

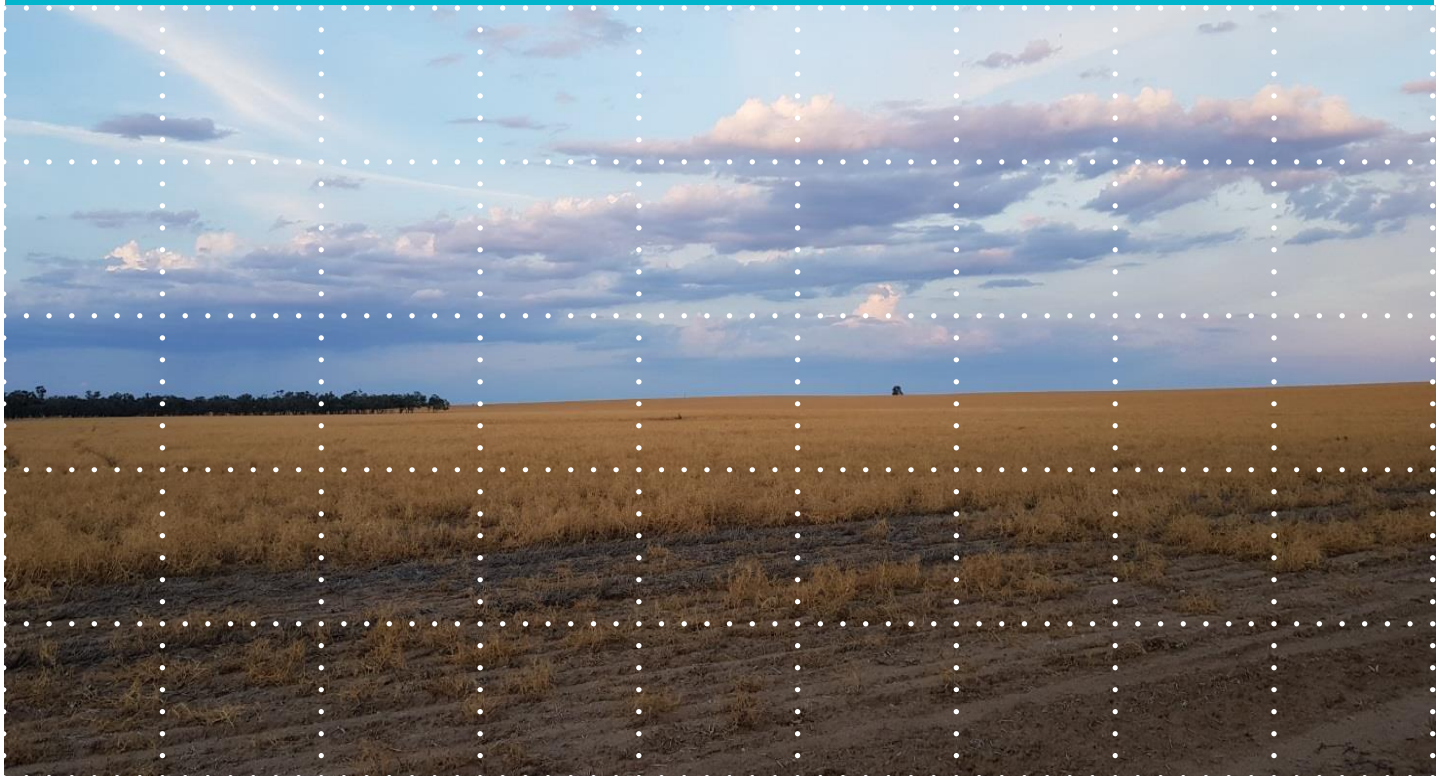
Final Report

# Ecological Characterisation Assessment of the Proposed Goschen Mineral Sands Project, Goschen, Victoria

Prepared for

**VHM Exploration Pty Ltd**

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**Ecology and Heritage Partners Pty Ltd**

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## GLOSSARY

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Acronym	Description
CALP	<i>Catchment and Land Protection Act 1994</i>
CMA	Catchment Management Authority
DBH	Diameter at Breast Height
DTV	Degraded Treeless Vegetation
DELWP	Victorian Department of Environment, Land, Water and Planning (formerly Department of Environment and Primary Industries)
DoE	Department of Environment
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EVC	Ecological Vegetation Class
FFG Act	<i>Flora and Fauna Guarantee Act 1988</i>
HabHa	Habitat Hectare
LOT	Large Old Tree
MOT	Medium Old Tree
NES	National Environmental Significance
PMST	Protected Matters Search Tool (DoE)
ST	Small Tree
TRZ	Tree Retention Zone
VLOT	Very Large Old Tree

## SUMMARY

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### Introduction

Ecology and Heritage Partners Pty Ltd was commissioned by the VHM Exploration Pty Ltd to conduct an Ecological Characterisation Assessment of the proposed Goschen Mineral Sands Project, located approximately two kilometres east of the township of Goschen in the north-west of Victoria.

This ecological characterisation report summarises the methods and results of ecological studies, including a detailed desktop review of biodiversity databases and literature, detailed vegetation mapping, and terrestrial fauna surveys. The findings presented herein support the project conduct of targeted fauna and flora surveys, and refinement of the development footprint.

### Methods

Desk-based and field surveys were undertaken to assess environmental conditions and identify key ecological features within the study area. The following assessments have been undertaken to date:

- Detailed desktop reviews of relevant literature, online resources and numerous databases.
- Vegetation surveys completed by two qualified Botanists between 27 November and 1 December 2017.
- Nocturnal surveys were completed over two nights within the study area to record any fauna observations.

### Results

The study area is representative of many areas within the Murray Mallee bioregion with large areas of improved pastures and derived native grasslands, scattered patches of remnant vegetation and regrowth from past clearing. The majority (18,800 ha or 96%) of the study area lacks ecological values (i.e. highly modified landscape) classified as being un-mappable. The remaining areas support native vegetation that is concentrated around roadsides and the dissecting gullies. Large (up to 666 hectares) and relatively well-connected remnants in these areas are complimented by smaller, fragmented patches of native vegetation and scattered trees which persist in modified areas.

### Conclusion

The study area is representative of many areas within the Murray Mallee bioregion as it has been previously disturbed for agriculture and possesses large areas of improved pastures and derived native grasslands with scattered patches of remnant vegetation and regrowth from past clearing. However, four EVCs are present within the study area. Much of this indigenous vegetation and good quality terrestrial fauna habitat present within the study area is confined to roadsides and dissecting gullies, which have been less affected by past land clearing and sustained agricultural land use. The large and relatively well-connected remnants in these areas are complimented by smaller, fragmented patches of native vegetation and scattered trees which persist in modified areas.

Other than South-eastern Long-eared Bat and Plains Wanderer, there is a low likelihood of any other EPBC Act-listed species would occupy habitats within the study area. While Plains Wanderer may use habitats (i.e. open, modified paddocks and crops) within the study area on occasions (a nomadic species), South-eastern Long-eared Bat typically occupy large areas supporting old growth mallee. Nevertheless, there is potential for the study area to support a resident population of the species. Once the development footprint has been

revised targeted surveys for this species may need to be undertaken (during the warmer months when the species is active) in areas supporting larger patches of mallee that support dead stags and hollows.

The findings presented in this ecological characterisation report will inform the development of a refined footprint and any requirement for any targeted significant species surveys. Once the footprint has been revised measures to avoid, minimise and offset potential impacts on the ecological values, along with information on relevant biodiversity legislation and government policy associated with the proposed development will be provided.

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# 1 INTRODUCTION

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## 1.1 Background

Ecology and Heritage Partners Pty Ltd was commissioned by the VHM Exploration Pty Ltd to conduct an Ecological Characterisation Assessment for the proposed Goschen Mineral Sands project, located approximately two kilometres east of the township of Goschen in the north-west of Victoria.

The purpose of the assessment was to map the extent, type and quality of Ecological values within all remnant native vegetation patches present within in the study area, to ascertain broadly, the areas to be avoided in subsequent revisions to the project footprint, and what targeted flora and fauna surveys would be prudent in further assessments. Ecological values were defined as both flora and fauna assets of state and national significance.

Vegetation and habitat presided within rural and semi-urban road reserves, bushland reserves, windrows and remnant vegetation patches on private property within the proposed project area.

This report outlines the methods and summarises the results of the assessment. The report also provides recommendations to mitigate or avoid any impact risks to identified areas of remnant vegetation within these areas where possible.

## 1.2 Objectives

The objectives of the assessment were to:

- Undertake a desktop review of the study area;
- Identify and map the extent of vegetation communities and broadly assess vegetation condition;
- Document flora and fauna species (both native and exotic) recorded during site surveys, including presence or absence of significant flora and fauna species, and ecological communities;
- Document the presence of pest plants and animals;
- Determine the extent and importance of fauna habitats (e.g. habitat corridors, foraging and breeding resources);
- Identify and describe any watercourses in the study area; and,
- Provide recommendations of additional surveys for significant flora and fauna species.

## 1.3 Study Area

The study area is located within the mineral sands exploration site, east of Goschen and Lalbert in the north-west of Victoria. The area of the exploration site is approximately 19,500 hectares and is bound by Fox Road to the north, Naider Road to the south, Donald-Swan Hill Road to the west, and Jampot Road to the east, and comprises all rural and semi-urban road reserves, remnant woodlots and private land within these bounds. The entire study area is zoned as Farming Zone (FZ) (DELWP 2018a) (Figure 1).

The study area is generally flat, with no ridges or crests within or immediately adjacent to the site. The Bael Bael Grassland Nature Conservation Reserve, Koorangie Wildlife Reserve, and a large lake system which



includes Lake Boga, occur to the east, however few natural water systems occur in the study area. The study area supports few waterbodies (largely farm dams and disconnected drainage channels).

The study area occurs within the Murray Mallee bioregion. It is located within the jurisdiction of the North-East Catchment Management Authority (CMA) and the Swan Hill Rural City and Gannawarra Shire municipality (DELWP 2018b).

## 2 METHOD

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### 2.1 Desktop Assessment

Relevant literature, online-resources and numerous databases were reviewed to provide an assessment of flora and fauna values associated with the study area. The following information sources were reviewed:

- The DELWP NVIM Tool (DELWP 2018b) for:
  - Modelled data for location risk, remnant vegetation patches, scattered trees and habitat for rare or threatened species; and,
  - The extent of historic and current EVCs.
- NatureKit for Modelled habitat and species distribution (DELWP 2018c)
- Ecological Vegetation Class (EVC) benchmarks (DELWP 2018d) for descriptions of EVCs within the relevant bioregion;
- The Victorian Biodiversity Atlas (VBA) for previously documented flora and fauna records within the project locality (DELWP 2017a);
- The Illustrated Flora Information System of Victoria (IFLISV) (Gullan 2017) for assistance with the distribution and identification of flora species;
- The Commonwealth Department of the Environment (DoEE) Protected Matters Search Tool (PMST) for matters of National Environmental Significance (NES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (DoEE 2017);
- Relevant listings under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act), including the latest Threatened and Protected Lists (DELWP 2017c); and,
- Aerial photography of the study area;

### 2.2 Ecological Assessment

Field assessments were undertaken between 27 November and 1 December 2017 to obtain information on the extent and condition of remnant vegetation within the study area. The purpose of the assessment was to assign remnant patches of native vegetation within the study area an Ecological Vegetation Class (EVC) and an indicative condition score ranging between 1-5 (see description below). The locations of scattered remnant trees were not recorded within the study area, and habitat hectare data as described in the Vegetation Quality Assessment manual (DSE 2004) was not collected.

The study area was assessed either by foot or vehicle and involved recording the extent and type of the patches of native vegetation. Existing areas of native vegetation elsewhere in the local area were also investigated to assist in determining the pre-European vegetation type within the study area. The EVC of remnant patches was determined with reference to existing on-ground conditions, DELWP pre-1750 and extant (2005) EVC mapping (DELWP 2018a) and their published descriptions (DELWP 2018b). The significance assessment criteria of taxa and vegetation communities are presented in Appendix 1.

In addition to assigning an indicative condition score, the field assessment also considered the presence of suitable habitat for significant flora, fauna and ecological communities. This included nocturnal surveys where the study area was visited after dusk to record any species observations. Bird calls were played in locations identified to have suitable hollow bearing trees to attract birds of prey.

### 2.2.1 EVC condition rating

The assessment method assessed the quality of native vegetation throughout the study area to give an indicative quality rating with respect to variables used in the habitat hectares assessment methodology (DSE 2004). Victoria’s *Guidelines for the removal, destruction or lopping of native vegetation* describes a remnant patch as:

- *An area of vegetation where at least 25 per cent of total perennial understorey cover is native; or,*
- *Any area with three or more native canopy trees where the drip line of each tree touches the drip line of at least on other tree, forming a continuous canopy; or,*
- *Any mapped wetland included in the Current wetlands map, available in DELWP systems and tools (DELWP 2017b, pg 6).*

Additional weighting was given to the following key factors: canopy cover, weed cover, patch continuity, understory structure, and life form and species diversity. The Indicative Quality Rating consisted of 5 quality labels based off the aforementioned variables, these labels ranged from: Low, to Moderate/Low, to Moderate, to Moderate/High, to High (Table 1; Plates 2 - 6).

**Table 1.** Quality Rating Definitions

Rating Number	Criteria for defining Vegetation Condition
1	<p><b>High Quality:</b></p> <p>Relative to the respective Ecological Vegetation Class benchmarks; patches of high quality vegetation meets the benchmark of Large Old Trees (LOT’s) within patches and percentage canopy cover. The understory is characterised by a lack of weeds (0-25% cover with 0-50% considered as high threat) and is dominated by a diversity of native species with at least 90% of the benchmark lifeforms being present. ≥70% of species present that are considered ‘woody’ showed adequate recruitment. Degree of organic litter was variable between 50% and 150% of the benchmark cover. Where appropriate, the presence of logs met or exceeded at least 50% of the benchmark length.</p>
2	<p><b>Moderate- High Quality</b></p> <p>Contiguous patches of native vegetation variable between moderate and high condition.</p>
3	<p><b>Moderate Quality:</b></p> <p>Relative to the respective Ecological Vegetation Class benchmarks; areas of moderate quality was generally characterised by meeting LOT and canopy cover benchmarks within patches. Understory was typically un-diverse with 3-4 commonly occurring small shrubs with a low diversity of woody species showing recruitment (30-50%). Degree of organic litter was typically very high (≥150% of the benchmark), with a moderate cover of weeds (typically annual). Where appropriate, the presence of logs met or exceeded at least 50% of the benchmark length.</p> <p>Patches of moderate condition were dynamic between meeting and failing benchmarks for various components (e.g LOT and canopy cover is met although understory is effectively absent, or LOT and canopy cover effectively absent with understory components meeting benchmarks).</p>
4	<p><b>Moderate- Low</b></p> <p>Contiguous patches of native vegetation variable between moderate and low condition.</p>
5	<p><b>Low Quality:</b></p>

Rating Number	Criteria for defining Vegetation Condition
	Areas of low quality vegetation were defined as meeting the minimum required percentage cover of native vegetation (20% canopy cover, or 25% understory cover). Typically, these areas were highly disturbed resulting in a low diversity of native species and high bare ground and/or weed cover. Recruitment and log components are generally absent.

## 2.3 Assessment Qualifications

The current investigations were to document the type, extent and quality of remnant native vegetation including a flora and fauna inventory. These surveys are a snap shot in time and several additional species (not recorded during the field surveys) are expected to occur within the study area. In addition, a number of significant flora and fauna species are likely to persist within the study area, largely in areas supporting remnant native vegetation (e.g. along roadsides).

Known and potential impacts to ecological values within the study area, along with detailed project mitigation measures have not been provided, as this information will be provided once the project footprint has been finalised. Similarly, information on the required offsets under the State Guidelines have not been provided.

## 3 RESULTS

### 3.1 Existing Conditions

#### 3.1.1 Remnant Patches

The study area supports three EVCs: Woorinen Mallee (EVC 824), Ridged Plains Mallee (EVC 96) and Plains Savannah (EVC 826) (Figure 2a-o). The condition and extent of these EVCs within the study area are discussed further below, and summarised in Table 2. The number of EVCs recorded during the field assessments is less than the extant DELWP EVC mapping (DELWP 2018e), with additional EVCs not recorded in the field that are modelled to occur within the extant mapping including Semi-Arid Woodland (EVC 96), Samphire Shrubland (EVC 97), Riverine Chenopod Woodland (EVC 103), and Lignum Swamp (EVC 104). As the EVC mapping by DELWP is based on modelled data, it does not often accurately reflect on-ground conditions.

Woorinen Mallee EVC covers the largest area within the study area, with 611.5 hectares recorded (Figure 2). It was the dominant vegetation type along roadsides and was recorded across all aspects and slopes. Ridge Plains Mallee constituted 36.7 hectares and was localised to the south and the east of the study area, in locations where disturbance was limited (Figure 2a-o). Small areas of Plains Savannah (EVC826) were also identified in small pockets of road side summing a total of 1.0 hectares (Figure 2b & 2f). 18.6 hectares of Riverine Chernapod Woodland (EVC103) was identified along Donald-swan hill road (Figure 2i).

**Table 2.** Quality Rating breakdown by EVC

Rating	Extent of EVC (hectares)			
	Woorinen Mallee (EVC 824) (Vulnerable)	Plains Savannah (EVC 826) (Endangered)	Ridged Plains Mallee (EVC 96) (Endangered)	Riverine Chernapod Woodland (EVC 103) (Depleted)
High	10.8	0.2	1.9	16.7
Moderate-High	80.6	0.0	13.3	0
Moderate	208.1	0.3	5.1	0
Moderate-Low	209.0	0.4	0.4	0.7
Low	102.9	0.0	16.0	1.2
<b>Total</b>	<b>611.5</b>	<b>1.0</b>	<b>36.7</b>	<b>18.6</b>

##### 3.1.1.1 Woorinen Mallee

Woorinen Mallee woodland is a widespread EVC found on fine textured red-brown sand loams typified by a low, open understory dominated by chenopod shrubs with a diverse array of sub-shrubs, herbs and grasses (DELWP 2018b). The EVC is listed as Vulnerable in the Murray Mallee bioregion (DELWP 2018e).

Woorinen Mallee was the dominant EVC recorded within the study area, and was predominantly recorded on gently undulating slopes. The condition of the EVC ranged from low to high quality (although predominantly in low to moderate quality throughout the study area) (Plates 2-6). Condition of this community is in a largely moderate (208.1ha) and moderate-low (209.0ha) condition (Table 2).

