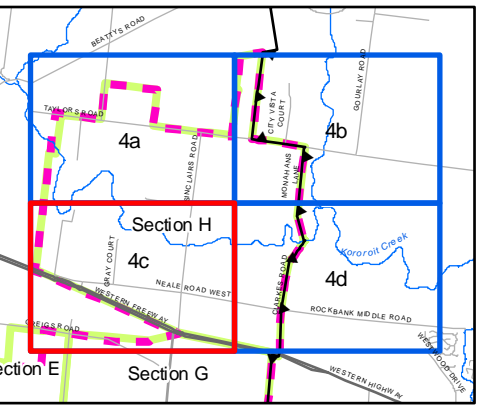
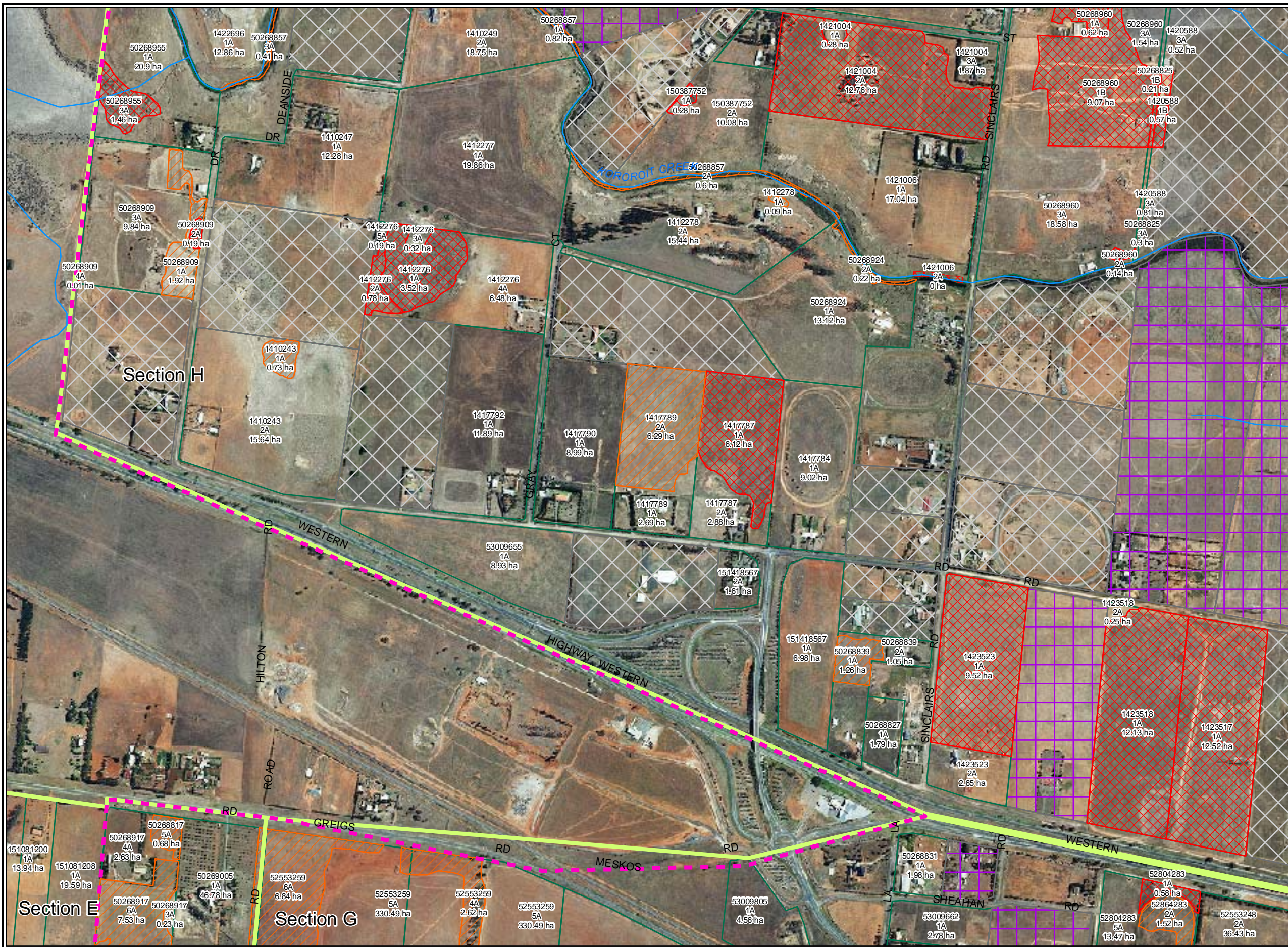












#### Legend

##### Conservation Significance

- Very High
- High

Urban Growth Boundary

Section boundary

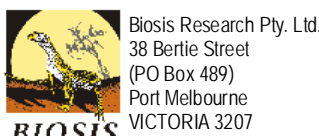
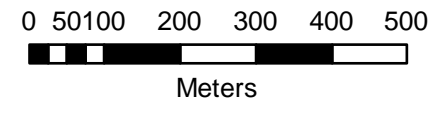
Melton/Wyndham Investigation Area

##### Access status for properties not assessed

- Access Denied
- Access unable to be obtained
- Access obtained

Figure 4c: Conservation significance of habitat zones according to the Native Vegetation Framework (NRE 2002), Section H.

Date: 5 June 2009  
Checked by: NHF  
Drawn by: SKM  
File number: 7813



Offices also in:  
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Location: ...7813\Mapping\Section H\7813 Section H Fig 4.mxd



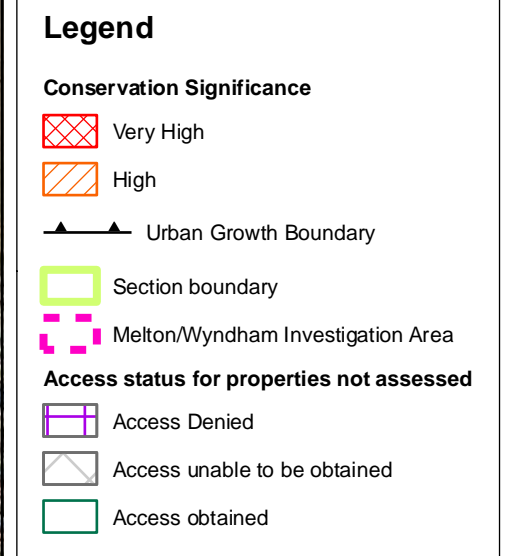
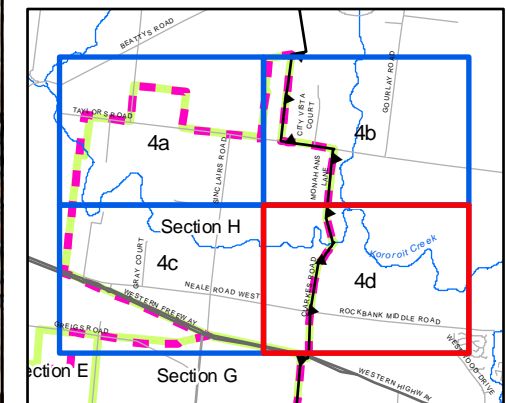
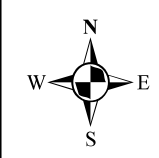
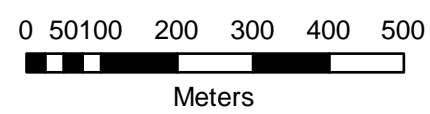
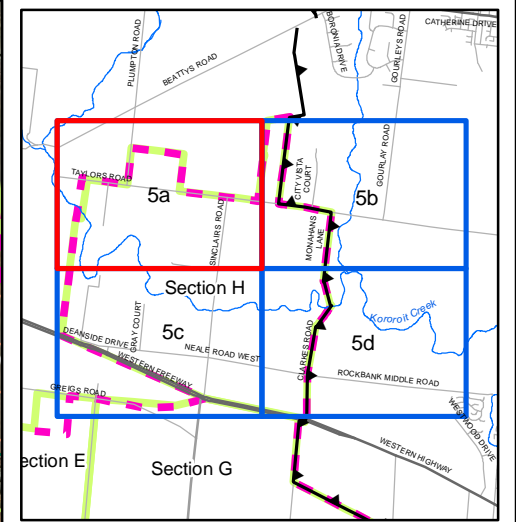
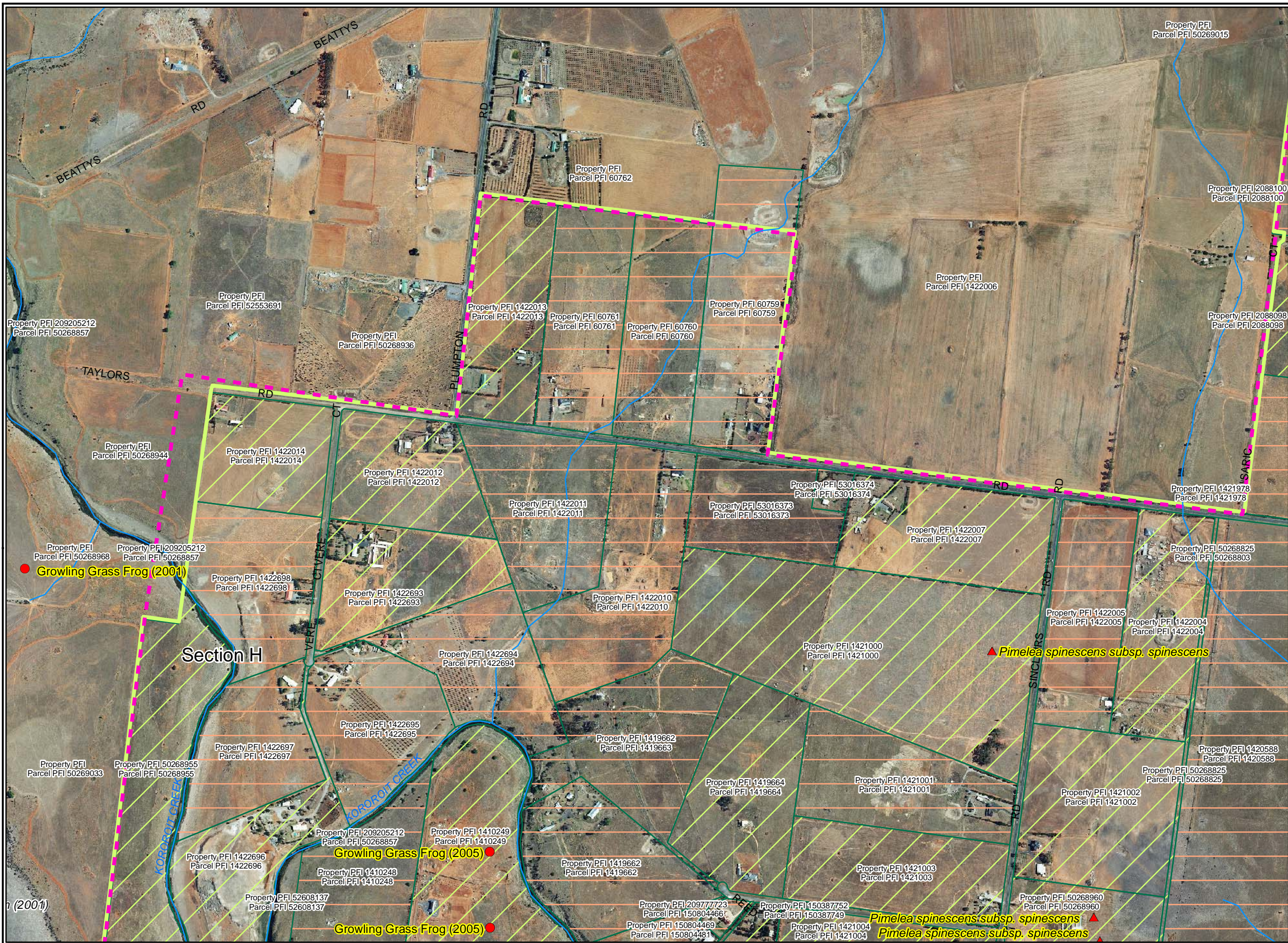


Figure 4d: Conservation significance of habitat zones according to the Native Vegetation Framework (NRE 2002), Section H.

Date: 5 June 2009  
Checked by: NHF  
Drawn by: SKM  
File number: 7813







**Legend**

**Incidental records**

- ▲ Nationally significant<sup>\*</sup>
- ▲ State Significant<sup>\*</sup>

**Flora**

**Database records**

- Nationally significant<sup>\*</sup>
- State significant<sup>\*</sup>

**Fauna**

**Database records**

- Nationally significant<sup>\*</sup>
- State significant<sup>\*</sup>

**Incidental records**

- ◆ Nationally significant<sup>\*</sup>

▲ Urban Growth Boundary

□ Section boundary

□ Melton/Wyndham Investigation Area

**Parcels**

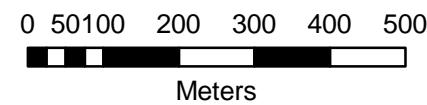
**Assessment status**

- Assessed
- Not assessed

Figure 5a: National and State Significant and DSE Advisory list (VROT) flora and fauna species locations, Section H.

Date: 5 June 2009  
Checked by: NHF  
Drawn by: SKM  
File number: 7813

Location: ...7813\Mapping\Section H\7813 Section H Fig 5.mxd

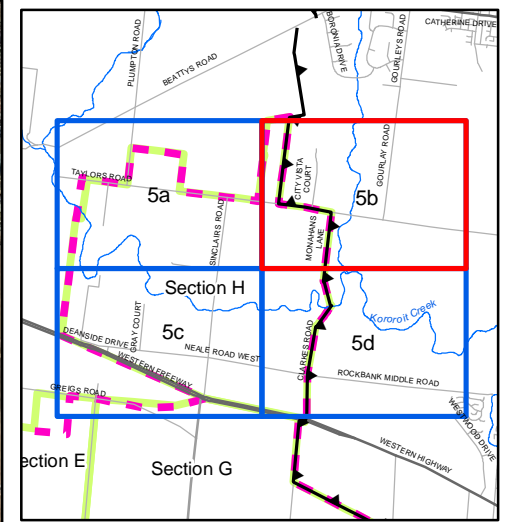


Incidental records collected October 08 to March 09 by Biosis Research Pty. Ltd.

▲ Nationally significant species labels highlighted in yellow

\* FFG listed and/or DSE VROT Advisory list





**Legend**

**Incidental records**

- Nationally significant<sup>^</sup>
- State Significant<sup>\*</sup>

**Flora**

**Database records**

- Nationally significant<sup>^</sup>
- State significant<sup>\*</sup>

**Fauna**

**Database records**

- Nationally significant<sup>^</sup>
- State significant<sup>\*</sup>

**Incidental records**

- Nationally significant<sup>^</sup>

**Urban Growth Boundary**

**Section boundary**

**Melton/Wyndham Investigation Area**

**Parcels**

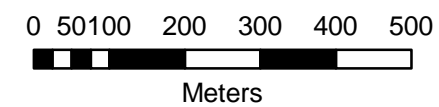
**Assessment status**

- Assessed
- Not assessed

Figure 5b: National and State Significant and DSE Advisory list (VROT) flora and fauna species locations, Section H.

Date: 5 June 2009  
Checked by: NHF  
Drawn by: SKM  
File number: 7813

Location: ...7813\Mapping\Section H\7813 Section H Fig 5.mxd



Incidental records collected October 08 to March 09 by Biosis Research Pty. Ltd.

