

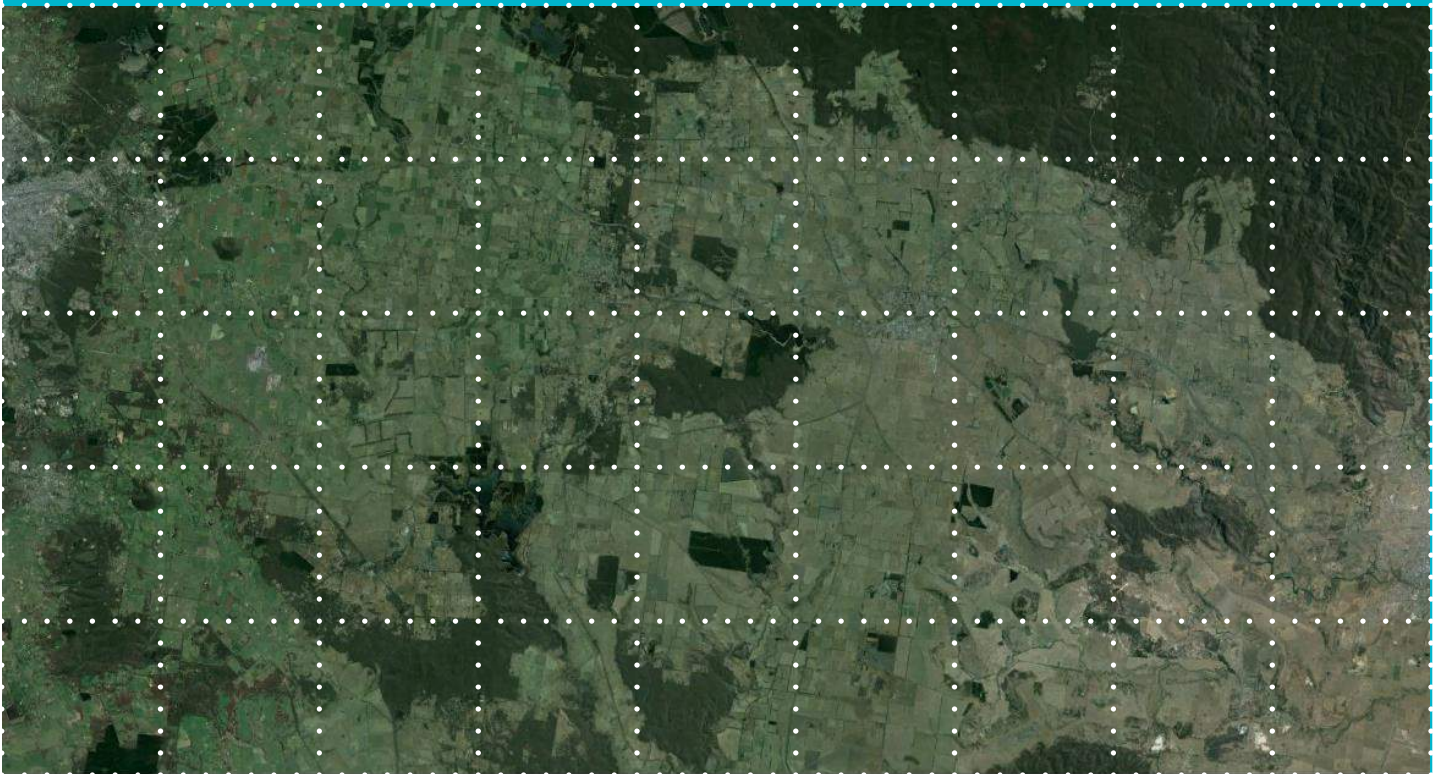
Final Report

Moorabool 2041 Environmental Assessment Project

Prepared for

Moorabool Shire Council

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Ecology and Heritage Partners Pty Ltd

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GLOSSARY

Acronym	Description
ACHRIS	Aboriginal Cultural Heritage Register and Information System
AVW	Atlas of Victorian Wildlife
CaLP	<i>Catchment and Land Protection Act 1994</i>
CHMP	Cultural Heritage Management Plan
CMA	Catchment Management Authority
DELWP	Victorian Department of Environment, Land, Water and Planning
DoE	Federal 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>
FIS	Flora Information System
NES	National Environmental Significance
NVIM Tool	Native Vegetation Information Management Tool (DELWP)
PMST	Protected Matters Search Tool (DoE)
RAP	Registered Aboriginal Party
VBA	Victorian Biodiversity Atlas (DELWP)
VAHR	Victorian Aboriginal Heritage Register
VHI	Victorian Heritage Inventory
VHR	Victorian Heritage Register

SUMMARY

Table S1. Summary of ecological, cultural and industrial constraints identified within each township.

Township	Bushfire Risk	Native vegetation	Significant flora and fauna					Cultural Heritage (no. sites)		Industry
			National			State		Aboriginal heritage	Historical heritage	
			Communities	Flora	Fauna	Flora	Fauna			
Bungaree	Low	Small fragmented patches and scattered trees	X	X	P	P	P	2	2	None
Dunnstown	Low	Small fragmented patches and scattered trees	X	X	P	P	P	2	2	None
Elaine	Low	Small fragmented patches and scattered trees	X	X	X	X	X	0	0	Wind farm
Myrniong	Low	Scattered Trees	X	X	X	X	X	1	10	Extractive
Wallace	Low	Small fragmented patches and scattered trees	P	P	P	P	P	0	0	None
Balliang	Low	Fragmented patches and scattered trees	✓	P	P	✓	P	0	3	None
Balliang East	Low	Large areas of remnant vegetation and scattered trees	✓	✓	P	✓	P	0	0	None
Barkstead*	Extreme	Majority of study area contains native vegetation	X	X	P	X	P	0	1	None
Blackwood	Extreme	Majority of study area contains native vegetation	X	P	✓	X	P	10	12	None
Clarendon	Moderate	Small and large areas of remnant vegetation and scattered trees	X	P	P	P	P	2	0	None
Greendale	High	Large areas of remnant vegetation and scattered	X	P	X	P	P	2	4	None

Township	Bushfire Risk	Native vegetation	Significant flora and fauna					Cultural Heritage (no. sites)		Industry
			National			State		Aboriginal heritage	Historical heritage	
			Communities	Flora	Fauna	Flora	Fauna			
		trees								
Hopetoun Park	Moderate	Large areas of remnant vegetation and scattered trees	✓	P	✓	P	✓	7	0	None
Korweinguboorra/Spargo Creek*	Extreme	Large areas of remnant vegetation	X	X	P	P	P	2	0	Wind Farm and Extractive Industry
Lal Lal	Moderate	Large areas of remnant vegetation	✓	P	P	P	P	2	2	Wind farm
Mt Egerton	High	Large contiguous areas of remnant vegetation	X	P	X	P	P	0	3	Mining
Yendon	Low	Small fragmented patches and scattered trees	X	P	P	P	P	0	0	Wind Farm
Gordon*	Moderate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ballan*	Moderate	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: X = threatened species or community unlikely to occur within the study area, ✓ = threatened species or community recorded within the study area, P = threatened species or community has potential to occur within study area, NA = Not Assessed. * denotes study areas which were not included in the field assessments.

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1 INTRODUCTION

1.1 Background

Ecology and Heritage Partners Pty Ltd was commissioned by the Moorabool Shire Council (MSC) to conduct a desktop environmental assessment of towns within the municipality. The Environmental Assessment Project has been initiated as part of the Moorabool 2041 Rural Growth Strategy to assess and review the current physical and legislative environmental constraints on 16 towns and settlements within the MSC. The aim was to identify environmental factors which may limit the future development of these settlements within the municipality.

1.2 Study Area

The study area consists of 16 towns and settlements within the Moorabool Shire Council municipality, which have been broken down into Priority A and Priority B areas based on the level of assessment that was carried out as part of the project (Table 1; Plate 1; Figure 1a). Settlements were assessed based on a 500m radius of the existing Township Zone or township area with minor adjustments made to some study areas based on physical and infrastructure constraints for future development.

Priority A towns were all included in both the desktop and on-ground assessment to determine environmental constraints that may impact future development. Priority B towns were all included in the desktop assessment and all except for Barkstead and Korweinguboorra/Spargo Creek were included in the on-ground assessment. The Priority B on-ground assessments were determined based on constraints identified in the desktop assessment.

Ballan and Gordon have also been added to Table 1 and given a Priority C rating as they were only assessed as part of the bushfire risk component of the assessment.

Table 1. List of towns assessed and their priority.

Priority	Settlement	Field Assessment Undertaken
A	Bungaree	Y
A	Dunnstown	Y
A	Elaine	Y
A	Myrniong	Y
A	Wallace	Y
B	Balliang	Y
B	Balliang East	Y
B	Barkstead	N
B	Blackwood	Y
B	Clarendon	Y
B	Greendale	Y

B	Hopetoun Park	Y
B	Korweinguboora/Spargo Creek	N
B	Lal Lal	Y
B	Mt Egerton	Y
B	Yendon	Y
C	Gordon	N
C	Ballan	N

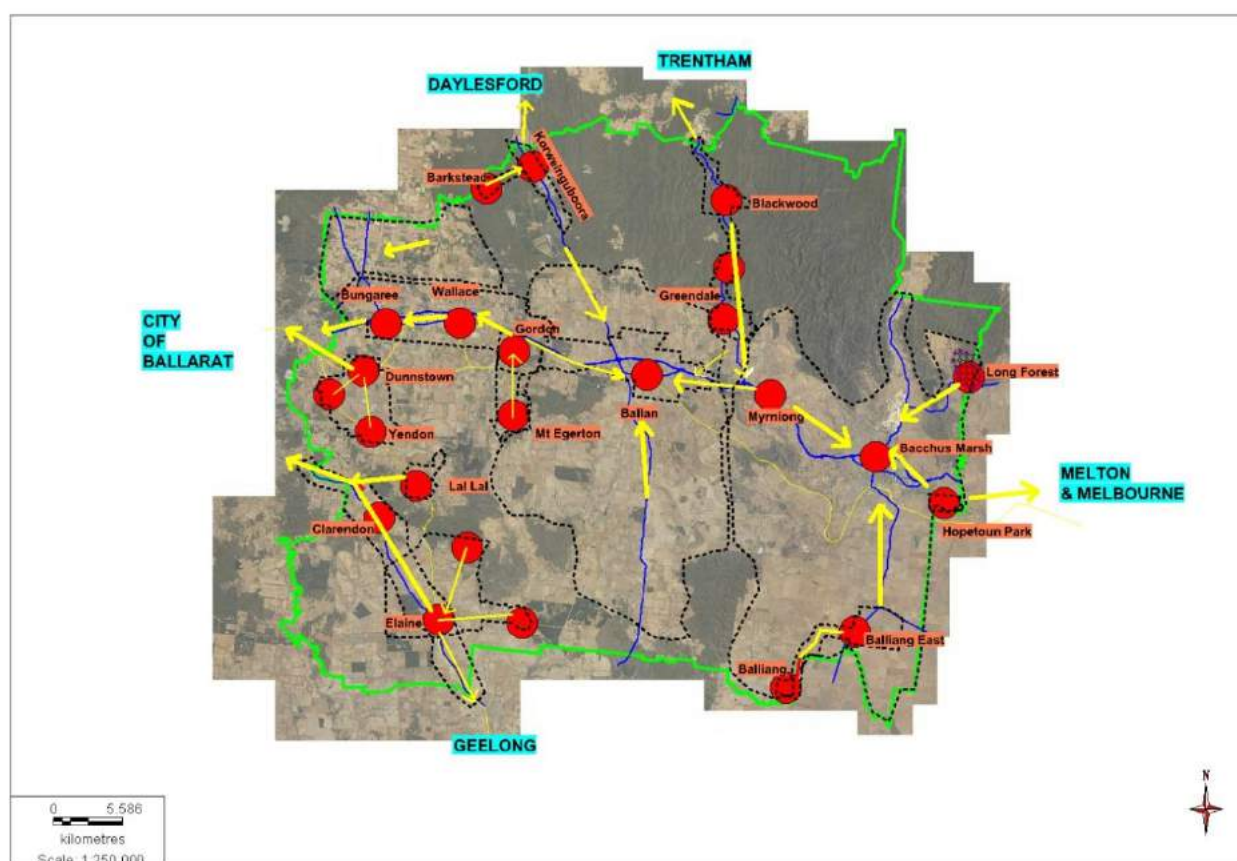
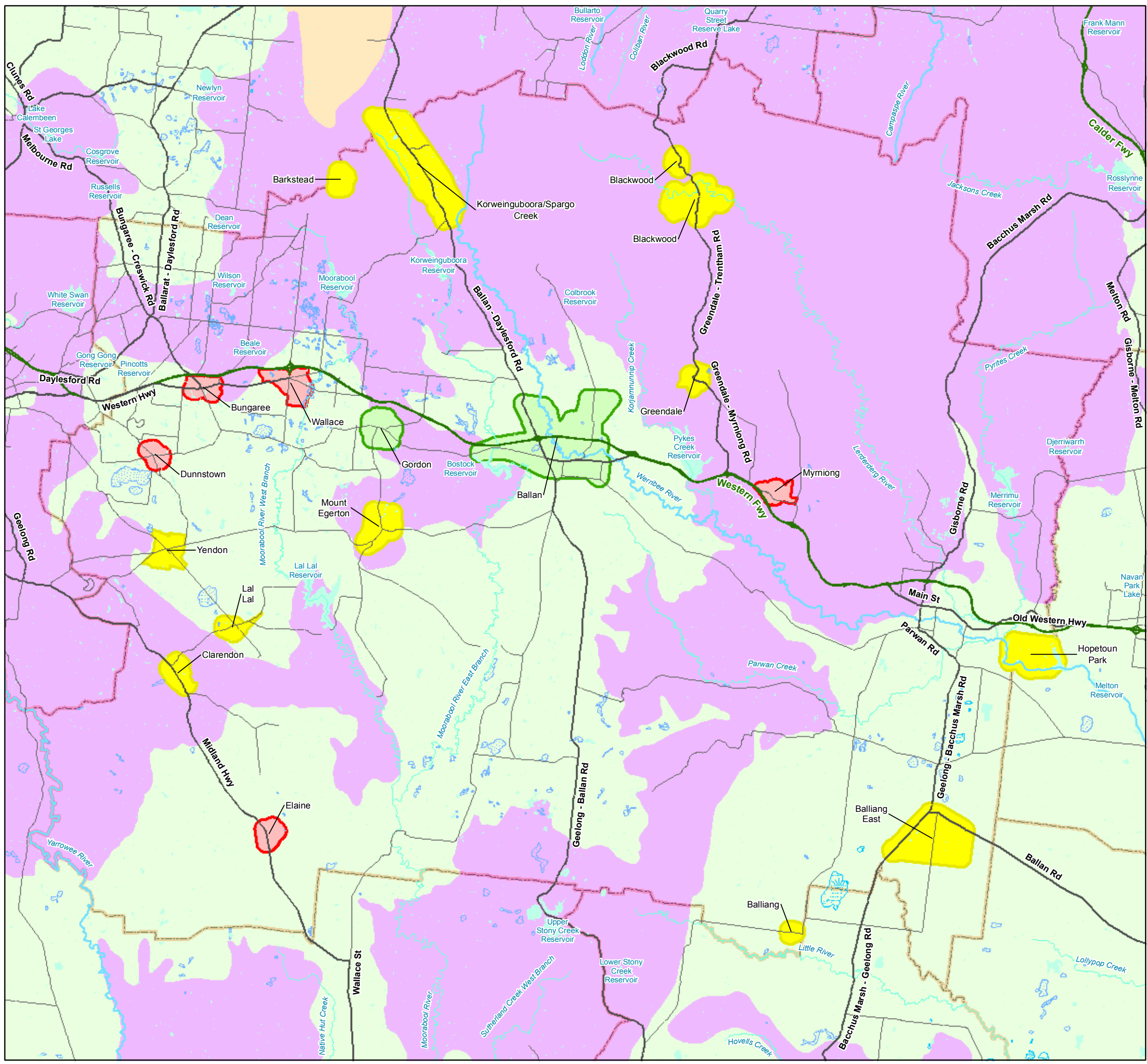