A moderate diversity of species is present in all life forms, including:

- Eucalypts (Yorrell *Eucalyptus gracilis*, Red Mallee *Eucalyptus calycogona*, and, Grey Mallee *Eucalyptus socialis*);
- Overstorey trees (Buloke *Allocasurina luehmannii*)
- Understorey trees and medium shrubs (Red-stemmed wattle *Acacia myrtifolia*, Lightwood *Acacia implexa*, Umbrella Wattle *Acacia oswaldii*, Common Emu-bush *Eremophila glabra*, Ruby Saltbush *Enchylaena tomentosa*);
- Graminoids (Feather Spear-grass *Austrostipa elegantissima*, Bristly Wallaby-grass *Rytidosperma setacea*, Windmill Grass *Enteropogon acicularis*, Common Wallaby-grass *Rytidosperma caespitosa*); and,
- Scramblers (Small-leaved Clematis *Clematis microphylla*)

Weed cover was generally low and cover of bare ground was high. Dominant and high threat weeds included Panic Veldt-grass *Ehrharta erecta*, Large Quaking-grass *Briza maxima*, and Cocksfoot *Dactylis glomerata*.



**Plate 1** . Un-mappable sections of roadside | No Indicative Quality Rating (Ecology and Heritage Partners Pty Ltd 28/11/2017).



**Plate 2** . Woorinen Mallee EVC 824 | Low Indicative Quality Rating (Ecology and Heritage Partners Pty Ltd 28/11/2017).



**Plate 3.** Woorinen Mallee EVC 824 | Low/Moderate Indicative Quality Rating (Ecology and Heritage Partners Pty Ltd 28/11/2017).



**Plate 4.** Woorinen Mallee EVC 824 | Moderate Indicative Quality Rating (Ecology and Heritage Partners Pty Ltd 28/11/2017).



**Plate 5.** Woorinen Mallee EVC 824 | Moderate/High Indicative Quality Rating (Ecology and Heritage Partners Pty Ltd 28/11/2017).



**Plate 6.** Woorinen Mallee EVC 824 | High Indicative Quality Rating (Ecology and Heritage Partners Pty Ltd 28/11/2017).

### 3.1.1.2 *Ridged Plains Mallee*

Ridged Plains Mallee is an open, grassy mallee woodland to 10 metres tall, typical of the gently undulating plains of the Wimmera and Southern Mallee. Soils are somewhat variable but are typically duplex with grey or brown sandy clay loam or clay loam topsoils (DELWP 2018b).

Ridged Plains Mallee is listed as Endangered in the Murray Mallee bioregion (DELWP 2018e).

Scattered sparsely throughout the study area, Ridged Plains Mallee is present in slightly higher and dryer locations than Woorinen Mallee (Figure 2). It deviates from the Woorinen Mallee EVC in its canopy height and cover of monocotyledonous species (Plates 7-10).

A moderate diversity of species is present in all life forms, including:

- Eucalypts (Black Mallee-Box *Eucalyptus dumosa*, Grey Mallee *Eucalyptus socialis*);

- Understorey trees and medium shrubs (Red-stemmed Wattle, Lightwood, Umbrella Wattle, Common Emu-bush); and,
- Graminoids (Feather Spear-grass, Bristly Wallaby-grass, Windmill Grass, Common Wallaby-grass).



**Plate 7.** Ridged Plains Mallee EVC g6 | Low Indicative Quality Rating (Ecology and Heritage Partners Pty Ltd 28/11/2017).



**Plate 8.** Ridged Plains Mallee EVC g6 | Low/Moderate Indicative Quality Rating (Ecology and Heritage Partners Pty Ltd 28/11/2017).



**Plate 9.** Ridged Plains Mallee EVC g6 | Moderate Indicative Quality Rating (Ecology and Heritage Partners Pty Ltd 28/11/2017).



**Plate 10.** Ridged Plains Mallee EVC g6 | Moderate/High Indicative Quality Rating (Ecology and Heritage Partners Pty Ltd 28/11/2017).

### 3.1.1.3 Plains Savannah

Plains Savannah EVC is typically described as a structurally diverse vegetation unit which includes ‘grassy openings’, with a variable tree density ranging from a very sparse savanna to woodland. The relative absence of eucalypts is a characteristic of this EVC, with Buloke and perhaps Murray Pine to 10 m tall being the dominant trees. This EVC is typically widespread on the northern plains of Victoria (DELWP 2018b).

Plains Savannah is listed as Endangered in the Murray Mallee bioregion (DELWP 2018e).



This EVC is present in locations where eucalypts are largely absent and where Buloke and Southern Cypress Pine *Callitris gracilis*. *Spp murrayensis* dominate the overstorey. Plains Savannah is limited in extent within the study area and where it is present it is of Low to Moderate quality (See Plate 11-12; Table 2).



**Plate 11.** Plains Savannah EVC 826 | Moderate Indicative Quality Rating (Ecology and Heritage Partners Pty Ltd 28/11/2017).



**Plate 12.** Plains Savannah EVC 826 | Moderate/Low Indicative Quality Rating (Ecology and Heritage Partners Pty Ltd 28/11/2017).

### 3.1.2 Planted and Exotic Vegetation

#### 3.1.2.1 Planted Vegetation

Vegetation (trees and shrubs) have been planted around houses and as wind rows within the study area (Plate 13 and 14).



**Plate 13.** Planted garden variety species. (Ecology and Heritage Partners Pty Ltd 28/11/2017).



**Plate 14.** Planted indigenous trees. (Ecology and Heritage Partners Pty Ltd 28/11/2017).

#### 3.1.2.2 Riverine Chernapod Woodland

Eucalypt woodland to 15 metres tall with a diverse shrubby and grassy understorey occurring on most elevated riverine terraces. Confined to heavy clay soils on higher level terraces within or on the margins of riverine

floodplains (or former floodplains), naturally subject to only extremely infrequent incidental shallow flooding from major events if at all flooded (DELWP 2018b).

Plains Savannah is listed as Depleted in the Murray Mallee bioregion (DELWP 2018e).

Riverine Chernapod Woodland's distribution within the study area is restricted to an 18-hectare patch along Donald Swan Hill Road (Figure 2i), to the west of the study area (Plate 15 and 16).



**Plate 15.** High Quality Riverine Chernapod Woodland EVC 103. (Ecology and Heritage Partners Pty Ltd 28/11/2017).



**Plate 16.** High Quality Riverine Chernapod Woodland EVC 103. (Ecology and Heritage Partners Pty Ltd 28/11/2017).

### 3.1.2.3 Paddocks

The majority of non-remnant areas comprised cleared paddocks used for agricultural purposes (cropping). These environments provide little conservation value for native flora and fauna. Rodents, small ground dwelling marsupials, and quails may sometimes frequent these areas for shade, rest and foraging however, cropped areas are considered of low habitat value.

### 3.1.2.4 Weeds

No large patches of weeds listed as noxious under the *Catchment and Land Protection Act 1994* (CaLP Act) or as Weeds of National Significance (WONS) were found within the study area, nor were any deemed to be an imminent threatening process to the condition or classification of vegetation patches. However isolated individuals of Onion Weed *Asphodelus fistulosus*, Saffron Thistle *Carthamus lanatus*, Skeleton Weed *Chondrilla juncea*, Spiny Rush *Juncus acutus subsp. acutus*, Prickly Lettuce *Lactuca serriola*, and African Boxthorn *Lycium ferocissimum* were found within some roadside reserves and properties located in the project area.

With only a few exceptions, the ground layer of all vegetation across the site had a low diversity of dicotyledonous weeds. Monocotyledonous weeds were more diverse and consisted of largely of annual pasture or lawn grasses. Weed species observed within the study area are listed in Appendix 1.

## 3.2 Fauna

Fauna observed within the study area primarily consisted of common bird species adapted to modified landscapes. Birds of prey that were observed on site were the Nankeen Kestrel *Falco cenchroides*, Wedge-tailed Eagle *Aquila audax*, and Pacific Barn Owl *Tyto javanica*. These were observed during day and night surveys along roadsides. Birds of prey are common in these areas due to the availability of habitat, prevalence of prey species such as Hares *Lepus europaeus*, and the use of road kill as an opportunistic source of food. None of the observed birds of prey are listed under the EPBC Act, FFG Act or Victoria's Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2013).

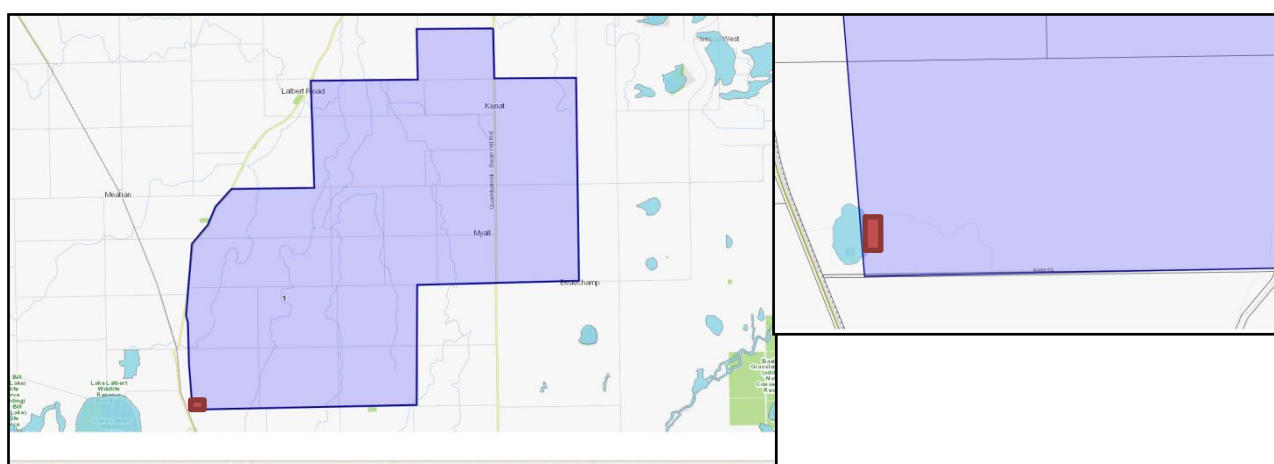
### 3.2.1 Fauna Habitat

The age class of many of the eucalyptus throughout the survey area were sufficient to develop hollows. Tree hollows are essential fauna habitat and for this reason hold a heavy weighting in the scoring of conservation values. The density of tree hollows throughout the site was considered 'high' for roadside reserves.

Inter-tussock spaces, rock crevices and bare cracking soil are key habitats for small reptiles. There were very few locations where native tussock grasses and graminoides provided this habitat, however litter and fallen logs were common throughout the site.

## 3.3 Wetlands and Waterways

A small section on the south-western border of the study area contains a DELWP modelled wetland (see below) (Plate 15). Under Victoria's *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017b), modelled wetlands are assumed to contain native vegetation regardless of the condition in the field (except for hard-surfaces such as roads and buildings). As such, any impacts to this area would be assumed to be impacting native vegetation.



**Plate 15.** Map of DELWP modelled wetlands from DELWP's NVIM tool (LEFT). Red areas represent DELWP wetland within study area (RIGHT)(DELWP 2018a).

There are five wetlands of international importance listed under the Ramsar Convention on Wetlands that are within the broad region of the study area:

- Banrock station wetland complex 300 – 400 kilometres upstream;

- Hattah-kulkyne lakes 100 – 150 kilometres upstream; and,
- Kerang wetlands Within 10 kilometres of project area.
- Riverland 200 – 300 kilometres upstream
- The Coorong, and lakes Alexandrina and Albert wetland 300 – 400 kilometres upstream

## 4 SIGNIFICANCE ASSESSMENT

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### 4.1 Flora

Forty-six flora species (31 indigenous and 15 non-indigenous or introduced) were recorded within the study area during the field assessment. Of these species, one (Umbrella Wattle) is listed under the FFG Act (DELWP 2018d, DoEE 2018), and as Vulnerable on the DELWP Advisory List (DEPI 2014).

#### 4.1.1 National

The VBA contains records of five nationally significant flora species previously recorded within 10 kilometres of the study area (DELWP 2017a, DoEE 2018) (Figure 3) (Appendix 2.2). All five nationally listed flora species have a high likelihood of occurring within the study area. There is potential habitat for the following nationally significant species within the study area (i.e. principally along roadside remnants) (Appendix 2.2):

- Candy Spider-orchid                      *Caladenia versicolor*;
- Greencomb Spider-orchid                *Caladenia tensa*;
- Winged Peppergrass                      *Lepidium monoplocoides*;
- Charriot Wheels                          *Maireana cheelii*; and,
- Slender Darling-pea                      *Swainsona murrayana*.

#### 4.1.2 State

Of the 47 State significant flora species previously recorded in the VBA within 10 kilometres of the study area, nine were listed species under the FFG Act, seven species of which, have a moderate to high likelihood of occurrence within the study area (Figure 3) (i.e. principally along roadside remnants). Species of special note are Umbrella Wattle, and Buloke which were recorded onsite. Likelihoods of occurrence were determined by the presence of previous records of the species in the local vicinity; and/or the presence of potential habitat identified in the study area during the field assessments (Appendix 2.2). Significant species with a high likelihood of being present onsite are:

- Hoary Scurf-pea                          *Cullen cinereum*
- Tough Scurf-pea                          *Cullen tenax*
- Nealie                                        *Acacia loderi*
- Yarran                                        *Acacia melvillei*
- Umbrella Wattle                          *Acacia oswaldii*
- Weeping Myall                            *Acacia pendula*
- Buloke                                        *Allocasuarina luehmannii*

Given these species were not detected during the characterisation assessment; any populations within the study area are expected to be small in numbers. However, there are multiple recent records of all species. The likelihood of the remaining state significant species occurring within the study area is considered low due to the absence of suitable habitat and/or lack of records in close proximity (Appendix 1.2, Figure 3).

### 4.1.3 Recommendation

Targeted surveys are recommended for Candy Spider-orchid, Greencomb Spider-orchid, Winged Peppergrass, Chariot Wheels, and, Slender Darling-pea. The optimal time to undertake these surveys is when the species are known to be flowering (i.e. between September and November) to ascertain their presence, or otherwise, within the study area.

Targeted surveys for State significant flora are not typically required for legislative approvals and requirements under the *Mineral Resources (Sustainable Development) Act 1990* (MRSD Act) or *Planning and Environment Act 1987* (P&E Act). However, if the project triggers an assessment under the *Environment Effects Act 1978* (EE Act), targeted surveys for State-significant species are likely to be required.

## 4.2 Fauna

### 4.2.1 National

No national or state significant fauna species were recorded within the study area during the assessment.

A total of 68 fauna species were incidentally recorded within the study area during the field assessment, including: Five mammals (one native, four introduced), 60 birds (58 native, two introduced) and three (3) native reptiles. A consolidated list of observed fauna species recorded is provided in Appendix 3.1.

The VBA contains records of 15 nationally significant species records within 10 kilometres of the study area (DELWP 2017a) (Figure 4) (Appendix 3.2). The PMST nominated 15 nationally significant species which have not been previously recorded but have the potential to occur in the locality (DoEE 2018).

Of the nationally significant species, Plains-wanderer *Pedionomus torquatus* and South-eastern Long-eared Bat *Nyctophilus corbeni* may utilise habitat within the study area on occasions. Based on the modified nature of much of the study area, landscape context and the proximity of previous records, additional nationally significant fauna species are considered highly unlikely to occur within the study area on a regular basis, as the study area is not considered to support important or limiting habitat (Figure 4).

### 4.2.2 State and Regional

A total of 28 state significant and 10 regionally significant fauna species under the Advisory List of Threatened Fauna in Victoria (DSE 2013), have VBA records within 10 kilometres of the study areas (DELWP 2018f). There is potential for the State significant Hooded Robin *Melanodryas cucullata cucullata*, Blue-billed Duck *Oxyura australis*, Brown Treecreeper (south-eastern ssp.) *Climacteris picumnus victoriae*, Black Falcon *Falco subniger*, Bandy Bandy *Vermicella annulata*, and Musk Duck *Biziura lobata* to use habitats within the study area (Table 3).

The remaining records are confined to existing road reserves, conservation reserves within the local area, and the Boga, Charm, and Kangaroo lake systems to the east of the site, where high quality and survey frequency is high. Based on the modified nature of the study area, landscape context, lack of natural, connected or persistent water systems in the study area, and the proximity of previous records, remaining significant fauna species are considered unlikely to occur.

**Table 3.** Justification for the high likelihood of fauna within the study area.

Common Name	Scientific Name	Habitat
<b>National Significance</b>		
Plains Wanderer	<i>Pedionomus torquatus</i>	There are six records dating as recently as 2012 of the Plains-wonderer within 10 kilometres of the study area (VBA). There is low quality habitat present within the study area (i.e. lack of high quality grassland), and therefore while few individuals may use cropped areas on occasions, there is no important or limiting habitat for Plains Wanderer within the area. There have been recent targeted surveys undertaken within the region and the species has been positively identified through call recognition (song metres) (Mark Antos, Parks Victoria pers. comms.)
South-eastern Long-eared Bat	<i>Nyctophilus corbeni</i>	There have been no documented records of South-eastern Long-eared Bat within the study area, although this species was identified in EPBC Act PMST. The species is known to inhabit a variety of vegetation types, including mallee, buloke and box eucalypt dominated communities, all of which are located within the study area. Hollow bearing trees within the study area provide potentially suitable breeding and roosting habitat for this species.
<b>State Significance</b>		
Hooded Robin	<i>Melanodryas cucullata cucullata</i>	Hooded Robin has been recorded 18 times within 10 kilometres of the study area (AVW). The most recent record was as recent as 2012. The age class and growth habit of the canopy eucalypts provides suitable nesting and foraging resources across the study area.
Blue-billed Duck	<i>Oxyura australis</i>	There have been 19 records of the Blue-bellied Duck as recently as 2002 (AVW). The rural dams and constructed waterways provide foraging resources for individuals moving between larger wetlands. However, this species is not likely to rely on habitat resources within the study area.
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	Found in a diverse range of habitats varying from coastal forests to mallee shrublands, the brown treecreeper often occupies eucalypt-dominated woodland habitats up to 1,000 metres, avoiding areas with a dense shrubby understorey. The dominant woorine mallee EVC meets this description and would provide suitable habitat for this species. There are also a high number of documented records of the species from within 10km of the study area (AVW).
Black Falcon	<i>Falco subniger</i>	There are four document records of Black Falcon within 10 kilometres of the study area (AVW). Black Falcon usually inhabits arid and semi-arid zones such as that present within the study area. It is usually found near watercourses or using patches of isolated trees. While Black Falcon is likely to use habitat resources within the study area on occasions, there is no important or limiting habitat for this species.
Musk Duck	<i>Biziura lobata</i>	There are 57 document records of Musk Duck within 10km of the study area (AVW). These all occur within the lake systems to the north east and within the surrounding townships. The rural dams and constructed waterways may provide rest and foraging habitats to individuals originating from the larger wetlands. However, this species is not considered to depend on habitat that occurs within the study area and is not considered likely to compromise the survivability of this species.
Bandy Bandy	<i>Vermicella annulata</i>	There is a single record of Bandy Bandy documented from the local area (VBA). The inter-tussock spaces, cracking clays and rocky environments present within the study area provides potentially suitable habitat for the species (primarily in area that have not been subject to intensive land use practices).
<b>Regional Significance</b>		
Red-backed Kingfisher	<i>Todiramphus pyrropygia pyrrhopygia</i>	Red-backed Kingfisher inhabit dry forests, mulga and mallee country, to savannah. The study area provides suitable habitat of the species. The proximity and size of the surrounding RAMSAR wetlands increases the likelihood of this species

Common Name	Scientific Name	Habitat
		frequenting the study area. However, this species is not considered to depend on any habitats within the study area.