<sup>^</sup> Nationally significant species labels highlighted in yellow

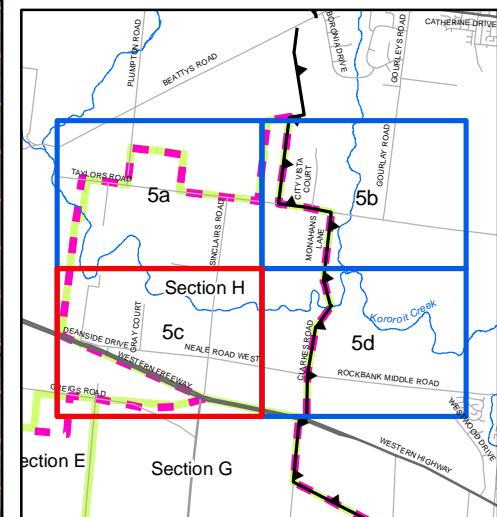
<sup>\*</sup> FFG listed and/or DSE VROT Advisory list



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**Legend**

**Incidental records**

- ▲ Nationally significant<sup>^</sup>
- ▲ State Significant<sup>\*</sup>

**Flora**

**Database records**

- Nationally significant<sup>^</sup>
- State significant<sup>\*</sup>

**Fauna**

**Database records**

- Nationally significant<sup>^</sup>
- State significant<sup>\*</sup>

**Incidental records**

- ◆ Nationally significant<sup>^</sup>

▲ Urban Growth Boundary

□ Section boundary

□ Melton/Wyndham Investigation Area

**Parcels**

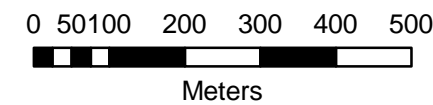
**Assessment status**

- Assessed
- Not assessed

Figure 5c: National and State Significant and DSE Advisory list (VROT) flora and fauna species locations, Section H.

Date: 5 June 2009  
Checked by: NHF  
Drawn by: SKM  
File number: 7813

Location: ...7813\Mapping\Section H\7813 Section H Fig 5.mxd

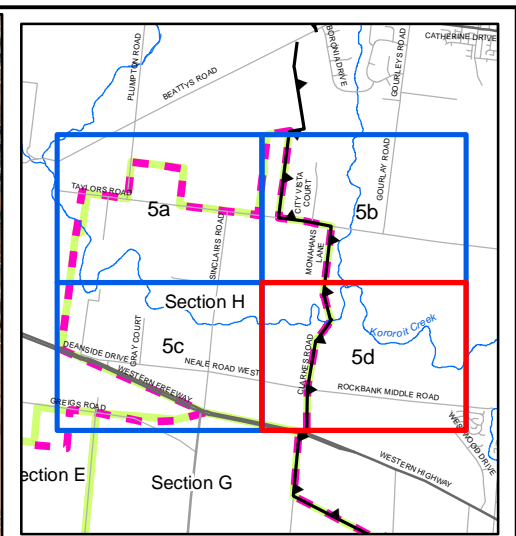
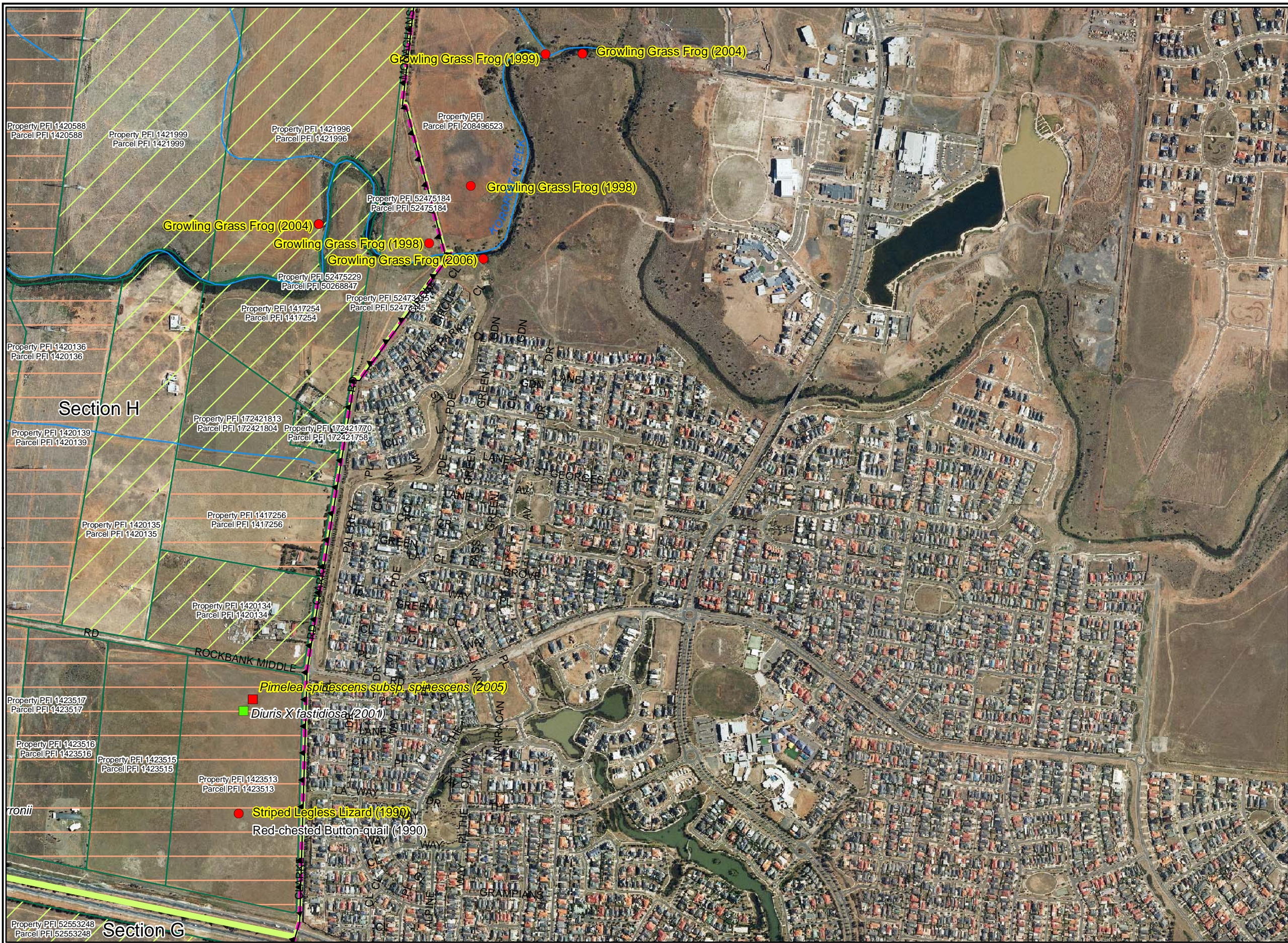


Incidental records collected October 08 to March 09 by Biosis Research Pty. Ltd.

▲ Nationally significant species labels highlighted in yellow

\* FFG listed and/or DSE VROT Advisory list





**Legend**

**Incidental records**

- Nationally significant<sup>^</sup>
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**Flora**

**Database records**

- Nationally significant<sup>^</sup>
- State significant<sup>\*</sup>

**Fauna**

**Database records**

- Nationally significant<sup>^</sup>
- State significant<sup>\*</sup>

**Incidental records**

- Nationally significant<sup>^</sup>

**Urban Growth Boundary**

**Section boundary**

**Melton/Wyndham Investigation Area**

**Parcels**

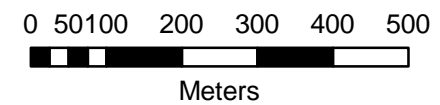
**Assessment status**

- Assessed
- Not assessed

Figure 5d: National and State Significant and DSE Advisory list (VROT) flora and fauna species locations, Section H.

Date: 5 June 2009  
Checked by: NHF  
Drawn by: SKM  
File number: 7813

Location: ...7813\Mapping\Section H\7813 Section H Fig 5.mxd



Incidental records collected October 08 to March 09 by Biosis Research Pty. Ltd.

<sup>^</sup> Nationally significant species labels highlighted in yellow

<sup>\*</sup> FFG listed and/or DSE VROT Advisory list



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# APPENDICES



# APPENDIX 1

## DSE Vegetation Assessment Methodology

### A1.1 Habitat hectares

Habitat hectares are calculated where at least 25 % of the understorey cover is native or a group (i.e. at least 3) of trees where the tree canopy cover is at least 20% (DSE 2007). Such sites are termed 'patches' of native vegetation.

Each vegetation patch has one or more habitat quality zones. Each habitat zone consists of one ecological vegetation class (EVC) and has uniform quality within limits.

The assessment process compares the vegetation of the habitat zone against a DSE 'benchmark' description of the EVC, using methods described in the DSE assessment manual (DSE 2004). A habitat score for the habitat zone is calculated by this method.

Each habitat zone has a habitat score of between 0 and 100, with extensive intact vegetation having a theoretical score of 100. Habitat score is calculated using ten components: large trees, tree canopy cover, understorey, weediness, recruitment, organic litter, logs, patch size, neighbourhood context and distance to core area. In naturally treeless vegetation, or vegetation that can exist in different structural forms, the score is standardised to account for the absence of some or all 'woody' criteria.

The habitat hectare value of a habitat zone is given by its habitat score (expressed as a decimal between 0 and 1) multiplied by its land area in hectares. For example, 4 ha of vegetation with a habitat score of 50 contain 2.0 habitat hectares.

Habitat hectares are used to measure losses arising from clearing, and also gains obtained through protection measures and active management of existing vegetation.

### A1.2 Indigenous canopy trees

The following information on indigenous canopy trees does not apply if the subject land contains only treeless vegetation types.

#### Large Old Trees within patches

'Large Old Trees' within native vegetation patches are subject to offset requirements, as outlined in the Native Vegetation Management Framework (NRE 2002: Table 6, p 55). Trees smaller than benchmark size within patches are not included in this assessment, as they are addressed in the habitat hectare analysis.

#### Scattered trees outside patches

Trees over predominantly introduced understoreys are offset through tree protection/replacement ratios.

Trees in areas where less than 25 % of the understorey cover is native are assessed as 'scattered old trees'. Trees are offset by the protection of other old trees and/or recruitment of new trees.

For land parcels (usually a title boundary) where tree density is greater than eight per hectare, the offset ratios are outlined in the Native Vegetation Management Framework (NRE 2002, p 55). For areas where tree density is less, the offset ratios are specified in the Regional Native Vegetation Plan. Offsets for small trees are also included in the Native Vegetation Plan.



# APPENDIX 2

## Section H Flora results

### A.2.1. Flora Results

The table below lists the flora species (100 indigenous species, 67 introduced species) recorded within Section H of the Melton/Wyndham Investigation Area during the current assessment.

Significance of species (Source: DSE Flora Information System)

Australian status:

CE	Listed under EPBC Act as critically endangered
E	Listed under EPBC Act as endangered
V	Listed under EPBC Act as vulnerable
R	Rare (Briggs & Leigh 1996)

Victorian status (DSE Flora Information System, 2007 Version):

e	Endangered
v	Vulnerable
r	Rare
listed	Listed as threatened under the Flora and Fauna Guarantee Act 1988
p	Protected species under the Flora and Fauna Guarantee Act 1988 (Note: all species part of the Western (Basalt) Plains Grassland Community are also protected in addition to those species shown in Table A2.1)

Species of regional significance recorded during the Melton/Wyndham Investigation (50) are highlighted in **bold**. These species are those recorded in less than 5% of sites (quadrats/defined area lists) from the Victorian Volcanic Plain Bioregion in the DSE Flora Information System unless there is reason to believe they are undersampled in the available data.

All indigenous species have at least local significance

**Table A2.1 Flora recorded within Section H during the Melton/Wyndham Investigation**

Status	Scientific name	Common name
<b>Indigenous species:</b>		
P	<i>Acacia mearnsii</i>	Black Wattle
	<i>Acaena echinata</i>	Sheep's Burr
	<i>Acaena</i> spp.	Sheep's Burr
	<b><i>Alisma</i> spp.</b>	<b>Water Plantain</b>
	<b><i>Alternanthera denticulata</i></b>	<b>Lesser Joyweed</b>
	<i>Arthropodium</i> spp.	Vanilla Lily
	<b><i>Arthropodium strictum</i></b>	<b>Chocolate Lily</b>
	<i>Asperula conferta</i>	Common Woodruff
	<i>Atriplex semibaccata</i>	Berry Saltbush
	<b><i>Austrodanthonia auriculata</i></b>	<b>Lobed Wallaby-grass</b>
	<i>Austrodanthonia caespitosa</i>	Common Wallaby-grass
	<b><i>Austrodanthonia carphoides</i></b>	<b>Short Wallaby-grass</b>
	<i>Austrodanthonia duttoniana</i>	Brown-back Wallaby-grass
	<i>Austrodanthonia eriantha</i>	Hill Wallaby-grass
	<i>Austrodanthonia geniculata</i>	Knead Wallaby-grass
	<i>Austrodanthonia racemosa</i> var. <i>racemosa</i>	Slender Wallaby-grass
	<i>Austrodanthonia setacea</i>	Bristly Wallaby-grass
	<b><i>Austrostipa aristiglumis</i></b>	<b>Plump Spear-grass</b>



Status	Scientific name	Common name
	<i>Austrostipa curticoma</i>	Short-crown Spear-grass
	<i>Austrostipa nodosa</i>	<b>Knotty Spear-grass</b>
	<i>Austrostipa scabra</i>	<b>Rough Spear-grass</b>
	<i>Austrostipa setacea</i>	<b>Corkscrew Spear-grass</b>
	<i>Bolboschoenus caldwellii</i>	<b>Salt Club-sedge</b>
	<i>Bursaria spinosa</i> subsp. <i>spinosa</i>	Sweet Bursaria
p	<i>Calocephalus citreus</i>	Lemon Beauty-heads
	<i>Carex breviculmis</i>	Common Grass-sedge
	<i>Carex</i> spp.	Sedge
p	<i>Cassinia arcuata</i>	<b>Drooping Cassinia</b>
#	<i>Chamaesyce drummondii</i>	Flat Spurge
	<i>Chloris truncata</i>	Windmill Grass
P	<i>Chrysocephalum apiculatum</i>	<b>Common Everlasting</b>
P	<i>Chrysocephalum semipapposum</i>	<b>Clustered Everlasting</b>
P	<i>Chrysocephalum</i> sp. 1	<b>Plains Everlasting</b>
	<i>Convolvulus angustissimus</i>	<b>Blushing Bindweed</b>
	<i>Convolvulus erubescens</i> spp. agg.	Pink Bindweed
	<i>Convolvulus remotus</i>	<b>Grass Bindweed</b>
	<i>Crassula decumbens</i> var. <i>decumbens</i>	Spreading Crassula
	<i>Crassula helmsii</i>	<b>Swamp Crassula</b>
	<i>Crassula sieberiana</i>	Sieber Crassula
v	<i>Dianella</i> sp. aff. <i>longifolia</i> (Benambra)	<b>Arching Flax-lily</b>
	<i>Dichondra repens</i>	Kidney-weed
	<i>Distichlis distichophylla</i>	<b>Australian Salt-grass</b>
	<i>Einadia nutans</i> subsp. <i>nutans</i>	Nodding Saltbush
	<i>Eleocharis acuta</i>	Common Spike-sedge
	<i>Elymus scaber</i> var. <i>scaber</i>	Common Wheat-grass
	<i>Erodium crinitum</i>	<b>Blue Heron's-bill</b>
	<i>Eryngium ovinum</i>	Blue Devil
	<i>Eucalyptus camaldulensis</i>	River Red-gum
P	<i>Euchiton</i> spp.	Cudweed
	<i>Geranium</i> spp.	Crane's Bill
	<i>Glyceria australis</i>	<b>Australian Sweet-grass</b>
f, v	<i>Goodenia macbarronii</i>	<b>Narrow Goodenia</b>
	<i>Goodenia pinnatifida</i>	<b>Cut-leaf Goodenia</b>
k	<i>Haloragis glauca</i> f. <i>glauca</i>	<b>Bluish Raspwort</b>
	<i>Haloragis heterophylla</i>	Varied Raspwort
	<i>Hypericum gramineum</i>	Small St John's Wort
	<i>Isolepis inundata</i>	<b>Swamp Club-sedge</b>
	<i>Juncus</i> spp.	Rush
	<i>Lachnagrostis filiformis</i>	Common Blown-grass
P	<i>Leptorhynchus squamatus</i>	Scaly Buttons
	<i>Lobelia anceps</i>	<b>Angled Lobelia</b>
	<i>Lobelia pratensis</i>	Poison Lobelia
	<i>Lythrum</i> spp.	Loosestrife
	<i>Maireana decalvans</i>	<b>Black Cotton-bush</b>
	<i>Maireana enchylaenoides</i>	<b>Wingless Bluebush</b>
	<i>Marsilea drummondii</i>	<b>Common Nardoo</b>
	<i>Melicytus dentatus</i>	<b>Tree Violet</b>
	<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass
	<i>Mimulus repens</i>	<b>Creeping Monkey-flower</b>
	<i>Muehlenbeckia florulenta</i>	<b>Tangled Lignum</b>