Plate 1 Location of the study area



Legend

Local Government Area

Settlements

Priority A

Priority B

Priority C

Waterways

Major Watercourse

Minor Watercourse

Water Area

Permanent Waterbody

Land Subject to Inundation

Wetland/Swamp

Bioregions

Central Victorian Uplands

Victorian Volcanic Plain

Goldfields

Figure 1a

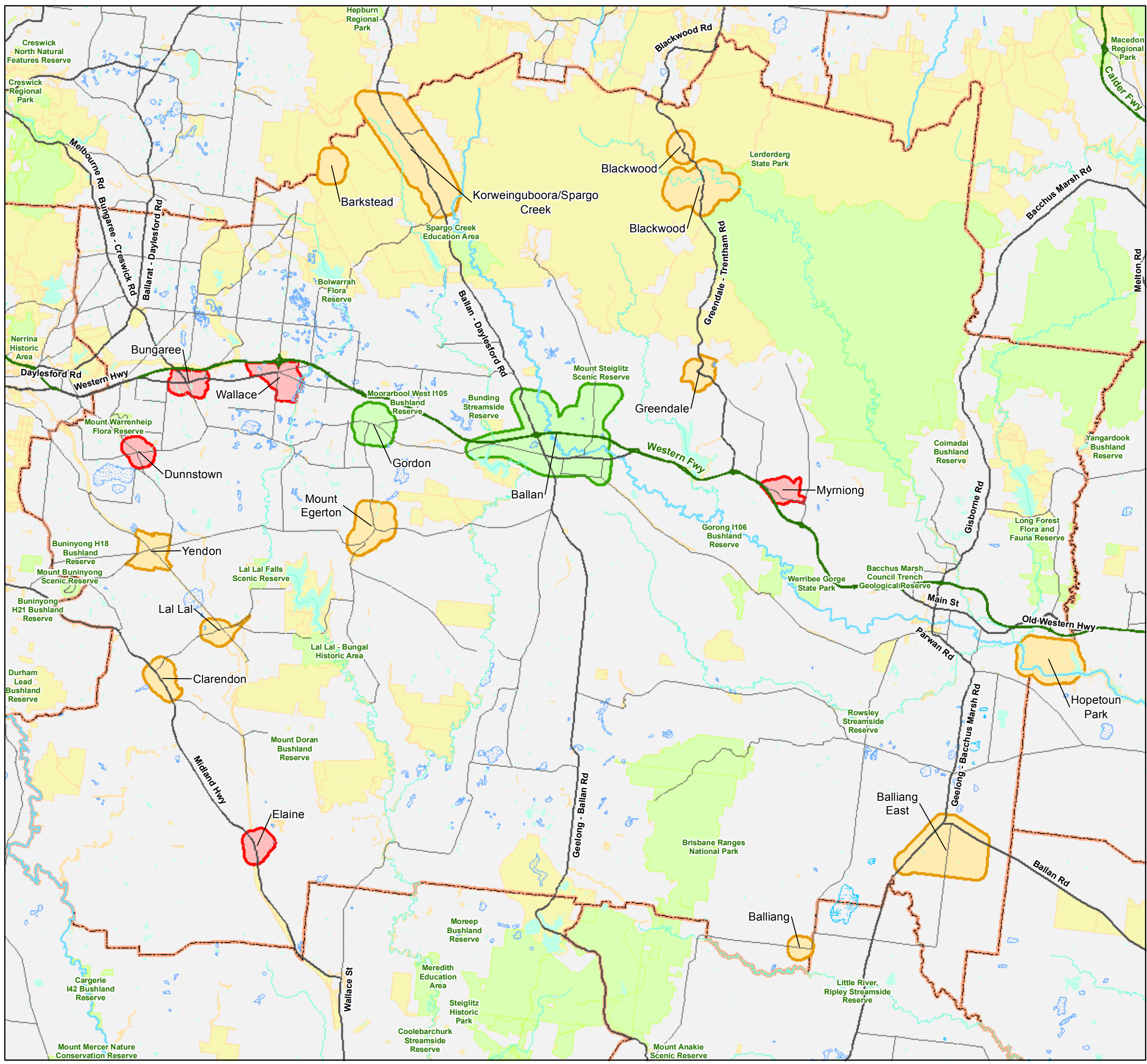
Location of each settlement
Environmental Assessment Project
Moorabool Shire Council



Kilometres



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- Legend**
- Local Government Area
 - Parks and Reserves
 - Crown Land
 - Settlements**
 - Priority A
 - Priority B
 - Priority C
 - Waterways**
 - Major Watercourse
 - Minor Watercourse
 - Water Area**
 - Permanent Waterbody
 - Land Subject to Inundation
 - Wetland/Swamp

Figure 1b
Location of each settlement
Environmental Assessment Project
Moorabool Shire Council



Kilometres



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2 METHODS

2.1 Nomenclature

Common and scientific names of vascular plants follow the Victorian Biodiversity Atlas (VBA) (DEPI 2014) and the Census of Vascular Plants of Victoria (Walsh and Stajsic 2007). Vegetation community names follow the Department of Environment and Primary Industries (DEPI) Ecological Vegetation Classes (EVC) benchmarks (DELWP 2015a). The names of aquatic and terrestrial vertebrate and invertebrate fauna follow the VBA (DEPI 2014).

2.2 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 Department of Environment, Land, Water and Planning (DELWP) Biodiversity Interactive Map (DELWP 2015b) for the extent of historic and current EVCs (Figure 3);
- The DELWP GeoVic – Explore Victoria Online map (DSDBI 2014) for the location of waterways and waterbodies, topography, wind farms and current extraction and mining licences (Figures 2, 3, 4, 6);
- The DELWP Victorian Water Resources map (DELWP 2014c) for identified areas of salinity;
- The VBA (DEPI 2014), Flora Information System (FIS) (Viridans 2013a), Atlas of Victorian Wildlife (AVW) (Viridans 2013b) for previously documented flora and fauna records within the project locality (Figures 3, 7 & 8);
- The Federal Department of Environment (DoE) Protected Matters Search Tool (PMST) for matters of National Environmental Significance (NES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (DoE 2015);
- The DELWP Planning Maps Online to ascertain current zoning and environmental overlays (DELWP 2014D);
- Environmental Protection Authority (EPA) licence search via the EPA Victoria website (EPA 2014);
- The Victorian Aboriginal Heritage Register (VAHR) for documented Aboriginal heritage places within the study area (Figures 3 and 9);
- The Victorian Heritage Register (VHR) and Victorian Heritage Inventory (VHI) for documented historical heritage places of State significance (built heritage and archaeological) within the study area;
- The Heritage Overlay to the Planning Schemes (DELWP 2014d) of Local Government Areas in the study area for documented historical heritage places of local significance;
- Aerial photography of the study area;
- Relevant environmental legislation and policies; and,

- Previous ecological assessments within the study area.

A search of the Victorian Biodiversity Atlas (VBA) and Protected Matters Search Tool (PMST) was conducted on 2 June 2014 for threatened flora and fauna species records within a 10 kilometre radius of the study area.

A search of the Victorian Aboriginal Heritage Register (VAHR) was conducted on 17 June 2014 for sites within a two kilometre radius of the study area. Searching an area with this radius ensured that a relevant and representative sample of information was obtained.

A search of the Victorian Heritage Register (VHR), Victorian Heritage Inventory (VHI) and Moorabool Shire Council Heritage Overlay (HO) via the Heritage Victoria HERMES database was conducted on 17 June 2014, for sites within a two kilometre radius of the study area.

2.3 Field Assessment

A rapid site assessment was undertaken by a qualified ecologist between 26 of January and 6 of February 2015 within the fourteen settlements identified in Table 1. The aim of the site assessment was to visually assess all areas within the settlement and map all physical ecological constraints, including:

- Identify dominant flora species and fauna habitat values;
- Identify areas of remnant vegetation and scattered trees, including all classifiable vegetation as per the Bushfire Attack Level (BAL) assessment and EVCs where applicable;
- Record the locations of any significant flora and fauna species and areas of ecological significance;
- Identify key topographical features which may impact bushfire risk; and,
- Identify additional environmental issues including areas of erosion and impacts of salinity.

The results of the field assessment were then integrated in to the reporting for each settlement and additional mapping prepared. All mapped physical ecological constraints are shown in Figure 5 for each settlement.

2.4 Bushfire Risk

Bushfire risk for each town was determined using criteria adapted from *Planning for Bushfire Victoria: Guidelines for Meeting Victoria's Bushfire Planning Requirements* (CFA 2012), which is used to meet the Location Objective (BF3) and Access Objective (BF10) of the Australian Standard 3959-2009 *Construction of Buildings in Bushfire-prone Areas* (AS 3959-2009).

Bushfire risk for each town was determined on the following criteria:

- Landscape risk, comprising:
 - Topography;
 - Extent of classifiable vegetation; and,
 - Vegetation type.
- Access/egress limitations.

See Figures 2 and 3 for each individual settlement for existing conditions relating to landscape risk and access/egress options.

Landscape risk was determined using Table 2. The overall bushfire risk was then determined according to the landscape risk and number of access/egress routes (Table 3).

Table 2: Bushfire Risk Matrix: Landscape Risk

		Extent of Classifiable Vegetation*								
		Sparse (<10%)			Moderate (10-50%)			Significant (>50%)		
		Dominant Vegetation Type			Dominant Vegetation Type			Dominant Vegetation Type		
		Grassland	Woodland	Forest	Grassland	Woodland	Forest	Grassland	Woodland	Forest
Topography	Flat/slightly undulating (<5°)	Low	Low	Moderate	Low	Moderate	High	Moderate	High	High
	Undulating (5-10°)	Low	Moderate	Moderate	Moderate	High	Extreme	Moderate	Extreme	Extreme
	Steep slopes (>10°)	Moderate	Moderate	High	Moderate	High	Extreme	High	Extreme	Extreme

Note: * Vegetation classified in accordance with Table 2.3 and Figure 2.4 of AS 3959-2009.

Table 3: Bushfire Risk Matrix: Overall Bushfire Risk

		Number of Reasonably Maintained Access/Egress Routes					
		≥6	5	4	3	2	1
Landscape Risk	Low	Low	Low	Low	Low	Moderate	Moderate
	Moderate	Low	Moderate	Moderate	Moderate	High	High
	High	Moderate	Moderate	High	High	Extreme	Extreme
	Extreme	High	High	Extreme	Extreme	Extreme	Extreme

2.5 Legislation Overview

Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

The EPBC Act establishes a Commonwealth process for the assessment of proposed actions (i.e. project, development, undertaking, activity, or series of activities) that are likely to have a significant impact on matters of National Environmental Significance (NES), or on Commonwealth land. An action, unless otherwise exempt, requires approval from the Commonwealth Environment Minister if it is considered likely to have an impact on any of the following matters of NES:

- World Heritage properties;
- National heritage places;
- Ramsar wetlands of international significance;
- Threatened species and ecological communities;
- Migratory and marine species;
- Commonwealth marine area;
- Nuclear actions (including uranium mining);
- Great Barrier Reef Marine Park; or,
- Water resources impacted by coal seam gas or mining development.

Proponents are required to submit a referral to the Commonwealth Environment Minister if a proposed action is likely to have a significant impact on any matter of NES listed under the EPBC Act.

Flora and Fauna Guarantee Act 1988 (Victoria)

The FFG Act is the primary Victorian legislation providing for the conservation of threatened species and ecological communities, and for the management of processes that are threatening to Victoria's native flora and fauna. The FFG Act contains protection procedures such as the listing of threatened species and/or communities, and the preparation of action statements to protect the long-term viability of these values.

Proponents are required to apply for an FFG Act Permit to 'take' listed and/or protected¹ flora species, listed vegetation communities and listed fish species in areas of public land (i.e. within road reserves, drainage lines and public reserves). An FFG Act permit is generally not required for removal of species or communities on private land, or for the removal of habitat for a listed terrestrial fauna species.

Planning and Environment Act 1987 (Victoria)

All municipalities in Victoria are covered by land use planning controls which are prepared and administered by State and local government authorities.

The legislation governing such controls is the *Planning and Environment Act 1987*. All planning schemes contain native vegetation provisions at Clause 52.17 which require a planning permit from the relevant local

¹ See Appendix 1 for protected flora species under the FFG Act.

Council to remove, destroy or lop native vegetation on a site of more than 0.4 hectares, unless an exemption under clause 52.17-7 of the Victorian Planning Schemes applies or a subdivision is proposed with lots less than 0.4 hectares².

Where the clearing of native vegetation is permitted, the quantity and type of vegetation to be offset is determined using methodology specified in the new 'Permitted clearing of native vegetation - Biodiversity assessment guidelines' (DEPI 2013).

Significant landscapes or vegetation requiring protection may be listed on a local planning scheme and protected by a Significant Landscape Overlay, Vegetation Protection Overlay or Environmental Significance Overlay (or other overlay where appropriate). Similarly, places of significance to a locality can be listed on a local planning scheme and protected by a Heritage Overlay (or other overlay where appropriate). Places of Aboriginal cultural heritage significance are not often included on local government planning schemes.