#### 4.2.3 Recommendation

Targeted surveys for State significant fauna are not required for approvals and requirements under the MRSD Act or P&E Act. However, if the project triggers an assessment under the (EE Act), targeted surveys for State and regionally significant species may be required.

### 4.3 Listed Communities

Four nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoEE 2018):

- Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions, Endangered Community
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia, Endangered Community
- Natural Grasslands of the Murray Valley Plains Critically Endangered Community Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains, Critically Endangered Community
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland, Critically Endangered Community

However, based on the site assessment, it is considered that vegetation within the study area does not meet the condition thresholds that define any national-significant communities.

State listed threatened communities that have the potential occur within the site include:

- Victorian Temperate Woodland Bird Community
- Victorian Mallee Bird Community



## 5 CONCLUSION

The study area is representative of many areas within the Murray Mallee bioregion as it has been previously disturbed for agriculture and possesses large areas of improved pastures and derived native grasslands with scattered patches of remnant vegetation and regrowth from past clearing. However, four EVCs are present within the study area. Much of this indigenous vegetation and good quality terrestrial fauna habitat present within the study area is confined to roadsides and dissecting gullies, which have been less affected by past land clearing and sustained agricultural land use. The large and relatively well-connected remnants in these areas are complimented by smaller, fragmented patches of native vegetation and scattered trees which persist in modified areas.

The findings presented in this ecological characterisation report will inform the development of a refined footprint and any requirement for any targeted significant species surveys. Once the footprint has been revised measures to avoid, minimise and offset potential impacts on the ecological values, along with information on relevant biodiversity legislation and government policy associated with the proposed development will be provided.

### 5.1 Additional Requirements

It is understood that the development footprint will be refined following detailed investigations to confirm the extent of the resource. After a refined footprint is completed a detailed habitat hectare assessment of vegetation within the impact area will be undertaken, together with targeted surveys for significant flora species. Species that have potential to occur within the study area and may be impacted by the proposed development are provided below (Table 4).

**Table 4.** Targeted surveys for significant flora species that have potential to occur within the study area.

Species	Survey period	Survey Method
Candy Spider-orchid	(Sep.- Nov)	Transects
Greencomb Spider-orchid	(Sep.- Oct)	Transects
Winged Peppergrass	(Aug.- Oct)	Transects
Charriot Wheels	(Sep.- Nov)	Transects
Slender Darling-pea	(Sep.- Nov)	Transects
Hoary Scurf-pea	(Oct - May)	Transects
Tough Scurf-pea	All Year	Transects
Nealie	All Year	Transects
Yarran	All Year	Transects
Umbrella Wattle	All year	Transects
Weeping Myall	All Year	Transects
Buloke	All Year	Transects

Other than South-eastern Long-eared Bat and Plains Wanderer, there is a low likelihood of any other EPBC Act-listed species would occupy habitats within the study area (Table 5). While Plains Wanderer may use habitats (i.e. open, modified paddocks and crops) within the study area on occasions (a nomadic species),

South-eastern Long-eared Bat typically occupy large areas supporting old growth mallee. Nevertheless, there is potential for the study area to support a resident population of the species. Once the development footprint has been revised targeted surveys for this species may need to be undertaken (during the warmer months when the species is active) in areas supporting larger patches of mallee that support dead stags and hollows.

**Table 5.** Targeted surveys for significant fauna species that have potential to occur within the study area.

Species	Survey period	Survey Method
South-eastern Long-eared Bat	(Sep.- Nov)	Anabat
Plains Wanderer	(Sep.- March)	Transects and Song metres

Conversely, there is not likely to be a requirement to undertake targeted surveys for other State significant species (e.g. Hooded Robin, Blue-billed Duck, Brown Treecreeper (south-eastern ssp.), Black Falcon, Bandy Bandy and Musk Duck), given that these species are either expected to use the study area as residents, or as visitors on a frequent or infrequent basis, and/or are highly mobile and would readily disperse to other suitable habitats outside of the proposed development.

There is no requirement under Clause 52.17 of the *Planning and Environment Act 1987* to undertake targeted surveys for the State significant species outlined in Table 3. Furthermore, there are no specific zoning or planning scheme overlays that require additional surveys to be undertaken. However, requirements may be specified by DELWP should the project be assessed under an EES.

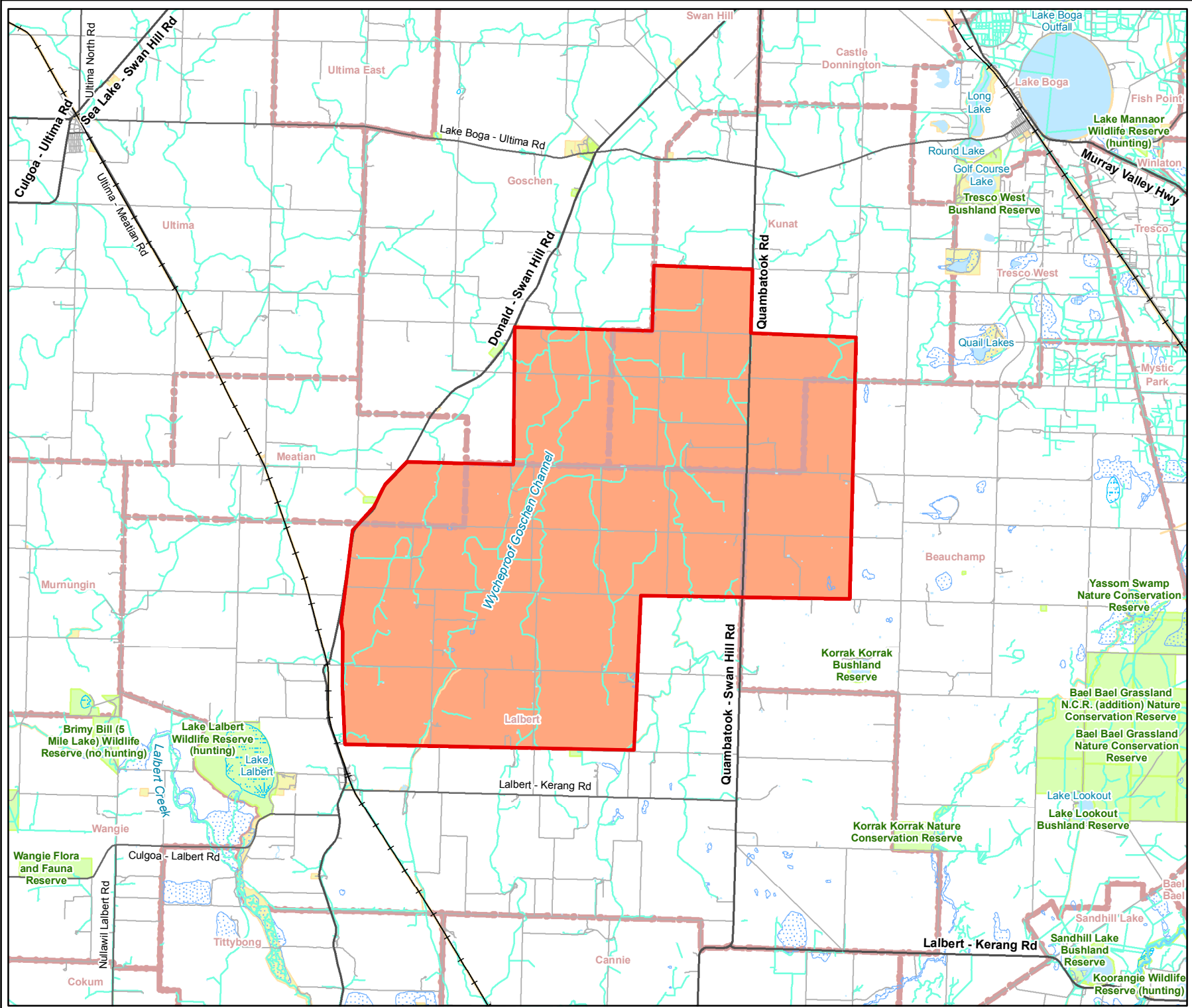
## REFERENCES

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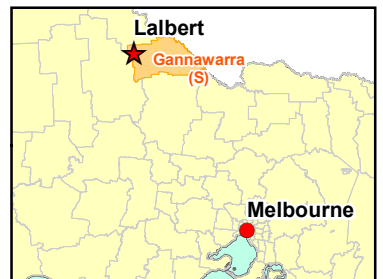
- DELWP 2018a. Planning Maps Online [www Document]. URL <http://services.land.vic.gov.au/landchannel/jsp/map/PlanningMapsIntro.jsp>.
- DELWP 2018b. The Native Vegetation Information Management system (NVIM) [WWW Document]. URL <https://nvim.delwp.vic.gov.au/>. Victorian Department of Environment, Land, Water and Planning.
- DELWP 2018c. NatureKit. [WWW Document] <http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit> Victorian Department of Environment, Land, Water and Planning.
- DELWP 2018d. Ecological Vegetation Class (EVC) Benchmarks for each Bioregion [WWW Document]. URL <https://www.environment.vic.gov.au/biodiversity/bioregions-and-ecv-benchmarks> Victorian Department of Environment, Land, Water and Planning.
- DELWP 2018e. Bioregional conservation status for each BioEVC [https://www.environment.vic.gov.au/\\_\\_data/assets/pdf\\_file/0012/50511/Bioregional-Conservation-Status-for-each-BioEVC.pdf](https://www.environment.vic.gov.au/__data/assets/pdf_file/0012/50511/Bioregional-Conservation-Status-for-each-BioEVC.pdf). Victorian Department of Environment, Land, Water and Planning.
- DELWP 2018f. Flora and Fauna Guarantee Act 1988 Threatened List. Accessed January 2018 [https://www.environment.vic.gov.au/\\_\\_data/assets/pdf\\_file/0024/115827/201801-FFG-Threatened-List.pdf](https://www.environment.vic.gov.au/__data/assets/pdf_file/0024/115827/201801-FFG-Threatened-List.pdf) Victorian Department of Environment, Land, Water and Planning.
- DELWP 2017a. Victorian Biodiversity Atlas. Sourced from GIS layers: “VBA\_FLORA25”, “VBA\_FLORA100”, “VBA\_FAUNA25”, “VBA\_FAUNA100”. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.
- DELWP 2017b. Guidelines for the removal, destruction or lopping of native vegetation. Victorian Department of Environment, Land, Water and Planning.
- DEH 2006. Management of *Phytolphtgora cinnamomi* for Biodiversity Conservation in Australia.
- DoE 2018. Protected Matters Search Tool: Interactive Map [WWW Document]. URL <http://www.environment.gov.au/epbc/protected-matters-search-tool>. Federal Department of the Environment, Canberra.
- DSE 2010. Native Vegetation Technical information sheet: Degraded treeless vegetation, Best and remaining habitat determinations, Tree protection/retainment requirements. Victorian Department of Sustainability and Environment.
- DSE 2013. Advisory List of Threatened Vertebrate Fauna in Victoria. Victorian Department of Sustainability and Environment.

## FIGURES

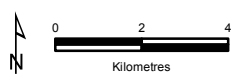
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- Legend**
- Study Area
  - Railway
  - Major Road
  - Collector Road
  - Minor Road
  - Minor Watercourse
  - Major Watercourse
  - Permanent Waterbody
  - Land Subject to Inundation
  - Wetland/Swamp
  - Parks and Reserves
  - Crown Land
  - Localities



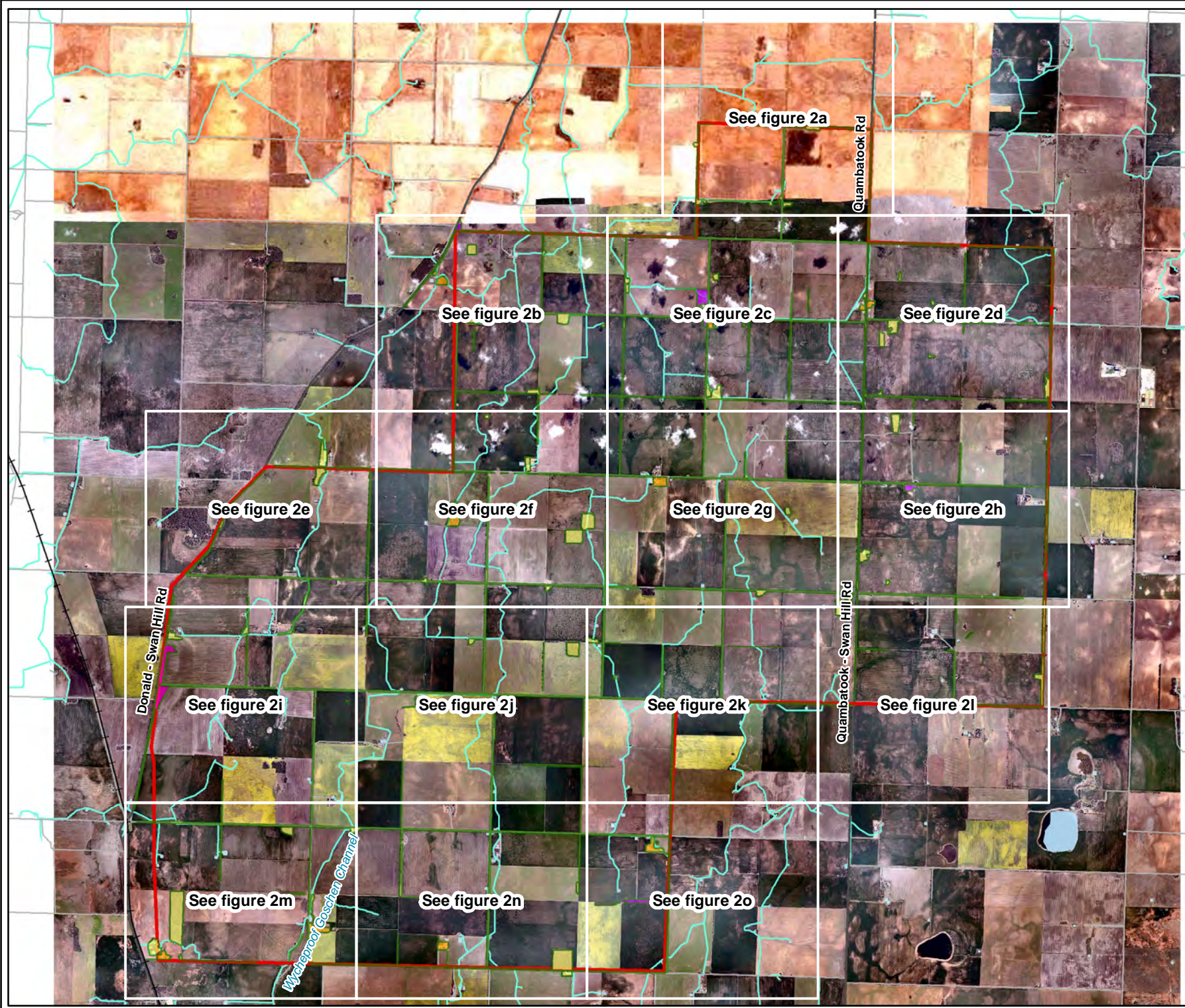
**Figure 1**  
**Location of the study area**  
*Goschen Project: Ecological Assessment*



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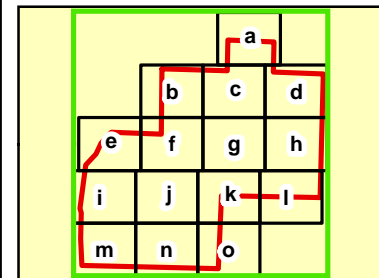
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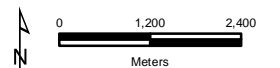
- Study Area
- Ecological Vegetation Classes**
- PS826
- RPM96
- WM824
- black box community
- mixed planted natives



**Figure 2 Overview**

**Ecological Vegetation Classes**

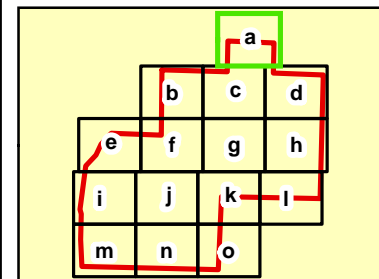
*Goschen Project: Ecological Assessment*



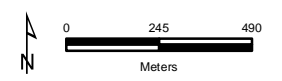
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- Legend**
- Study Area
  - Ecological Vegetation Classes**
  - PS826
  - RPM96
  - WM824
  - black box community
  - mixed planted natives