Status	Scientific name	Common name
	<i>Oxalis perennans</i>	Grassland Wood-sorrel
	<b><i>Panicum</i> spp.</b>	<b>Panic</b>
	<i>Pelargonium australe</i>	<b>Austral Stork's-bill</b>
	<i>Phragmites australis</i>	Common Reed
	<b><i>Pimelea curviflora</i></b>	<b>Curved Rice-flower</b>
	<i>Pimelea humilis</i>	Common Rice-flower
C, e	<b><i>Pimelea spinescens</i> subsp. <i>spinescens</i></b>	<b>Spiny Rice-flower</b>
	<i>Plantago gaudichaudii</i>	Narrow Plantain
	<i>Poa labillardierei</i>	Common Tussock-grass
	<i>Poa sieberiana</i>	Grey Tussock-grass
	<i>Potamogeton</i> spp.	Pondweed
P	<b><i>Pseudognaphalium luteoalbum</i></b>	<b>Jersey Cudweed</b>
	<b><i>Ptilotus</i> spp.</b>	<b>Pussy Tails</b>
	<b><i>Rubus parvifolius</i></b>	<b>Small-leaf Bramble</b>
	<i>Rumex brownii</i>	Slender Dock
	<i>Rumex dumosus</i>	Wiry Dock
	<i>Schoenus apogon</i>	Common Bog-sedge
P	<i>Senecio quadridentatus</i>	Cotton Fireweed
P	<i>Solenogyne dominii</i>	Smooth Solenogyne
P	<b><i>Solenogyne gunnii</i></b>	<b>Hairy Solenogyne</b>
	<b><i>Stackhousia monogyna</i></b>	<b>Creamy Stackhousia</b>
	<b><i>Stackhousia subterranea</i></b>	<b>Plains Stackhousia</b>
	<b><i>Stellaria pungens</i></b>	<b>Prickly Starwort</b>
	<i>Themeda triandra</i>	Kangaroo Grass
	<i>Tricoryne elatior</i>	Yellow Rush-lily
	<b><i>Triglochin procera</i></b>	<b>Common Water-ribbons</b>
P	<b><i>Triptilodiscus pygmaeus</i></b>	<b>Common Sunray</b>
	<b><i>Typha domingensis</i></b>	<b>Narrow-leaf Cumbungi</b>
	<b><i>Vallisneria</i> spp.</b>	<b>Eel Grass</b>
	<b><i>Velleia</i> spp.</b>	<b>Velleia</b>
P	<b><i>Vittadinia</i> spp.</b>	<b>New Holland Daisy</b>
	<b><i>Wahlenbergia luteola</i></b>	<b>Bronze Bluebell</b>
	<i>Walwhalleya proluta</i>	Rigid Panic
<b>Introduced species:</b>		
	<i>Acetosella vulgaris</i>	Sheep Sorrel
	<i>Aira caryophyllea</i>	Silvery Hair-grass
	<i>Anagallis arvensis</i>	Pimpernel
	<i>Arctotheca calendula</i>	Cape Weed
	<i>Asparagus asparagoides</i>	Bridal Creeper
	<i>Asphodelus fistulosus</i>	Onion Weed
	<i>Atriplex prostrata</i>	Hastate Orache
	<i>Avena fatua</i>	Wild Oat
	<i>Brassica fruticulosa</i>	Twiggy Turnip
	<i>Brassica rapa</i>	White Turnip
	<i>Briza maxima</i>	Large Quaking-grass
	<i>Briza minor</i>	Lesser Quaking-grass
	<i>Bromus diandrus</i>	Great Brome
	<i>Bromus hordeaceus</i> subsp. <i>hordeaceus</i>	Soft Brome
	<i>Chenopodium murale</i>	Sowbane
	<i>Cirsium vulgare</i>	Spear Thistle
	<i>Cotula coronopifolia</i>	Water Buttons
	<i>Cynara cardunculus</i>	Artichoke Thistle



Status	Scientific name	Common name
#	<i>Cynodon dactylon</i> var. <i>dactylon</i>	Couch
	<i>Dactylis glomerata</i>	Cocksfoot
	<i>Echium plantagineum</i>	Paterson's Curse
	<i>Ehrharta</i> spp.	Veldt Grass
	<i>Eucalyptus botryoides</i>	Southern Mahogany
	<i>Eucalyptus cladocalyx</i>	Sugar Gum
	<i>Foeniculum vulgare</i>	Fennel
	<i>Galenia pubescens</i> var. <i>pubescens</i>	Galenia
	<i>Hedypnois cretica</i>	Cretan Hedypnois
	<i>Helminthotheca echioides</i>	Ox-tongue
	<i>Hordeum</i> spp.	Barley Grass
	<i>Hypochoeris glabra</i>	Smooth Cat's-ear
	<i>Hypochoeris radicata</i>	Flatweed
	<i>Juncus acutus</i> subsp. <i>acutus</i>	Spiny Rush
	<i>Lactuca serriola</i>	Prickly Lettuce
	<i>Leontodon taraxacoides</i> subsp. <i>taraxacoides</i>	Hairy Hawkbit
	<i>Lolium perenne</i>	Perennial Rye-grass
	<i>Lolium rigidum</i>	Wimmera Rye-grass
	<i>Lotus</i> spp.	Trefoil
	<i>Lycium ferocissimum</i>	African Box-thorn
	<i>Malva</i> spp.	Mallow
	<i>Marrubium vulgare</i>	Horehound
	<i>Modiola caroliniana</i>	Red-flower Mallow
	<i>Moraea</i> spp.	Moraea
	<i>Nassella hyalina</i>	Cane Needle-grass
	<i>Nassella neesiana</i>	Chilean Needle-grass
	<i>Nassella trichotoma</i>	Serrated Tussock
	<i>Opuntia</i> spp.	Prickly Pear
	<i>Oxalis pes-caprae</i>	Soursob
	<i>Phalaris aquatica</i>	Toowoomba Canary-grass
	<i>Pinus radiata</i>	Radiata Pine
	<i>Plantago coronopus</i>	Buck's-horn Plantain
	<i>Plantago lanceolata</i>	Ribwort
	<i>Polygonum aviculare</i>	Hogweed
	<i>Raphanus raphanistrum</i>	Wild Radish
	<i>Romulea minutiflora</i>	Small-flower Onion-grass
	<i>Romulea rosea</i>	Onion Grass
	<i>Rumex</i> spp.	Dock (naturalised)
	<i>Salvia verbenaca</i>	Wild Sage
	<i>Scolymus hispanicus</i>	Golden Thistle
	<i>Silybum marianum</i>	Variegated Thistle
	<i>Solanum</i> spp.	Nightshade
	<i>Sonchus oleraceus</i>	Common Sow-thistle
	<i>Trifolium angustifolium</i> var. <i>angustifolium</i>	Narrow-leaf Clover
	<i>Trifolium campestre</i> var. <i>campestre</i>	Hop Clover
	<i>Ulex europaeus</i>	Gorse
	<i>Vulpia bromoides</i>	Squirrel-tail Fescue
	<i>Vulpia myuros</i>	Rat's-tail Fescue
	<i>Xanthium spinosum</i>	Bathurst Burr



**Table A2.2 Existing flora records within a 5km buffer zone of Section H (Source: Flora Information System 2007)**

Status	Scientific Name	Common Name
<b>Indigenous Species</b>		
	<i>Acacia implexa</i>	Lightwood
	<i>Acacia mearnsii</i>	Black Wattle
	<i>Acacia melanoxylon</i>	Blackwood
	<i>Acacia paradoxa</i>	Hedge Wattle
	<i>Acacia pycnantha</i>	Golden Wattle
	<i>Acacia verticillata</i> subsp. <i>verticillata</i>	Prickly Moses
	<i>Acaena agnipila</i>	Hairy Sheep's Burr
	<i>Acaena echinata</i>	Sheep's Burr
	<i>Acaena novae-zelandiae</i>	Bidgee-widgee
	<i>Acaena ovina</i>	Australian Sheep's Burr
	<i>Adiantum aethiopicum</i>	Common Maidenhair
listed	<i>Allocasuarina luehmannii</i>	Buloke
	<i>Allocasuarina verticillata</i>	Drooping Sheoak
	<i>Alternanthera denticulata</i>	Lesser Joyweed
	<i>Alternanthera</i> sp. 1 (Plains)	Plains Joyweed
V	<i>Amphibromus fluitans</i>	River Swamp Wallaby-grass
	<i>Amphibromus neesii</i>	Southern Swamp Wallaby-grass
	<i>Amphibromus nervosus</i>	Common Swamp Wallaby-grass
	<i>Aphanes australiana</i>	Australian Piert
	<i>Archidium stellatum</i>	Earth Moss
	<i>Arthropodium minus</i>	Small Vanilla-lily
	<i>Asperula conferta</i>	Common Woodruff
	<i>Asperula scoparia</i>	Prickly Woodruff
	<i>Asplenium flabellifolium</i>	Necklace Fern
	<i>Atriplex nummularia</i>	Old-man Saltbush
	<i>Atriplex semibaccata</i>	Berry Saltbush
	<i>Austrodanthonia auriculata</i>	Lobed Wallaby-grass
	<i>Austrodanthonia bipartita</i>	Leafy Wallaby-grass
	<i>Austrodanthonia caespitosa</i>	Common Wallaby-grass
	<i>Austrodanthonia carphoides</i>	Short Wallaby-grass
	<i>Austrodanthonia duttoniana</i>	Brown-back Wallaby-grass
	<i>Austrodanthonia eriantha</i>	Hill Wallaby-grass
	<i>Austrodanthonia fulva</i>	Copper-awned Wallaby-grass
	<i>Austrodanthonia geniculata</i>	Kneed Wallaby-grass
	<i>Austrodanthonia laevis</i>	Smooth Wallaby-grass
	<i>Austrodanthonia penicillata</i>	Weeping Wallaby-grass
	<i>Austrodanthonia pilosa</i>	Velvet Wallaby-grass
	<i>Austrodanthonia racemosa</i> var. <i>racemosa</i>	Slender Wallaby-grass
	<i>Austrodanthonia setacea</i>	Bristly Wallaby-grass
	<i>Austrodanthonia setacea</i> var. <i>setacea</i>	Bristly Wallaby-grass
	<i>Austrostipa aristiglumis</i>	Plump Spear-grass
	<i>Austrostipa bigeniculata</i>	Kneed Spear-grass
	<i>Austrostipa blackii</i>	Crested Spear-grass
	<i>Austrostipa curticoma</i>	Short-crown Spear-grass
	<i>Austrostipa eremophila</i>	Desert Spear-grass
r	<i>Austrostipa exilis</i>	Heath Spear-grass
	<i>Austrostipa flavescens</i>	Coast Spear-grass
	<i>Austrostipa gibbosa</i>	Spurred Spear-grass
	<i>Austrostipa nodosa</i>	Knotty Spear-grass
	<i>Austrostipa oligostachya</i>	Fine-head Spear-grass



Status	Scientific Name	Common Name
	<i>Austrostipa rudis</i>	Veined Spear-grass
	<i>Austrostipa rudis</i> subsp. <i>rudis</i>	Veined Spear-grass
	<i>Austrostipa scabra</i> subsp. <i>falcata</i>	Rough Spear-grass
	<i>Austrostipa scabra</i> subsp. <i>scabra</i>	Rough Spear-grass
	<i>Austrostipa setacea</i>	Corkscrew Spear-grass
	<i>Austrostipa stiposa</i>	Quizzical Spear-grass
	<i>Batrachium trichophyllum</i>	Water Fennel
	<i>Baumea articulata</i>	Jointed Twig-sedge
	<i>Bolboschoenus caldwellii</i>	Salt Club-sedge
	<i>Bolboschoenus medianus</i>	Marsh Club-sedge
	<i>Bothriochloa macra</i>	Red-leg Grass
	<i>Brachyscome basaltica</i> var. <i>gracilis</i>	Woodland Swamp-daisy
	<i>Brachyscome dentata</i>	Lobe-seed Daisy
	<i>Bulbine bulbosa</i>	Bulbine Lily
	<i>Bursaria spinosa</i> subsp. <i>spinosa</i>	Sweet Bursaria
	<i>Callitris glaucophylla</i>	White Cypress-pine
	<i>Calocephalus citreus</i>	Lemon Beauty-heads
	<i>Calocephalus lacteus</i>	Milky Beauty-heads
	<i>Calochilus robertsonii</i>	Purple Beard-orchid
	<i>Calotis anthemoides</i>	Cut-leaf Burr-daisy
	<i>Calotis scabiosifolia</i>	Rough Burr-daisy
	<i>Calotis scabiosifolia</i> var. <i>scabiosifolia</i>	Rough Burr-daisy
	<i>Calotis scapigera</i>	Tufted Burr-daisy
	<i>Cardamine</i> spp.	Bitter Cress
	<i>Carex appressa</i>	Tall Sedge
	<i>Carex bichenoviana</i>	Plains Sedge
	<i>Carex breviculmis</i>	Common Grass-sedge
	<i>Carex gaudichaudiana</i>	Fen Sedge
	<i>Carex inomitata</i>	Hillside Sedge
	<i>Carex inversa</i>	Knob Sedge
	<i>Carex tereticaulis</i>	Poong'ort
	<i>Cassinia arcuata</i>	Drooping Cassinia
	<i>Centella cordifolia</i>	Centella
	<i>Centipeda cunninghamii</i>	Common Sneezeweed
#	<i>Chamaesyce drummondii</i>	Flat Spurge
	<i>Cheilanthes austrotenuifolia</i>	Green Rock-fern
	<i>Cheilanthes distans</i>	Bristly Cloak-fern
	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	Narrow Rock-fern
	<i>Chenopodium desertorum</i>	Frosted Goosefoot
	<i>Chenopodium desertorum</i> subsp. <i>microphyllum</i>	Small-leaf Goosefoot
	<i>Chenopodium glaucum</i>	Glaucous Goosefoot
	<i>Chenopodium pumilio</i>	Clammy Goosefoot
	<i>Chloris truncata</i>	Windmill Grass
	<i>Chrysocephalum apiculatum</i>	Common Everlasting
	<i>Chrysocephalum semipapposum</i>	Clustered Everlasting
	<i>Chrysocephalum</i> sp. 1	Plains Everlasting
	<i>Clematis microphylla</i> s.l.	Small-leaved Clematis
listed, v	<i>Comesperma polygaloides</i>	Small Milkwort
	<i>Convolvulus angustissimus</i>	Blushing Bindweed
	<i>Convolvulus angustissimus</i> subsp. <i>omnigracilis</i>	Slender Bindweed
	<i>Convolvulus erubescens</i> spp. agg.	Pink Bindweed
	<i>Convolvulus remotus</i>	Grass Bindweed