Aboriginal Heritage Act 2006 (Victoria)

The *Aboriginal Heritage Act 2006* protects Aboriginal heritage in Victoria. If certain high impact activities are undertaken as stated in the *Aboriginal Heritage Regulations 2007* (revised 2009) then preparation of an Aboriginal Cultural Heritage Management Plan (CHMP) may be required to be approved by the OAAV or the Registered Aboriginal Party (RAP) prior to lodging a planning permit.

Triggers for mandatory preparation of a CHMP include whether certain criteria are met under the Regulations, required by the Minister, or if the activity requires an Environmental Effects Statement (EES) under Sections 46 to 49 of the Environmental Effects Act 1978.

The Regulations require a mandatory CHMP if:

- 1) All or part of the proposed activity is a high impact activity; and
- 2) All or part of the activity area (study area) is an area of Cultural Heritage Sensitivity (subject to whether the entire area of Cultural Heritage Sensitivity has been subject to significant ground disturbance).

Heritage Act 1995 (Victoria)

The *Victorian Heritage Act 1995* (the Act) is administered by Heritage Victoria (HV) and is the Victorian Government's key piece of historical heritage legislation.

The Act identifies and protects heritage places and objects that are of significance to the State of Victoria including:

- Historic archaeological sites and artefacts;
- Historic buildings, structures and precincts;
- Gardens, trees and cemeteries;
- Cultural landscapes;

² In accordance with the Victorian Civil and Administrative Tribunal's (VCAT) decision *Villawood v Greater Bendigo CC* (2005) VCAT 2703 (20 December 2005) all native vegetation is considered lost where proposed lots are less than 0.4 hectares in area and must be offset at the time of subdivision.

- Shipwrecks and relics; and
- Significant objects.

This Act protects all non-Aboriginal heritage sites older than 50 years. If a site is of State Significance it is listed on the Victorian Heritage Register and a Permit from HV is required to disturb it. If an archaeological site is not of State significance and has archaeological value it is usually listed on the VHI and a Consent from HV would be required to disturb it.

Up until late 2009, Heritage Victoria had a 'D' classification for places that are considered to have low historical or scientific significance. These sites are listed on the Victorian Heritage Inventory but are not subject to statutory protection, therefore there is no requirement to obtain a Consent to disturb or destroy these sites. Heritage Victoria has requested that a letter be sent to them informing them if 'D' listed sites or places are destroyed to maintain records of these destroyed sites.

2.6 Assessment Qualifications and Limitations

Data and information held within the ecological databases and mapping programs reviewed in the desktop assessment (e.g. VBA, PMST, Biodiversity Interactive Maps etc.) are unlikely to represent all flora and fauna observations within, and surrounding, the study area. It is therefore important to acknowledge that a lack of documented records does not necessarily indicate that a species or community is absent, but instead may reflect a lack of survey effort.

The on-ground assessment was undertaken during a sub-optimal season for the identification of flora and fauna species (mid summer). Private land was not accessed, and was assessed from the nearest publicly accessible land. The 'snap shot' nature of the survey reduces the likelihood of mobile, migratory, seasonal, cryptic, nocturnal or uncommon fauna species being detected. In addition, annual or cryptic flora species such as those that persist via underground tubers may also be absent. Detailed flora and fauna assessments, including habitat hectares and targeted surveys were not undertaken, as this was beyond the scope of this project.

Notwithstanding the above, information obtained from relevant sources (e.g. biological databases and relevant literature) are considered adequate to provide a guide to the ecological values within the study area.

PRIORITY A SETTLEMENTS

Bungaree

Dunnstown

Elaine

Myrniong

Wallace

3 BUNGAREE

3.1 Introduction

Bungaree is a small town approximately 14 kilometres east of Ballarat, containing approximately 48 dwellings (Figure 1a). Bungaree is located along Bungaree-Wallace Road, 400 metres south of the Western Highway.

3.2 Physical Attributes of the Settlement

3.2.1 Landscape

The Bungaree study area occurs on the junction of the Central Victorian Uplands and Victorian Volcanic Plain bioregions (DELWP 2015b). The township centre is predominantly within the Central Victorian Uplands bioregion, with the Victorian Volcanic Plains occurring to the south (Figure 1b). The study area falls within the jurisdiction of the Corangamite CMA.

Bungaree is located on flat plains, with Lal Lal Creek and Two Mile Creek running south through the study area. The town is within a grazing/cropping environment. The creek and its tributaries include numerous moderate to large sized artificial waterbodies (farm dams) along its length, in addition to several large scattered farm dams within private farmland (DELWP 2015a) (Figure 2).

According to the Department of Environment, Land, Water and Planning's (DELWP) Victorian Water Resources map (2014c), there are no salinity prone areas or Erosion Management Overlays within the study area. No salinity or erosion prone areas were identified during the field assessment.

3.2.2 Flora and Fauna

3.2.2.1 Existing Conditions

Ecological Vegetation Classes

According to DELWP's pre-1750 EVC map (DELWP 2015b), the study area was likely to support predominantly Herb-rich Foothill Forest (EVC 23), with Creekline Herb-rich Woodland (EVC 164) occurring along the Lal Lal Creek. Areas to the south of Bungaree, within the Victorian Volcanic Plain, were likely to support Plains Grassy Woodland (EVC 55). Current EVC mapping (2005) shows fragmented occurrences of Herb-rich Foothill Forest and Plains Grassy Woodland are likely to be present, predominantly along creeklines, with a relatively contiguous occurrence of Creekline Herb-rich Woodland along the Lal Lal Creek (Figure 3).

Three EVCs were recorded during the field assessment, one small occurrence of Plains Grassy Wetland (EVC 125), one small occurrence of Herb-rich Foothill Forest and a relatively contiguous occurrence of Creekline Grassy Woodland along Lal Lal Creek (Figure 5). Several Scattered Trees (Manna Gum *Eucalyptus viminalis*) were also recorded throughout the study area.

Dominant flora species

Herb-rich Foothill Forest within the study area was dominated by Manna Gum over a degraded understorey of pasture grasses. Creekline Grassy Woodland within the study area was dominated by Manna Gum and Blackwood *Acacia melanoxylon* over an understorey of Cumbungi *Typha domingensis*.

Plains Grassy Wetland within the study area was dominated by Rushes *Juncus sp.*

Weeds present predominantly comprised pasture grasses (e.g. Cocksfoot *Dactylis glomerata*, Toowoomba Canary Grass *Phalaris aquatica*, Wild Oats *Avena fatua*). Blackberry *Rubus fruticosus* sp. agg. was also locally abundant along creeklines and fencelines.

Fauna habitat

The study area supports six broad habitat types, woodland, scattered trees, permanent and ephemeral creeklines, wetlands and artificial waterbodies (farm dams), introduced grasslands and planted vegetation.

Woodland and scattered trees within the study area provides habitat to a range of native fauna, including birds, possums and microbats. Many of the Eucalypts recorded in this area are likely to contain hollows, and provide fruitful nectar yields that would attract a large number of native bird species in the immediate area. Scattered woodland remnants are also likely to facilitate fauna movement between habitats throughout the otherwise cleared landscape.

Permanent creeklines are considered to be of moderate value for fauna. Common native waterbirds, frogs and reptiles are likely to utilise the creek for breeding, foraging, dispersal and cover including Pacific Black Duck, Australian Wood Duck, Eastern Banjo Frog and Common Froglet. Ephemeral creeklines are likely to provide occasional habitat for common frog species. However, due to the variability in water levels, few fish or frog species are likely to use this habitat on a permanent basis.

Wetlands and artificial waterbodies within the study area are likely to support occasional foraging habitat for common wetland species, including frogs, ducks and wading birds. These wetlands also have the potential to support the nationally listed Growling Grass Frog.

Introduced grassland and planted vegetation provide foraging resources for species adapted to modified environments such as Magpies, wattlebirds, and honeyeaters. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills, and fantails for nesting and foraging purposes.

3.2.2.2 Significant species and ecological communities

EPBC Act listed Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoE 2015):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain;
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains; and,

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

No nationally listed ecological communities are considered likely to occur within the study area.

Plains Grassy Woodland is predicted to occur within the study area, this EVC correlates with the nationally listed ecological community *Grassy Eucalypt Woodland of the Victorian Volcanic Plain*. However, Plains Grassy Woodland was not recorded during the field assessment, and as such *Grassy Eucalypt Woodland of the Victorian Volcanic Plain* is unlikely to occur within the study area.

Plains Grassy Wetland was recorded within the study area during the field assessment. This EVC correlates with the nationally listed ecological community *Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains*. However, during the field assessment, it was considered unlikely that this patch would meet the condition thresholds of the nationally listed community (TSSC 2012).

FFG Act listed Ecological Communities

According to DELWP's Biodiversity Interactive Map (DELWP 2015a), *Western Basalt Plains (River Red-gum) Grassy Woodland* and *Western (Basalt) Plains Grassland* are likely to occur within the study area. However, these communities were not recorded during the field assessment and they are considered unlikely to occur.

Nationally Significant Flora

The VBA and FIS contain records of five nationally listed flora species previously recorded within 10 kilometres of the study area; River Swamp Wallaby-grass *Amphibromus fluitans*, Adamson's Blown Grass *Lachnagrostis adamsonii*, Basalt Peppergrass *Lepidium hyssopifolium*, Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens* and Swamp Fireweed *Senecio psilocarpus* (DEPI 2014; Viridans 2013a; Appendix 1; Figure 3). The PMST nominated an additional five nationally significant species which have not been recorded in the locality but have the potential to occur (DoE 2015).

Based on habitat within the study area, landscape context and the proximity of previous records, there is a low likelihood River Swamp Wallaby-grass and Swamp Fireweed occur within the study area (Appendix 1).

State Significant Flora

The VBA and FIS contain records of 13 state significant flora species within 10 kilometres of the study area (DEPI 2014; Viridans 2013a) (Appendix 1; Figure 3).

Based on habitat within the study area, landscape context and the proximity of previous records, several state significant flora species may occur within the study area (Appendix 1), including Slender Tick-trefoil *Desmodium varians* and Brooker's Gum *Eucalyptus brookeriana*.

Nationally Significant Fauna

The VBA and AVW contain records of four nationally listed fauna species previously recorded within 10 kilometres of the study area; Plains-wanderer *Pedionomus torquatus*, Red-tailed Black-Cockatoo *Calyptorhynchus banksii graptogyne*, Swift Parrot *Lathamus discolor* and Growling Grass Frog *Litoria raniformis* (DEPI 2014; Viridans 2013b; Appendix 2; Figure 3).

The PMST nominated an additional nine nationally significant species which have not been recorded in the locality but have the potential to occur due to the presence of suitable habitat (DoE 2015).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, one nationally significant fauna species, Growling Grass Frog, has the potential to occur within the study area as suitable habitat is present (Appendix 2).

State Significant Fauna

The VBA and AVW contain records of 24 state significant fauna species within 10 kilometres of the study area (DEPI 2014; Viridans 2013b) (Appendix 2; Figure 3).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, six state significant fauna species may use habitat within the study area for foraging, purposes including Black Falcon *Falco subniger*, Eastern Great Egret *Ardea modesta*, Musk Duck *Biziura lobata*, Freckled Duck *Stictonetta naevosa*, Hardhead *Aythya australis* and Australasian Shoveler *Anas rhynchotis* (Appendix 2).

3.2.3 Cultural Heritage

3.2.3.1 Aboriginal Cultural Heritage

There are no registered Aboriginal archaeological places within the study area, and two within the surrounding 2km (Table 4; Figure 4). These sites were identified in ploughed fields, and comprise an isolated occurrence of two broken silcrete flakes, and a large scatter of quartz, silcrete, chert and basalt.

Table 4: Aboriginal Cultural Heritage within or surrounding the Bungaree Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VAHR 7622-0029	Leigh Creek 1	Isolated Artefact	No. 1.8km west
VAHR 7622-0030	Leigh Creek 2	Artefact Scatter	No, 1.8km west

There are two areas of Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, within the study area (Figure 4). Under Regulation 23(1), land within 200 metres of a named waterway is classified as being of Cultural Heritage Sensitivity. The following areas of sensitivity were identified within the study area:

- Lal Lal Creek; and
- Two Mile Creek.

Aboriginal Heritage Act 2006

It is considered likely that Aboriginal heritage will be found in the study area. This conclusion is derived from the likelihood of areas of unmodified land in close proximity to waterways. A CHMP is used to assess the Aboriginal heritage and manage any heritage in the context of an impact such as a subdivision activity. Under Regulation 23, the study area is within an area of Cultural Heritage Sensitivity as it is located within 200 m of a waterway. Therefore, any future development within the above named areas of Cultural Heritage Sensitivity will require a mandatory CHMP.

3.2.3.2 Historical Cultural Heritage

There is one site listed on the Victorian Heritage Inventory within the study area, and one listed within 2km (Table 5).

Table 5: Historical Cultural Heritage within or surrounding the Bungaree Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VHI 7622-0010	Bluestone Quarry	Quarry	Yes
VHI 7622-0016	The Mud Dairy	Built: Agriculture	No, 1.6km west

Heritage Act 1995

There are two heritage sites listed on the VHI. Under the *Heritage Act 1995*, this site will require a Consent from Heritage Victoria prior to any future development.

Planning and Environment Act 1987

There are no heritage sites of local significance listed on the Heritage Overlay under the Moorabool Shire Council Planning Scheme within the study area.

3.3 Legislative and Policy Implications

3.3.1 Extractive Industry

There are no current mining licenses or extractive industry tenements within the study area (DSDBI 2014) (Figure 6).

3.3.2 Wind Farms

Based on the results of the field assessment, aerial photography interpretation and GeoVic – Explore Victoria Online, there are no operating or proposed wind farms within two kilometres of the study area (DSDBI 2014) (Figure 6).

3.3.3 Intensive Agriculture

Based on aerial photography interpretation, the predominant land use within the settlement is rural living and agriculture. Grazing and cropping (including irrigated crops) is the main agricultural use.

3.3.4 Schedule of Licenced Premises

The study area does not include any EPA licences (EPA 2014).

3.4 Bushfire Risk

Based upon aerial photography, extant EVC mapping and results of the field assessment, the bushfire risk for Bungaree is low (Tables 2 and 3), given:

- The study area and surrounding landscape predominantly contains low threat vegetation (crops and managed pasture) with a 0-5° slope (Figures 2 and 3);
- Long bushfire runs (>10 kilometres) are unlikely and the surrounding landscape easily accessed for fire fighting purposes;
- Extreme bushfire behaviour is not possible and the type and extent of vegetation is unlikely to result in neighbourhood scale destruction of property; and,
- There are at least four well maintained access or escape routes from Bungaree to places that provide shelter from bushfire, along roads with only scattered occurrences of moderate threat vegetation (woodland).