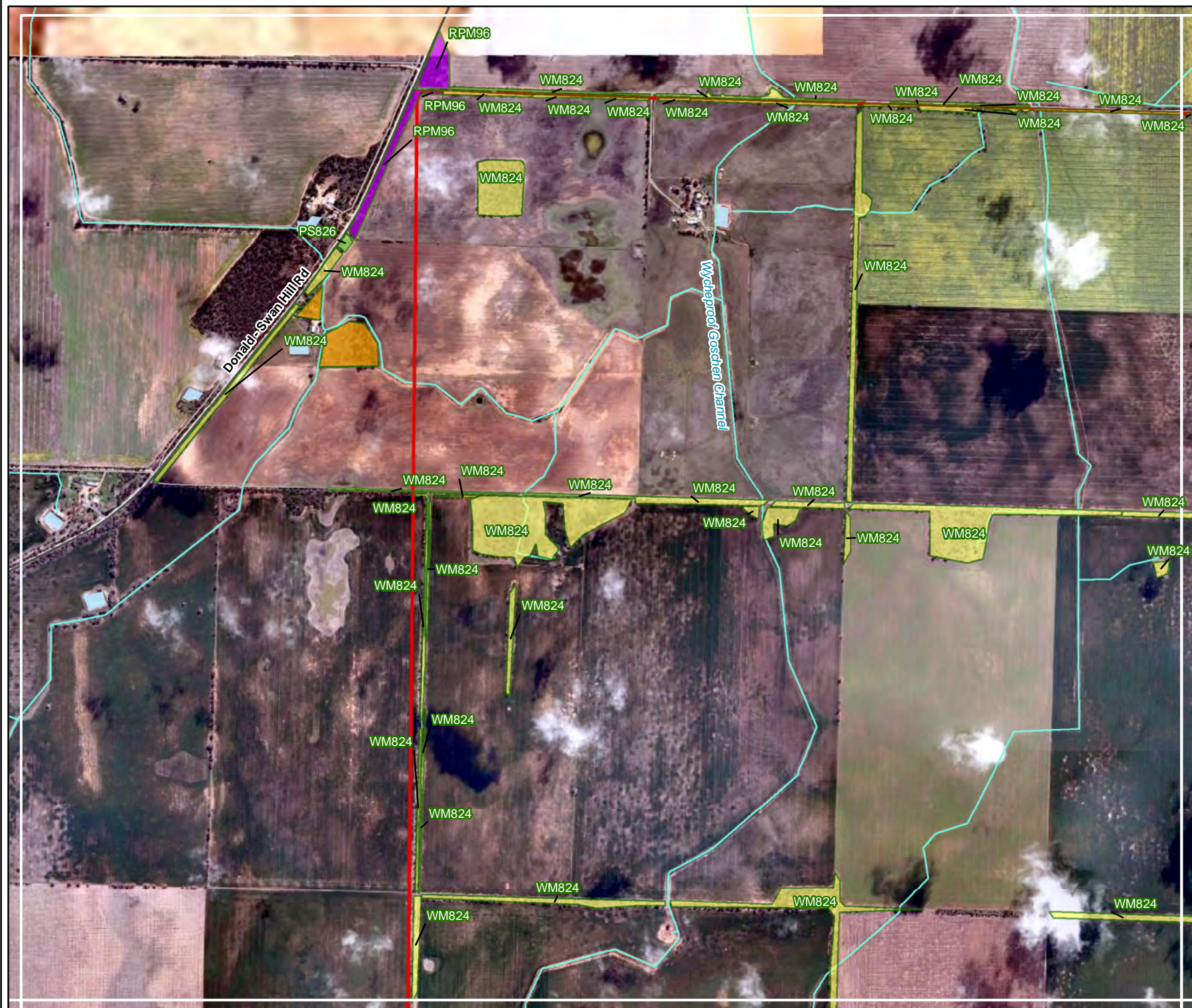
**Figure 2a**  
**Ecological Vegetation Classes**  
*Goschen Project: Ecological Assessment*



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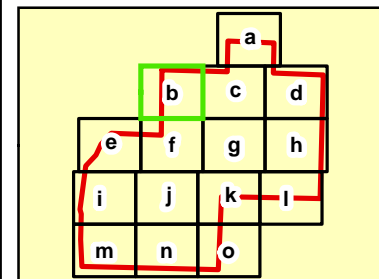


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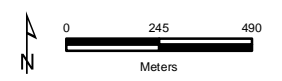
- Study Area

**Ecological Vegetation Classes**

- PS826
- RPM96
- WM824
- black box community
- mixed planted natives

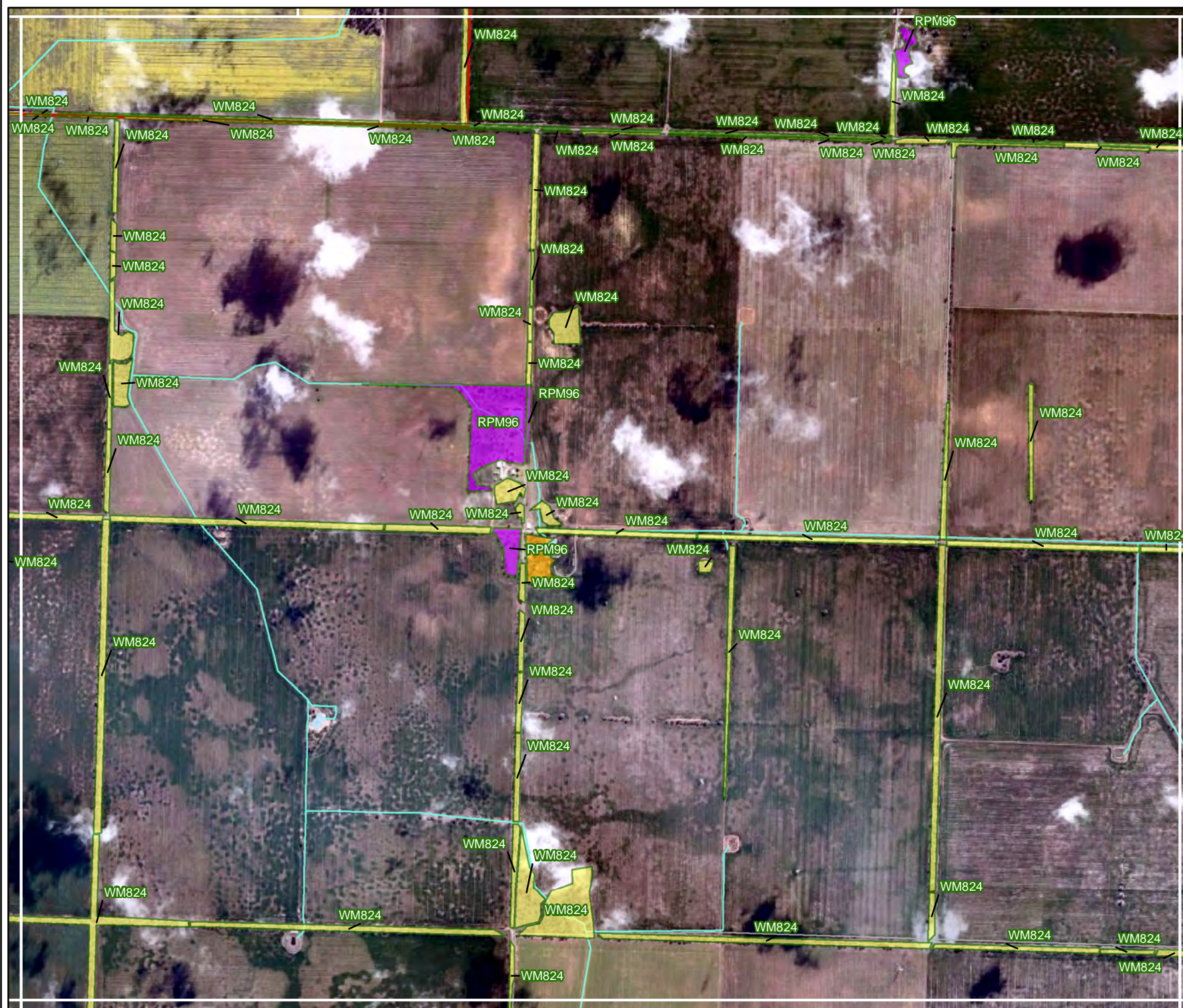


**Figure 2b**  
**Ecological Vegetation Classes**  
*Goschen Project: Ecological Assessment*



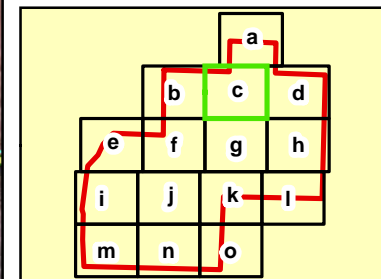
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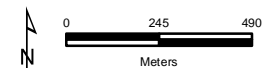


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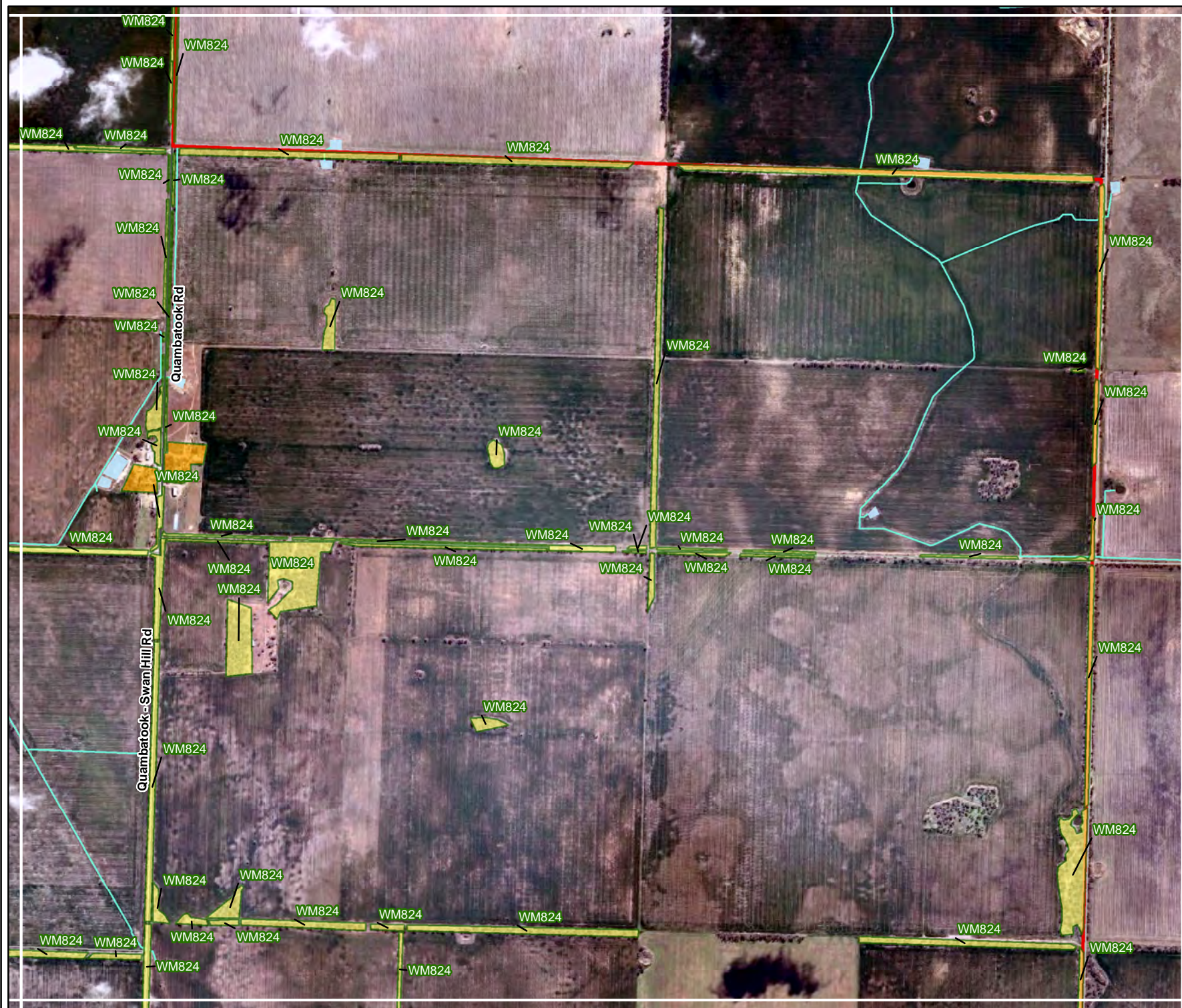
- Study Area
- Ecological Vegetation Classes**
- PS826
- RPM96
- WM824
- black box community
- mixed planted natives



**Figure 2c**  
**Ecological Vegetation Classes**  
*Goschen Project: Ecological Assessment*

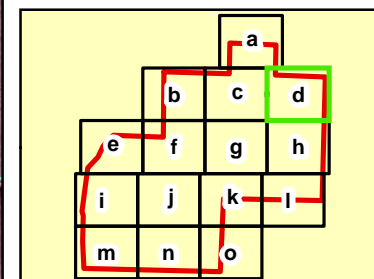


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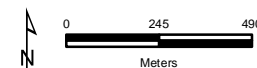


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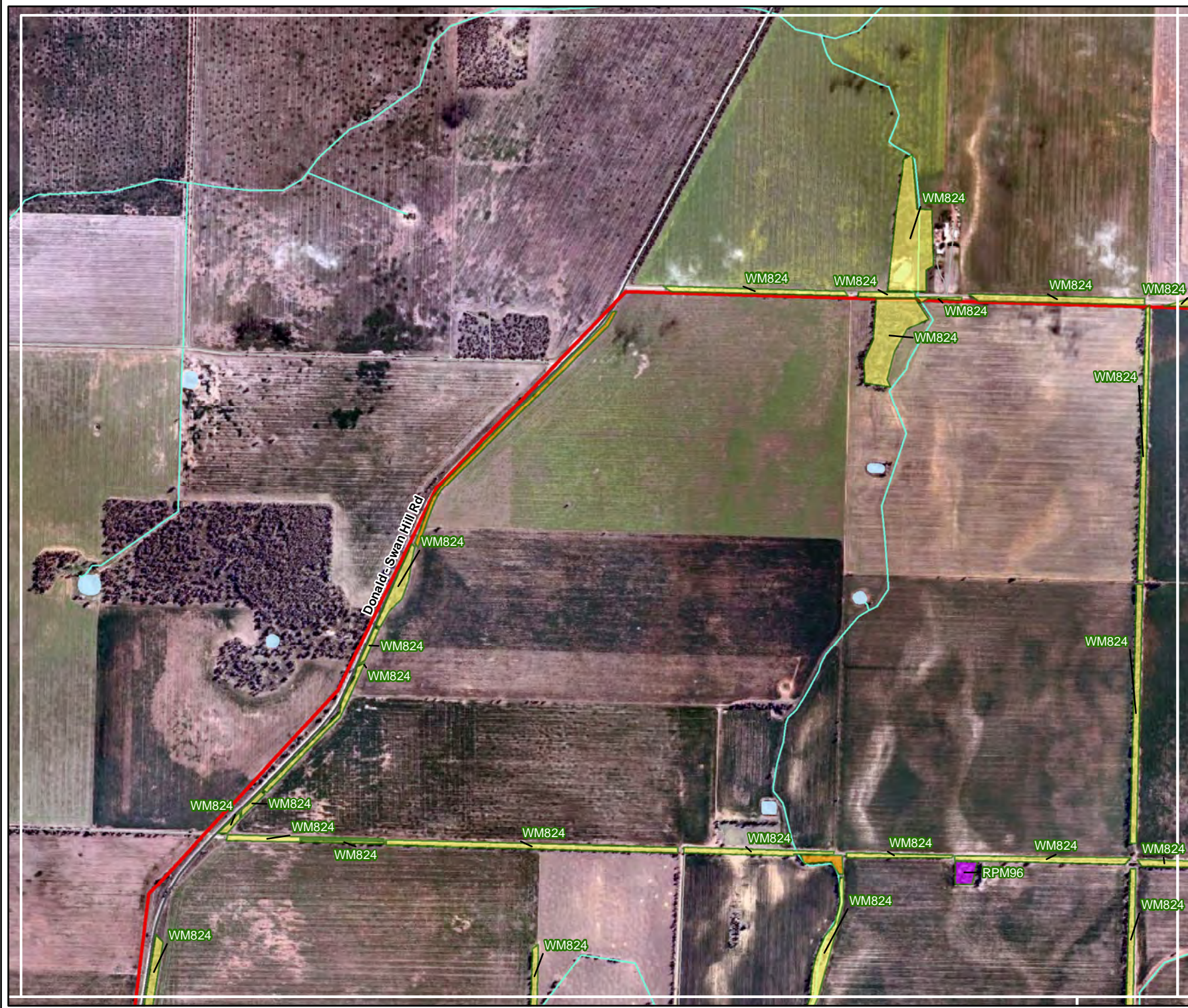
- Study Area
- Ecological Vegetation Classes**
- PS826
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- WM824
- black box community
- mixed planted natives



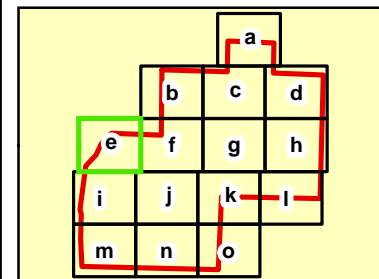
**Figure 2d**  
**Ecological Vegetation Classes**  
*Goschen Project: Ecological Assessment*



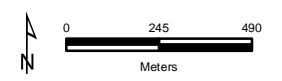
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- Legend**
- Study Area
  - Ecological Vegetation Classes**
  - PS826
  - RPM96
  - WM824
  - black box community
  - mixed planted natives



**Figure 2e**  
**Ecological Vegetation Classes**  
*Goschen Project: Ecological Assessment*

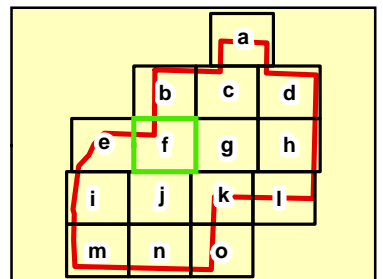


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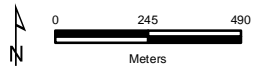
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- Legend**
- Study Area
  - Ecological Vegetation Classes**
  - PS826
  - RPM96
  - WM824
  - black box community
  - mixed planted natives



**Figure 2f**  
**Ecological Vegetation Classes**  
*Goschen Project: Ecological Assessment*



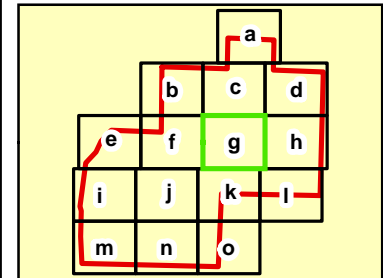
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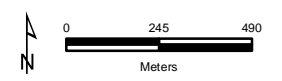