Status	Scientific Name	Common Name
	<i>Correa glabra</i> var. <i>glabra</i>	Rock Correa
	<i>Cotula australis</i>	Common Cotula
	<i>Craspedia variabilis</i>	Variable Billy-buttons
	<i>Crassula decumbens</i> var. <i>decumbens</i>	Spreading Crassula
	<i>Crassula helmsii</i>	Swamp Crassula
	<i>Crassula peduncularis</i>	Purple Crassula
	<i>Crassula sieberiana</i>	Sieber Crassula
	<i>Crossidium davidai</i>	Gypsum Moss
listed, e	<i>Cullen parvum</i>	Small Scurf-pea
listed, e	<i>Cullen tenax</i>	Tough Scurf-pea
	<i>Cynoglossum suaveolens</i>	Sweet Hound's-tongue
	<i>Damasonium minus</i>	Star Fruit
	<i>Desmodium gunnii</i>	Southern Tick-trefoil
	<i>Desmodium varians</i>	Slender Tick-trefoil
	<i>Deyeuxia quadriseta</i>	Reed Bent-grass
	<i>Deyeuxia</i> spp.	Bent-grass
E, e	<i>Dianella amoena</i>	Matted Flax-lily
	<i>Dianella brevicaulis</i>	Small-flower Flax-lily
	<i>Dianella longifolia</i> s.l.	Pale Flax-lily
	<i>Dianella longifolia</i> var. <i>grandis</i> s.l.	Glaucous Flax-lily
	<i>Dianella revoluta</i> s.l.	Black-anther Flax-lily
v	<i>Dianella</i> sp. aff. <i>longifolia</i> (Benambra)	Arching Flax-lily
#	<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>	Silky Blue-grass
	<i>Dichelachne crinita</i>	Long-hair Plume-grass
	<i>Dichelachne rara</i>	Common Plume-grass
	<i>Dichelachne sciurea</i> spp. agg.	Short-hair Plume-grass
	<i>Dichondra repens</i>	Kidney-weed
	<i>Dillwynia cinerascens</i>	Grey Parrot-pea
e	<i>Dipodium campanulatum</i>	Bell-flower Hyacinth-orchid
	<i>Distichlis distichophylla</i>	Australian Salt-grass
E, listed,		
e	<i>Diuris fragrantissima</i>	Sunshine Diuris
listed, v	<i>Diuris palustris</i>	Swamp Diuris
e	<i>Diuris X fastidiosa</i>	Proud Diuris
	<i>Dysphania glomulifera</i> ssp. <i>glomulifera</i>	Globular Pigweed
	<i>Einadia nutans</i> subsp. <i>nutans</i>	Nodding Saltbush
	<i>Elatine gratioloides</i>	Waterwort
	<i>Eleocharis acuta</i>	Common Spike-sedge
	<i>Eleocharis pallens</i>	Pale Spike-sedge
	<i>Eleocharis pusilla</i>	Small Spike-sedge
	<i>Eleocharis sphacelata</i>	Tall Spike-sedge
	<i>Elymus scaber</i> var. <i>scaber</i>	Common Wheat-grass
	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	Ruby Saltbush
	<i>Enneapogon nigricans</i>	Nigger-heads
	<i>Epilobium billardierianum</i>	Variable Willow-herb
	<i>Epilobium billardierianum</i> subsp. <i>cinereum</i>	Grey Willow-herb
	<i>Epilobium hirtigerum</i>	Hairy Willow-herb
	<i>Eragrostis brownii</i>	Common Love-grass
	<i>Eragrostis parviflora</i>	Weeping Love-grass
	<i>Erodium crinitum</i>	Blue Heron's-bill
	<i>Eryngium ovinum</i>	Blue Devil
	<i>Eryngium vesiculosum</i>	Prickfoot
	<i>Eucalyptus camaldulensis</i>	River Red-gum
	<i>Euchiton collinus</i>	Creeping Cudweed



Status	Scientific Name	Common Name
	<i>Euchiton involucratus</i>	Star Cudweed
	<i>Euchiton sphaericus</i>	Annual Cudweed
	<i>Eutaxia microphylla</i> var. <i>diffusa</i>	Spreading Eutaxia
	<i>Ficinia nodosa</i>	Knobby Club-sedge
	<i>Galium migrans</i>	Wandering Bedstraw
	<i>Geranium retrorsum</i>	Grassland Crane's-bill
	<i>Geranium solanderi</i> s.l.	Austral Crane's-bill
v	<i>Geranium solanderi</i> var. <i>solanderi</i>	Austral Crane's-bill
	<i>Geranium</i> sp. 2	Variable Crane's-bill
	<i>Geranium</i> sp. 5	Naked Crane's-bill
	<i>Glycine clandestina</i>	Twining Glycine
V, listed,		
v	<i>Glycine latrobeana</i>	Clover Glycine
	<i>Glycine microphylla</i>	Small-leaf Glycine
	<i>Glycine tabacina</i>	Variable Glycine
	<i>Gnaphalium</i> spp.	Cudweed
	<i>Gonocarpus tetragynus</i>	Common Raspwort
	<i>Goodenia gracilis</i>	Slender Goodenia
	<i>Goodenia pinnatifida</i>	Cut-leaf Goodenia
	<i>Gratiola peruviana</i>	Austral Brooklime
	<i>Haloragis aspera</i>	Rough Raspwort
	<i>Haloragis heterophylla</i>	Varied Raspwort
	<i>Hardenbergia violacea</i>	Purple Coral-pea
v	<i>Helichrysum</i> aff. <i>rutidolepis</i> (Lowland Swamps)	Pale Swamp Everlasting
	<i>Helichrysum rutidolepis</i> s.l.	Pale Everlasting
	<i>Heliotropium europaeum</i>	Common Heliotrope
	<i>Hemarthria uncinata</i> var. <i>uncinata</i>	Mat Grass
	<i>Hyalosperma demissum</i>	Moss Sunray
	<i>Hydrocotyle laxiflora</i>	Stinking Pennywort
	<i>Hydrocotyle sibthorpioides</i>	Shining Pennywort
	<i>Hydrocotyle tripartita</i>	Slender Pennywort
	<i>Hypericum gramineum</i>	Small St John's Wort
	<i>Hypoxis glabella</i> var. <i>glabella</i>	Tiny Star
	<i>Imperata cylindrica</i>	Blady Grass
	<i>Indigofera australis</i>	Austral Indigo
	<i>Isoetes muelleri</i>	Rock Quillwort
	<i>Isoetopsis graminifolia</i>	Grass Cushion
	<i>Isolepis cernua</i> var. <i>cernua</i>	Nodding Club-sedge
	<i>Isolepis cernua</i> var. <i>platycarpa</i>	Broad-fruit Club-sedge
	<i>Isolepis hookeriana</i>	Grassy Club-sedge
	<i>Isolepis marginata</i>	Little Club-sedge
	<i>Isolepis victoriensis</i>	Victorian Club-sedge
	<i>Juncus amabilis</i>	Hollow Rush
	<i>Juncus australis</i>	Austral Rush
	<i>Juncus bufonius</i>	Toad Rush
	<i>Juncus filicaulis</i>	Thread Rush
	<i>Juncus flavidus</i>	Gold Rush
	<i>Juncus gregiflorus</i>	Green Rush
	<i>Juncus holoschoenus</i>	Joint-leaf Rush
	<i>Juncus homalocaulis</i>	Wiry Rush
	<i>Juncus pallidus</i>	Pale Rush
	<i>Juncus procerus</i>	Tall Rush
	<i>Juncus radula</i>	Hoary Rush



Status	Scientific Name	Common Name
listed, e	<i>Juncus sarophorus</i>	Broom Rush
	<i>Juncus subsecundus</i>	Finger Rush
	<i>Kennedia prostrata</i>	Running Postman
	<i>Lachnagrostis aemula</i>	Leafy Blown-grass
	<i>Lachnagrostis filiformis</i>	Common Blown-grass
	<i>Lachnagrostis filiformis</i> var. 1	Common Blown-grass
	<i>Lagenophora huegelii</i>	Coarse Bottle-daisy
	<i>Leiocarpa leptolepis</i>	Pale Plover-daisy
	<i>Leiocarpa panaetioides</i>	Woolly Buttons
	<i>Lemna disperma</i>	Common Duckweed
	<i>Lepidosperma laterale</i>	Variable Sword-sedge
	<i>Leptorhynchus squamatus</i>	Scaly Buttons
	<i>Leptorhynchus squamatus</i> subsp. <i>squamatus</i>	Scaly Buttons
	<i>Lilaeopsis polyantha</i>	Australian Lilaeopsis
	<i>Linum marginale</i>	Native Flax
	<i>Lobelia anceps</i>	Angled Lobelia
	<i>Lobelia concolor</i>	Poison Pratia
	<i>Lobelia irrigua</i>	Salt Pratia
	<i>Lobelia pedunculata</i> s.l.	Matted Pratia
	<i>Lobelia pratioides</i>	Poison Lobelia
	<i>Lomandra filiformis</i>	Wattle Mat-rush
	<i>Lomandra filiformis</i> subsp. <i>filiformis</i>	Wattle Mat-rush
	<i>Lomandra longifolia</i>	Spiny-headed Mat-rush
	<i>Lomandra micrantha</i> s.l.	Small-flower Mat-rush
	<i>Lotus australis</i> var. <i>australis</i>	Austral Trefoil
	<i>Lythrum hyssopifolia</i>	Small Loosestrife
	<i>Maireana decalvans</i>	Black Cotton-bush
	<i>Maireana enchylaenoides</i>	Wingless Bluebush
	<i>Malva</i> aff. <i>preissiana</i> (pink-flowered inland form)	Australian Hollyhock
	<i>Marsilea costulifera</i>	Narrow-leaf Nardoo
	<i>Marsilea drummondii</i>	Common Nardoo
	<i>Meliccytus</i> sp. aff. <i>dentatus</i> (Volcanic Plain variant)	Tangled Shrub-violet
	<i>Mentha diemenica</i>	Slender Mint
	<i>Mentha</i> spp.	Mint
	<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass
	<i>Microtis unifolia</i>	Common Onion-orchid
	<i>Mimulus repens</i>	Creeping Monkey-flower
	<i>Minuria leptophylla</i>	Minnie Daisy
	<i>Mitrasacme</i> spp. (s.l.)	Mitrewort
	<i>Muehlenbeckia florulenta</i>	Tangled Lignum
	<i>Muellerina eucalyptoides</i>	Creeping Mistletoe
	<i>Myriocephalus rhizocephalus</i>	Woolly-heads
	<i>Myriophyllum muelleri</i>	Hooded Water-milfoil
	<i>Myriophyllum verrucosum</i>	Red Water-milfoil
	<i>Neopaxia australasica</i>	White Purslane
	<i>Notodanthonia semiannularis</i>	Wetland Wallaby-grass
	<i>Ophioglossum lusitanicum</i>	Austral Adder's-tongue
	<i>Oxalis exilis</i>	Shady Wood-sorrel
	<i>Oxalis perennans</i>	Grassland Wood-sorrel
	<i>Oxalis radicata</i>	Stout-rooted Wood-sorrel
	<i>Ozothamnus obcordatus</i>	Grey Everlasting
	<i>Panicum decompositum</i> var. <i>decompositum</i>	Native Millet



Status	Scientific Name	Common Name
	<i>Panicum effusum</i>	Hairy Panic
	<i>Parietaria debilis</i> s.l.	Shade Pellitory
	<i>Pelargonium australe</i>	Austral Stork's-bill
	<i>Pellaea falcata</i> s.s.	Sickle Fern
	<i>Persicaria decipiens</i>	Slender Knotweed
	<i>Persicaria hydropiper</i>	Water Pepper
	<i>Persicaria prostrata</i>	Creeping Knotweed
	<i>Phragmites australis</i>	Common Reed
	<i>Picris angustifolia</i>	Native Picris
	<i>Pilularia novae-hollandiae</i>	Austral Pillwort
	<i>Pimelea curviflora</i>	Curved Rice-flower
	<i>Pimelea curviflora</i> var. 1	Curved Rice-flower
	<i>Pimelea glauca</i>	Smooth Rice-flower
	<i>Pimelea humilis</i>	Common Rice-flower
	<i>Pimelea linifolia</i>	Slender Rice-flower
C, e	<i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower
	<i>Plantago gaudichaudii</i>	Narrow Plantain
	<i>Plantago varia</i>	Variable Plantain
	<i>Platysace lanceolata</i>	Shrubby Platysace
	<i>Pleurosorus rutifolius</i>	Blanket Fern
	<i>Poa clelandii</i>	Noah's Ark
	<i>Poa labillardierei</i>	Common Tussock-grass
	<i>Poa labillardierei</i> var. (Volcanic Plains)	Basalt Tussock-grass
	<i>Poa labillardierei</i> var. <i>labillardierei</i>	Common Tussock-grass
	<i>Poa morrisii</i>	Soft Tussock-grass
	<i>Poa sieberiana</i>	Grey Tussock-grass
	<i>Poa sieberiana</i> var. <i>hirtella</i>	Grey Tussock-grass
	<i>Poa sieberiana</i> var. <i>sieberiana</i>	Grey Tussock-grass
	<i>Podolepis jaceoides</i>	Showy Podolepis
	<i>Polystichum proliferum</i>	Mother Shield-fern
	<i>Portulaca oleracea</i>	Common Purslane
	<i>Potamogeton ochreatus</i>	Blunt Pondweed
	<i>Potamogeton pectinatus</i>	Fennel Pondweed
	<i>Potamogeton tricarinatus</i> s.l.	Floating Pondweed
	<i>Pseudognaphalium luteoalbum</i>	Jersey Cudweed
	<i>Pteridium esculentum</i>	Austral Bracken
	<i>Ptilotus macrocephalus</i>	Feather Heads
	<i>Ptilotus spathulatus</i> f. <i>spathulatus</i>	Pussy Tails
	<i>Pycnosorus chrysanthes</i>	Golden Billy-buttons
r	<i>Ranunculus diminutus</i>	Brackish Plains Buttercup
	<i>Ranunculus lappaceus</i>	Australian Buttercup
r	<i>Rhagodia parabolica</i>	Fragrant Saltbush
	<i>Rhodanthe anthemoides</i>	Chamomile Sunray
	<i>Rorippa laciniata</i>	Jagged Bitter-cress
	<i>Rubus parvifolius</i>	Small-leaf Bramble
	<i>Rumex bidens</i>	Mud Dock
	<i>Rumex brownii</i>	Slender Dock
	<i>Rumex dumosus</i>	Wiry Dock
	<i>Ruppia megacarpa</i>	Large-fruit Tassel
E, listed, e	<i>Rutidosia leptorhynchoides</i>	Button Wrinklewort
	<i>Samolus repens</i>	Creeping Brookweed
	<i>Schoenoplectus pungens</i>	Sharp Club-sedge
	<i>Schoenoplectus tabernaemontani</i>	River Club-sedge



Status	Scientific Name	Common Name
r V, listed, e	<i>Schoenus apogon</i>	Common Bog-sedge
	<i>Sclerolaena muricata</i> var. <i>villosa</i>	Grey Roly-poly
	<i>Scutellaria humilis</i>	Dwarf Skullcap
	<i>Sebaea ovata</i>	Yellow Sebaea
	<i>Senecio bathurstianus</i>	Dissected Fireweed
	<i>Senecio cunninghamii</i> var. <i>cunninghamii</i>	Branching Groundsel
	<i>Senecio glomeratus</i>	Annual Fireweed
	<i>Senecio macrocarpus</i>	Large-headed Fireweed
	<i>Senecio odoratus</i>	Scented Groundsel
	<i>Senecio pinnatifolius</i>	Variable Groundsel
	<i>Senecio quadridentatus</i>	Cotton Fireweed
	<i>Solenogyne dominii</i>	Smooth Solenogyne
	<i>Solenogyne gunnii</i>	Hairy Solenogyne
	<i>Sonchus hydrophilus</i>	Native Sow-thistle
	<i>Sporobolus virginicus</i>	Salt Couch
	<i>Stackhousia monogyna</i>	Creamy Stackhousia
	<i>Stackhousia subterranea</i>	Plains Stackhousia
	<i>Stellaria pungens</i>	Prickly Starwort
	<i>Tetragonia tetragonioides</i>	New Zealand Spinach
	<i>Teucrium</i> spp.	Germander
r	<i>Themeda triandra</i>	Kangaroo Grass
	<i>Tricoryne elatior</i>	Yellow Rush-lily
	<i>Triglochin procera</i>	Common Water-ribbons
	<i>Triglochin striata</i>	Streaked Arrowgrass
	<i>Tripogon loliiformis</i>	Rye Beetle-grass
	<i>Typha domingensis</i>	Narrow-leaf Cumbungi
	<i>Velleia paradoxa</i>	Spur Velleia
	<i>Veronica gracilis</i>	Slender Speedwell
	<i>Vittadinia cervicalis</i>	Annual New Holland Daisy
	<i>Vittadinia cuneata</i>	Fuzzy New Holland Daisy
	<i>Vittadinia cuneata</i> var. <i>cuneata</i>	Fuzzy New Holland Daisy
	<i>Vittadinia dissecta</i> s.l.	Dissected New Holland Daisy
	<i>Vittadinia gracilis</i>	Woolly New Holland Daisy
	<i>Vittadinia muelleri</i>	Narrow-leaf New Holland Daisy
	<i>Wahlenbergia communis</i>	Tufted Bluebell
	<i>Wahlenbergia gracilentia</i>	Hairy Annual-bluebell
	<i>Wahlenbergia gracilis</i>	Sprawling Bluebell
	<i>Wahlenbergia luteola</i>	Bronze Bluebell
	<i>Wahlenbergia multicaulis</i>	Branching Bluebell
Introduced Species	<i>Walwhalleya proluta</i>	Rigid Panic
	<i>Wilsontia rotundifolia</i>	Round-leaf Wilsontia
	<i>Xerochrysum viscosum</i>	Shiny Everlasting
	<i>Acacia decurrens</i>	Early Black-wattle
	# <i>Acacia pravissima</i>	Ovens Wattle
	# <i>Acacia retinodes</i> s.l.	Wirilda
	<i>Acetosella vulgaris</i>	Sheep Sorrel
	<i>Agrostis capillaris</i> var. <i>capillaris</i>	Brown-top Bent
	<i>Aira caryophyllea</i>	Silvery Hair-grass
	<i>Aira cupaniana</i>	Quicksilver Grass
	<i>Aira elegantissima</i>	Delicate Hair-grass
	<i>Aira praecox</i>	Early Hair-grass
	<i>Amaranthus albus</i>	Stiff Tumbleweed