3.5 Summary

Native vegetation within Bungaree is limited to Lal Lal Creek, with the exception of one small occurrence along Two Mile Creek. It is considered unlikely that any vegetation meets the diagnostic characteristics and condition thresholds of nationally listed ecological communities.

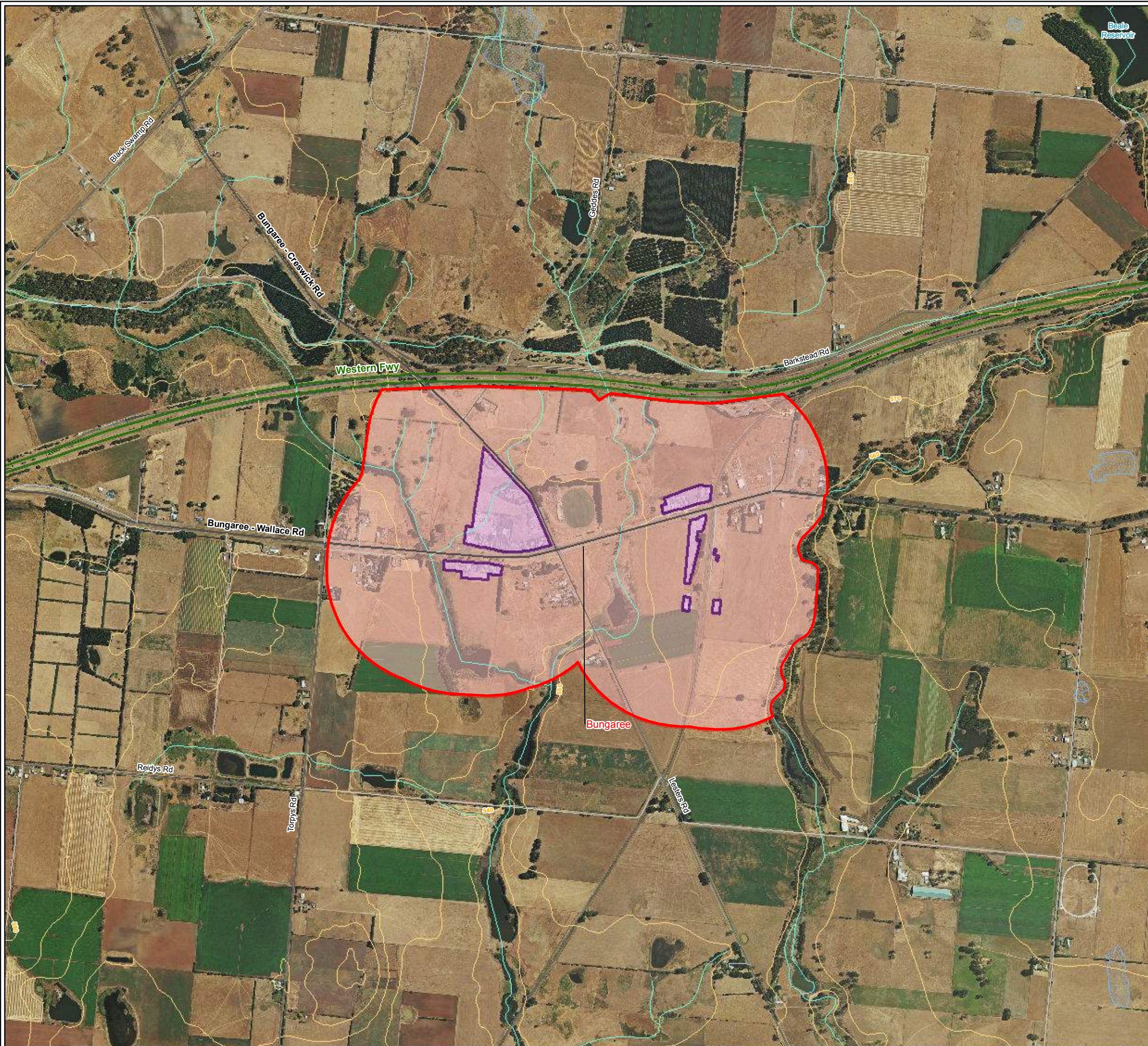
There is a low likelihood that nationally significant flora species occur within the study area, however, one nationally significant fauna species, Growling Grass Frog, has the potential to occur within the study area.

There are two areas of known Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, located within the study area, Lal Lal Creek and Two Mile Creek. There is also one listed historical heritage site within the study area, Bluestone Quarry.

The bushfire risk for Bungaree is Low.

3.6 Recommendations

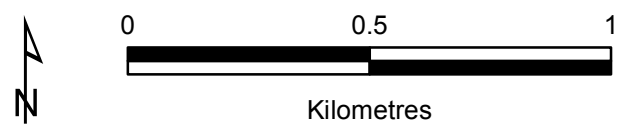
In order to mitigate degradation of environmental values it is recommended that opportunities are investigated to protect remnant vegetation along Lal Lal Creek through planning controls (e.g. Environmental Significance Overlays/Vegetation Protection Overlays).



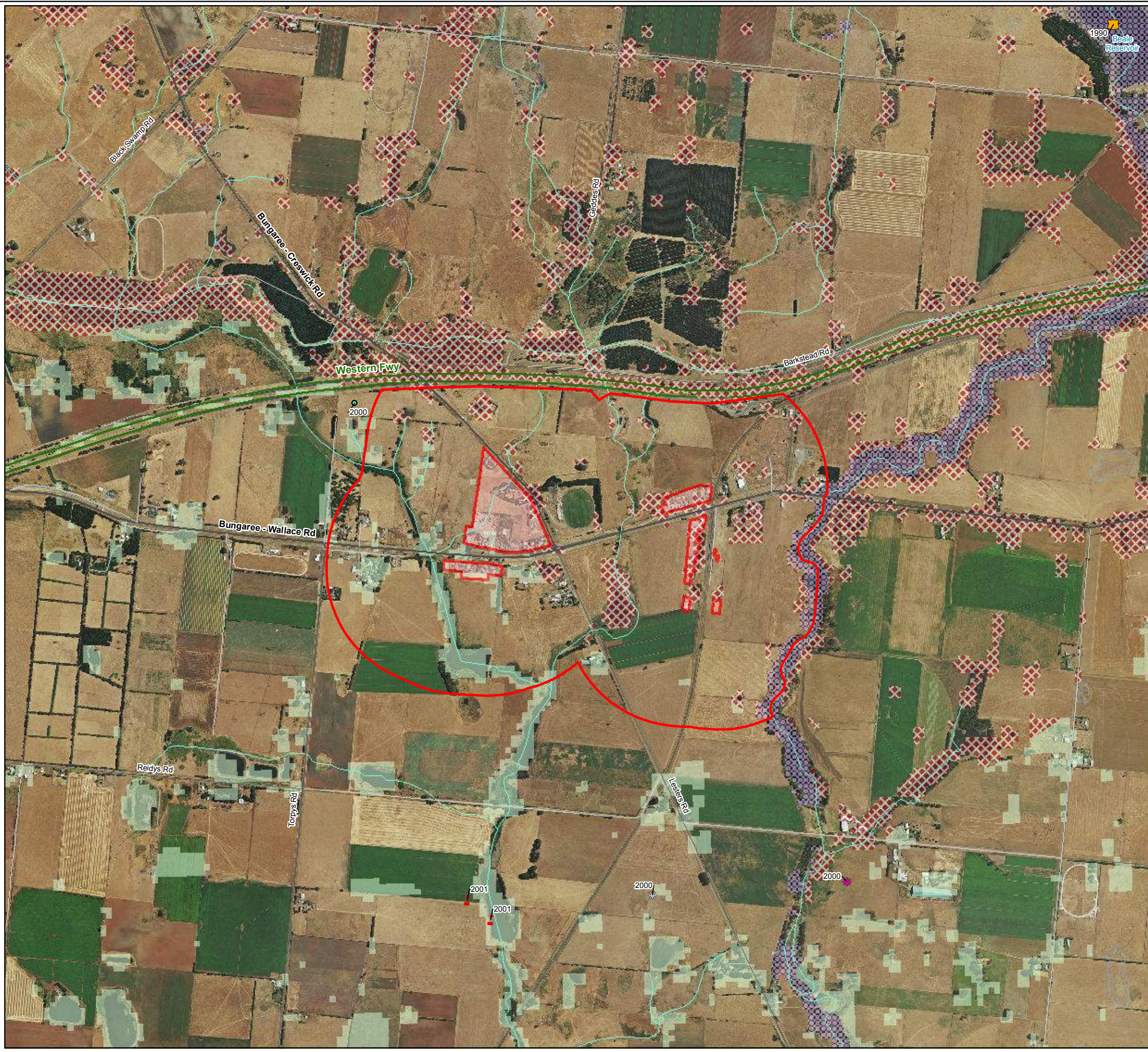
Legend

- Priority A Settlement
 - Township Zone
 - Contour (10m)
- Roads**
- Freeway
 - Major Road
 - Collector Road
 - Minor Road
- Water**
- Minor Watercourse
 - Land Subject to Inundation

Figure 2 -Bungaree
Physical features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council

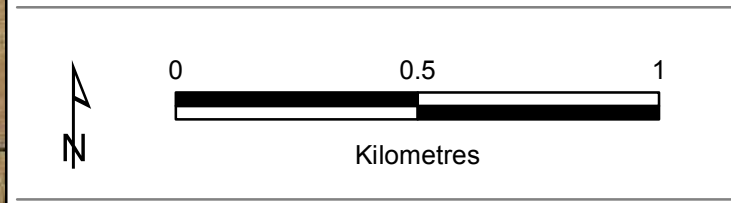


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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

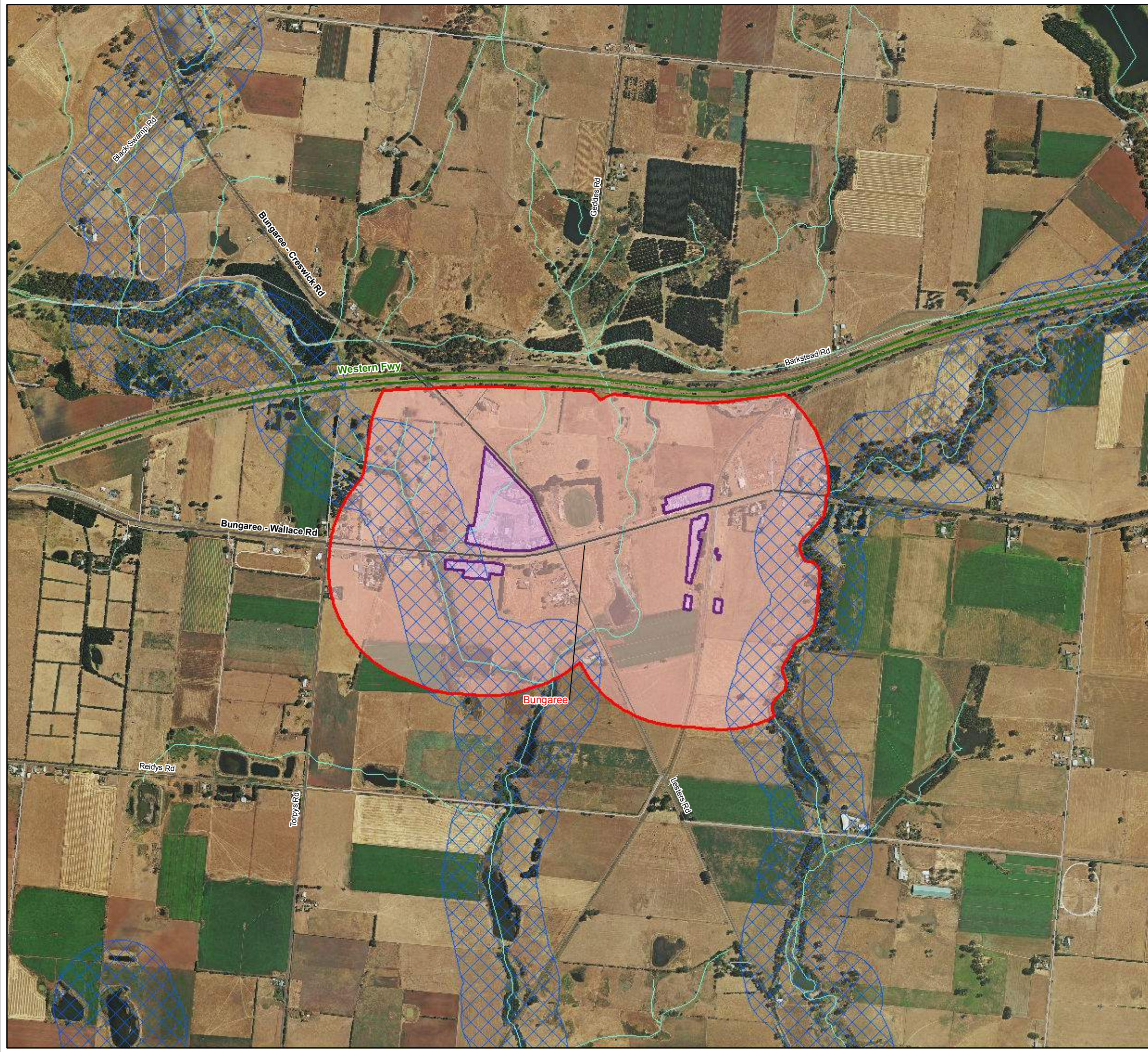


- Legend**
- Priority A Settlement
 - Township Zone
 - Ecological Vegetation Class (2005)**
 - Creekline Herb-rich Woodland
 - Herb-rich Foothill Forest
 - Plains Grassy Woodland
 - Significant Flora Records**
 - Brooker's Gum
 - Significant Fauna Records**
 - Blue-billed Duck
 - Brown Treecreeper (south-eastern ssp.)
 - Eastern Great Egret
 - Pied Cormorant

Figure 3 -Bungaree
Constraining ecological features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council




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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