**Legend**

- Study Area
- Ecological Vegetation Classes**
- PS826
- RPM96
- WM824
- black box community
- mixed planted natives



**Figure 2g**  
**Ecological Vegetation Classes**  
*Goschen Project: Ecological Assessment*

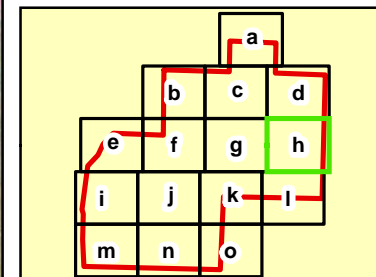


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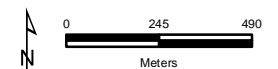


**Legend**

- Study Area
- Ecological Vegetation Classes**
- PS826
- RPM96
- WM824
- black box community
- mixed planted natives



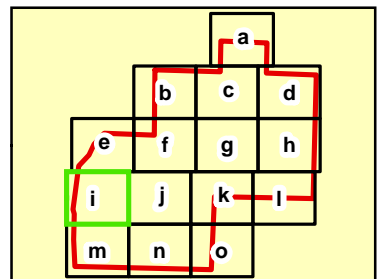
**Figure 2h**  
**Ecological Vegetation Classes**  
*Goschen Project: Ecological Assessment*



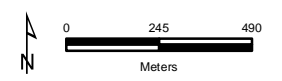
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects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



- Legend**
- Study Area
  - Ecological Vegetation Classes**
  - PS826
  - RPM96
  - WM824
  - black box community
  - mixed planted natives



**Figure 2i**  
**Ecological Vegetation Classes**  
*Goschen Project: Ecological Assessment*



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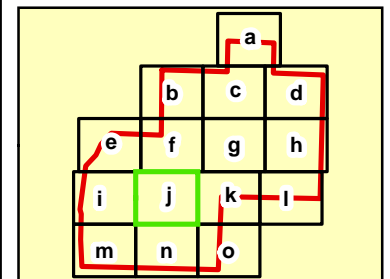


**Legend**

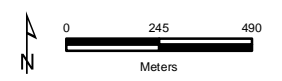
- Study Area

**Ecological Vegetation Classes**

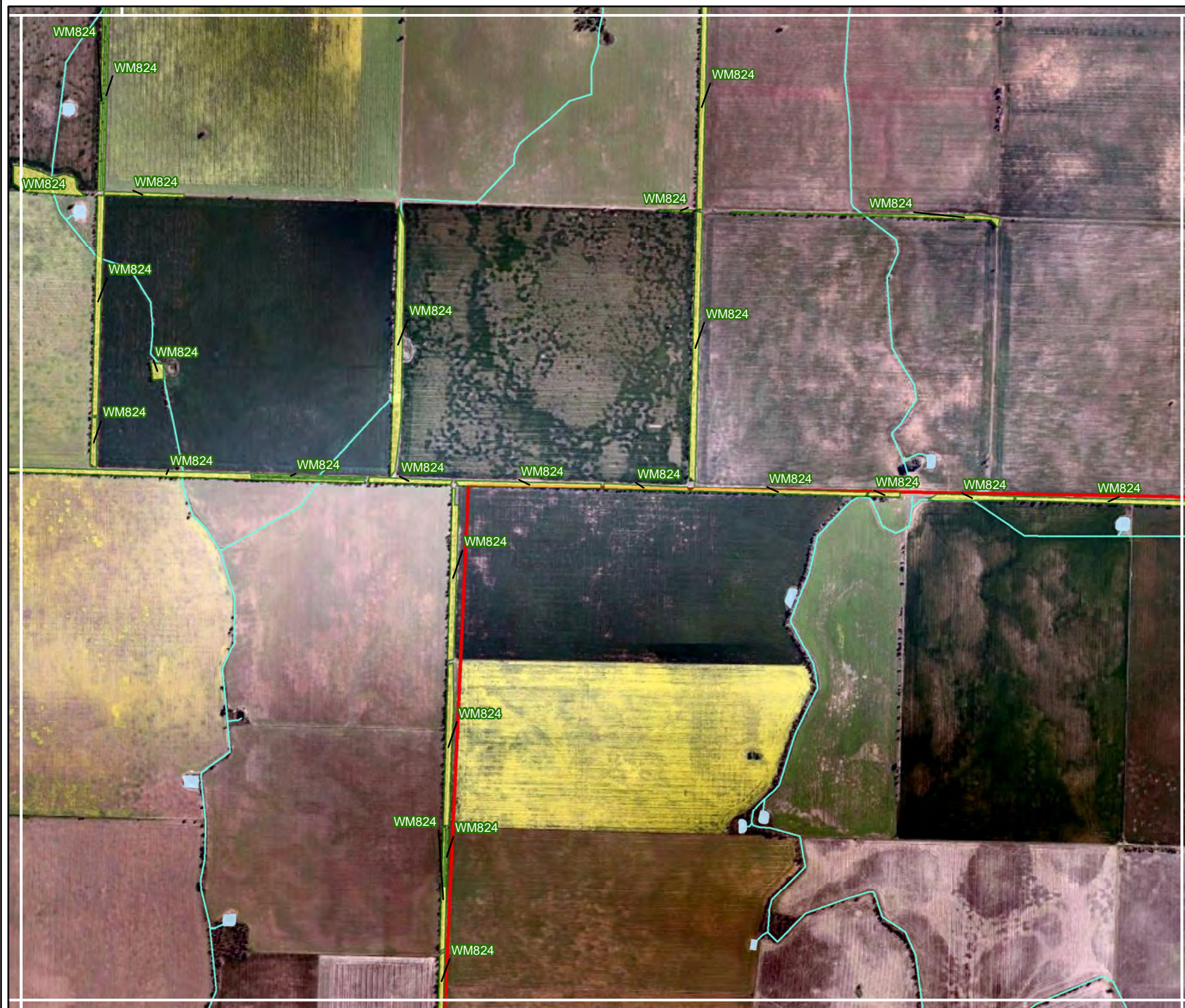
- PS826
- RPM96
- WM824
- black box community
- mixed planted natives



**Figure 2j**  
**Ecological Vegetation Classes**  
*Goschen Project: Ecological Assessment*

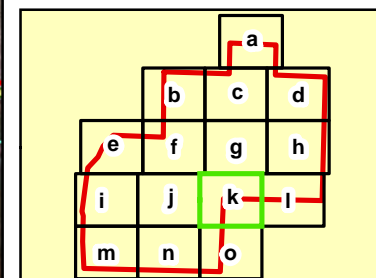


VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects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

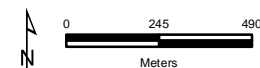


**Legend**

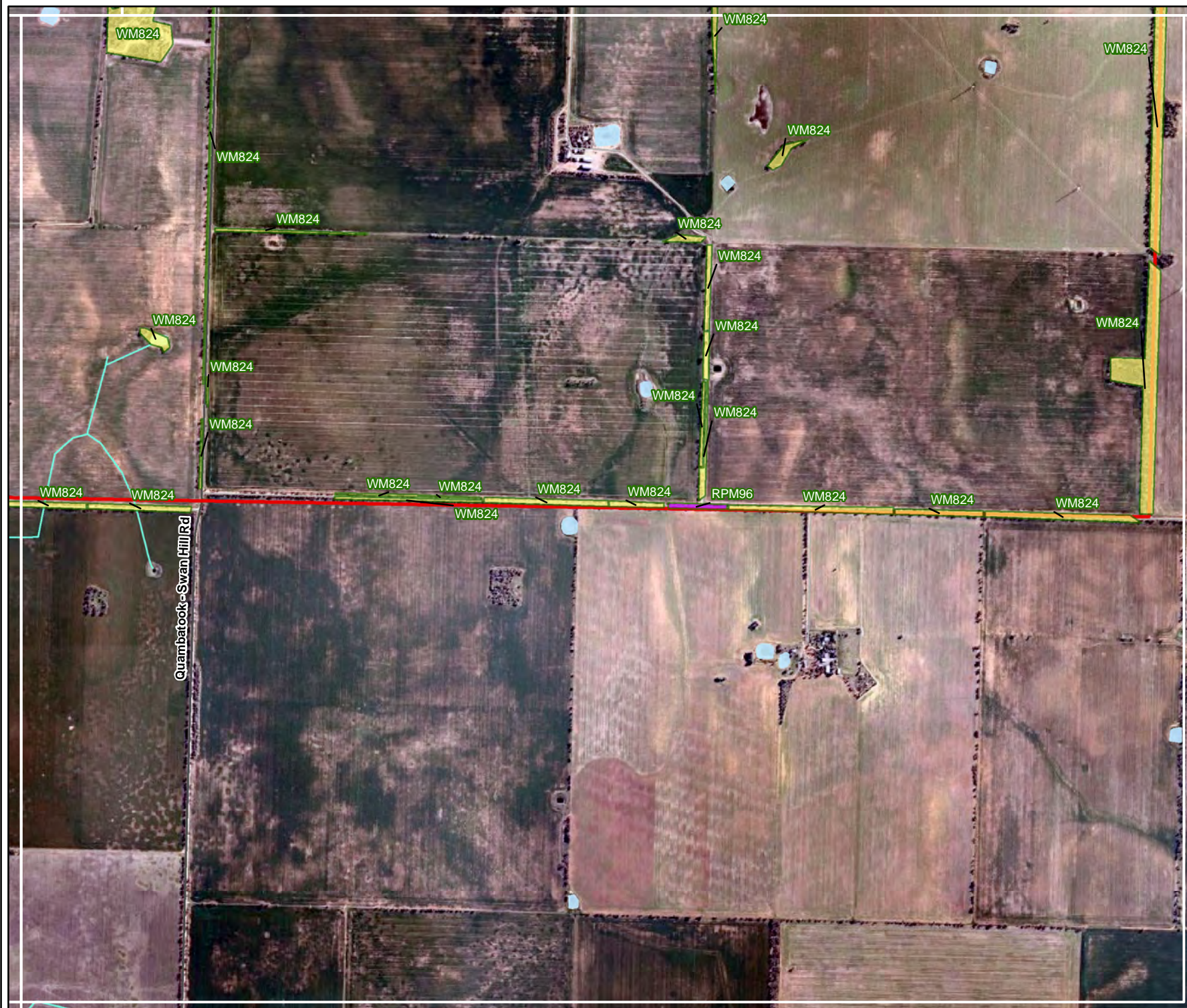
- Study Area
- Ecological Vegetation Classes**
- PS826
- RPM96
- WM824
- black box community
- mixed planted natives



**Figure 2k**  
**Ecological Vegetation Classes**  
*Goschen Project: Ecological Assessment*

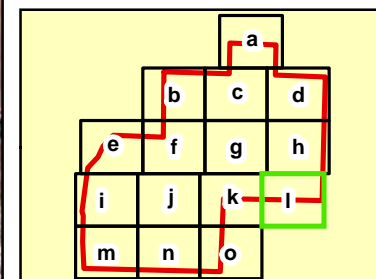


VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects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

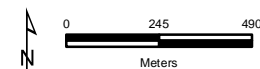


**Legend**

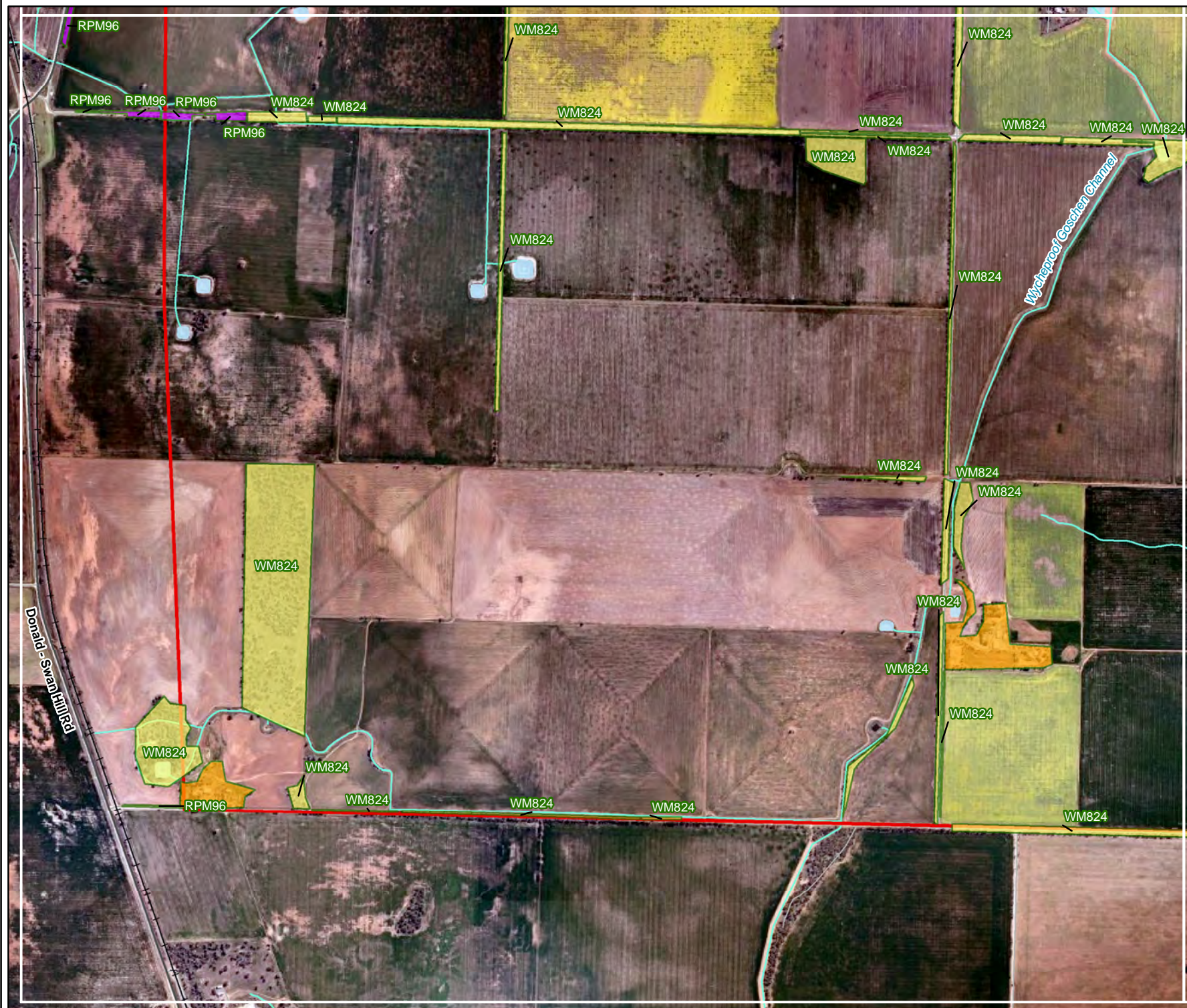
- Study Area
- Ecological Vegetation Classes**
- PS826
- RPM96
- WM824
- black box community
- mixed planted natives



**Figure 21**  
**Ecological Vegetation Classes**  
*Goschen Project: Ecological Assessment*

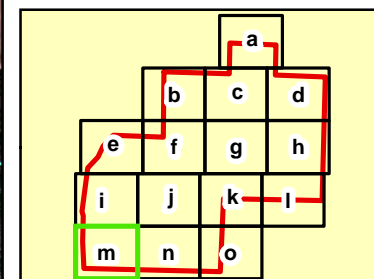


VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects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

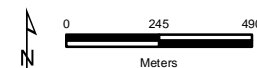


**Legend**

- Study Area
- Ecological Vegetation Classes**
- PS826
- RPM96
- WM824
- black box community
- mixed planted natives



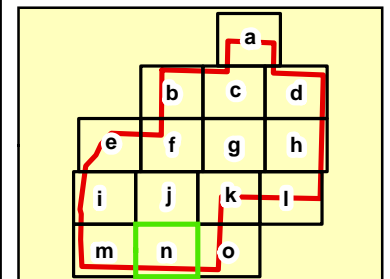
**Figure 2m**  
**Ecological Vegetation Classes**  
*Goschen Project: Ecological Assessment*



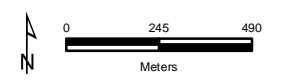
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects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



- Legend**
- Study Area
  - Ecological Vegetation Classes**
  - PS826
  - RPM96
  - WM824
  - black box community
  - mixed planted natives