Status	Scientific Name	Common Name
	<i>Anagallis arvensis</i>	Pimpernel
	<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass
	<i>Aptenia cordifolia</i>	Heart-leaf Ice-plant
	<i>Arctotheca calendula</i>	Cape Weed
	<i>Asparagus asparagoides</i>	Bridal Creeper
	<i>Asphodelus fistulosus</i>	Onion Weed
	<i>Aster subulatus</i>	Aster-weed
	<i>Atriplex prostrata</i>	Hastate Orache
	<i>Avena barbata</i>	Bearded Oat
	<i>Avena fatua</i>	Wild Oat
	<i>Avena sterilis</i>	Sterile Oat
	<i>Avena sterilis</i> subsp. <i>ludoviciana</i>	Sterile Oat
	<i>Barbarea intermedia</i>	Wintercress
	<i>Berkheya rigida</i>	African Thistle
	<i>Brachypodium distachyon</i>	False Brome
	<i>Brassica fruticulosa</i>	Twiggy Turnip
	<i>Brassica rapa</i>	White Turnip
	<i>Brassica X juncea</i>	Indian Mustard
	<i>Briza maxima</i>	Large Quaking-grass
	<i>Briza minor</i>	Lesser Quaking-grass
	<i>Bromus catharticus</i>	Prairie Grass
	<i>Bromus diandrus</i>	Great Brome
	<i>Bromus hordeaceus</i> subsp. <i>hordeaceus</i>	Soft Brome
	<i>Bromus lanceolatus</i>	Mediterranean Brome
	<i>Bromus madritensis</i>	Madrid Brome
	<i>Bromus rubens</i>	Red Brome
	<i>Callitriche stagnalis</i>	Common Water-starwort
	<i>Capsella bursa-pastoris</i>	Shepherd's Purse
	<i>Carduus pycnocephalus</i>	Slender Thistle
	<i>Carduus tenuiflorus</i>	Winged Slender-thistle
	<i>Carthamus lanatus</i>	Saffron Thistle
	<i>Catapodium rigidum</i>	Fern Grass
	<i>Centaurea melitensis</i>	Malta Thistle
	<i>Centaureum erythraea</i>	Common Centaury
	<i>Centaureum tenuiflorum</i>	Slender Centaury
	<i>Cerastium balearicum</i>	Balearic Mouse-ear Chickweed
	<i>Cerastium fontanum</i> subsp. <i>vulgare</i>	Common Mouse-ear Chickweed
	<i>Cerastium glomeratum</i>	Sticky Mouse-ear Chickweed
	<i>Chamaecytisus palmensis</i>	Tree Lucerne
	<i>Chamaemelum nobile</i>	Common Chamomile
	<i>Chenopodium album</i>	Fat Hen
	<i>Chenopodium macrospermum</i>	Red-stem Goosefoot
	<i>Chenopodium murale</i>	Sowbane
	<i>Chloris gayana</i>	Rhodes Grass
	<i>Chondrilla juncea</i>	Skeleton Weed
	<i>Cicendia filiformis</i>	Slender Cicendia
	<i>Cicendia quadrangularis</i>	Square Cicendia
	<i>Cirsium arvense</i>	Perennial Thistle
	<i>Cirsium vulgare</i>	Spear Thistle
	<i>Convolvulus arvensis</i>	Common Bindweed
	<i>Conyza bonariensis</i>	Flaxleaf Fleabane
	<i>Conyza sumatrensis</i>	Tall Fleabane
	<i>Cotoneaster pannosus</i>	Velvet Cotoneaster
	<i>Cotula bipinnata</i>	Ferny Cotula



Status	Scientific Name	Common Name
	<i>Cotula coronopifolia</i>	Water Buttons
	<i>Crassula natans</i> var. <i>minus</i>	Water Crassula
	<i>Crataegus monogyna</i>	Hawthorn
	<i>Cucumis myriocarpus</i> subsp. <i>leptodermis</i>	Paddy Melon
	<i>Cuscuta epithymum</i>	Common Dodder
	<i>Cynara cardunculus</i>	Artichoke Thistle
	<i>Cynodon dactylon</i> var. <i>dactylon</i>	Couch
	<i>Cynosurus echinatus</i>	Rough Dog's-tail
	<i>Cyperus eragrostis</i>	Drain Flat-sedge
	<i>Dactylis glomerata</i>	Cocksfoot
	<i>Datura stramonium</i>	Common Thorn-apple
	<i>Diplotaxis tenuifolia</i>	Sand Rocket
	<i>Dipsacus fullonum</i> subsp. <i>fullonum</i>	Wild Teasel
	<i>Dittrichia graveolens</i>	Stinkwort
	<i>Ecballium elaterium</i>	Squirting Cucumber
	<i>Echinochloa crus-galli</i>	Barnyard Grass
	<i>Echium plantagineum</i>	Paterson's Curse
	<i>Ehrharta erecta</i> var. <i>erecta</i>	Panic Veldt-grass
	<i>Ehrharta longiflora</i>	Annual Veldt-grass
	<i>Eichhornia crassipes</i>	Water Hyacinth
	<i>Eleusine tristachya</i>	American Crows-foot Grass
	<i>Elytrigia repens</i>	English Couch
	<i>Eragrostis curvula</i>	African Love-grass
	<i>Erodium botrys</i>	Big Heron's-bill
	<i>Erodium cicutarium</i>	Common Heron's-bill
	<i>Erodium moschatum</i>	Musky Heron's-bill
	<i>Eucalyptus cladocalyx</i>	Sugar Gum
	<i>Euphorbia peplus</i>	Petty Spurge
	<i>Festuca arundinacea</i>	Tall Fescue
	<i>Foeniculum vulgare</i>	Fennel
	<i>Fraxinus</i> spp.	Ash
	<i>Fumaria bastardii</i>	Bastard's Fumitory
	<i>Fumaria capreolata</i>	White Fumitory
	<i>Fumaria muralis</i> subsp. <i>muralis</i>	Wall Fumitory
	<i>Galenia pubescens</i> var. <i>pubescens</i>	Galenia
	<i>Galium aparine</i>	Cleavers
	<i>Gamochaeta calviceps</i>	Silky Cudweed
	<i>Gamochaeta purpurea</i>	Spiked Cudweed
	<i>Gastridium phleoides</i>	Nit-grass
	<i>Gaudinia fragilis</i>	Fragile Oat
	<i>Gazania linearis</i>	Gazania
	<i>Genista linifolia</i>	Flax-leaf Broom
	<i>Genista monspessulana</i>	Montpellier Broom
	<i>Geranium dissectum</i>	Cut-leaf Crane's-bill
	<i>Geranium molle</i> var. <i>molle</i>	Dove's Foot
	<i>Hainardia cylindrica</i>	Common Barb-grass
	<i>Hedypnois cretica</i>	Cretan Hedypnois
	<i>Heliotropium supinum</i>	Creeping Heliotrope
	<i>Helminthotheca echioides</i>	Ox-tongue
	<i>Hirschfeldia incana</i>	Buchan Weed
	<i>Holcus annuus</i>	Annual Fog
	<i>Holcus lanatus</i>	Yorkshire Fog
	<i>Hordeum hystrix</i>	Mediterranean Barley-grass
	<i>Hordeum leporinum</i>	Barley-grass



Status	Scientific Name	Common Name
	<i>Hordeum marinum</i>	Sea Barley-grass
	<i>Hordeum</i> spp.	Barley Grass
	<i>Hordeum vulgare</i> s.s.	Barley
	<i>Hypericum perforatum</i> subsp. <i>veronense</i>	St John's Wort
	<i>Hypochoeris glabra</i>	Smooth Cat's-ear
	<i>Hypochoeris radicata</i>	Flatweed
	<i>Isolepis levynsiana</i>	Tiny Flat-sedge
	<i>Juncus acutus</i> subsp. <i>acutus</i>	Spiny Rush
	<i>Juncus capitatus</i>	Capitate Rush
	<i>Juncus microcephalus</i>	Tiny-headed Rush
	<i>Kickxia elatine</i>	Hairy Toadflax
	<i>Lactuca saligna</i>	Willow-leaf Lettuce
	<i>Lactuca serriola</i>	Prickly Lettuce
	<i>Leontodon taraxacoides</i> subsp. <i>taraxacoides</i>	Hairy Hawkbit
	<i>Lepidium africanum</i>	Common Peppergrass
	<i>Lepidium draba</i>	Hoary Cress
	<i>Lilaea scilloides</i>	Lilaea
	<i>Linum trigynum</i>	French Flax
	<i>Lolium loliaceum</i>	Stiff Rye-grass
	<i>Lolium multiflorum</i>	Italian Rye-grass
	<i>Lolium perenne</i>	Perennial Rye-grass
	<i>Lolium rigidum</i>	Wimmera Rye-grass
	<i>Lophopyrum ponticum</i>	Tall Wheat-grass
	<i>Lotus angustissimus</i>	Slender Bird's-foot Trefoil
	<i>Lotus corniculatus</i>	Bird's-foot Trefoil
	<i>Lotus subbiflorus</i>	Hairy Bird's-foot Trefoil
	<i>Lycium ferocissimum</i>	African Box-thorn
	<i>Malva dendromorpha</i>	Tree Mallow
	<i>Malva nicaeensis</i>	Mallow of Nice
	<i>Malva parviflora</i>	Small-flower Mallow
	<i>Marrubium vulgare</i>	Horehound
	<i>Medicago arabica</i>	Spotted Medic
	<i>Medicago lupulina</i>	Black Medic
	<i>Medicago minima</i>	Little Medic
	<i>Medicago polymorpha</i>	Burr Medic
	<i>Medicago truncatula</i>	Barrel Medic
	<i>Melilotus indicus</i>	Sweet Melilot
	<i>Modiola caroliniana</i>	Red-flower Mallow
	<i>Moenchia erecta</i>	Erect Chickweed
	<i>Moraea flaccida</i>	One-leaf Cape-tulip
	<i>Moraea miniata</i>	Two-leaf Cape-tulip
	<i>Moraea setifolia</i>	Thread Iris
	<i>Myriophyllum aquaticum</i>	Parrot's Feather
	<i>Nassella hyalina</i>	Cane Needle-grass
	<i>Nassella leucotricha</i>	Texas Needle-grass
	<i>Nassella neesiana</i>	Chilean Needle-grass
	<i>Nassella trichotoma</i>	Serrated Tussock
	<i>Nasturtium officinale</i>	Watercress
	<i>Olea europaea</i>	Olive
	<i>Onopordum acanthium</i> subsp. <i>acanthium</i>	Scotch Thistle
	<i>Opuntia monacantha</i>	Drooping Prickly-pear
	<i>Opuntia robusta</i>	Wheel Cactus
	<i>Opuntia stricta</i>	Common Prickly-pear
	<i>Oxalis corniculata</i>	Creeping Wood-sorrel



Status	Scientific Name	Common Name
	<i>Oxalis pes-caprae</i>	Soursob
	<i>Panicum gilvum</i>	Sweet Panic
	<i>Papaver dubium</i>	Long-headed Poppy
	<i>Parapholis strigosa</i>	Slender Barb-grass
	<i>Paronychia franciscana</i>	Chile Nailwort
	<i>Paspalum dilatatum</i>	Paspalum
	<i>Paspalum distichum</i>	Water Couch
	<i>Pennisetum clandestinum</i>	Kikuyu
	<i>Pentaschistis airoides</i> subsp. <i>airoides</i>	False Hair-grass
	<i>Persicaria maculosa</i>	Redshank
	<i>Petrorhagia dubia</i>	Velvety Pink
	<i>Phalaris aquatica</i>	Toowoomba Canary-grass
	<i>Phalaris minor</i>	Lesser Canary-grass
	<i>Phalaris paradoxa</i>	Paradoxical Canary-grass
	<i>Physalis viscosa</i>	Sticky Ground-cherry
	<i>Phytolacca octandra</i>	Red-ink Weed
	<i>Pinus radiata</i>	Radiata Pine
	<i>Piptatherum miliaceum</i>	Rice Millet
#	<i>Pittosporum undulatum</i>	Sweet Pittosporum
	<i>Plantago coronopus</i> subsp. <i>coronopus</i>	Buck's-horn Plantain
	<i>Plantago lanceolata</i>	Ribwort
	<i>Plantago major</i>	Greater Plantain
	<i>Poa annua</i>	Annual Meadow-grass
	<i>Poa trivialis</i> subsp. <i>trivialis</i>	Rough Meadow-grass
	<i>Polycarpon tetraphyllum</i>	Four-leaved Allseed
	<i>Polygala monspeliaca</i>	Annual Milkwort
	<i>Polygonum arenastrum</i>	Wireweed
	<i>Polygonum aviculare</i> s.s.	Hogweed
	<i>Polypogon monspeliensis</i>	Annual Beard-grass
	<i>Prunus cerasifera</i>	Cherry Plum
	<i>Puccinellia fasciculata</i>	Borrer's Saltmarsh-grass
	<i>Ranunculus ophioglossifolius</i>	Snake-tongue Buttercup
	<i>Raphanus raphanistrum</i>	Wild Radish
	<i>Rapistrum rugosum</i>	Giant Mustard
	<i>Reseda lutea</i>	Cut-leaf Mignonette
	<i>Ricinus communis</i>	Castor Oil Plant
	<i>Romulea minutiflora</i>	Small-flower Onion-grass
	<i>Romulea rosea</i>	Onion Grass
	<i>Romulea rosea</i> var. <i>australis</i> s.s.	Common Onion-grass
	<i>Rorippa palustris</i>	Marsh Yellow-cress
	<i>Rosa rubiginosa</i>	Sweet Briar
	<i>Rostraria cristata</i>	Annual Cat's-tail
	<i>Rubus anglocandicans</i>	Blackberry
	<i>Rubus fruticosus</i> spp. agg.	Blackberry
	<i>Rumex conglomeratus</i>	Clustered Dock
	<i>Rumex crispus</i>	Curled Dock
	<i>Rumex obtusifolius</i> subsp. <i>obtusifolius</i>	Broad-leaf Dock
	<i>Rumex pulcher</i> subsp. <i>pulcher</i>	Fiddle Dock
	<i>Salix X rubens</i>	Basket Willow
	<i>Salvia verbenaca</i>	Wild Sage
	<i>Salvia verbenaca</i> var. <i>verbenaca</i>	Wild Sage
	<i>Schinus molle</i>	Pepper Tree
	<i>Scorzonera laciniata</i>	Scorzonera
	<i>Senecio vulgaris</i>	Common Groundsel