 Priority A Settlement

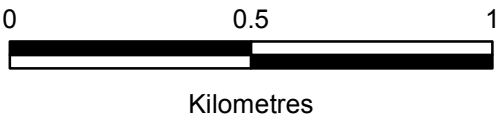
 Township Zone

Cultural Heritage

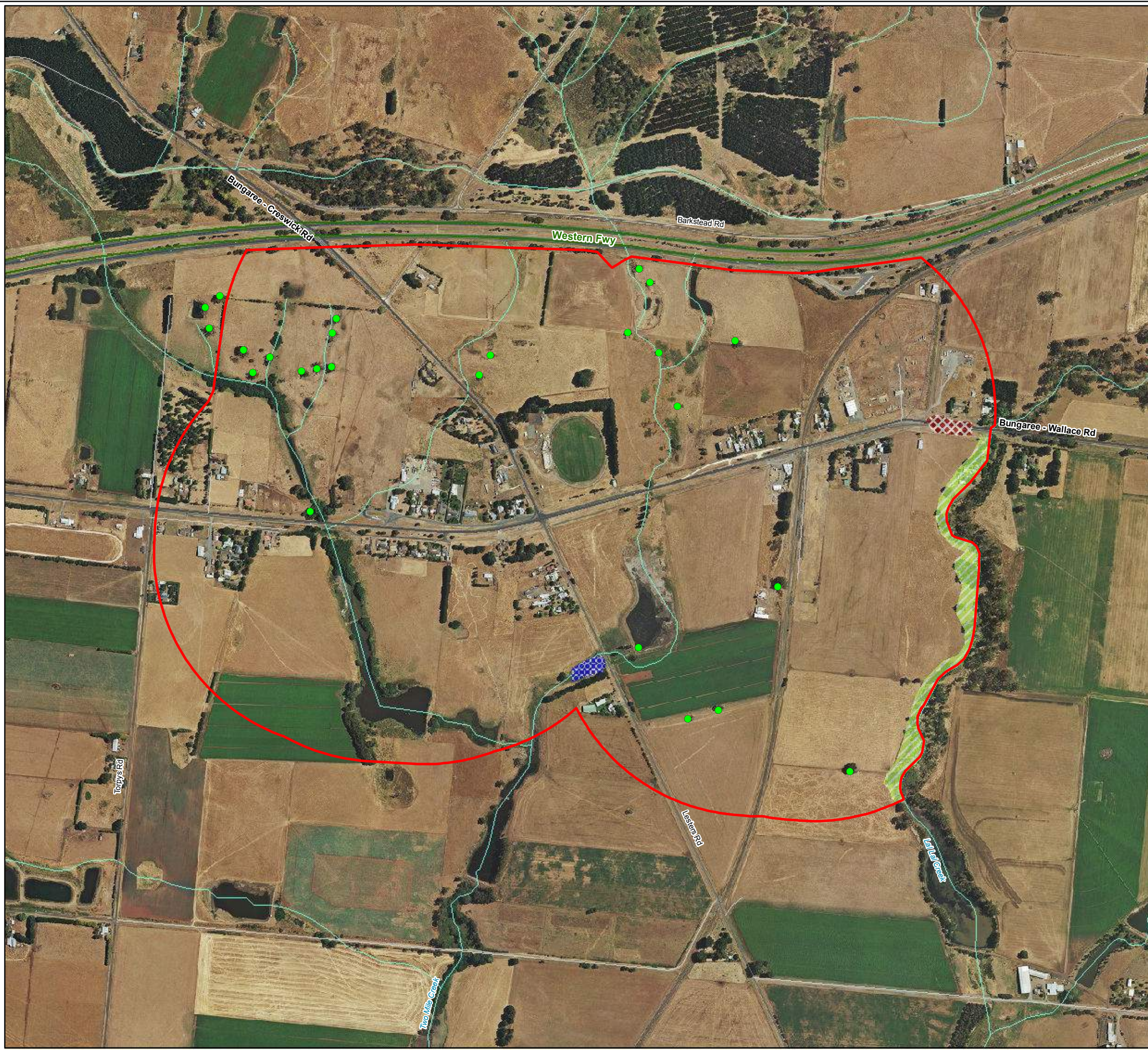
 Areas of Cultural Heritage Sensitivity

Figure 4 -Bungaree

**Constraining Aboriginal Heritage features,
Extractive Licenses and Wind Farms within
and surrounding the settlement**
*Environmental Assessment Project
Moorabool Shire Council*



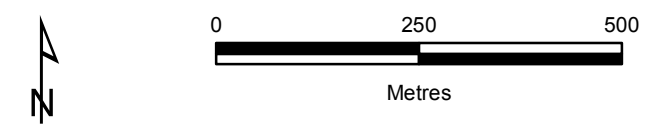
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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

- Priority A
- Ecological Vegetation Classes**
- Creekline Grassy Woodland
- Herb-rich Foothill Forest
- Plains Grassy Wetland
- Scattered Trees
- Watercourse**
- Minor Watercourse

Figure 5 -Bungaree
 Ecological features recorded during the field assessment
Environmental Assessment Project
 Moorabool Shire Council



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 Aerial photo (2013) and contours supplied by Moorabool Shire Council.

APPENDIX 1 – FLORA DATABASE RESULTS

Table A1 Significant flora recorded within 10 kilometres of the study area

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.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
NATIONAL SIGNIFICANCE							
# <i>Amphibromus fluitans</i>	River Swamp Wallaby-grass	1	2006	VU	-	-	3
# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	L	v	4
# <i>Dianella amoena</i>	Matted Flax-lily	-	-	EN	L	e	5
# <i>Glycine latrobeana</i>	Clover Glycine	-	-	VU	L	v	5
<i>Lachnagrostis adamsonii</i>	Adamson's Blown-grass	1	1997	EN	L	v	4
# <i>Lepidium hyssopifolium</i>	Basalt Peppergrass	21	2013	EN	L	e	4
# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	3	2010	CR	L	e	4
# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	-	-	EN	L	e	5
# <i>Senecio psilocarpus</i>	Swamp Fireweed	1	1996	VU	-	v	4
# <i>Xerochrysum palustre</i>	Swamp Everlasting	-	-	VU	L	v	5
STATE SIGNIFICANCE							
* <i>Bossiaea cordigera</i>	Wiry Bossiaea	2	1998	-	-	r	5
<i>Cardamine tenuifolia</i>	Slender Bitter-cress	1	1964	-	-	k	5
<i>Coronidium gunnianum</i>	Pale Swamp Everlasting	1	1996	-	-	v	5
<i>Desmodium varians</i>	Slender Tick-trefoil	2	1992	-	-	k	4
<i>Discaria pubescens</i>	Australian Anchor Plant	9	2001	-	L	r	5
<i>Encalypta vulgaris</i>	Common Extinguisher-moss	1	1996	-	-	r	5
<i>Eucalyptus brookeriana</i>	Brooker's Gum	5	2002	-	-	r	3
<i>Eucalyptus yarraensis</i>	Yarra Gum	27	2006	-	-	r	4

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>Hypoxis vaginata</i> var. <i>brevistigmata</i>	Yellow Star	1	1882	-	-	k	5
<i>Pultenaea reflexifolia</i>	Wombat Bush-pea	1	1770	-	-	r	5
* <i>Scleranthus brockei</i>	Brock Knawel	1	1876	-	-	r	5
* <i>Senecio campylocarpus</i>	Floodplain Fireweed	1	2006	-	-	r	5
<i>Westringia glabra</i>	Violet Westringia	2	1996	-	-	r	5

Data source: Victorian Biodiversity Atlas (DEPI 2014); Protected Matters Search Tool (DoE 2015).

Taxonomic order: Alphabetical.

APPENDIX 2 – SIGNIFICANT FAUNA SPECIES

Table A2. Significant fauna within 10 kilometres of the study area.

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

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 (DEPI 2013b); 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

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
Plains-wanderer	<i>Pedionomus torquatus</i>	1911	1	VU	CR	L	EN	4
Red-tailed Black-Cockatoo	<i>Calyptorhynchus banksii graptogyne</i>	1896	1	EN	EN	L	EN	4
Swift Parrot	<i>Lathamus discolor</i>	1977	2	EN	EN	L	EN	4
Growling Grass Frog	<i>Litoria raniformis</i>	2001	5	VU	EN	L	VU	2
# Australasian Bittern	<i>Botaurus poiciloptilus</i>	-	-	EN	EN	L	VU	4
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	4
# Australian Painted Snipe	<i>Rostratula australis</i>	-	-	VU	CR	L	VU	4
# Dwarf Galaxias	<i>Galaxiella pusilla</i>	-	-	VU	VU	L	VU	4
# Golden Sun Moth	<i>Synemon plana</i>	-	-	CR	EN	L	-	4
# Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	-	-	VU	VU	L	VU	3
# Macquarie Perch	<i>Macquaria australasica</i>	-	-	EN	EN	L	DD	4
# Murray Cod	<i>Maccullochella peelii peelii</i>	-	-	VU	EN	L	-	4
# Smoky Mouse	<i>Pseudomys fumeus</i>	-	-	EN	CR	L	RA	4
STATE SIGNIFICANCE								
Brush-tailed Phascogale	<i>Phascogale tapoatafa tapoatafa</i>	1991	1	-	VU	L	NT	4
Australasian Shoveler	<i>Anas rhynchos</i>	2009	13	-	VU	-	-	2
Common Dunnart	<i>Sminthopsis murina murina</i>	1964	1	-	VU	-	-	4
King Quail	<i>Coturnix chinensis victoriae</i>	1995	1	-	EN	L	-	4
Musk Duck	<i>Biziura lobata</i>	2009	41	-	VU	-	-	2
Freckled Duck	<i>Stictonetta naevosa</i>	2009	1	-	EN	L	-	2
Hardhead	<i>Aythya australis</i>	2009	25	-	VU	-	-	2

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Blue-billed Duck	<i>Oxyura australis</i>	2009	12	-	EN	L	-	3
White-throated Needletail	<i>Hirundapus caudacutus</i>	1977	5	-	VU	-	-	4
Eastern Great Egret	<i>Ardea modesta</i>	2001	12	-	VU	L	-	2
Square-tailed Kite	<i>Lophoictinia isura</i>	2000	2	-	VU	L	-	3
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	1991	1	-	VU	L	-	4
Grey Goshawk	<i>Accipiter novaehollandiae novaehollandiae</i>	2001	2	-	VU	L	-	3
Black Falcon	<i>Falco subniger</i>	2000	2	-	VU	-	-	2
Lewin's Rail	<i>Lewinia pectoralis pectoralis</i>	1992	1	-	VU	L	NT	3
Baillon's Crake	<i>Porzana pusilla palustris</i>	2001	1	-	VU	L	-	3
Elegant Parrot	<i>Neophema elegans</i>	1886	1	-	VU	-	-	4
Powerful Owl	<i>Ninox strenua</i>	2008	7	-	VU	L	-	4
Barking Owl	<i>Ninox connivens connivens</i>	1995	2	-	EN	L	NT	4
Masked Owl	<i>Tyto novaehollandiae novaehollandiae</i>	1995	1	-	EN	L	NT	4
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2000	3	-	NT	-	NT	4
Speckled Warbler	<i>Chthonicola sagittatus</i>	1960	2	-	VU	L	NT	4
Diamond Firetail	<i>Stagonopleura guttata</i>	1996	3	-	NT	L	NT	4
Tussock Skink	<i>Pseudemoia pagenstecheri</i>	2007	2	-	VU	-	-	3

Data source: Victorian Biodiversity Atlas (DEPI 2014); Victorian Fauna Database (Viridans 2013b); Protected Matters Search Tool (DoE 2015).

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).

4 DUNNSTOWN

4.1 Introduction

Dunnstown is a small settlement approximately 10 kilometres east of Ballarat, containing approximately 45 dwellings (Figure 1a). Dunnstown is located along Old Melbourne Road, south of the Melbourne-Ballarat rail line.

4.2 Physical Attributes of the Settlement

4.2.1 Landscape

The Dunnstown study area occurs within the Victorian Volcanic Plain bioregion and falls within the jurisdiction of the Corangamite CMA (DELWP 2015b) (Figure 1b).

Dunnstown is located on flat plains and gentle gullies surrounding Granite Creek within an agricultural/rural living environment. Several medium to large waterbodies are located along Granite Creek and its tributaries (DELWP 2015a) (Figure 2).

According to the DELWP Victorian Water Resources map (2015c), there are no salinity prone areas or Erosion Management Overlays within the study area. No salinity or erosion prone areas were identified during the field assessment.

4.2.2 Flora and Fauna

4.2.2.1 Existing Conditions

Ecological Vegetation Classes

According to the DELWP pre-1750 EVC mapping (DELWP 2015b), the study area was likely to support predominantly Plains Grassy Woodland (EVC 55), with Grassy Woodland (EVC 175) dominating the south east of the study area, to the east of Dunnstown-Yendon Road. Based on extant vegetation mapping, small fragmented areas of these EVCs are likely to be present, predominantly along creeklines and drainage lines (Figure 2).

One EVC was recorded during the field assessment, Grassy Woodland. One small patch of this EVC was recorded within the township zone and two moderate to large patches (1.4-6.4 hectares) were recorded to the south-east (Figure 5).

Several Scattered Trees (Manna Gum *Eucalyptus viminalis*) were also recorded within the study area, predominantly within the south-east.

Dominant flora species

Grassy Woodland within the study area was dominated by Manna Gum over a degraded understorey of pasture grasses.

Weeds present predominantly comprised pasture grasses (e.g. Cocksfoot *Dactylis glomerata*, Toowoomba Canary Grass *Phalaris aquatica*, Wild Oats *Avena fatua*). Blackberry *Rubus fruticosus* sp. agg. and Gorse *Ulex europaeus* were also locally abundant.

Fauna habitat

The study area supports six broad habitat types, woodland, scattered trees, ephemeral creeklines, artificial waterbodies (farm dams), introduced grasslands and planted vegetation.

Woodland and scattered trees within the study area provides habitat to a range of native fauna, including birds, possums and microbats. Many of the Eucalypts recorded in this area are likely to contain hollows, and provide fruitful nectar yields that would attract a large number of native bird species in the immediate area. Scattered woodland remnants are also likely to facilitate fauna movement between habitats throughout the otherwise cleared landscape.

Ephemeral creeklines are likely to provide occasional habitat for common frog species. However, due to the variability in water levels, few fish or frog species are likely to use this habitat on a permanent basis.

Artificial waterbodies within the study area are likely to support occasional foraging habitat for common wetland species, including frogs, ducks and wading birds. These wetlands also have the potential to support the nationally listed Growling Grass Frog.

Introduced grassland and planted vegetation provide foraging resources for species adapted to modified environments such as Magpies, wattlebirds, and honeyeaters. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills, and fantails for nesting and foraging purposes.

4.2.2.2 Significant species and ecological communities

EPBC Act listed Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoE 2015):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain;
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains; and,
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

No nationally listed ecological communities are considered likely to occur within the study area.

Plains Grassy Woodland is predicted to occur within the study area, this EVC correlates with the nationally listed ecological community *Grassy Eucalypt Woodland of the Victorian Volcanic Plain*. However, Plains Grassy Woodland was not recorded during the field assessment, and as such *Grassy Eucalypt Woodland of the Victorian Volcanic Plain* is unlikely to occur within the study area.