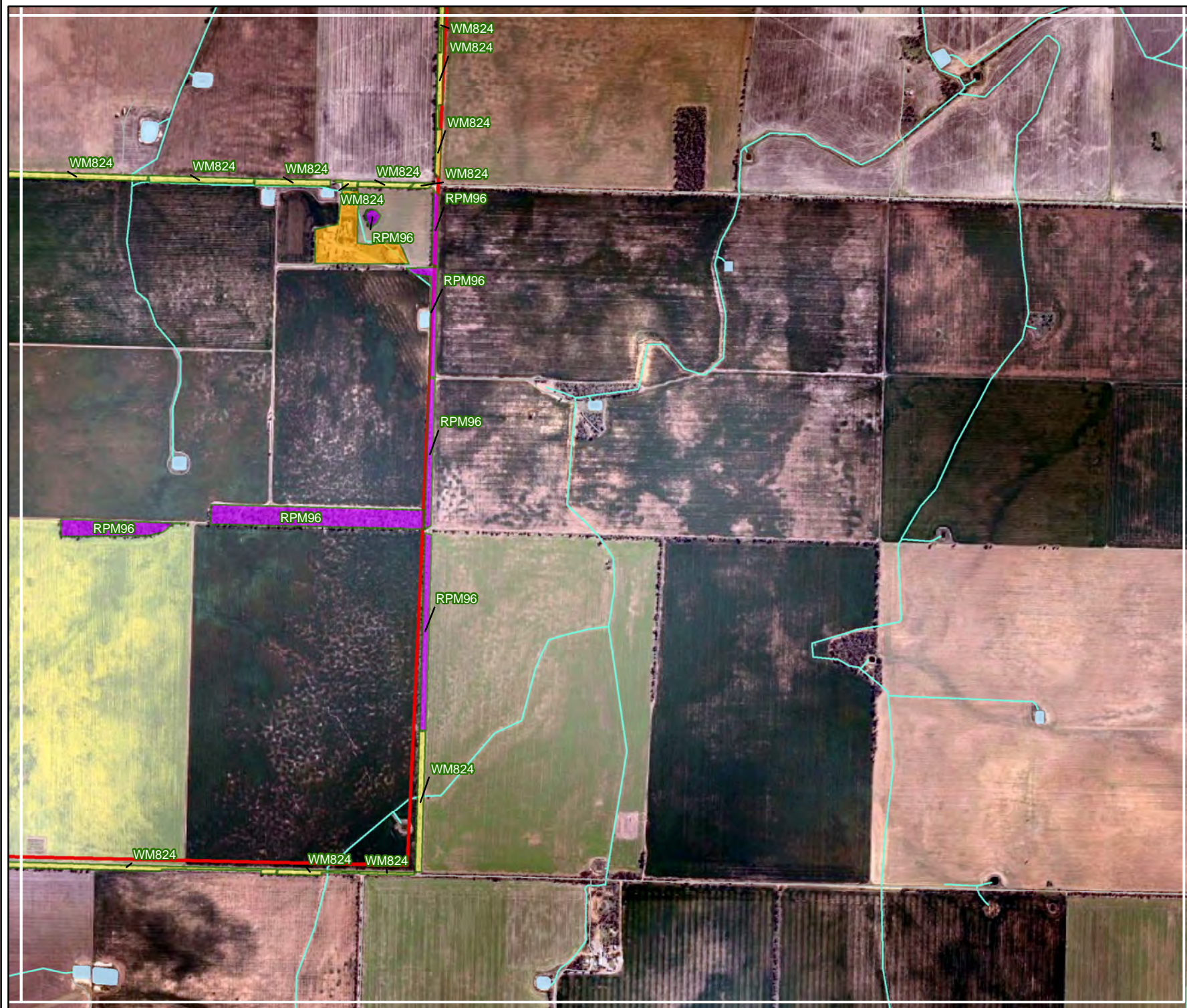


**Figure 2n**  
**Ecological Vegetation Classes**  
*Goschen Project: Ecological Assessment*



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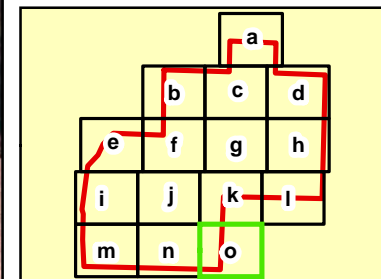


**Legend**

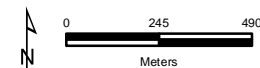
- Study Area

**Ecological Vegetation Classes**

- PS826
- RPM96
- WM824
- black box community
- mixed planted natives

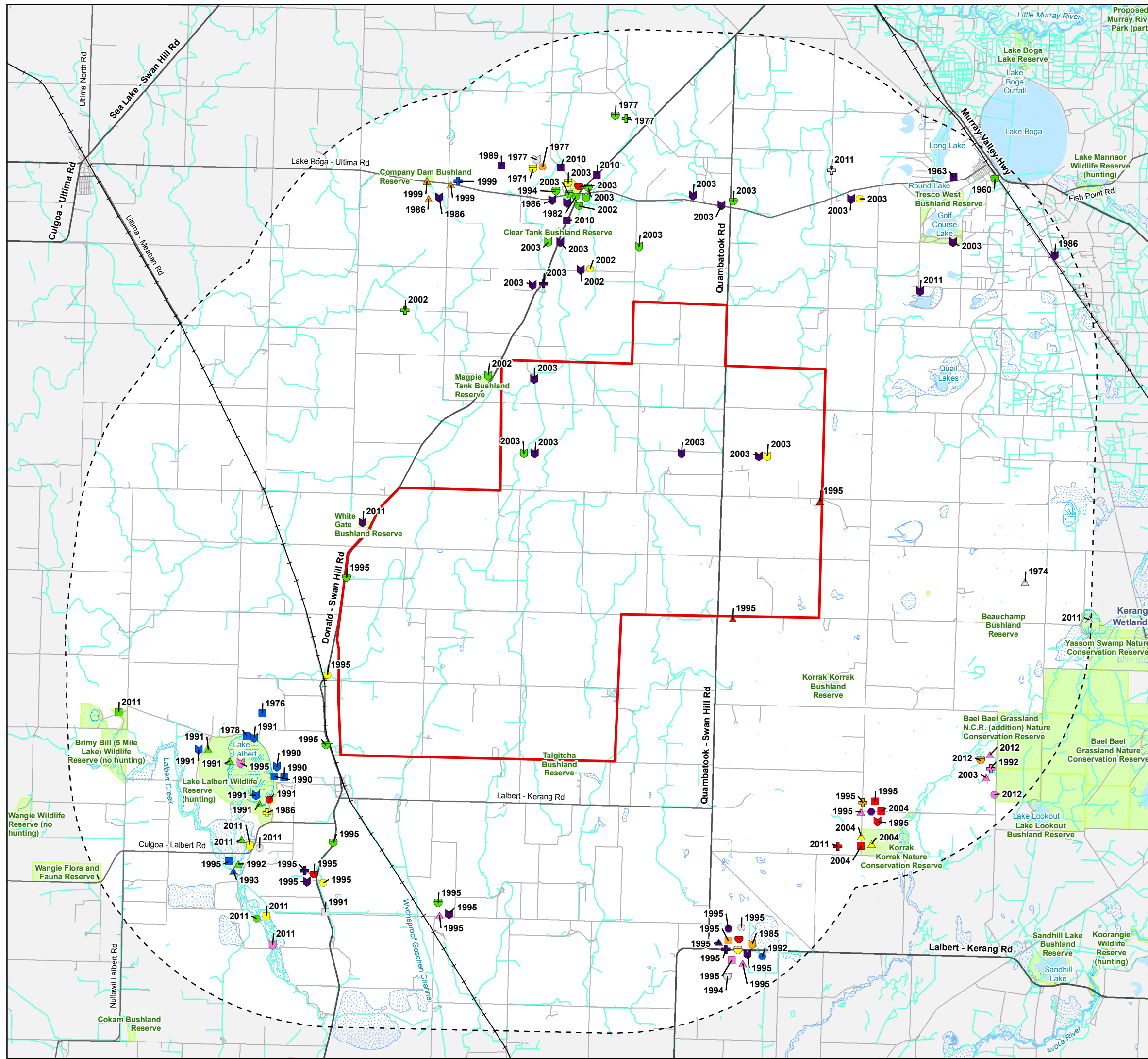


**Figure 2o**  
**Ecological Vegetation Classes**  
*Goschen Project: Ecological Assessment*



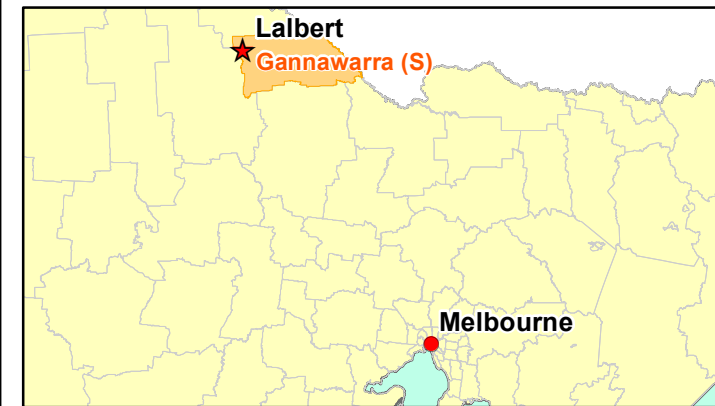
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**Legend**

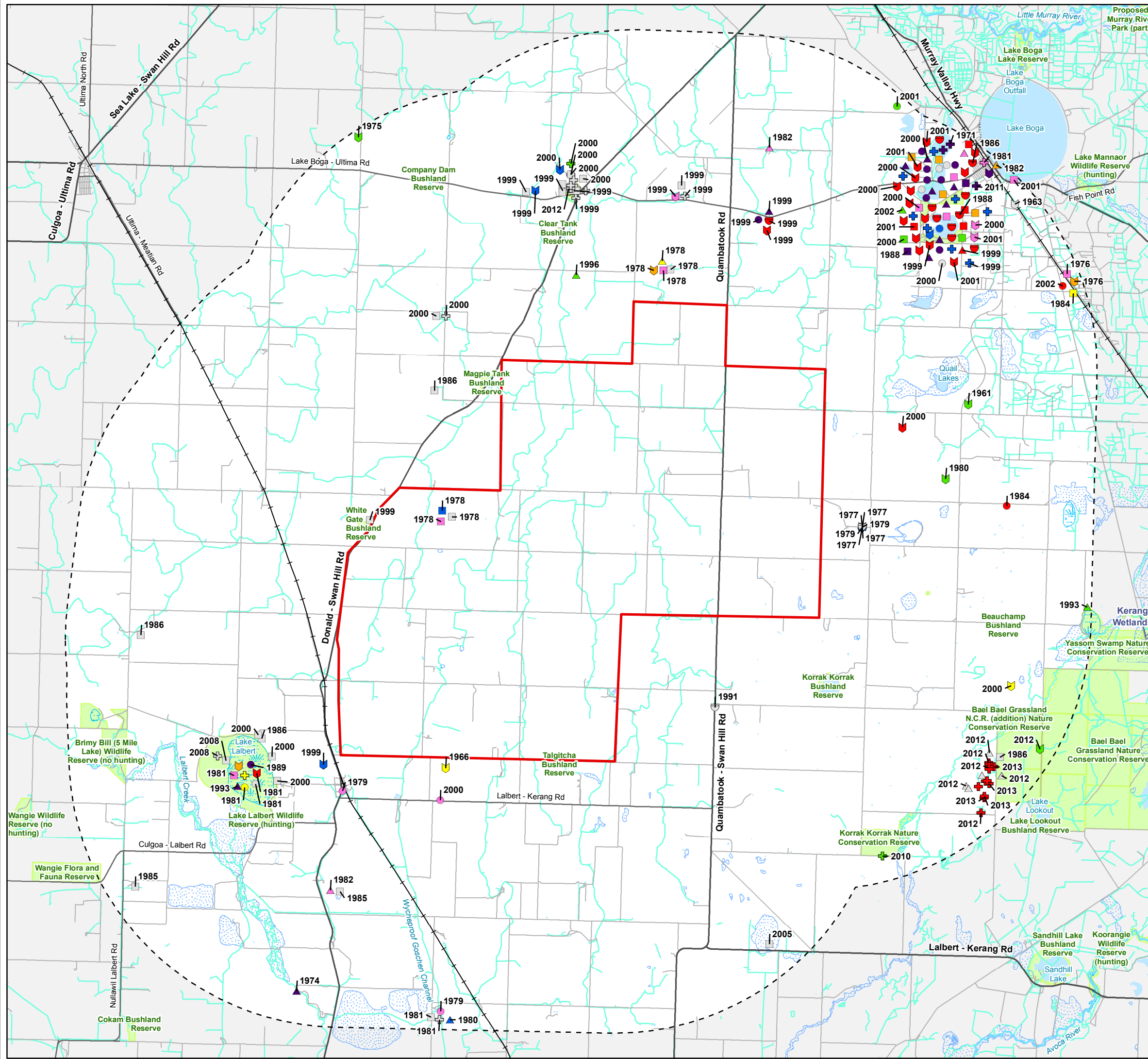
- |                             |                          |
|-----------------------------|--------------------------|
| Study Area                  | Jerry-jerry              |
| <b>Significant flora</b>    | Leafless Bluebush        |
| Bluish Raspwort             | Long Eryngium            |
| Branching Groundsel         | Nealie                   |
| Bristly Love-grass          | Oat Kangaroo-grass       |
| Buloke                      | Pale Spike-sedge         |
| Bundled Peppercross         | Purple Love-grass        |
| Bush Minuria                | Round Templetonia        |
| Camel Bush                  | Satin Daisy-bush         |
| Cane Grass                  | Scaly Mantle             |
| Cane Spear-grass            | Scurfy Germander         |
| Chariot Wheels              | Small Burr-grass         |
| Club-hair New Holland Daisy | Smooth Minuria           |
| Common Joyweed              | Soft Sunray              |
| Dissected New Holland Daisy | Spear-grass              |
| Downs Nutgrass              | Spiny Goosefoot          |
| Downy Swainson-pea          | Sweet Fenugreek          |
| Dwarf Myall                 | Tough Scurf-pea          |
| Flat-top Saltbush           | Umbrella Wattle          |
| Frosted Goosefoot           | Weeping Myall            |
| Glandular Phebalium         | Winged New Holland Daisy |
| Grassland Bindweed          | Woolly Mantle            |
| Hoary Scurf-pea             | Yakka Grass              |
|                             | Yarran                   |



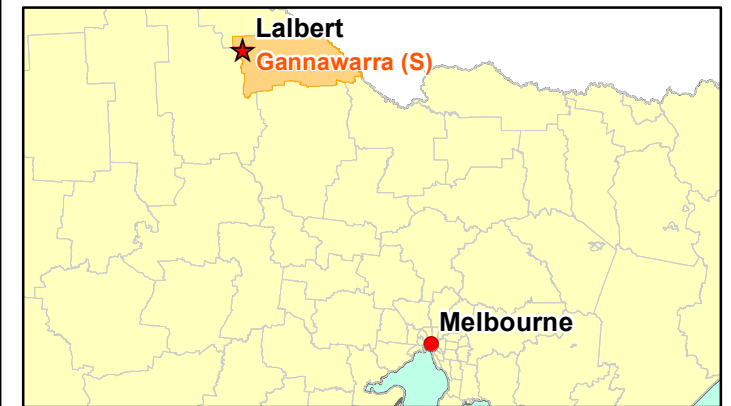
**Figure 3**  
**Previously documented significant flora within 10km of the study area**  
*Goschen Project: Ecological Assessment*



VBA 2017. Victorian Biodiversity Atlas. // Sourced from: 'VBA\_FLORA25' and 'VBA\_FLORA100', February 2017 © The State of Victoria, Department of Environment, Land, Water and Planning. Records prior to 1949 not shown.  
 VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.  
 10079\_Fig03\_SigFlora 3/11/2017 mlesley



- ### Legend
- Study Area
- #### Significant fauna
- |  |                         |
|--|-------------------------|
| ○ Australasian Shoveler                  | ▲ Grey-crowned Babbler  |
| ● Australian Bustard                     | ▲ Ground Cuckoo-shrike  |
| ● Australian Pratincole                  | ▲ Growing Grass Frog    |
| ● Baillon's Crake                        | ▲ Hardhead              |
| ● Bandy Bandy                            | ⊕ Hooded Robin          |
| ● Bearded Dragon                         | ⊕ Hooded Scaly-foot     |
| ● Black Falcon                           | ⊕ Inland Dotterel       |
| ● Blue-billed Duck                       | ⊕ Intermediate Egret    |
| ● Brown Treecreeper (south-eastern ssp.) | ⊕ Little Button-quail   |
| ● Caspian Tern                           | ⊕ Marsh Sandpiper       |
| ● Common Greenshank                      | ⊕ Murray Cod            |
| ● Common Sandpiper                       | ⊕ Murray Hardyhead      |
| ● Curlew Sandpiper                       | ⊕ Murray River Turtle   |
| ● Diamond Firetail                       | ⊕ Musk Duck             |
| ● Eastern Great Egret                    | ⊕ Nankeen Night Heron   |
| ● Eastern Snake-necked Turtle            | ⊕ Pied Cormorant        |
| ▲ Fat-tailed Dunnart                     | ⊕ Plains-wanderer       |
| ▲ Freckled Duck                          | ⊕ Red-backed Kingfisher |
| ▲ Golden Perch                           | ⊕ Royal Spoonbill       |
| ▲ Grey Falcon                            | ⊕ Silver Perch          |
|  | ⊕ Spotted Harrier       |
|  | ⊕ Whiskered Tern        |



**Figure 4**  
 Previously documented significant fauna within 10km of the study area  
*Goschen Project: Ecological Assessment*



VBA 2017. Victorian Biodiversity Atlas. // Sourced from: 'VBA\_FLORA25' and 'VBA\_FLORA100', February 2017 © The State of Victoria, Department of Environment, Land, Water and Planning. Records prior to 1949 not shown.  
 VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.  
 10079\_Fig04\_SigFauna 3/11/2017 melisley



## APPENDICES

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## APPENDIX 1

### Appendix 1.1 – Rare or Threatened Categories for Listed Victorian Taxa

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

Rare or Threatened Categories
<b>Conservation Status in Australia (Based on the EPBC Act 1999)</b>
<b>EX</b> - Extinct: Extinct is when there is no reasonable doubt that the last individual of the species has died.
<b>CR</b> - Critically Endangered: A species is critically endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.
<b>EN</b> - Endangered: A species is endangered when it is not critically endangered but is facing a very high risk of extinction in the wild in the near future.
<b>VU</b> - Vulnerable: A species is vulnerable when it is not critically endangered or endangered but is facing a high risk of extinction in the wild in the medium-term future.
<b>R*</b> - Rare: A species is rare but overall is not currently considered critically endangered, endangered or vulnerable.
<b>K*</b> - Poorly Known: A species is suspected, but not definitely known, to belong to any of the categories extinct, critically endangered, endangered, vulnerable or rare.
<b>Conservation Status in Victoria (Based on DEPI 2014, DSE 2009 or 2013)</b>
<b>x</b> - Presumed Extinct in Victoria: not recorded from Victoria during the past 50 years despite field searches specifically for the plant, or, alternatively, intensive field searches (since 1950) at all previously known sites have failed to record the plant.
<b>e</b> - Endangered in Victoria: at risk of disappearing from the wild state if present land use and other causal factors continue to operate.
<b>v</b> - Vulnerable in Victoria: not presently endangered but likely to become so soon due to continued depletion; occurring mainly on sites likely to experience changes in land-use which would threaten the survival of the plant in the wild; or, taxa whose total population is so small that the likelihood of recovery from disturbance, including localised natural events such as drought, fire or landslip, is doubtful.
<b>r</b> - Rare in Victoria: rare but not considered otherwise threatened - there are relatively few known populations or the taxon is restricted to a relatively small area.
<b>k</b> - Poorly Known in Victoria: poorly known and suspected, but not definitely known, to belong to one of the above categories (x, e, v or r) within Victoria. At present, accurate distribution information is inadequate.