Status	Scientific Name	Common Name
	<i>Setaria parviflora</i>	Slender Pigeon Grass
	<i>Setaria pumila</i> subsp. <i>pumila</i>	Pale Pigeon-grass
	<i>Sherardia arvensis</i>	Field Madder
	<i>Silene gallica</i>	French Catchfly
	<i>Silybum marianum</i>	Variegated Thistle
	<i>Sisymbrium irio</i>	London Rocket
	<i>Sisymbrium officinale</i>	Hedge Mustard
	<i>Sisymbrium orientale</i>	Indian Hedge-mustard
	<i>Solanum nigrum</i>	Black Nightshade
	<i>Soliva sessilis</i>	Jo Jo
	<i>Sonchus asper</i> subsp. <i>asper</i>	Rough Sow-thistle
	<i>Sonchus asper</i> subsp. <i>glaucescens</i>	Blue Sow-thistle
	<i>Sonchus oleraceus</i>	Common Sow-thistle
	<i>Spergularia bocconii</i>	Bocconi's Sand-spurrey
	<i>Spergularia media</i>	Greater Sea-spurrey
	<i>Sporobolus africanus</i>	Rat-tail Grass
	<i>Stellaria media</i>	Chickweed
	<i>Suaeda baccifera</i>	Berry Seablite
	<i>Taraxacum officinale</i> spp. agg.	Garden Dandelion
	<i>Tragopogon porrifolius</i>	Salsify
	<i>Tribolium acutiflorum</i>	Crested Desmazeria
	<i>Tribolium oblitterum</i>	Desmazeria
	<i>Trifolium angustifolium</i> var. <i>angustifolium</i>	Narrow-leaf Clover
	<i>Trifolium arvense</i> var. <i>arvense</i>	Hare's-foot Clover
	<i>Trifolium campestre</i> var. <i>campestre</i>	Hop Clover
	<i>Trifolium dubium</i>	Suckling Clover
	<i>Trifolium fragiferum</i> var. <i>fragiferum</i>	Strawberry Clover
	<i>Trifolium glomeratum</i>	Cluster Clover
	<i>Trifolium pratense</i>	Red Clover
	<i>Trifolium repens</i> var. <i>repens</i>	White Clover
	<i>Trifolium striatum</i>	Knotted Clover
	<i>Trifolium subterraneum</i>	Subterranean Clover
	<i>Trifolium tomentosum</i> var. <i>tomentosum</i>	Woolly Clover
	<i>Triticum aestivum</i>	Wheat
	<i>Ulex europaeus</i>	Gorse
	<i>Ulmus</i> spp.	Elm
	<i>Urtica urens</i>	Small Nettle
	<i>Vellereophyton dealbatum</i>	White Cudweed
	<i>Verbascum thapsus</i> subsp. <i>thapsus</i>	Great Mullein
	<i>Vicia sativa</i>	Common Vetch
	<i>Vicia sativa</i> subsp. <i>sativa</i>	Common Vetch
	<i>Vulpia bromoides</i>	Squirrel-tail Fescue
	<i>Vulpia muralis</i>	Wall Fescue
	<i>Vulpia myuros</i>	Rat's-tail Fescue
	<i>Vulpia myuros</i> f. <i>megalura</i>	Fox-tail Fescue
	<i>Xanthium spinosum</i>	Bathurst Burr



## A2.2 Significant flora species

**Table A2.3 Flora of national or state significance recorded or predicted to occur within Section H of the Melton/Wyndham Investigation Area**

Australian status:

CE	Listed under EPBC Act as critically endangered
E	Listed under EPBC Act as endangered
V	Listed under EPBC Act as vulnerable
R	Rare (Walsh & Stajsic 2007)

Victorian status (DSE Flora Information System, 2007 Version):

e	Endangered
v	Vulnerable
r	Rare
f	Listed as threatened under FFG Act

Source of record:

FIS:	Recorded within 5 km of centre of study area, DSE Flora Information System
DEWHA:	Predicted to occur in local area, EPBC Act Protected Matters Search Tool

Likelihood scale:

	No habitat present	Habitat poorly represented	Habitat moderately well represented	Habitat well represented
No records from bioregion (terrestrial) or neighbouring basin (aquatic)	Negligible	Negligible	Low	Medium
Records from bioregion (terrestrial) or basin/neighbouring basin (aquatic)	Negligible	Low	Medium	High
Records from within 5 km (terrestrial) or from catchment (aquatic)	Negligible	Medium	High	High

Scientific name	Common name	Aust. status	Vic. status	Source of record	FFG	Occurrence in study area
<b>National Significance</b>						
<i>Amphibromus fluitans</i>	River Swamp Wallaby-grass	V		FIS/DEWHA		Recorded (FIS)
<i>Carex tasmanica</i>	Curly Sedge	V	v	DEWHA	listed	Low
<i>Dianella amoena</i>	Matted Flax-lily	E	e	FIS	listed	High
<i>Diuris basaltica</i>	Small Golden Moths	E	v	DEWHA	listed	High
<i>Diuris fragrantissima</i>	Sunshine Diuris	E	e	FIS	listed	High
<i>Glycine latrobeana</i>	Clover Glycine	V	v	FIS/DEWHA	listed	Medium
<i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	C	e	FIS/DEWHA		Recorded (FIS and current assessment)
<i>Prasophyllum frenchii</i>	Maroon Leek-orchid	E	e	DEWHA	listed	Negligible
<i>Rutidosia leptorhynchoides</i>	Button Wrinklewort	E	e	FIS/DEWHA	listed	High
<i>Senecio macrocarpus</i>	Large-headed Fireweed	V	e	FIS/DEWHA	listed	High
<b>State Significance</b>						
<i>Allocasuarina luehmannii</i>	Buloke			FIS	listed	High
<i>Austrostipa exilis</i>	Heath Spear-grass		r	FIS		High
<i>Comesperma polygaloides</i>	Small Milkwort		v	FIS	listed	High
<i>Cullen parvum</i>	Small Scurf-pea		e	FIS	listed	High

Scientific name	Common name	Aust. status	Vic. status	Source of record	FFG	Occurrence in study area
<i>Cullen tenax</i>	Tough Scurf-pea		e	FIS	listed	High
<i>Dianella</i> sp. aff. <i>longifolia</i> (Benambra)	Arching Flax-lily		v, K	FIS		Recorded (current assessment)
<i>Dipodium campanulatum</i>	Bell-flower Hyacinth- orchid		e, K	FIS		Medium
<i>Diuris palustris</i>	Swamp Diuris		v	FIS	listed	High
<i>Diuris X fastidiosa</i>	Proud Diuris		e	FIS		Recorded (FIS)
<i>Geranium solanderi</i> var. <i>solanderi</i> s.s.	Austral Crane's-bill		v	FIS		High
<i>Goodenia macbarronii</i>	Narrow Goodenia		v	Current assessment	listed	Recorded (current assessment)
<i>Helichrysum</i> aff. <i>rutidolepis</i> (Lowland Swamps)	Pale Swamp Everlasting		v	FIS		High
<i>Leiocarpa leptolepis</i>	Pale Plover-daisy		e	FIS	listed	High
<i>Ranunculus diminutus</i>	Brackish Plains Buttercup		r	FIS		High
<i>Rhagodia parabolica</i>	Fragrant Saltbush		r	FIS		High
<i>Senecio cunninghamii</i> var. <i>cunninghamii</i>	Branching Groundsel		r	FIS		High
<i>Tripogon loliiformis</i>	Rye Beetle-grass		r	FIS		High



# **APPENDIX 3**

## **EVC Benchmarks**

# EVC/Bioregion Benchmark for Vegetation Quality Assessment

## Victorian Volcanic Plain bioregion

### EVC 132\_61: *Heavier-soils* Plains Grassland

#### Description:

Treeless vegetation mostly less than 1 m tall dominated by largely graminoid and herb life forms. Occupies fertile cracking basalt soils prone to seasonal waterlogging in areas receiving at least 500 mm annual rainfall.

#### Life Forms:

Life form	#Spp	%Cover	LF code
Large Herb	2	5%	LH
Medium Herb	12	20%	MH
Small or Prostrate Herb	4	5%	SH
Large Tufted Graminoid	1	5%	LTG
Medium to Small Tufted Graminoid	13	40%	MTG
Medium to Tiny Non-tufted Graminoid	4	5%	MNG
Bryophytes/Lichens and Soil Crust*	na	20%	BL

\* Note: treat as one life form in this EVC

LF Code	Species typical of at least part of EVC range	Common Name
SS	<i>Pimelea humilis</i>	Common Rice-flower
LH	<i>Rumex dumosus</i>	Wiry Dock
MH	<i>Calocephalus citreus</i>	Lemon Beauty-heads
MH	<i>Acaena echinata</i>	Sheep's Burr
MH	<i>Leptorhynchus squamatus</i>	Scaly Buttons
MH	<i>Eryngium ovium</i>	Blue Devil
SH	<i>Solenogyne dominii</i>	Smooth Solenogyne
SH	<i>Lobelia pratioides</i>	Poison Lobelia
LTG	<i>Austrostipa bigeniculata</i>	Kneed Spear-grass
LTG	<i>Dichelachne crinita</i>	Long-hair Plume-grass
MTG	<i>Themeda triandra</i>	Kangaroo Grass
MTG	<i>Austrodanthonia caespitosa</i>	Common Wallaby-grass
MTG	<i>Elymus scaber</i> var. <i>scaber</i>	Common Wheat-grass
MTG	<i>Schoenus apogon</i>	Common Bog-sedge
MNG	<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass
MNG	<i>Thelymitra pauciflora</i> s.l.	Slender Sun-orchid
MNG	<i>Microtis unifolia</i>	Common Onion-orchid
SC	<i>Convolvulus erubescens</i>	Pink Bindweed

#### Recruitment:

Episodic/Fire or Grazing. Desirable period between disturbances is 5 years.

#### Organic Litter:

10% cover



# EVC 132\_61: *Heavier-soils* Plains Grassland - Victorian Volcanic Plain bioregion

## Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
LH	<i>Plantago lanceolata</i>	Ribwort	high	low
LH	<i>Cirsium vulgare</i>	Spear Thistle	high	high
LH	<i>Sonchus oleraceus</i>	Common Sow-thistle	high	low
MH	<i>Hypochoeris radicata</i>	Cat's Ear	high	low
MH	<i>Leontodon taraxacoides</i> ssp. <i>taraxacoides</i>	Hairy Hawkbit	high	low
MH	<i>Trifolium subterraneum</i>	Subterranean Clover	high	low
MH	<i>Plantago coronopus</i>	Buck's-horn Plantain	high	low
MH	<i>Trifolium striatum</i>	Knotted Clover	high	low
MH	<i>Trifolium dubium</i>	Suckling Clover	high	low
LTG	<i>Phalaris aquatica</i>	Toowoomba Canary-grass	high	high
LNG	<i>Holcus lanatus</i>	Yorkshire Fog	high	high
MTG	<i>Romulea rosea</i>	Onion Grass	high	low
MTG	<i>Vulpia bromoides</i>	Squirrel-tail Fescue	high	low
MTG	<i>Briza minor</i>	Lesser Quaking-grass	high	low
MTG	<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	Soft Brome	high	low
MTG	<i>Briza maxima</i>	Large Quaking-grass	high	low
MTG	<i>Lolium rigidum</i>	Wimmera Rye-grass	high	low
MTG	<i>Lolium perenne</i>	Perennial Rye-grass	high	low
MTG	<i>Nassella neesiana</i>	Chilean Needle-grass	high	high
MNG	<i>Cynosurus echinatus</i>	Rough Dog's-tail	high	low
MNG	<i>Juncus capitatus</i>	Capitate Rush	high	low

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# EVC/Bioregion Benchmark for Vegetation Quality Assessment

## Victorian Volcanic Plain bioregion

### EVC 132\_63: *Low-rainfall* Plains Grassland

#### Description:

Treeless vegetation mostly < 1 m tall dominated by largely graminoid and herb life forms. Occupies cracking basalt soils prone to seasonal waterlogging in areas receiving < 500 mm annual rainfall.

#### Life forms:

Life form	#Spp	%Cover	LF code
Small Shrub*	1	5%	SS
Prostrate Shrub	1	5%	PS
Large Herb*	2	5%	LH
Medium Herb	8	20%	MH
Small or Prostrate Herb*	3	10%	SH
Large Tufted Graminoid	1	5%	LTG
Medium to Small Tufted Graminoid	10	30%	MTG
Medium to Tiny Non-tufted Graminoid*	2	5%	MNG
Bryophytes/Lichens and Soil Crust**	na	20%	BL

\* Largely seasonal life form

\*\* Note: treat as one life form in this EVC

LF Code	Species typical of at least part of EVC range	Common Name
SS	<i>Pimelea curviflora</i> s.s.	Curved Rice-flower
PS	<i>Atriplex semibaccata</i>	Berry Saltbush
LH	<i>Ptilotus macrocephalus</i>	Feather-heads
MH	<i>Acaena echinata</i>	Sheep's Burr
MH	<i>Plantago gaudichaudii</i>	Narrow Plantain
MH	<i>Maireana enchylaenoides</i>	Wingless Bluebush
MH	<i>Calocephalus citreus</i>	Lemon Beauty-heads
SH	<i>Solenogyne dominii</i>	Smooth Solenogyne
SH	<i>Oxalis perennans</i>	Grassland Wood-sorrel
SH	<i>Chamaesyce drummondii</i>	Flat Spurge
SH	<i>Goodenia pinnatifida</i>	Cut-leaf Goodenia
LTG	<i>Austrostipa bigeniculata</i>	Kneed Spear-grass
MTG	<i>Austrostipa scabra</i>	Rough Spear-grass
MTG	<i>Austrostipa nodosa</i>	Knotty Spear-grass
MTG	<i>Whalleya proluta</i>	Rigid Panic
MTG	<i>Austrodanthonia duttoniana</i>	Brown-back Wallaby-grass
TTG	<i>Centrolepis strigosa</i> ssp. <i>strigosa</i>	Hairy Centrolepis
TTG	<i>Centrolepis aristata</i>	Pointed Centrolepis
SC	<i>Convolvulus erubescens</i> spp. agg.	Pink Bindweed

#### Recruitment:

Episodic/Fire or Grazing. Desirable period between disturbances is 5 years.

#### Organic Litter:

10% cover



# EVC 132\_63: *Low-rainfall* Plains Grassland - Victorian Volcanic Plain bioregion

## Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
LH	<i>Plantago lanceolata</i>	Ribwort	high	low
LH	<i>Cirsium vulgare</i>	Spear Thistle	high	high
LH	<i>Sonchus oleraceus</i>	Common Sow-thistle	high	low
MH	<i>Hypochoeris radicata</i>	Cat's Ear	high	low
MH	<i>Leontodon taraxacoides</i> ssp. <i>taraxacoides</i>	Hairy Hawkbit	high	low
MH	<i>Trifolium subterraneum</i>	Subterranean Clover	high	low
MH	<i>Plantago coronopus</i>	Buck's-horn Plantain	high	low
MH	<i>Trifolium striatum</i>	Knotted Clover	high	low
MH	<i>Trifolium dubium</i>	Suckling Clover	high	low
MTG	<i>Romulea rosea</i>	Onion Grass	high	low
MTG	<i>Vulpia bromoides</i>	Squirrel-tail Fescue	high	low
MTG	<i>Briza minor</i>	Lesser Quaking-grass	high	low
MTG	<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	Soft Brome	high	low
MTG	<i>Briza maxima</i>	Large Quaking-grass	high	low
MTG	<i>Lolium rigidum</i>	Wimmera Rye-grass	high	low
MTG	<i>Lolium perenne</i>	Perennial Rye-grass	high	low
MTG	<i>Nassella neesiana</i>	Chilean Needle-grass	high	high
MNG	<i>Cynosurus echinatus</i>	Rough Dog's-tail	high	low
MNG	<i>Juncus capitatus</i>	Capitate Rush	high	low

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# EVC/Bioregion Benchmark for Vegetation Quality Assessment

## Victorian Volcanic Plain bioregion

### EVC 104: Lignum Swamp

#### Description:

Shrubland to 3 m tall or open woodland to 15 m tall, with an understorey that can be rich in herbaceous species. Occurs on inundation-prone heavy grey soils in depressions or floodways in low rainfall areas.

+ woodland only components (ignore when assessing treeless areas and standardise final score as appropriate)

#### Large trees<sup>+</sup>:

Species	DBH(cm)	#/ha
<i>Eucalyptus</i> spp.	80 cm	5

#### Tree Canopy Cover<sup>+</sup>:

%cover	Character Species	Common Name
10%	<i>Eucalyptus camaldulensis</i>	River Red Gum

#### Life forms:

Life form	#Spp	%Cover	LF code
Immature Canopy Tree <sup>+</sup>		5%	IT
Medium Shrub	1	20%	MS
Large Herb	2	5%	LH
Medium Herb	3	15%	MH
Small or Prostrate Herb	3	10%	SH
Large Tufted Graminoid	1	5%	LTG
Medium to Small Tufted Graminoid	6	20%	MTG
Medium to Tiny Non-tufted Graminoid	3	10%	MNG
Bryophytes/Lichens	na	10%	BL
Soil Crust	na	10%	S/C

#### LF Code

#### Species typical of at least part of EVC range

#### Common Name

MS	<i>Muehlenbeckia florulenta</i>	Lignum
LH	<i>Brachyscome basaltica</i> var. <i>gracilis</i>	Woodland Swamp-daisy
LH	<i>Rumex brownii</i>	Slender Dock
MH	<i>Marsilea drummondii</i>	Common Nardoo
MH	<i>Alternanthera denticulata</i> s.l.	Lesser Joyweed
MH	<i>Myriophyllum muelleri</i>	Hooded Water-milfoil
SH	<i>Eryngium vesiculosum</i>	Prickfoot
SH	<i>Lobelia pratioides</i>	Poison Lobelia
SH	<i>Lobelia concolor</i>	Poison Pratia
LTG	<i>Amphibromus nervosus</i>	Common Swamp Wallaby-grass
MTG	<i>Lachnagrostis filiformis</i>	Common Blown-grass
MTG	<i>Juncus subsecundus</i>	Finger Rush
MTG	<i>Austrodanthonia duttoniana</i>	Brown-back Wallaby-grass
MNG	<i>Eleocharis acuta</i>	Common Spike-sedge
MNG	<i>Eleocharis pusilla</i>	Small Spike-sedge

#### Recruitment:

Episodic/Flood - Desirable period between disturbances is 10 years.