FFG Act listed Ecological Communities

According to DELWP's Biodiversity Interactive Map (DELWP 2015a), *Western Basalt Plains (River Red-gum) Grassy Woodland* is likely to occur within the study area. However, this community was not recorded during the field assessment and it is considered unlikely to occur.

Nationally Significant Flora

The VBA and FIS contain records of six nationally listed flora species previously recorded within 10 kilometres of the study area, River Swamp Wallaby-grass *Amphibromus fluitans*, Matted Flax-lily *Dianella amoena*, Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*, Maroon Leek-orchid *Prasophyllum frenchii*, Swamp Fireweed *Senecio psilocarpus* and Swamp Everlasting *Xerochrysum palustre* (DEPI 2014; Viridans 2013a; Appendix 1; Figure 3). The PMST nominated an additional four nationally significant species which have not been recorded in the locality but have the potential to occur (DoE 2015).

Based on habitat within the study area, landscape context and the proximity of previous records, nationally significant flora species are considered unlikely to occur within the study area (Appendix 1).

State Significant Flora

The VBA and FIS contain records of 20 state significant flora species within 10 kilometres of the study area (DEPI 2014; Viridans 2013a) (Appendix 1; Figure 3).

Based on habitat within the study area, landscape context and the proximity of previous records, several state significant flora species may occur within the study area (Appendix 1), including Pale Swamp Everlasting *Coronidium gunnianum*, Slender Tick-trefoil *Desmodium varians*, Common Extinguisher-moss *Encalypta vulgaris* and Brooker's Gum *Eucalyptus brookeriana*.

Nationally Significant Fauna

The VBA and AVW contain records of four nationally listed fauna species previously recorded within 10 kilometres of the study area, Plains-wanderer *Pedionomus torquatus*, Red-tailed Black-Cockatoo *Calyptorhynchus banksii graptogyne*, Swift Parrot *Lathamus discolor* and Growling Grass Frog *Litoria raniformis* (DEPI 2014; Viridans 2013b; Appendix 2; Figure 3).

The PMST nominated an additional nine nationally significant species which have not been recorded in the locality but have the potential to occur due to the presence of suitable habitat (DoE 2015).

Based on the number of previous records, extent EVC mapping, landscape context and associated habitat within the study area, one nationally significant fauna species, Growling Grass Frog, has the potential to occur within the study area as suitable habitat is present (Appendix 2).

State Significant Fauna

The VBA and AVW contain records of 23 State significant fauna species within 10 kilometres of the study area (DEPI 2014; Viridans 2013b) (Appendix 2; Figure 3).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, four State significant fauna species may use habitat within the study area for foraging purposes including Eastern Great Egret *Ardea modesta*, Grey Goshawk *Accipiter novaehollandiae novaehollandiae*, Black Falcon *Falco subniger* and Tussock Skink *Pseudemoia pagenstecher* (Appendix 2).

A number of more mobile species (principally bird species) may pass over the study area en-route to more preferred habitats on an occasional basis.

4.2.3 Cultural Heritage

4.2.3.1 Aboriginal Cultural Heritage

There are no registered Aboriginal archaeological places within the study area, and three within the surrounding 2km (Table 6; Figure 4). These sites comprised a scarred tree, a surface scatter of 17 silcrete and quartz artefacts over an area of 300 x 50m, and one historical reference; a named place (Warren-Geep).

Table 6: Aboriginal Cultural Heritage within or surrounding the Dunnstown Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VAHR 7622-0022	Mt Warrenheip 1	Scarred Tree	No, 800m north west
VAHR 7622-0038	Britts 1	Artefact Scatter	No, 1km east
12.9-12	Warren-Geep (Warrenheip)	12.9 Named place	No, 1km north west

There are two areas of Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, within the study area. Under Regulation 23(1) land within 200 metres of a named waterway is classified as being of Cultural Heritage Sensitivity. The following areas of sensitivity were identified within the study area:

- Granite Creek; and
- Ring Creek.

Aboriginal Heritage Act 2006

It is considered likely that Aboriginal heritage will be found in the study area. This conclusion is derived from the likelihood of areas of unmodified land in close proximity to waterways. A CHMP is used to assess the Aboriginal heritage and manage any heritage in the context of an impact such as a subdivision activity. The following considerations are made with respect to the mandatory preparation of a CHMP:

Under Regulation 23, the study area is within an area of Cultural Heritage Sensitivity as it is located within 200 m of a waterway. Therefore, any future development within the above named areas of Cultural Heritage Sensitivity will require a mandatory CHMP.

4.2.3.2 Historical Cultural Heritage

There is one site listed on the Victorian Heritage Register and the Moorabool Shire Council Heritage Overlay, and one site listed on the Victorian Heritage Inventory within the study area (Table 7).

Table 7: Historical Cultural Heritage within or surrounding the Dunnstown Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VHR H1013 HO33	Former Brinds Distillery	Built: Commercial	Yes
VHI H7622-0423	Dunnstown Railway Siding	Archaeological: Infrastructure	Yes

Heritage Act 1995

There is one heritage site listed on the Victorian Heritage Register within the study area. Under the *Heritage Act 1995*, this site will require a Permit from Heritage Victoria prior to any future development.

There is one heritage site listed on the Victorian Heritage Inventory within the study area. Under the *Heritage Act 1995*, this site will require Consent from Heritage Victoria prior to any future development.

Planning and Environment Act 1987

There is one heritage sites of local significance listed on the Heritage Overlay under the Moorabool Shire Council Planning Scheme within the study area. A planning permit from the Moorabool Shire Council will be required to remove, impact or destroy these sites.

4.3 Legislative and Policy Implications

4.3.1 Extractive Industry

There are no current mining licenses or extractive industry tenements within the study area (DSDBI 2014) (Figure 6). There are three current extractive industry tenements directly south of the study area (Figure 6).

4.3.2 Wind Farms

Based on the results of the field assessment, aerial photography interpretation and GeoVic – Explore Victoria Online, there are no operating or proposed wind farms within two kilometres of the study area (DSDBI 2014) (Figure 6).

4.3.3 Intensive Agriculture

The predominant land use within the settlement is rural living and agriculture (grazing, non-irrigated cropping). Two horse racing/training tracks are also present immediately to the north of the settlement centre. No intensive agriculture is present.

4.3.4 Schedule of Licenced Premises

The study area does not include any EPA licences (EPA 2014).

4.4 Bushfire Risk

Based upon aerial photography, extant EVC mapping and results of the field assessment, the bushfire risk for Dunnstown is low (Tables 2 and 3), given:

- Small areas of woodland exist, however, the study area and surrounding landscape predominantly contains low threat vegetation (crops and managed pasture) with a 0-5° slope (Figures 2 and 3);
- Long bushfire runs (>10 kilometres) are unlikely and the surrounding landscape easily accessed for fire fighting purposes;
- Extreme bushfire behaviour is not possible and the type an extent of vegetation is unlikely to result in neighbourhood scale destruction of property; and,

- Access and escape routes are available to the north, south, east and west via moderately well maintained roads containing low threat vegetation with occasional trees.

4.5 Summary

Native vegetation within Dunnstown is limited to small fragmented patches. It is considered unlikely that any vegetation meets the diagnostic characteristics and condition thresholds of nationally listed ecological communities.

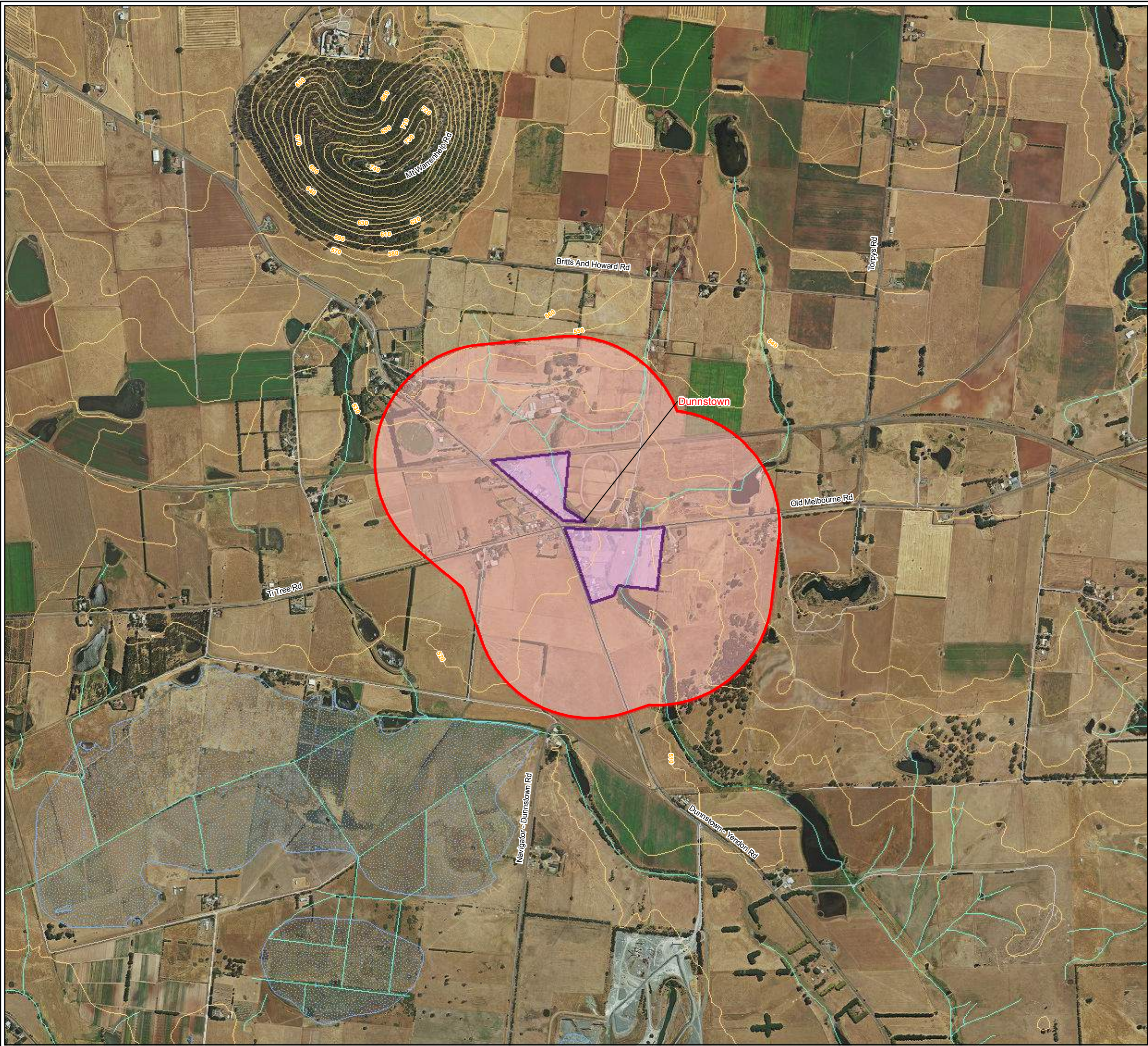
There is a low likelihood that nationally significant flora species occur within the study area, however, one nationally significant fauna species, Growling Grass Frog, has the potential to occur within the study area.

There are two areas of known Cultural Heritage Sensitivity located within the study area, Granite Creek; and Ring Creek. There are two listed historical heritage sites within the study area (Former Brinds Distillery and Dunnstown Railway Siding).

The bushfire risk for Dunnstown is Low.

4.6 Recommendations

In order to mitigate degradation of environmental values it is recommended that opportunities are investigated to protect remnant vegetation through planning controls (e.g. Environmental Significance Overlays/Vegetation Protection Overlays).



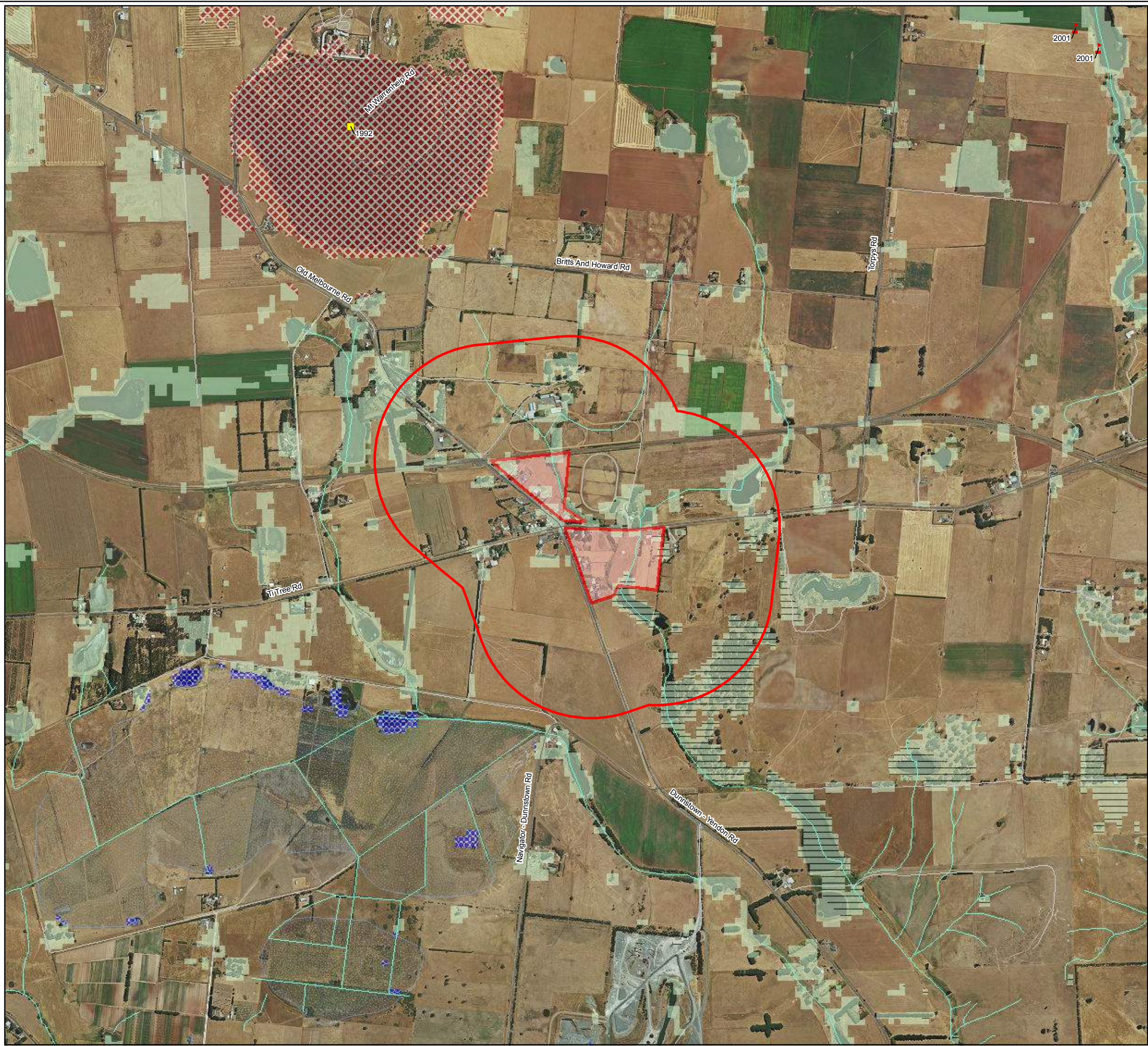
Legend

- Priority A Settlement
 - Township Zone
 - Contour (10m)
- Roads**
- Collector Road
 - Minor Road
- Water**
- Minor Watercourse
 - Land Subject to Inundation