## Appendix 1.2 – Defining Ecological Significance

**Table A1.2.** Criteria for defining Ecological Significance ratings for significant flora, fauna and communities.

National Significance
<p><b>Flora:</b> National conservation status is based on the EPBC Act list of taxa considered threatened in Australia (i.e. extinct, critically endangered, endangered, vulnerable).</p>
<p><b>Fauna:</b> National conservation status is based on the EPBC Act list of taxa considered threatened in Australia (i.e. Extinct, Critically Endangered, Endangered, Vulnerable). Fauna listed as Extinct, Critically Endangered, Endangered, Vulnerable, or Rare under National Action Plans for terrestrial taxon prepared for DoE: mammals (Woinarski <i>et al.</i> 2014), bats (Duncan <i>et al.</i> 1999), birds (Garnett <i>et al.</i> 2011), reptiles (Cogger <i>et al.</i> 1993), amphibians (Tyler 1997) and butterflies (Sands and New 2002).</p>
<p><b>Communities:</b> Vegetation communities considered critically endangered, endangered or vulnerable under the EPBC Act and considering vegetation condition.</p>
State Significance
<p><b>Flora:</b> Threatened taxa listed under the provisions of the FFG Act. Flora listed in the State Government’s Advisory List of Rare or Threatened Plants in Victoria (DEPI 2014).</p>
<p><b>Fauna:</b> Threatened taxon listed under Schedule 2 of the FFG Act. Fauna listed as Extinct, Critically Endangered, Endangered and Vulnerable on the State Government’s Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2013). Listed as Lower Risk (Near Threatened, Conservation Dependent or Least concern) or Data Deficient under National Action Plans for terrestrial species prepared for the DoE: mammals (Woinarski <i>et al.</i> 2014), bats (Duncan <i>et al.</i> 1999), birds (Garnett <i>et al.</i> 2011), reptiles (Cogger <i>et al.</i> 1993), amphibians (Tyler 1997) and butterflies (Sands and New 2002).</p>
<p><b>Communities:</b> Ecological communities listed as threatened under the FFG Act (DELWP 2018h). EVC listed as threatened (i.e. endangered, vulnerable) or rare in a Native Vegetation Plan for a particular bioregion and considering vegetation condition.</p>
Regional Significance
<p><b>Fauna:</b> Fauna with a disjunct distribution, or a small number of documented recorded or naturally rare in the particular Bioregion in which the study area is located. A particular taxon that is has an unusual ecological or biogeographical occurrence or listed as Lower Risk – Near Threatened, Data Deficient or Insufficiently Known on the State Government’s Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2013).</p>
<p><b>Communities:</b> EVC listed as depleted or least concern in a Native Vegetation Plan for a particular bioregion) and considering vegetation condition. EVC considered rare by the author for a particular bioregion.</p>
<p><b>Local Significance</b></p>
<p>Local significance is defined as flora, fauna and ecological communities indigenous to a particular area, which are not considered rare or threatened on a national, state or regional level.</p>

## Appendix 1.3 – Defining Site Significance

**Table A1.3.** Criteria for defining Site Significance ratings.

National Significance
<p>A site is of National significance if:</p> <ul style="list-style-type: none"> <li>• It regularly supports, or has a high probability of regularly supporting individuals of a taxon listed as ‘Critically Endangered’ or ‘Endangered’ under the EPBC Act and/or under National Action Plans for terrestrial taxon prepared for the DoE.</li> <li>• It regularly supports, or has a high probability of supporting, an ‘important population’ as defined under the EPBC Act of one or more nationally ‘vulnerable’ flora and fauna taxon.</li> <li>• It is known to support, or has a high probability of supporting taxon listed as ‘Vulnerable’ under National Action Plans.</li> <li>• It is known to regularly support a large proportion (i.e. greater than 1%) of a population of a taxon listed as ‘Conservation Dependent’ under the EPBC Act and/or listed as Rare or Lower Risk (near threatened, conservation dependent or least concern) under National Action Plans.</li> <li>• It contains an area, or part thereof designated as ‘critical habitat’ under the EPBC Act, or if the site is listed under the Register of National Estate compiled by the Australian Heritage Commission.</li> <li>• It is a site which forms part of, or is connected to a larger area(s) of remnant native vegetation or habitat of national conservation significance such as most National Park, and/or a Ramsar Wetland(s).</li> </ul>
State Significance
<p>A site is of State significance if:</p> <ul style="list-style-type: none"> <li>• It occasionally (i.e. every 1 to 5 years) supports, or has suitable habitat to support taxon listed as ‘Critically Endangered’ or ‘Endangered’ under the EPBC Act and/or under National Action Plans.</li> <li>• It regularly supports, or has a high probability of regularly supporting (i.e. high habitat quality) taxon listed as ‘Vulnerable’, ‘Near threatened’, ‘Data Deficient’ or ‘Insufficiently Known’ in Victoria (DSE 2013; DEPI 2014), or species listed as ‘Data Deficient’ or ‘Insufficiently Known’ under National Action Plans.</li> <li>• It contains an area, or part thereof designated as ‘critical habitat’ under the FFG Act.</li> <li>• It supports, or likely to support a high proportion of any Victorian flora and fauna taxa.</li> <li>• It contains high quality, intact vegetation/habitat supporting a high species richness and diversity in a particular bioregion.</li> <li>• It is a site which forms part of, or connected to a larger area(s) of remnant native vegetation or habitat of state conservation significance such as most State Parks and/or Flora and Fauna Reserves.</li> </ul>
Regional Significance
<p>A site is of Regional significance if:</p> <ul style="list-style-type: none"> <li>• It regularly supports, or has a high probability of regularly supporting regionally significant fauna as defined in Table 1.2.</li> <li>• It contains a large population (i.e. greater than 1% or 5%) of flora considered rare in any regional Native Vegetation Plan for a particular bioregion.</li> <li>• It supports a fauna population with a disjunct distribution, or a particular taxon that has an unusual ecological or biogeographical occurrence.</li> <li>• It is a site which forms part of, or is connected to a larger area(s) of remnant native vegetation or habitat of regional conservation significance such as most Regional Parks and/or Flora and Fauna Reserves.</li> </ul>
Local Significance
<p>Most sites are considered to be of at least local significant for conservation, and in general a site of local significance can be defined as:</p> <ul style="list-style-type: none"> <li>• An area which supports indigenous flora species and/or a remnant EVC, and habitats used by locally significant fauna species.</li> <li>• An area which currently acts, or has the potential to act as a wildlife corridor linking other areas of higher conservation significance and facilitating fauna movement throughout the landscape.</li> </ul>

## Appendix 1.4 – Vegetation Condition and Habitat Quality

**Table A1.4.1** Defining Vegetation Condition ratings.

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

**Table A1.4.2** Defining Habitat Quality.

Criteria for defining Habitat Quality
<p><b>High Quality:</b></p> <ul style="list-style-type: none"> <li>• High degree of intactness (i.e. floristically and structurally diverse), containing several important habitat features such as ground debris (logs, rocks, vegetation), mature hollow-bearing trees, and a dense understorey component.</li> <li>• High species richness and diversity (i.e. represented by a large number of species from a range of fauna groups).</li> <li>• High level of foraging and breeding activity, with the site regularly used by native fauna for refuge and cover.</li> <li>• Habitat that has experienced, or is experiencing low levels of disturbance and/or threatening processes (i.e. weed invasion, introduced animals, soil erosion, salinity).</li> <li>• High contribution to a wildlife corridor, and/or connected to a larger area(s) of high quality habitat.</li> <li>• Provides known, or likely habitat for one or more rare or threatened species listed under the EPBC Act, FFG Act, or species considered rare or threatened according to DEPI 2014; DSE 2009 or 2013.</li> </ul>
<p><b>Moderate Quality:</b></p> <ul style="list-style-type: none"> <li>• Moderate degree of intactness, containing one or more important habitat features such as ground debris (logs, rocks, vegetation), mature hollow-bearing trees, and a dense understorey component.</li> <li>• Moderate species richness and diversity - represented by a moderate number of species from a range of fauna groups.</li> <li>• Moderate levels of foraging and breeding activity, with the site used by native fauna for refuge and cover.</li> <li>• Habitat that has experienced, or is experiencing moderate levels of disturbance and/or threatening processes.</li> <li>• Moderate contribution to a wildlife corridor, or is connected to area(s) of moderate quality habitat.</li> <li>• Provides potential habitat for a small number of threatened species listed under the EPBC Act, FFG Act, or species considered rare or threatened according to DEPI 2014; DSE 2009 or 2013.</li> </ul>
<p><b>Low Quality:</b></p> <ul style="list-style-type: none"> <li>• Low degree of intactness, containing few important habitat features such as ground debris (logs, rocks, vegetation), mature hollow-bearing trees, and a dense understorey component.</li> <li>• Low species richness and diversity (i.e. represented by a small number of species from a range of fauna groups).</li> <li>• Low levels of foraging and breeding activity, with the site used by native fauna for refuge and cover.</li> <li>• Habitat that has experienced, or is experiencing high levels of disturbance and/or threatening processes.</li> <li>• Unlikely to form part of a wildlife corridor, and is not connected to another area(s) of habitat.</li> <li>• Unlikely to provide habitat for rare or threatened species listed under the EPBC Act, FFG Act, or considered rare or threatened according to DEPI 2014; DSE 2009 or 2013.</li> </ul>

## Appendix 1.6 – Permit Exemptions and Vegetation Offsets

**Table A1.6.1.** Permit exemptions (from Victorian Planning Provisions Clause 52.17 -6)

No permit is required to remove, destroy or lop native vegetation to the minimum extent necessary if any of the following apply:	
Property size	A permit is not required for removal of native vegetation if the native vegetation is on land which, together with all contiguous land in one ownership, has an area of less than 0.4 hectares. This exemption does not apply to native vegetation within a road reservation.
Lopping or pruning	Generally, minor lopping or pruning of up to a third of the foliage (not including the trunk) that does not affect the continued health of the tree does not require a permit or attract an offset requirement.
Regrowth	A permit is not generally not required for removal of native vegetation that is For regrowth which has naturally established or regenerated on land lawfully cleared of naturally established native vegetation and is: <ul style="list-style-type: none"> <li>a) Less than 10 years old; or,</li> <li>b) Bracken (<i>Pteridium esculentum</i>); or,</li> <li>c) Less than ten years old at the time of a Property Vegetation Plan being signed by the Secretary of the Department of Environment and Primary Industries (as constituted under Part 2 of the <i>Conservation, Forest and Lands Act 1987</i>), and is shown on that Plan as being 'certified regrowth', and is on land that is to be used or maintained for cultivation or pasture during the term of that Plan; or,</li> <li>d) Within the boundary of a timber production plantation, as indicated on a Plantation Development Notice or other documented record, and has established after the plantation.</li> </ul> This exemption does not apply to land on which native vegetation has been cleared or otherwise destroyed or damaged as a result of flood, fire or other natural disaster.
Weeds	A permit is not required for removal of native vegetation to enable the removal or destruction of a weed listed in the schedule to the clause. The maximum extent of native vegetation removed, destroyed or lopped under this exemption on contiguous land in the same ownership in a five-year period must not exceed any of the following: <ul style="list-style-type: none"> <li>a) 1 hectare of native vegetation which does not include a tree; or,</li> <li>b) 15 native trees if each tree has a DBH of less than 20.</li> </ul>
Planted vegetation	The removal of planted trees does not require a permit or attract an offset requirement, except if public funding was provided to assist in planting or managing the native vegetation and the terms of the funding did not anticipate removal or harvesting of the vegetation.
Other	Numerous additional exemptions apply to works relating to approvals granted prior to 15 September 2008, fencing, mowing, stone exploration / extraction, utility maintenance, crown land, emergency works, works in Farming Zone and Rural Activity Zone, fire protection, geothermal energy exploration, grazing, greenhouse gas sequestration, harvesting timber, mineral exploration / extraction, pest animal burrow removal, road safety, stock movement on roads and surveying. See Clause 52.17 -6 for details.

## **APPENDIX 2 – FLORA**

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## Appendix 2.1 – Flora Results

### Legend:

I Protected under the FFG Act (DELWP 2016);

L Listed under the FFG Act (DELWP 2017e);

\* Listed as a noxious weed under the CaLP Act;

# Planted Victorian and non-Victorian species;

w Weed of National Significance;

- Not applicable

**Table A2.1.** Flora recorded within the study area.

Scientific Name	Common Name	Native / Intro
<b>Indigenous</b>		
<i>Acacia ligulata</i>	Cooba	I
<i>Acacia microcarpa s.l.</i>	Manna Wattle	I-
<i>Acacia myrtifolia</i>	Myrtle Wattle	I-
<i>Acacia oswaldii</i>	Umbrella Wattle	LI
<i>Acacia sclerophylla var. sclerophylla</i>	Hard-leaf Wattle	-
<i>Allocasuarina luehmannii</i>	Buloke	L
<i>Atriplex vesicaria</i>	Bladder Saltbush	-
<i>Austrostipa elegantissima</i>	Feather Spear-grass	-
<i>Callistemon spp.</i>	Bottlebrush	#
<i>Callitris gracilis</i>	Slender Cypress-pine	-
<i>Cassytha pubescens s.s.</i>	Downy Dodder-laurel	-
<i>Chloris truncata</i>	Windmill Grass	-
<i>Clematis microphylla s.l.</i>	Small-leaved Clematis	-
<i>Cynodon dactylon</i>	Couch	-
<i>Dissocarpus paradoxus</i>	Hard-head Saltbush	-
<i>Enchylaena tomentosa var. tomentosa</i>	Ruby Saltbush	-
<i>Eucalyptus calycogona</i>	Red Mallee	-
<i>Eucalyptus dumosa</i>	Dumosa Mallee	-
<i>Eucalyptus gracilis</i>	Yorrell	-
<i>Eucalyptus sideroxylon subsp. sideroxylon</i>	Mugga	-
<i>Eucalyptus socialis</i>	Grey Mallee	-
<i>Hakea tephrosperma</i>	Hooked Needlewood	-



<i>Maireana brevifolia</i>	Short-leaf Bluebush	-
<i>Maireana pyramidata</i>	Sago Bush	-
<i>Panicum effusum</i>	Hairy Panic	-
<i>Rytidosperma caespitosum</i>	Common Wallaby-grass	-
<i>Rytidosperma setaceum</i>	Bristly Wallaby-grass	-
<i>Rytidosperma spp.</i>	Wallaby Grass	-
<i>Salsola tragus</i>	Prickly Saltwort	-
<i>Santalum murrayanum</i>	Bitter Quandong	-
<i>Sclerochlamys brachyptera</i>	Short-wing Saltbush	-
<i>Senna artemisioides spp. agg.</i>	Desert Cassia	-
<i>Tribulus spp.</i>	Caltrop	-
<i>Vittadinia cuneata</i>	Fuzzy New Holland Daisy	-
<i>Xerochrysum spp.</i>	Everlasting	-
<i>Zygophyllum glaucum</i>	Pale Twin-leaf	-
<b>Non-Indigenous Species</b>		
<i>Asphodelus fistulosus</i>	Onion Weed	*
<i>Avena barbata</i>	Bearded Oat	-
<i>Briza maxima</i>	Large Quaking-grass	-
<i>Carthamus lanatus</i>	Saffron Thistle	*
<i>Chondrilla juncea</i>	Skeleton Weed	*
<i>Conyza bonariensis</i>	Flaxleaf Fleabane	-
<i>Cucumis myriocarpus subsp. leptodermis</i>	Paddy Melon	-
<i>Dactylis glomerata</i>	Cocksfoot	-
<i>Ehrharta erecta var. erecta</i>	Panic Veldt-grass	-
<i>Eucalyptus leucoxydon</i>	Yellow Gum	-
<i>Heliotropium europaeum</i>	Common Heliotrope	-
<i>Hordeum spp.</i>	Barley Grass	-
<i>Juncus acutus subsp. acutus</i>	Spiny Rush	*
<i>Lactuca serriola</i>	Prickly Lettuce	*
<i>Limonium lobatum</i>	Winged Sea-lavender	-
<i>Lycium ferocissimum</i>	African Box-thorn	w*
<i>Mesembryanthemum nodiflorum</i>	Small Ice-plant	-
<i>Psilocaulon granulicaule</i>	Wiry Noon-flower	-
<i>Schinus molle</i>	Pepper Tree	-
<i>Solanum nigrum s.l.</i>	Black Nightshade	-
<i>Triticum aestivum</i>	Wheat	-

**Note:** A large number of additional species are expected to occur within the study area and the flora list will be updated after the habitat hectare assessments are undertaken.

## Appendix 2.2 – Significant Flora Species

Key:

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

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

DSE Advisory List of Threatened Flora in Victoria (DSE 2005)

EX	Extinct	X	Extinct
CR	Critically endangered	e	Endangered
EN	Endangered	v	Vulnerable
VU	Vulnerable	r	Rare
K	Poorly Known (Briggs and Leigh 1996)	k	Poorly Known
#	Records identified from EPBC Act Protected Matters Search Tool.	L	Listed
*	Records identified from the FIS		
^	Records identified from Meredith <i>et al</i> (1992)		

1	Known occurrence	Recorded within the study area recently (i.e. within ten years)
2	High Likelihood	Previous records of the species in the local vicinity; and/or, The study area contains areas of high quality habitat.
3	Moderate Likelihood	Limited previous records of the species in the local vicinity; and/or, The study area contains poor or limited habitat.
4	Low Likelihood	Poor or limited habitat for the species however other evidence (such as a lack of records or environmental factors) indicates there is a very low likelihood of presence.
5	Unlikely	No suitable habitat and/or outside the species range.