#### Organic Litter:

10 % cover

#### Logs<sup>+</sup>:

5 m/0.1 ha.



# EVC 104: Lignum Swamp - Victorian Volcanic Plain bioregion

## Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
MS	<i>Lycium ferocissimum</i>	African Box-thorn	high	high
LH	<i>Cirsium vulgare</i>	Spear Thistle	high	high
LH	<i>Sonchus oleraceus</i>	Common Sow-thistle	high	low
LH	<i>Helminthotheca echioides</i>	Ox-tongue	high	high
LH	<i>Cynara cardunculus</i>	Spanish Artichoke	high	high
LH	<i>Sonchus asper</i> s.l.	Rough Sow-thistle	high	low
LH	<i>Aster subulatus</i>	Aster-weed	high	low
MH	<i>Hypochoeris radicata</i>	Cat's Ear	high	low
MH	<i>Cerastium glomeratum</i> s.l.	Common Mouse-ear Chickweed	high	low
MTG	<i>Nassella trichotoma</i>	Serrated Tussock	high	high
MTG	<i>Lolium rigidum</i>	Wimmera Rye-grass	high	low
MTG	<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	Soft Brome	high	low
MTG	<i>Vulpia bromoides</i>	Squirrel-tail Fescue	high	low

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# EVC/Bioregion Benchmark for Vegetation Quality Assessment

## Victorian Volcanic Plain bioregion

### EVC 895: Escarpment Shrubland

#### Description:

Occurs on rocky escarpments in steep valleys or gorges, associated with limestone or basalt. Sites have moderate to high fertility, are well-drained but subject to regular summer drought due to shallow soils. Eucalypt woodland to 15 m tall or non-eucalypt shrubland to 8 m tall, with occasional eucalypts; lichen-covered rock outcrops are common.

+ eucalypt woodland only components (ignore when assessing shrubland areas and standardise site condition score as required)

#### Large trees<sup>+</sup>:

Species	DBH(cm)	#/ha
<i>Eucalyptus</i> spp.	70 cm	15 / ha

#### Tree Canopy Cover:

%cover	Character Species	Common Name
15%	<i>Acacia implexa</i>	Lightwood
	<i>Allocasuarina verticillata</i>	Drooping Sheoak
	<i>Acacia mearnsii</i>	Black Wattle
	<i>Bursaria spinosa</i>	Sweet Bursaria
	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	Manna Gum

#### Understorey:

Life form	#Spp	%Cover	LF code
Immature Canopy Tree <sup>+</sup>		5%	IT
Understorey Tree or Large Shrub <sup>+</sup>	3	10%	T
Medium Shrub	3	10%	MS
Small Shrub	2	5%	SS
Large Herb	3	5%	LH
Medium Herb	4	10%	MH
Small or Prostrate Herb	5	5%	SH
Large Tufted Graminoid	1	5%	LTG
Large Non-tufted Graminoid	1	5%	LNG
Medium to Small Tufted Graminoid	9	25%	MTG
Medium to Tiny Non-tufted Graminoid	3	5%	MNG
Ground Fern	1	5%	GF
Scrambler or Climber	1	5%	SC
Bryophytes/Lichens	na	10%	BL
Soil Crust	na	10%	S/C

LF Code	Species typical of at least part of EVC range	Common Name
MS	<i>Rhagodia parabolica</i>	Fragrant Saltbush
MS	<i>Hymenanthera dentata</i> s.l.	Tree Violet
SS	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	Ruby Saltbush
LH	<i>Wahlenbergia communis</i> s.l.	Tufted Bluebell
MH	<i>Oxalis perennans</i>	Grassland Wood-sorrel
MH	<i>Maireana enchylaenoides</i>	Wingless Bluebush
MH	<i>Einadia nutans</i> ssp. <i>nutans</i>	Nodding Saltbush
SH	<i>Chamaesyce drummondii</i>	Flat Spurge
SH	<i>Dichondra repens</i>	Kidney-weed
LTG	<i>Austrostipa bigeniculata</i>	Knead Spear-grass
MTG	<i>Austrodanthonia racemosa</i> var. <i>racemosa</i>	Stiped Wallaby-grass
MTG	<i>Austrodanthonia setacea</i>	Bristly Wallaby-grass
MNG	<i>Panicum effusum</i>	Hairy Panic
GF	<i>Cheilanthes distans</i>	Bristly Cloak-fern
SC	<i>Clematis microphylla</i>	Small-leaved Clematis
SC	<i>Convolvulus erubescens</i> spp. agg.	Pink Bindweed



# EVC 895: Escarpment Shrubland - Victorian Volcanic Plain bioregion

## Recruitment:

Continuous

## Organic Litter:

20 % cover

## Logs:

15 m/0.1 ha<sup>+</sup>.

5 m/0.1 ha. (note: large log class does not apply)

## Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
T	<i>Schinus molle</i>	Pepper Tree	high	high
MS	<i>Lycium ferocissimum</i>	African Box-thorn	high	high
MS	<i>Genista monspessulana</i>	Montpellier Broom	high	high
SS	<i>Marrubium vulgare</i>	Horehound	high	high
LH	<i>Sonchus oleraceus</i>	Common Sow-thistle	high	low
LH	<i>Helminthotheca echinoides</i>	Ox-tongue	high	high
LH	<i>Lactuca serriola</i>	Prickly Lettuce	high	low
LH	<i>Sisymbrium officinale</i>	Hedge Mustard	high	high
LH	<i>Sonchus asper</i> s.l.	Rough Sow-thistle	high	low
LH	<i>Verbascum thapsus</i> ssp. <i>thapsus</i>	Great Mullein	high	high
LH	<i>Echium plantagineum</i>	Paterson's Curse	high	high
LH	<i>Centaurea tenuiflorum</i>	Slender Centaury	high	low
LH	<i>Foeniculum vulgare</i>	Fennel	high	high
MH	<i>Hypochoeris radicata</i>	Cat's Ear	high	low
MH	<i>Trifolium arvense</i> var. <i>arvense</i>	Hare's-foot Clover	high	low
MH	<i>Trifolium subterraneum</i>	Subterranean Clover	high	low
MH	<i>Trifolium campestre</i> var. <i>campestre</i>	Hop Clover	high	low
MH	<i>Trifolium angustifolium</i> var. <i>angustifolium</i>	Narrow-leaf Clover	high	low
MH	<i>Lotus suaveolens</i>	Hairy Bird's-foot Trefoil	high	low
MH	<i>Cerastium glomeratum</i> s.l.	Common Mouse-ear Chickweed	high	low
SH	<i>Medicago polymorpha</i>	Burr Medic	high	low
SH	<i>Trifolium glomeratum</i>	Cluster Clover	high	low
SH	<i>Modiola caroliniana</i>	Red-flower Mallow	high	low
SH	<i>Aptenia cordifolia</i>	Heart-leaf Ice-plant	high	high
LTG	<i>Phalaris aquatica</i>	Toowoomba Canary-grass	high	high
LNG	<i>Holcus lanatus</i>	Yorkshire Fog	high	high
LNG	<i>Avena fatua</i>	Wild Oat	high	low
MTG	<i>Nassella trichotoma</i>	Serrated Tussock	high	high
MTG	<i>Ehrharta longiflora</i>	Annual Veldt-grass	high	low
MTG	<i>Briza maxima</i>	Large Quaking-grass	high	low
MTG	<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	Soft Brome	high	low
MTG	<i>Sporobolus africanus</i>	Rat-tail Grass	high	high
MTG	<i>Vulpia bromoides</i>	Squirrel-tail Fescue	high	low
MTG	<i>Romulea rosea</i>	Onion Grass	high	low
MTG	<i>Pentstemon airoides</i> ssp. <i>airoides</i>	False Hair-grass	high	low
MTG	<i>Lolium perenne</i>	Perennial Rye-grass	high	high
MTG	<i>Dactylis glomerata</i>	Cocksfoot	high	high
MTG	<i>Vulpia myuros</i>	Rat's-tail Fescue	high	low
MTG	<i>Bromus rubens</i>	Red Brome	high	low
MTG	<i>Avena barbata</i>	Bearded Oat	high	low
MTG	<i>Aira caryophylla</i>	Silvery Hair-grass	high	low
SC	<i>Vicia sativa</i> ssp. <i>sativa</i>	Common Vetch	high	low

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# EVC/Bioregion Benchmark for Wetland Vegetation Assessment

## Volcanic Plain bioregion

### EVC 291: Cane Grass Wetland

#### Description:

Species-poor vegetation dominated by Southern Cane Grass occurring in association with seasonal wetlands of low rainfall plains areas, typically on extremely heavy, grey clay soils. Scattered in drier plains areas in the west and north of the State.

#### Indicator species (some or all of these species should be present)

Scientific name	Common name	Comments
<i>Eragrostis infecunda</i>	Southern Cane-grass	variously with e.g. <i>Eleocharis acuta</i> , <i>Potamogeton tricarinatus</i> s.l., <i>Lachnagrostis filiformis</i> var. 1.

#### Notes on indicator species

Species-poor.

#### Conditions when the EVC should not be assessed

None recognised, but may underscore following protracted drought conditions.

## 1. CRITICAL LIFEFORM GROUPINGS

#### Conditions when specific critical lifeform groupings should not be assessed

Representation of groups (other than Cane grass) required on verges only.

#### General comments on assessing critical lifeform groupings

None.

#### Critical lifeform groupings and threshold values for determining if lifeform is substantially modified

Critical lifeform	No. spp.	% Cover	Comments
Cane grass	1	5	
Herbs, aquatic	2		or medium sedges.
Medium to small herbs, semi-aquatic	5	10	on verges.

## 2. WEEDS

#### High threat weed species

Scientific name	Common name	Comments
<i>Alisma lanceolata</i>	Water Plantain	
<i>Hordeum</i> spp.	Barley Grass	on verges
<i>Lilaea scilloides</i>	Lilaea	
<i>Phalaris aquatica</i>	Toowoomba Canary-grass	on verges

#### Conditions where weeds are considered to have a negligible impact

None recognised.



# EVC 291: Cane Grass Wetland – Victorian Volcanic Plain bioregion

## 3. INDICATORS OF ALTERED PROCESSES

None recognised.

## 4. VEGETATION STRUCTURE AND HEALTH

### Structural dominant

Southern Cane-grass *Eragrostis infecunda*

### Benchmark cover

10%

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APPENDIX 4

Results Summary Tables

A4.1 Vegetation Quality Assessment

Notes to Table:

Habitas ID #	Parcel PFI or Property PFI	
Vegetation Category DT	Degraded Treeless Vegetation	
	RP	Remnant Patch
Ecological Vegetation Class (EVC)	H-s PG	Heavier-soils Plains Grassland
	CGW	Creekline Grassy Woodland
	LS	Lignum Swamp
	L-r P G	Low-rainfall Plains Grassland
	ES	Escarpment Shrubland
Conservation Status	E	Endangered
Conservation Significance (CS)	VH	Very High
	H	High
Key Areas & Management Zones	MZ	Management Zones

\*Section H is entirely contained within the Victorian Volcanic Plain Bioregion.

^ Presence of significant species was not a factor in increasing conservation significance of patches in Section H. All patches of Very High conservation significance are endangered EVCs in the Victorian Volcanic Plain Bioregion with a habitat score >40.

Table A4.1 Section H Habitat Hectare assessment results from the Melton/Wyndham Investigation Area assessment (undertaken by Biosis Research Pty. Ltd. October 2008 - March 2009)

Habitas ID #	Site	Zone	Vegetation Category	Area (ha)	EVC	Conservation Status*	Large Trees	Tree Canopy Cover	Lack of Weeds	Understorey	Recruitment	Organic Litter	Logs	Standardiser	Site condition	Landscape Context	Habitat Score ( /100)	Habitat Hectares	Conservation Significance	Reason for Significance	Net Outcome Ratio	Very High CS Offset Prescription (Total)	High CS Offset Prescription (Total)	Key Area & Management Zones	Very High CS Offset Prescription (excl. Key Areas and MZs)	High CS Offset Prescription (excl. Key Areas and MZs)	Location on Figures
1410243	1	A	RP	0.73	H-s P G	E	n/a	n/a	9	5	0	5	0	1.36	25.84	5	31	0.23	H		1.5		0.34		0.34	c	
1410243	2	A	DT	15.64														0.00								c	
1410247	1	A	DT	12.28														0.00								c	
1410249	1	A	RP	0.09	CGW	E	0	0	0	10	0	3	0	1.00	13.00	5	18	0.02	H		1.5		0.02		0.02	a	
1410249	2	A	DT	18.75														0.00								a	
1412276	1	A	RP	3.52	LS	E	n/a	n/a	7	10	6	3	0	1.36	35.00	5	40	1.41	VH	HS above 40	2	2.82			2.82		c
1412276	2	A	RP	0.78	L-r P G	E	n/a	n/a	6	15	3	4	0	1.36	38.08	5	43	0.34	VH	HS above 40	2	0.67			0.67		c



Habitas ID #	Site	Zone	Vegetation Category	Area (ha)	EVC	Conservation Status*	Large Trees	Tree Canopy Cover	Lack of Weeds	Understorey	Recruitment	Organic Litter	Logs	Standardiser	Site condition	Landscape Context	Habitat Score ( /100)	Habitat Hectares	Conservation Significance	Reason for Significance	Net Outcome Ratio	Very High CS Offset Prescription (Total)	High CS Offset Prescription (Total)	Key Area & Management Zones	Very High CS Offset Prescription (excl. Key Areas and MZs)	High CS Offset Prescription (excl. Key Areas and MZs)	Location on Figures
1412276	3	A	DT	0.32														0.00									c
1412276	4	A	DT	6.48														0.00									c
1412276	5	A	DT	0.19														0.00									c
1412277	1	A	DT	19.86														0.00									c
1412278	1	A	RP	0.09	H-s P G	E	n/a	n/a	9	5	0	4	0	1.36	24.48	10	34	0.03	H		1.5		0.05			0.05	c
1412278	2	A	DT	15.44														0.00									c
1417254	1	A	RP	3.12	L-r P G	E	n/a	n/a	6	15	10	4	0	1.36	47.60	15	63	1.95	VH	HS above 40	2	3.91		MZ			d
1417254	1	B	RP	2.43	L-r P G	E	n/a	n/a	6	5	10	5	0	1.36	35.36	15	50	1.22	VH	HS above 40	2	2.45		MZ			d
1417254	2	A	DT	1.31														0.00					MZ			d	
1417784	1	A	DT	9.02														0.00									c
1417787	1	A	RP	6.12	H-s P G	E	n/a	n/a	7	5	6	5	0	1.36	31.28	10	41	2.53	VH	HS above 40	2	5.05			5.05		c
1417787	2	A	DT	2.88														0.00									c
1417789	1	A	DT	2.69														0.00									c
1417789	2	A	RP	6.29	H-s P G	E	n/a	n/a	6	5	3	4	0	1.36	24.48	5	29	1.85	H		1.5		2.78			2.78	c
1417790	1	A	DT	8.99														0.00									c
1417792	1	A	DT	11.89														0.00									c
1419664	1	A	RP	4.62	H-s P G	E	n/a	n/a	9	5	3	5	0	1.36	29.92	10	40	1.84	H		1.5		2.77			2.77	a
1419664	2	A	DT	1.26														0.00									a
1419664	3	A	DT	1.43														0.00									a
1419664	4	A	DT	1.00														0.00									a
1419664	5	A	DT	5.78														0.00									a
1420134	1	A	RP	1.53	H-s P G	E	n/a	n/a	9	15	6	5	0	1.36	47.60	15	63	0.96	VH	HS above 40	2	1.92		Yes			d
1420134	1	B	RP	4.04	H-s P G	E	n/a	n/a	9	5	3	5	0	1.36	29.92	15	45	1.81	VH	HS above 40	2	3.63		Yes			d
1420134	2	A	DT	0.36														0.00					MZ				d
1420134	3	A	DT	4.25														0.00									d
1420135	1	A	RP	0.06	CGW	E	0	0	4	15	3	4	0	1.00	26.00	15	41	0.02	VH	HS above 40	2	0.05			0.05		d
1420135	2	A	DT	4.27														0.00					Part MZ				d
1420135	3	A	RP	16.96	H-s P G	E	n/a	n/a	11	10	3	5	0	1.36	39.44	15	54	9.23	VH	HS above 40	2	18.47		Yes			d
1420588	1	B	RP	0.57	H-s P G	E	n/a	n/a	9	10	10	4	0	1.36	44.88	15	60	0.34	VH	HS above 40	2	0.68		Yes			c
1420588	3	A	DT	0.81														0.00									c
1420588	3	A	DT	0.52														0.00									c