Figure 2 -Dunnstown
Physical features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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.
Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

- Priority A Settlement
- Township Zone

Ecological Vegetation Class (2005)

- Grassy Woodland
- Herb-rich Foothill Forest
- Plains Grassy Wetland
- Plains Grassy Woodland

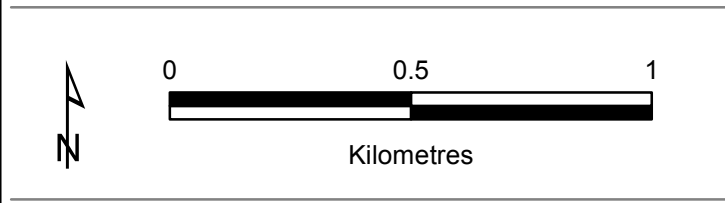
Significant Flora Records

- Slender Tick-trefoil

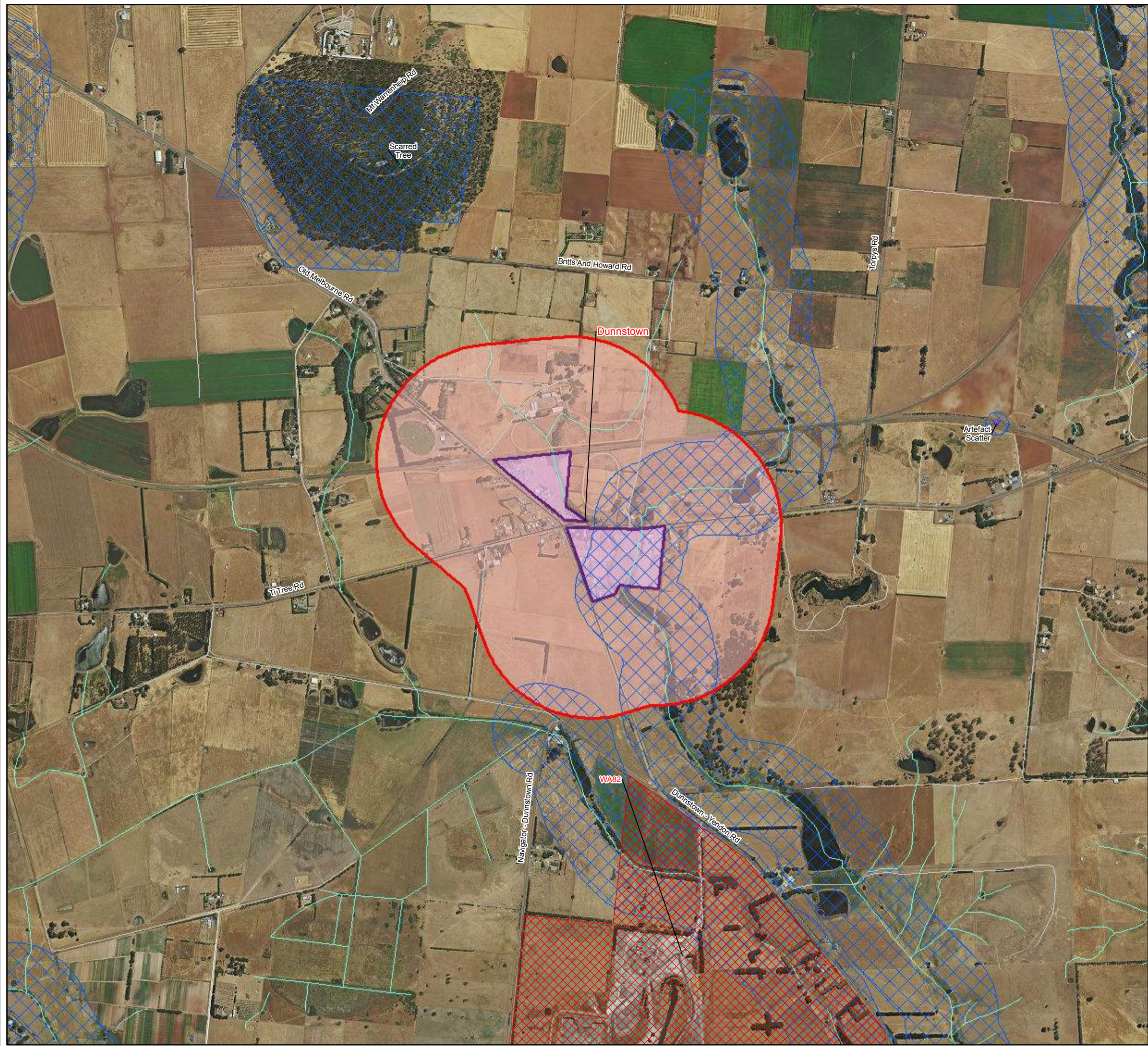
Significant Fauna Records

- Eastern Great Egret

Figure 3 -Dunnstown
Constraining ecological features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



- Legend**
- Priority A Settlement
 - Township Zone
 - Cultural Heritage**
 - Areas of Cultural Heritage Sensitivity
 - Artefact Scatter
 - Scarred Tree
 - Mining and Extraction**
 - Current Extractive Industry Tenements

Figure 4 -Dunnstown
Constraining Aboriginal Heritage features, Extractive Licenses and Wind Farms within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority A

Ecological Vegetation Classes

Grassy Woodland

Scattered Trees

Watercourse

Minor Watercourse

Water Area

Land Subject to Inundation

Figure 5 -Dunnstown

Ecological features recorded during the field assessment

*Environmental Assessment Project
Moorabool Shire Council*



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

APPENDIX 1 – FLORA DATABASE RESULTS

Table A1 Significant flora recorded within 10 kilometres of the study area

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.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
NATIONAL SIGNIFICANCE							
# <i>Amphibromus fluitans</i>	River Swamp Wallaby-grass	1	2006	VU	-	-	4
# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	L	v	5
# <i>Dianella amoena</i>	Matted Flax-lily	1	1770	EN	L	e	5
# <i>Glycine latrobeana</i>	Clover Glycine	-	-	VU	L	v	5
# <i>Lepidium hyssopifolium</i>	Basalt Peppercress	-	-	EN	L	e	5
# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	3	2010	CR	L	e	5
# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	1	1992	EN	L	e	5
# <i>Senecio psilocarpus</i>	Swamp Fireweed	7	1996	VU	-	v	4
# <i>Thelymitra matthewsii</i>	Spiral Sun-orchid	-	-	VU	L	v	5
# <i>Xerochrysum palustre</i>	Swamp Everlasting	9	2008	VU	L	v	5
STATE SIGNIFICANCE							
<i>Amphibromus sinuatus</i>	Wavy Swamp Wallaby-grass	1	2008	-	-	v	5
<i>Bolboschoenus fluviatilis</i>	Tall Club-sedge	1	1982	-	-	k	5
* <i>Bossiaea cordigera</i>	Wiry Bossiaea	1	1998	-	-	r	5
<i>Cardamine tenuifolia</i>	Slender Bitter-cress	2	1964	-	-	k	5
<i>Carex chlorantha</i>	Green-top Sedge	3	1905	-	-	k	5
<i>Coronidium gunnianum</i>	Pale Swamp Everlasting	2	1996	-	-	v	4
<i>Desmodium varians</i>	Slender Tick-trefoil	2	1992	-	-	k	3
<i>Discaria pubescens</i>	Australian Anchor Plant	15	2003	-	L	r	5
<i>Encalypta vulgaris</i>	Common Extinguisher-moss	1	1996	-	-	r	4
<i>Eucalyptus brookeriana</i>	Brooker's Gum	5	2002	-	-	r	4

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>Eucalyptus yarraensis</i>	Yarra Gum	46	2006	-	-	r	5
<i>Euphrasia collina</i> subsp. <i>speciosa</i>	Purple Eyebright	1	1770	-	-	x	5
<i>Euphrasia scabra</i>	Rough Eyebright	1	1770	-	L	e	5
<i>Lachnagrostis perennis</i> spp. agg.	Perennial Blown-grass	1	1992	-	-	k	5
<i>Lepidium pseudohyssopifolium</i>	Native Peppercress	1	1993	-	-	k	5
<i>Plantago</i> aff. <i>gaudichaudii</i> (Lowland Swamps)	Swamp Plantain	1	1992	-	-	v	5
<i>Pultenaea reflexifolia</i>	Wombat Bush-pea	1	1770	-	-	r	5
* <i>Scleranthus brockei</i>	Brock Knawel	1	1876	-	-	r	5
* <i>Senecio campylocarpus</i>	Floodplain Fireweed	1	2006	-	-	r	5
<i>Westringia glabra</i>	Violet Westringia	2	1996	-	-	r	5

Data source: Victorian Biodiversity Atlas (DEPI 2014); Protected Matters Search Tool (DoE 2015).

Taxonomic order: Alphabetical.

APPENDIX 2 – SIGNIFICANT FAUNA SPECIES

Table A2. Significant fauna within 10 kilometres of the study area.

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

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 (DEPI 2013b); 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

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
Plains-wanderer	<i>Pedionomus torquatus</i>	1911	2	VU	CR	L	EN	4
Red-tailed Black-Cockatoo	<i>Calyptorhynchus banksii graptogyne</i>	1896	1	EN	EN	L	EN	4
Swift Parrot	<i>Lathamus discolor</i>	1977	2	EN	EN	L	EN	4
Growling Grass Frog	<i>Litoria raniformis</i>	2001	5	VU	EN	L	VU	2
# Australasian Bittern	<i>Botaurus poiciloptilus</i>	-	-	EN	EN	L	VU	4
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	4
# Australian Painted Snipe	<i>Rostratula australis</i>	-	-	VU	CR	L	VU	4
# Dwarf Galaxias	<i>Galaxiella pusilla</i>	-	-	VU	VU	L	VU	4
# Golden Sun Moth	<i>Synemon plana</i>	-	-	CR	EN	L	-	4
# Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	-	-	VU	VU	L	VU	4
# Macquarie Perch	<i>Macquaria australasica</i>	-	-	EN	EN	L	DD	4
# Regent Honeyeater	<i>Anthochaera phrygia</i>	-	-	EN	CR	L	EN	4
# Smoky Mouse	<i>Pseudomys fumeus</i>	-	-	EN	CR	L	RA	4
STATE SIGNIFICANCE								
Brush-tailed Phascogale	<i>Phascogale tapoatafa tapoatafa</i>	1991	1	-	VU	L	NT	4
Australasian Shoveler	<i>Anas rhynchotis</i>	2009	13	-	VU	-	-	3
Common Dunnart	<i>Sminthopsis murina murina</i>	1964	1	-	VU	-	-	4
Common Bent-wing Bat	<i>Miniopterus schreibersii GROUP</i>	1962	1	-	-	L	CD	4
Musk Duck	<i>Biziura lobata</i>	2009	44	-	VU	-	-	3
Freckled Duck	<i>Stictonetta naevosa</i>	2009	1	-	EN	L	-	3
Hardhead	<i>Aythya australis</i>	2009	25	-	VU	-	-	3

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Blue-billed Duck	<i>Oxyura australis</i>	2009	11	-	EN	L	-	3
White-throated Needletail	<i>Hirundapus caudacutus</i>	1977	6	-	VU	-	-	4
Eastern Great Egret	<i>Ardea modesta</i>	2001	13	-	VU	L	-	2
Square-tailed Kite	<i>Lophoictinia isura</i>	2000	2	-	VU	L	-	3
Grey Goshawk	<i>Accipiter novaehollandiae</i>	2010	6	-	VU	L	-	2
Black Falcon	<i>Falco subniger</i>	2000	2	-	VU	-	-	2
Lewin's Rail	<i>Lewinia pectoralis pectoralis</i>	1995	2	-	VU	L	NT	4
Baillon's Crake	<i>Porzana pusilla palustris</i>	2001	1	-	VU	L	-	4
Marsh Sandpiper	<i>Tringa stagnatilis</i>	1986	1	-	VU	-	-	4
Elegant Parrot	<i>Neophema elegans</i>	1886	1	-	VU	-	-	4
Powerful Owl	<i>Ninox strenua</i>	2008	6	-	VU	L	-	3
Barking Owl	<i>Ninox connivens connivens</i>	1989	1	-	EN	L	NT	4
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2000	2	-	NT	-	NT	3
Speckled Warbler	<i>Chthonicola sagittatus</i>	1960	2	-	VU	L	NT	4
Hooded Robin	<i>Melanodryas cucullata cucullata</i>	1975	1	-	NT	L	NT	4
Tussock Skink	<i>Pseudemoia pagenstecheri</i>	2007	3	-	VU	-	-	2

Data source: Victorian Biodiversity Atlas (DEPI 2014); Victorian Fauna Database (Viridans 2013b); Protected Matters Search Tool (DoE 2015).

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).

5 ELAINE

5.1 Introduction

Elaine is a scattered small town approximately 30 kilometres south of Ballarat, containing approximately 26 dwellings, located along the Midland Highway (Figure 1a).

5.2 Physical Attributes of the Settlement

5.2.1 Landscape

The Elaine study area occurs within the Victorian Volcanic Plain bioregion and falls within the jurisdiction of the Corangamite CMA (DELWP 2015b) (Figure 1b).

Elaine is located on flat plains and gentle gullies of the Tea Tree Creek and is within an agricultural (grazing) landscape. Several small to medium artificial waterbodies (farm dam) are located along the Tea Tree Creek and other minor waterways and within grazing paddocks (DELWP 2015a) (Figure 2).

According to the DELWP Victorian Water Resources map (2015c), the upper reaches of Tea Tree Creek are prone to salinity. There are no Erosion Management Overlays present within the study area. No erosion prone areas were recorded during field assessments.