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

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DEPI	Likely occurrence in study area
<b>NATIONAL SIGNIFICANCE</b>							
<i>Caladenia versicolor</i>	Candy Spider-orchid	-	-	VU	L	e	2
<i>Caladenia tensa</i>	Greencomb Spider-orchid	-	-	EN	-	v	2
<i>Lepidium monoplacoides</i>	Winged Peppergrass	-	-	EN	L	e	2
<i>Maireana cheelii</i>	Charriot Wheels	-	-	VU	L	v	2
<i>Swainsona murrayana</i>	Slender Darling-pea	-	-	VU	L	e	2
<b>STATE SIGNIFICANCE</b>							
<i>Acacia ancistrophylla</i> var. <i>lissophylla</i>	Dwarf Myall	1	2011	-	-	v	3
<i>Acacia loderi</i>	Nealie	12	2003	-	L	v	2
<i>Acacia melvillei</i>	Yarran	20	2011	-	L	v	2
<i>Acacia oswaldii</i>	Umbrella Wattle	1	1994	-	L	v	1
<i>Acacia pendula</i>	Weeping Myall	4	2003	-	L	e	2
<i>Allocasuarina luehmannii</i>	Buloke	2	2011	-	L	e	2
<i>Alternanthera nodiflora</i>	Common Joyweed	1	1993	-	-	k	2
<i>Ammannia multiflora</i>	Jerry-jerry	3	2011	-	-	v	2
<i>Atriplex lindleyi</i> subsp. <i>lindleyi</i>	Flat-top Saltbush	1	1991	-	-	k	3
<i>Austrostipa breviglumis</i>	Cane Spear-grass	1	2003	-	-	r	3
<i>Austrostipa trichophylla</i>	Spear-grass	2	1995	-	-	r	3
<i>Chenopodium desertorum</i> subsp. <i>rectum</i>	Frosted Goosefoot	2	2004	-	-	v	3
<i>Convolvulus graminetinus</i>	Grassland Bindweed	5	2011	-	-	e	3
<i>Cullen cinereum</i>	Hoary Scurf-pea	2	2011	-	L	e	2

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DEPI	Likely occurrence in study area
<i>Cullen tenax</i>	Tough Scurf-pea	5	1995	-	L	e	2
<i>Cyperus bifax</i>	Downs Nutgrass	1	1995	-	-	v	3
<i>Eleocharis pallens</i>	Pale Spike-sedge	2	1995	-	-	k	2
<i>Eragrostis australasica</i>	Cane Grass	1	1986	-	-	v	2
<i>Eragrostis lacunaria</i>	Purple Love-grass	1	1977	-	-	v	2
<i>Eragrostis setifolia</i>	Bristly Love-grass	1	2012	-	-	v	2
<i>Eriochlamys behrii</i> s.s.	Woolly Mantle	1	1992	-	-	r	2
<i>Eriochlamys squamata</i>	Scaly Mantle	1	1995	-	-	v	3
<i>Eryngium paludosum</i>	Long Eryngium	2	2011	-	-	v	3
<i>Haloragis glauca</i> f. <i>glauca</i>	Bluish Raspwort	1	2011	-	-	k	4
<i>Lepidium fasciculatum</i>	Bundled Peppercross	1	1903	-	-	k	3
<i>Lepidium papillosum</i>	Warty Peppercross	1	1985	-	-	k	3
<i>Leucochrysum molle</i>	Soft Sunray	5	2012	-	L	v	4
<i>Maireana aphylla</i>	Leafless Bluebush	3	2004	-	-	k	2
<i>Minuria cunninghamii</i>	Bush Minuria	1	1995	-	-	r	3
<i>Minuria integerrima</i>	Smooth Minuria	1	1999	-	-	r	3
<i>Olearia minor</i>	Satin Daisy-bush	3	1999	-	-	r	3
<i>Phebalium glandulosum</i> subsp. <i>macrocalyx</i>	Glandular Phebalium	1	1903	-	-	e	4
<i>Poa drummondiana</i>	Knotted Poa	1	1853	-	-	r	2
<i>Podolepis aristata</i> subsp. <i>affinis</i>	Grey Podolepis	5	2003	-	-	r	2
<i>Rhagodia ulicina</i>	Spiny Goosefoot	1	1991	-	-	r	2
<i>Senecio cunninghamii</i> var. <i>cunninghamii</i>	Branching Groundsel	3	2003	-	-	r	2

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DEPI	Likely occurrence in study area
<i>Sporobolus caroli</i>	Yakka Grass	2	1995	-	-	r	3
<i>Swainsona swainsonioides</i>	Downy Swainson-pea	3	2002	-	L	e	3
<i>Templetonia egena</i>	Round Templetonia	3	2003	-	-	v	2
<i>Teucrium albicaule</i>	Scurfy Germander	1	2012	-	-	k	3
<i>Teucrium sessiliflorum</i>	Camel Bush	2	2011	-	-	k	3
<i>Themeda avenacea</i>	Oat Kangaroo-grass	1	1977	-	-	k	2
<i>Tragus australianus</i>	Small Burr-grass	4	1991	-	-	r	4
<i>Trigonella suavissima</i>	Sweet Fenugreek	1	1995	-	-	r	3
<i>Vittadinia condyloides</i>	Club-hair New Holland Daisy	1	2011	-	-	r	3
<i>Vittadinia dissecta</i> var. <i>dissecta</i>	Dissected New Holland Daisy	3	2003	-	-	k	3
<i>Vittadinia pterochaeta</i>	Winged New Holland Daisy	4	2000	-	-	v	43

**Data source:** Victorian Biodiversity Atlas (DELWP 2018d); Protected Matters Search Tool (DoE2018).

Taxonomic order: Alphabetical.

## APPENDIX 3 – FAUNA

### Appendix 3.1 – Fauna Results

Habitat characteristics of significant fauna species previously recorded within 10 kilometres of the study area, or that may potentially occur within the study area were assessed to determine their likelihood of occurrence. The likelihood of occurrence rankings for each of the threatened species are:

1	High Likelihood	<ul style="list-style-type: none"> <li>• Known resident in the study area based on site observations, database records, or expert advice; and/or,</li> <li>• Recent records (i.e. within five years) of the species in the local area (VBA 2017a); and/or,</li> <li>• The study area contains the species' preferred habitat.</li> </ul>
2	Moderate Likelihood	<ul style="list-style-type: none"> <li>• The species is likely to visit the study area regularly (i.e. at least seasonally); and/or,</li> <li>• Previous records of the species in the local area (DSE 2011b); and/or,</li> <li>• The study area contains some characteristics of the species' preferred habitat.</li> </ul>
3	Low Likelihood	<ul style="list-style-type: none"> <li>• The species is likely to visit the study area occasionally or opportunistically whilst en route to more suitable sites; and/or,</li> <li>• There are only limited or historical records of the species in the local area (i.e. more than 20 years old); and/or,</li> <li>• The study area contains few or no characteristics of the species' preferred habitat.</li> </ul>
4	Unlikely	<ul style="list-style-type: none"> <li>• No previous records of the species in the local area; and/or,</li> <li>• The species may fly over the study area when moving between areas of more suitable habitat; and/or,</li> <li>• Out of the species' range; and/or,</li> <li>• No suitable habitat present.</li> </ul>

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

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

DSE Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2007); Advisory List of Threatened Invertebrate Fauna in Victoria (DSE 2009)

NAP National Action Plan (Cogger *et al.* 1993; Duncan *et al.* 1999; Garnet and Crowley 2000; Lee 1995; Maxwell *et al.* 1996; Sands and New 2002; Tyler 1997)

EX	Extinct	DD	Data deficient (insufficiently or poorly known)
RX	Regionally extinct	L	Listed as threatened under FFG Act
CR	Critically endangered	I	Invalid or ineligible for listing under the FFG Act
EN	Endangered	#	Listed on the Protected Matters Search Tool
VU	Vulnerable	*	Additional information from the Victorian Fauna Database
RA	Rare		
NT	Near threatened		

CD Conservation dependent  
LC least concern

**Table A3.1.** Fauna recorded within the study area.

Common Name	Scientific Name	Native/Introduced	Hollow Use	Migratory/Marine
Australian Magpie	<i>Gymnorhina tibicen</i>	N	-	-
Australian Raven	<i>Corvus coronoides</i>	N	-	-
Bearded Dragon	<i>Pogona barbata</i>	N	Partial	-
Black Falcon	<i>Falco subniger</i>	N	-	-
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	N	-	Ma
Black-shouldered Kite	<i>Elanus axillaris</i>	N	-	-
Blue Bonnet	<i>Northiella haematogaster</i>	N	Total	-
Boulenger's Skink	<i>Morethia boulengeri</i>	N	-	-
Brown Goshawk	<i>Accipiter fasciatus</i>	N	-	Ma
Brown-headed Honeyeater	<i>Melithreptus brevirostris</i>	N	-	-
Buff-rumped Thornbill	<i>Acanthiza reguloides</i>	N	-	-
Chestnut-rumped Thornbill	<i>Acanthiza uropygialis</i>	N	-	-
Common Bronzewing	<i>Phaps chalcoptera</i>	N	-	-
Common Starling	<i>Sturnus vulgaris</i>	Y	Partial	-
Corella	<i>Cacatua</i> spp.	N	-	-
Crested Pigeon	<i>Ocyphaps lophotes</i>	N	-	-
Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>	N	-	-
European Hare	<i>Lepus europeus</i>	Y	-	-
European Rabbit	<i>Oryctolagus cuniculus</i>	Y	-	-
Fairy Martin	<i>Hirundo ariel</i>	N	Partial	-

Common Name	Scientific Name	Native/Introduced	Hollow Use	Migratory/Marine
Fuscous Honeyeater	<i>Lichenostomus fuscus</i>	N	-	-
Galah	<i>Cacatua roseicapilla</i>	N	Total	-
Grey Butcherbird	<i>Cracticus torquatus</i>	N	-	-
Grey Shrike-thrush	<i>Colluricincla harmonica</i>	N	Partial	-
Grey's Skink	<i>Menetia greyii</i>	N	-	-
House Mouse	<i>Mus musculus</i>	Y	-	-
House Sparrow	<i>Passer domesticus</i>	Y	-	-
Inland Thornbill	<i>Acanthiza apicalis</i>	N	-	-
Jacky Winter	<i>Microeca fascians</i>	N	-	-
Little Raven	<i>Corvus mellori</i>	N	-	Ma
Magpie-lark	<i>Grallina cyanoleuca</i>	N	-	-
Mulga Parrot	<i>Psephotus varius</i>	N	-	-
Nankeen Kestrel	<i>Falco cenchroides</i>	N	Partial	Ma
Noisy Miner	<i>Manorina melanocephala</i>	N	-	-
Pacific Barn Owl	<i>Tyto javanica</i>	N	Partial	-
Peaceful Dove	<i>Geopelia striata</i>	N	-	-
Peregrine Falcon	<i>Falco peregrinus</i>	N	Partial	-
Pied Butcherbird	<i>Cracticus nigrogularis</i>	N	-	-
Pied Currawong	<i>Strepera graculina</i>	N	-	-
Red Fox	<i>Canis vulpes</i>	Y	-	-
Red Kangaroo	<i>Macropus rufus</i>	N	-	-
Red Wattlebird	<i>Anthochaera carunculata</i>	N	-	-
Red-rumped Parrot	<i>Psephotus haematonotus</i>	N	-	-
Restless Flycatcher	<i>Myiagra inquieta</i>	N	-	-



Common Name	Scientific Name	Native/Introduced	Hollow Use	Migratory/Marine
Singing Honeyeater	<i>Lichenostomus virescens</i>	N	-	-
Spiny-cheeked Honeyeater	<i>Acanthagenys rufogularis</i>	N	-	-
Splendid Fairy-wren	<i>Malurus splendens</i>	N	-	-
Spotted Pardalote	<i>Pardalotus punctatus</i>	N	-	-
Superb Fairy-wren	<i>Malurus cyanues</i>	N	-	-
Varied Sittella	<i>Daphoenositta chrysoptera</i>	N	-	-
Wedge-tailed Eagle	<i>Aquila audax</i>	N	-	-
Weebill	<i>Smicrornis brevirostris</i>	N	-	-
Western Grey Kangaroo	<i>Macropus fuliginosus</i>	N	-	-
Whistling Kite	<i>Haliastur sphenurus</i>	N	-	Ma
White-browed Babbler	<i>Pomatostomus superciliosus</i>	N	-	-
White-eared Honeyeater	<i>Lichenostomus leucotis</i>	N	-	-
White-fronted Chat	<i>Epthianura albifrons</i>	N	-	-
White-fronted Honeyeater	<i>Phylidonyris albifrons</i>	N	-	-
White-plumed Honeyeater	<i>Lichenostomus penicillatus</i>	N	-	-
White-winged Chough	<i>Corcorax melanorhamphos</i>	N	-	-
Willie Wagtail	<i>Rhipidura leucophrys</i>	N	-	-
Wood Gecko	<i>Diplodactylus vittatus</i>	N	-	-
Yellow Thornbill	<i>Acanthiza nana</i>	N	-	-
Yellow-plumed Honeyeater	<i>Lichenostomus ornatus</i>	N	-	-
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>	N	-	-
Yellow-throated Miner	<i>Manorina flavigula</i>	N	-	-
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus</i>	N	Total	-

**Notes:** \* = Introduced Species, H=Heard, S = Seen, I = Incidental, T = Trapped / handheld, Mi = Migratory, Ma = Marine

## Appendix 3.1 – Significant Fauna

Table A3.1. Significant fauna within 10 kilometres.

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	National Action Plan	Likelihood
<b>NATIONAL SIGNIFICANCE</b>								
Pink-tailed Worm-Lizard	<i>Aprasia parapulchella</i>	#	-	VU	L	EN	-	4
Australasian Bittern	<i>Botaurus poiciloptilus</i>	#1912	1	EN	L	EN	VU	4
Curlew Sandpiper	<i>Calidris ferruginea</i>	#2000	5	CR	-	EN	-	4
Murray Hardyhead	<i>Craterocephalus fluviatilis</i>	#2011	25	EN	L	CR	VU	4
Flat-headed Galaxias	<i>Galaxias rostratus</i>	#	-	CR	-	VU	RA	4
Painted Honeyeater	<i>Grantiella picta</i>	#	-	VU	L	VU	NT	4
Swift Parrot	<i>Lathamus discolor</i>	#	-	CR	L	EN	EN	4
Malleefowl	<i>Leipoa ocellata</i>	#	-	VU	L	EN	VU	3
Growling Grass Frog	<i>Litoria raniformis</i>	#1788	3	VU	L	EN	VU	3
Murray Cod	<i>Maccullochella peelii</i>	#1981	3	VU	L	VU	-	4
Eastern Curlew	<i>Numenius madagascariensis</i>	#	-	CR	-	VU	-	4
South-eastern Long-eared Bat	<i>Nyctophilus corbeni</i>	#	-	VU	L	EN	-	2
Plains-wanderer	<i>Pedionomus torquatus</i>	#2012	6	CR	L	CR	EN	2
Night Parrot	<i>Pezoporus occidentalis</i>	#	-	EN	-	RX	EN	4
Australian Painted Snipe	<i>Rostratula australis</i>	#	-	VU	L	CR	VU	4
<b>STATE SIGNIFICANCE</b>								
Common Sandpiper	<i>Actitis hypoleucos</i>	1984	1	-	-	VU	-	4
Australasian Shoveler	<i>Anas rhynchotis</i>	2002	13	-	-	VU	-	3

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	National Action Plan	Likelihood
Magpie Goose	<i>Anseranas semipalmata</i>	1913	2	-	L	NT	-	3
Intermediate Egret	<i>Ardea intermedia</i>	1981	1	-	L	EN	-	4
Eastern Great Egret	<i>Ardea modesta</i>	2001	9	-	L	VU	-	4
Australian Bustard	<i>Ardeotis australis</i>	2002	2	-	L	CR	NT	3
Hardhead	<i>Aythya australis</i>	2004	17	-	-	VU	-	3
Silver Perch	<i>Bidyanus bidyanus</i>	1981	3	-	L	VU	-	4
Musk Duck	<i>Biziura lobata</i>	2002	57	-	-	VU	-	2
Inland Dotterel	<i>Charadrius australis</i>	1978	2	-	-	VU	-	4
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2012	39	-	-	NT	NT	2
Ground Cuckoo-shrike	<i>Coracina maxima</i>	1980	1	-	L	VU	-	4
Murray Short-necked Turtle	<i>Emydura macquarii</i>	1963	2	-	-	VU	-	3
Grey Falcon	<i>Falco hypoleucos</i>	1978	1	-	L	EN	NT	3
Black Falcon	<i>Falco subniger</i>	2000	4	-	-	VU	-	2
Caspian Tern	<i>Hydroprogne caspia</i>	2001	5	-	L	NT	-	4
Hooded Robin	<i>Melanodryas cucullata cucullata</i>	2012	18	-	L	NT	NT	2
Blue-billed Duck	<i>Oxyura australis</i>	2002	19	-	L	EN	-	3
Bearded Dragon	<i>Pogona barbata</i>	1988	1	-	-	VU	-	1 (observed during site assessment)
Grey-crowned Babbler	<i>Pomatostomus temporalis temporalis</i>	2002	3	-	L	EN	NT	4
Baillon's Crake	<i>Porzana pusilla palustris</i>	1981	1	-	L	VU	-	3
Hooded Scaly-foot	<i>Pygopus schraderi</i>	2013	17	-	L	CR	-	3

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	National Action Plan	Likelihood
Diamond Firetail	<i>Stagonopleura guttata</i>	1978	1	-	L	NT	NT	2
Freckled Duck	<i>Stictonetta naevosa</i>	1999	1	-	L	EN	-	3
Common Greenshank	<i>Tringa nebularia</i>	2000	10	-	-	VU	-	3
Marsh Sandpiper	<i>Tringa stagnatilis</i>	2001	10	-	-	VU	-	3
Red-chested Button-quail	<i>Turnix pyrrhotorax</i>	1904	1	-	L	VU	-	3
Bandy Bandy	<i>Vermicella annulata</i>	2001	1	-	L	VU	-	3
<b>REGIONAL SIGNIFICANCE</b>								
Whiskered Tern	<i>Chlidonias hybridus javanicus</i>	2001	15	-	-	NT	-	3
Spotted Harrier	<i>Circus assimilis</i>	1991	2	-	-	NT	-	3
Golden Perch	<i>Macquaria ambigua</i>	1982	3	-	-	NT	-	3
Nankeen Night Heron	<i>Nycticorax caledonicus hillii</i>	1981	3	-	-	NT	-	3
Pied Cormorant	<i>Phalacrocorax varius</i>	2000	2	-	-	NT	-	4
Royal Spoonbill	<i>Platalea regia</i>	2001	4	-	-	NT	-	4
Fat-tailed Dunnart	<i>Sminthopsis crassicaudata</i>	2012	5	-	-	NT	-	4
Australian Pratincole	<i>Stiltia isabella</i>	1978	2	-	-	NT	-	4
Red-backed Kingfisher	<i>Todiramphus pyrropygia pyrropygia</i>	2000	6	-	-	NT	-	2
Little Button-quail	<i>Turnix velox</i>	2010	2	-	-	NT	-	4

**Data source:** Victorian Biodiversity Atlas (DELWP 2018d); Victorian Fauna Database (Viridans 2011b); Protected Matters Search Tool (SEWPac 2013).

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