Habitas ID #	Site	Zone	Vegetation Category	Area (ha)	EVC	Conservation Status*	Large Trees	Tree Canopy Cover	Lack of Weeds	Understorey	Recruitment	Organic Litter	Logs	Standardiser	Site condition	Landscape Context	Habitat Score ( /100)	Habitat Hectares	Conservation Significance	Reason for Significance	Net Outcome Ratio	Very High CS Offset Prescription (Total)	High CS Offset Prescription (Total)	Key Area & Management Zones	Very High CS Offset Prescription (excl. Key Areas and MZs)	High CS Offset Prescription (excl. Key Areas and MZs)	Location on Figures
1421000	1	A	RP	22.94	H-s P G	E	n/a	n/a	11	15	6	5	0	1.36	50.32	10	60	13.84	VH	HS above 40	2	27.68		Yes			a
1421000	2	A	DT	12.24														0.00								A	
1421000	3	A	DT	1.31														0.00					Part MZ			A	
1421000	4	A	DT	0.26														0.00								A	
1421002	1	A	DT	16.44														0.00								A	
1421004	1	A	DT	0.28														0.00						MZ		C	
1421004	2	A	RP	12.76	H-s P G	E	n/a	n/a	9	15	6	5	0	1.36	47.60	10	58	7.35	VH	HS above 40	2	14.7		Yes			C
1421004	3	A	DT	1.87														0.00					Part MZ			C	
1421006	1	A	DT	17.04														0.00								C	
1421996	1	A	DT	64.06														0.00								B	
1421996	2	A	RP	0.07	CGW	E	0	0	7	5	3	3	0	1.00	18.00	5	23	0.02	H		1.5		0.02			0.02	D
1421996	3	A	RP	0.02	ES	E	n/a	0	7	5	0	3	0	1.15	17.25	15	32	0.01	H		1.5		0.01			0.01	D
1421996	4	A	RP	0.02	ES	E	n/a	3	2	5	0	4	0	1.15	16.10	15	31	0.01	H		1.5		0.01			0.01	D
1421999	1	A	RP	0.13	H-s P G	E	n/a	n/a	6	5	6	4	0	1.36	28.56	15	44	0.06	VH	HS above 40	2	0.11			0.11		d
1421999	2	A	DT	67.19														0.00								b	
1421999	3	A	RP	0.08	H-s P G	E	n/a	n/a	9	10	6	4	0	1.36	39.44	15	54	0.04	VH	HS above 40	2	0.09			0.09		b
1422004	1	A	DT	11.98														0.00								a	
1422007	1	A	DT	13.61														0.00								a	
1422007	2	A	RP	0.18	H-s P G	E	n/a	n/a	7	5	6	5	0	1.36	31.28	5	36	0.07	H		1.5		0.10			0.10	a
1422012	1	A	DT	10.88														0.00								a	
1422013	1	A	RP	5.76	H-s P G	E	n/a	n/a	7	5	3	5	0	1.36	27.20	10	37	2.14	H		1.5		3.21			3.21	a
1422013	2	A	DT	6.06														0.00								a	
1422013	3	A	DT	0.18														0.00								a	
1422014	1	A	DT	9.62														0.00								a	
1422693	1	A	RP	1.62	H-s P G	E	n/a	n/a	7	5	3	4	0	1.36	25.84	5	31	0.50	H		1.5		0.75			0.75	a
1422693	2	A	DT	9.73														0.00								a	
1422696	1	A	DT	12.86														0.00								a	
1423517	1	A	RP	12.52	H-s P G	E	n/a	n/a	6	20	6	3	0	1.36	47.60	15	63	7.84	VH	HS above 40	2	15.68		Yes			c
1423518	1	A	RP	12.13	H-s P G	E	n/a	n/a	6	20	6	3	0	1.36	47.60	15	63	7.59	VH	HS above 40	2	15.19		Yes			c
1423518	2	A	DT	0.25														0.00					MZ			c	
1423523	1	A	RP	9.52	H-s P G	E	n/a	n/a	11	5	6	3	0	1.36	34.00	15	49	4.66	VH	HS above 40	2	9.33			9.33		c
1423523	2	A	DT	2.65														0.00								c	



Habitas ID #	Site	Zone	Vegetation Category	Area (ha)	EVC	Conservation Status*	Large Trees	Tree Canopy Cover	Lack of Weeds	Understorey	Recruitment	Organic Litter	Logs	Standardiser	Site condition	Landscape Context	Habitat Score ( /100)	Habitat Hectares	Conservation Significance	Reason for Significance	Net Outcome Ratio	Very High CS Offset Prescription (Total)	High CS Offset Prescription (Total)	Key Area & Management Zones	Very High CS Offset Prescription (excl. Key Areas and MZs)	High CS Offset Prescription (excl. Key Areas and MZs)	Location on Figures	
2088098	1	A	RP	1.94	H-s P G	E	n/a	n/a	6	15	6	5	0	1.36	43.52	15	59	1.14	VH	HS above 40	2	2.27			2.27		b	
2088098	2	A	DT	10.02														0.00								B		
50268825	1	B	RP	0.21	H-s P G	E	n/a	n/a	9	10	10	4	0	1.36	44.88	15	60	0.13	VH	HS above 40	2	0.25		Yes			C	
50268825	2	A	RP	0.01	ES	E	n/a	0	9	15	6	4	0	1.15	39.10	15	54	0.01	VH	HS above 40	2	0.01			0.01		C	
50268825	3	A	DT	0.18														0.00								C		
50268825	3	A	DT	0.30														0.00								C		
50268827	1	A	DT	1.79														0.00								C		
50268839	1	A	RP	1.26	H-s P G	E	n/a	n/a	6	5	6	4	0	1.36	28.56	5	34	0.42	H			1.5		0.63			0.63	C
50268839	2	A	DT	1.05														0.00								C		
50268857	1	A	RP	0.82	CGW	E	0	0	0	10	0	3	0	1.00	13.00	5	18	0.15	H			1.5		0.22			0.22	A
50268857	2	A	RP	0.60	CGW	E	0	0	9	5	0	3	0	1.00	17.00	10	27	0.16	H			1.5		0.24			0.24	c
50268857	3	A	RP	0.41	CGW	E	0	0	11	5	0	3	0	1.00	19.00	5	24	0.10	H			1.5		0.15			0.15	a
50268909	1	A	RP	1.92	L-r P G	E	n/a	n/a	6	5	6	4	0	1.36	28.56	5	34	0.64	H			1.5		0.97			0.97	c
50268909	2	A	RP	0.19	LS	E	n/a	n/a	7	10	6	3	0	1.36	35.00	5	40	0.08	VH	HS above 40	2	0.15			0.15		c	
50268909	3	A	DT	9.84														0.00								c		
50268909	4	A	RP	0.01	LS	E	n/a	n/a	7	10	6	3	0	1.36	35.00	10	45	0.00	VH	HS above 40	2	0.01			0.01		c	
50268924	1	A	DT	13.12														0.00								c		
50268924	2	A	RP	0.22	CGW	E	3	3	2	5	0	3	0	1.00	16.00	5	21	0.05	H			1.5		0.07			0.07	c
50268955	1	A	DT	20.90														0.00								a		
50268955	3	A	RP	1.46	LS	E	n/a	n/a	7	10	6	3	0	1.36	35.00	10	45	0.66	VH	HS above 40	2	1.31			1.31		c	
50268960	1	A	RP	0.62	H-s P G	E	n/a	n/a	9	15	10	5	0	1.36	53.04	15	68	0.42	VH	HS above 40	2	0.84		Yes			a	
50268960	1	B	RP	9.07	H-s P G	E	n/a	n/a	9	10	10	4	0	1.36	44.88	15	60	5.43	VH	HS above 40	2	10.86		Yes			c	
50268960	2	A	RP	0.14	ES	E	n/a	0	9	15	6	4	0	1.15	39.10	15	54	0.08	VH	HS above 40	2	0.15			0.15		c	
50268960	3	A	DT	18.58														0.00					Part MZ			c		
50268960	3	A	DT	1.54														0.00								c		
53009655	1	A	DT	8.93														0.00								c		
150387752	1	A	RP	0.28	LS	E	n/a	n/a	7	10	6	3	0	1.36	35.00	5	40	0.11	VH	HS above 40	2	0.22			0.22		c	
150387752	2	A	DT	10.08														0.00								c		
151418567	1	A	DT	6.98														0.00								c		
15141856	2	A	DT	1.61														0.00								c		

Habitas ID #	Site	Zone	Vegetation Category	Area (ha)	EVC	Conservation Status*	Large Trees	Tree Canopy Cover	Lack of Weeds	Understorey	Recruitment	Organic Litter	Logs	Standardiser	Site condition	Landscape Context	Habitat Score ( /100)	Habitat Hectares	Conservation Significance	Reason for Significance	Net Outcome Ratio	Very High CS Offset Prescription (Total)	High CS Offset Prescription (Total)	Key Area & Management Zones	Very High CS Offset Prescription (excl. Key Areas and MZs)	High CS Offset Prescription (excl. Key Areas and MZs)	Location on Figures
7																											
172421758	1	A	DT	1.06														0.00						MZ			d
172421804	1	A	RP	8.36	H-s P G	E	n/a	n/a	7	5	6	4	0	1.36	29.92	15	45	3.76	VH	HS above 40	2	7.51		Yes			d
172421804	2	A	DT	0.03														0.00						MZ			D
172421804	3	A	DT	0.07														0.00						MZ			D
172421804	4	A	DT	0.63														0.00						MZ			D
TOTAL				666.86														81.23				146.00	12.34		22.25	12.34	



A4.2 Scattered Tree Assessment

Table A4.2 Section H scattered Tree assessment results from the Melton/Wyndham Investigation Area assessment (undertaken by Biosis Research Pty. Ltd. October 2008 - March 2009)

Notes to Table:

Habitas ID #	Parcel PFI or Property PFI	
Ecological Vegetation Class (EVC)	CGW	Creekline Grassy Woodland
Conservation Status	E	Endangered
Conservation Significance (CS)	VH	Very High
Scattered Tree Size Classes	VL	Very Large
	L	Large
	M	Medium
	S	Small

\*Section H is entirely contained within the Victorian Volcanic Plain Bioregion.

Habitas ID #	Site	Zone	Area (Ha)	EVC	Conservation Status*	VL Eucalyptus sp.	L Eucalyptus sp.	M Eucalyptus sp.	S Eucalyptus sp.	Conservation Significance	Reason for Significance	Protect and Recruit Method					Recruit Only	Location on Figures
												Protect VL Old Trees (#)	Protect L Old Trees (#)	Protect M Old Trees (#)	Protect S Trees (#)	Recruit New Plants		
1421996	5	A	0.02	CGW	E	1	0	0	1	VH	Growling Grass Frog	10	0	0	n/a	50	380	d
1421006	2	A	0.16	CGW	E	0	3	0	0	VH	Growling Grass Frog	0	24	0	n/a	120	720	c
Total			0.18			1	3	0	1			10	24	0		170	1100	

# APPENDIX 5

## Significant Fauna Results

### A5.1 Significant fauna species

**Table A5.2. Fauna of national or state significance recorded, or predicted to occur, within the local area**

**Source: DSE Atlas of Victorian Wildlife 2007 Version, BA database (1998–14.05.09), DEWHA database (14.05.09)**

- AVW data search encompassed a 5 km radius (fish removed)
- DEWHA and BA data search encompassed a 5 km radius

• **Status of species:**

- CR critically endangered  
 EN endangered  
 VU vulnerable  
 L listed under Flora and Fauna Guarantee Act

**Sources used to derive species status:**

EPBC *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)

DSE *Advisory List of Threatened Vertebrate Fauna in Victoria* (DSE 2007b)

FFG *Flora and Fauna Guarantee Act 1988* (Vic.)

# denotes species predicted to occur or with habitat predicted to occur in the local area (DEWHA database)

Likelihood scale:

	No habitat present	Habitat poorly represented	Habitat moderately well represented	Habitat well represented
No records from bioregion (terrestrial) or neighbouring basin (aquatic)	Negligible	Negligible	Low	Medium
Records from bioregion (terrestrial) or basin/neighbouring basin (aquatic)	Negligible	Low	Medium	High
Records from within 5 km (terrestrial) or from catchment (aquatic)	Negligible	Medium	High	High

Scientific Name	Common Name	Last recorded	EPBC	DSE	FFG	Likelihood of Occurrence
<b>National Significance</b>						
<i>Pedionomus torquatus</i>	Plains-wanderer	2004	VU	CR	L	Medium
<i>Rostratula australis</i>	Australian Painted Snipe	#	VU	CR	L	Medium
<i>Lathamus discolor</i>	Swift Parrot	#	EN	EN	L	Low
<i>Anthochaera phrygia</i>	Regent Honeyeater	#	EN	CR	L	Low
<i>Dasyurus maculatus</i>	Spot-tailed Quoll	#	EN	EN	L	Negligible
<i>Isoodon obesulus obesulus</i>	Southern Brown Bandicoot	#	EN	NT		Negligible
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	#	VU	VU	L	Low
<i>Pseudomys fumeus</i>	Smoky Mouse	#	EN	CR	L	Negligible



Scientific Name	Common Name	Last recorded	EPB C	DSE	FF G	Likelihood of Occurrence
<i>Delma impar</i>	Striped Legless Lizard	1995/#	VU	EN	L	Recorded (AVW)
<i>Tympanocryptis pinguicollis</i>	Grassland Earless Dragon	#	EN	CR	L	Medium
<i>Litoria raniformis</i>	Growling Grass Frog	2005/#	VU	EN	L	Recorded (AVW)
<i>Prototroctes maraena</i>	Australian Grayling	#	VU	VU	L	Negligible
<i>Galaxiella pusilla</i>	Dwarf Galaxias	#	VU	VU	L	Low
<i>Synemon plana</i>	Golden Sun Moth	2005/#	CR	EN	L	High
<b>State Significance</b>						
<i>Grus rubicunda</i>	Brolga	1846		EN	L	Recorded (AVW)
<i>Turnix pyrrhotorax</i>	Red-chested Button-quail	1990		VU	L	Recorded (AVW)
<i>Porzana pusilla</i>	Baillon's Crake	2003		VU	L	High
<i>Platalea regia</i>	Royal Spoonbill	2005		VU		Recorded (AVW)
<i>Ardea modesta</i>	Eastern Great Egret	2005/#		VU	L	Recorded (AVW)
<i>Botaurus poiciloptilus</i>	Australasian Bittern	1973		EN	L	High
<i>Anas rhynchos</i>	Australasian Shoveler	1997		VU		High
<i>Stictonetta naevosa</i>	Freckled Duck	1990		EN	L	High
<i>Aythya australis</i>	Hardhead	1994		VU		High
<i>Oxyura australis</i>	Blue-billed Duck	1996		EN	L	High
<i>Biziura lobata</i>	Musk Duck	1996		VU		High
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	#		VU	L	Low
<i>Falco subniger</i>	Black Falcon	2003		VU		Recorded (AVW)

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