5.2.2 Flora and Fauna

5.2.2.1 Existing Conditions

Ecological Vegetation Classes

According to the DELWP pre-1750 EVC mapping (DELWP 2015b), the study area was likely to predominantly support a mosaic of Plains Grassland (EVC 132) and Plains Grassy Woodland (EVC 55). Grassy Dry Forest was also likely to occur on the slopes and ridges the north-east. Based on extant vegetation mapping, small fragmented occurrences of these Plains Grassland (EVC 132) and Plains Grassy Woodland are likely to be present, with areas of Grassy Dry Forest contiguous with a larger forest to the north-east of the study area (Figure 3).

One EVC was recorded during the field assessment, Grassy Woodland (EVC 175). Grassy Woodland was predominantly located along rail and road reserves, contiguous with vegetation outside the study area. A small number of scattered trees (approximately 10; Swamp Gum *Eucalyptus ovata*) were also recorded within the study area (Figure 5).

Dominant flora species

Plains Grassy Woodland within the study area was dominated by Swamp Gum over an understorey of Silver Wattle *Acacia mearnsii*, Blackwood *Acacia melanoxylon*, Cherry Ballart *Exocarpos cupressiformis*, Kangaroo-grass *Themeda triandra*, Wallaby-grasses *Rytidosperma spp.* and Spear-grasses *Austrostipa spp.*

Weeds present predominantly comprised pasture grasses (e.g. Cocksfoot *Dactylis glomerata*, Toowoomba Canary Grass *Phalaris aquatica*, Wild Oats *Avena fatua*). Gorse *Ulex europaeus* were also present in some areas.

Fauna habitat

The study area supports six broad habitat types, woodland, scattered trees, ephemeral creeklines, artificial waterbodies (farm dams), introduced grasslands and planted vegetation.

Woodland and scattered trees within the study area provides habitat to a range of native fauna, including birds, possums and microbats. Many of the Eucalypts recorded in this area are large, likely to contain hollows, and provide fruitful nectar yields that would attract a large number of native bird species in the immediate area. Scattered woodland remnants are also likely to facilitate fauna movement between habitats throughout the otherwise cleared landscape.

Ephemeral creeklines are likely to provide occasional habitat for common frog species. However, due to the variability in water levels, few fish or frog species are likely to use this habitat on a permanent basis.

Artificial waterbodies within the study area are likely to support occasional foraging habitat for common wetland species, including frogs, ducks and wading birds.

Introduced grassland and planted vegetation provide foraging resources for species adapted to modified environments such as Magpies, wattlebirds, and honeyeaters. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills, and fantails for nesting and foraging purposes.

5.2.2.2 Significant species and ecological communities

EPBC Act listed Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoE 2015):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain;
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains; and,
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

No nationally listed ecological communities are considered likely to occur within the study area.

Plains Grassy Woodland was recorded within the study area, this EVC correlates with the nationally listed ecological community *Grassy Eucalypt Woodland of the Victorian Volcanic Plain*. However it was considered unlikely that Plains Grassy Woodland within the study area would meet the condition thresholds of this nationally listed ecological community (SEWPaC 2011).

Plains Grassland is predicted to occur within the study area, this EVC correlates with the nationally listed ecological community *Natural Temperate Grassland of the Victorian Volcanic Plain*. However, Plains

Grassland was not recorded during the field assessment, and as such *Natural Temperate Grassland of the Victorian Volcanic Plain* is unlikely to occur within the study area.

FFG Act listed Ecological Communities

One state significant ecological community was recorded within the study area during the field assessment, *Western Basalt Plains (River Red-gum) Grassy Woodland*, correlating with areas of Plains Grassy Woodland.

According to the DELWP Biodiversity Interactive Map (DELWP 2015b), *Western (Basalt) Plains Grasslands* is also likely to occur within the study area. However, this community was not recorded during the field assessment and is considered unlikely to occur.

Nationally Significant Flora

The VBA and FIS contain records of four nationally listed flora species previously recorded within 10 kilometres of the study area; Matted Flax-lily *Dianella amoena*, Clover Glycine *Glycine latrobeana*, Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens* and Button Wrinklewort *Rutidosis leptorhynchoides* (DEPI 2014; Viridans 2013a; Appendix 1; Figure 3). The PMST nominated an additional five nationally significant species which have not been recorded in the locality but have the potential to occur (DoE 2015).

Based on habitat within the study area, landscape context and the proximity of previous records, several nationally significant flora species may occur within the study area (albeit a low likelihood; Appendix 1), including Matted Flax-lily, Button Wrinklewort and Swamp Everlasting.

State Significant Flora

The VBA and FIS contain records of 19 state significant flora species within 10 kilometres of the study area (DEPI 2014; Viridans 2013a) (Appendix 1; Figure 3).

Based on habitat within the study area, landscape context and the proximity of previous records, several state significant flora species may occur within the study area (Appendix 1), including Salt Blown-grass *Lachnagrostis robusta* and Austral Trefoil *Lotus australis* var. *australis*.

Nationally Significant Fauna

The VBA and AVW contain records of two nationally listed fauna species previously recorded within 10 kilometres of the study area; Golden Sun Moth *Synemon plana* and Growling Grass Frog *Litoria raniformis* (DEPI 2014; Viridans 2013b; Appendix 2; Figure 3). The PMST nominated an additional eight nationally significant species which have not been recorded in the locality but have the potential to occur due to the presence of suitable habitat (DoE 2015).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, one nationally significant fauna species, Golden Sun Moth, has the potential to occur within the study area (albeit a low likelihood; Appendix 2).

State Significant Fauna

The VBA and AVW contain records of 13 State significant fauna species within 10 kilometres of the study area (DEPI 2014; Viridans 2013b) (Appendix 2; Figure 3).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, four State significant fauna species may use habitat within the study area for foraging purposes, including Hairy Burrowing Cray *Engaeus sericatus*, Tussock Skink *Pseudemoia pagenstecheri* and Grey Goshawk *Accipiter novaehollandiae novaehollandiae* (Appendix 2).

A number of more mobile species (principally bird species) may pass over the study area en-route to more preferred habitats on an occasional basis. There is a low likelihood that other nominated EPBC Act and State listed species reside within the study area on a permanent basis as there is no suitable habitat or they are presumed to be extinct in the local area (Appendix 2).

5.2.3 Cultural Heritage

5.2.3.1 Aboriginal Cultural Heritage

There are no registered Aboriginal archaeological places within the study area, or the surrounding 2km.

There is no area of Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, within the study area. Tea Tree Creek, an area of Cultural Heritage Sensitivity, is located 400m west of the study area.

Aboriginal Heritage Act 2006

As the study area is not located within an area of Cultural Heritage Sensitivity, a mandatory Cultural Heritage Management Plan (CHMP) would not be required for future development.

However, it is considered likely that Aboriginal heritage is located in the study area. This conclusion is derived from the presence of the unnamed tributaries located within the study area and the proximity of Tea Tree Creek to the study area. It is recommended preliminary cultural heritage investigation be undertaken prior to development in the study area.

5.2.3.2 Historical Cultural Heritage

There are no sites listed within the study area. Five sites are listed on the Victorian Heritage Inventory within the surrounding 2km (Table 8). These sites reflect the pastoral settlement of the region.

Please note that Heritage Inventory sites displaying a 'D' in their Heritage Inventory Number have been de-listed, and are not subject to archaeological controls under the *Victorian Heritage Act 1995*.

Table 8: Historical Cultural Heritage within or surrounding the Elaine Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VHI H7722-0050	Elaine Diggings	Archaeological: Mining	No, 2km north
VHI H7722-0061	Elaine Well	Archaeological: Domestic	No, 600m west
VHI D7722-0062	Elaine Dry Stone Wall 1	Archaeological: Dry Stone Wall	No, 1km north
VHI D7722-0063	Elaine Dry Stone Wall 2	Archaeological: Dry Stone Wall	No, 1km north
VHI D7722-0064	Elaine Blue Stone Quarry Complex	Archaeological: Quarry	No, 1km north

Heritage Act 1995

There are no sites listed on the Victorian Heritage Register or Victorian Heritage Inventory within the study area.

Planning and Environment Act 1987

There are no heritage sites of local significance listed on the Heritage Overlay under the Moorabool Shire Council Planning Scheme within the study area.

5.3 Legislative and Policy Implications

5.3.1 Extractive Industry

There are no current mining licenses or extractive industry tenements within the study area (DSDBI 2014) (Figure 6).

5.3.2 Wind Farms

There is one approved wind farm, the proposed Lal Lal Wind Farm, less than two kilometres north-west of the study area (Figure 6). No wind farms were recorded during the field assessment.

5.3.3 Intensive Agriculture

The predominant land use within the settlement is agricultural grazing. There is no evidence of intensive agriculture within the study area.

5.3.4 Schedule of Licenced Premises

The study area does not include any EPA licences (EPA 2014).

5.4 Bushfire Risk

Based upon aerial photography, extant EVC mapping and the results of the field assessment, the bushfire Risk for Elaine is low (Tables 2 and 4), given:

- the study area contains predominantly grassland vegetation, with some areas of woodland to the west of the study area (Figure 3);
- The landscape is predominantly flat plains and gentle slopes of 0-5°, however, some area of >5-10° slopes are present;
- Extreme bushfire behaviour is not possible and the type and extent of vegetation is unlikely to result in neighbourhood scale destruction of property; and,
- Access and escape routes are available to the north, south, east and west, which includes a major highway and limited tree cover along all routes.

5.5 Summary

Native vegetation within Elaine is limited to small fragmented patches and scattered trees. It is considered unlikely that any vegetation meets the diagnostic characteristics and condition thresholds of nationally listed ecological communities.

There is a low likelihood that nationally significant flora or fauna species occur within the study area.

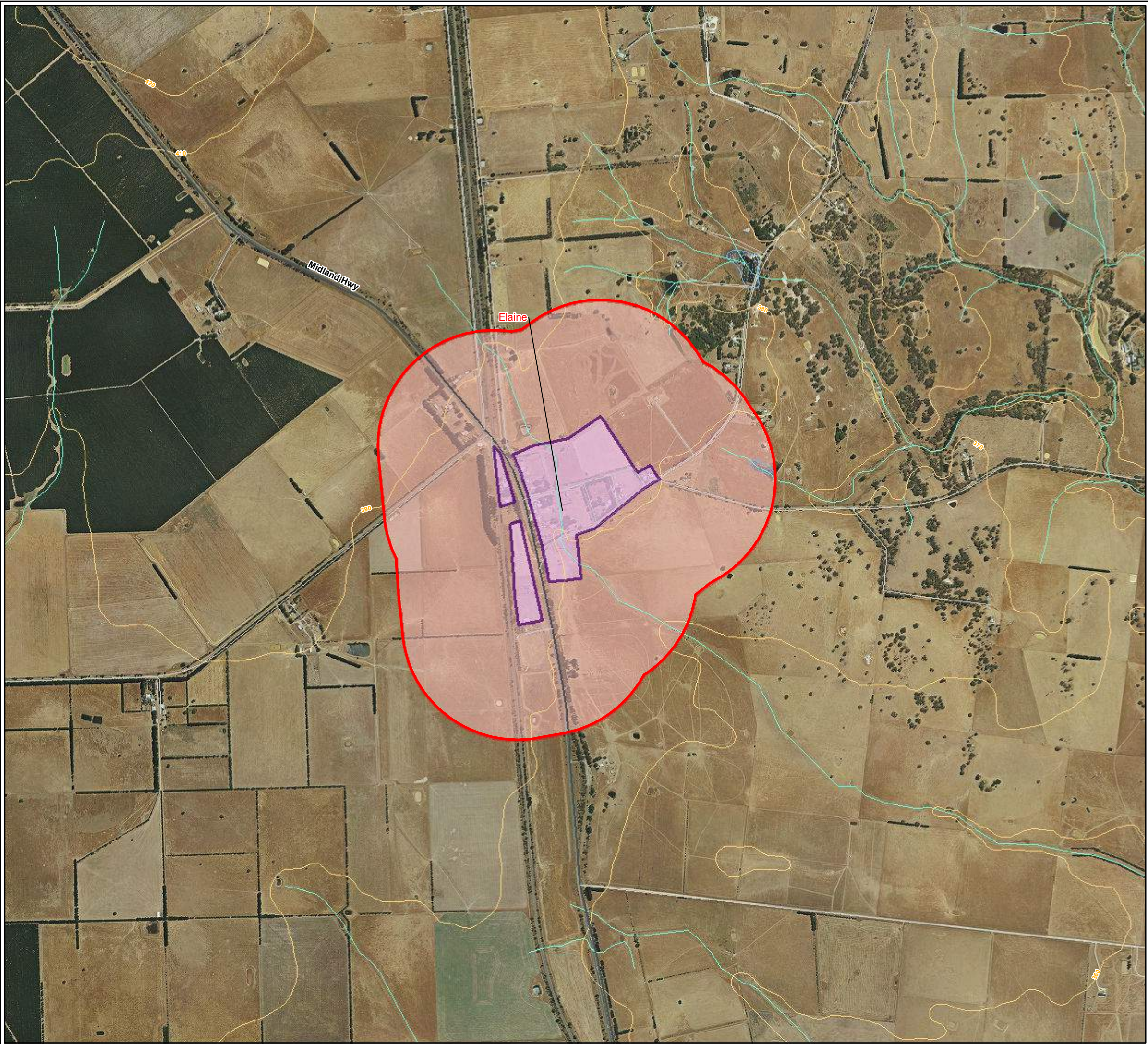
A mandatory Cultural Heritage Management Plan would not be required for future development; however, it is considered likely that Aboriginal heritage is located in the study area. There are no listed historical heritage sites within the study area.

There is one approved wind farm, the proposed Lal Lal Wind Farm, less than two kilometres north-west of the study area.

The bushfire risk for Elaine is Low.

5.6 Recommendations

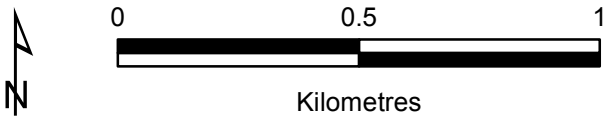
In order to mitigate degradation of environmental values it is recommended that opportunities are investigated to protect remaining remnant vegetation patches along road and rail reserves through planning controls (e.g. Environmental Significance Overlays/Vegetation Protection Overlays).



Legend

- Priority A Settlement
 - Township Zone
 - Contour (10m)
- Roads**
- Major Road
 - Minor Road
- Water**
- Minor Watercourse
 - Land Subject to Inundation

Figure 2 -Elaine
Physical features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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.
Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

- Priority A Settlement
- Township Zone

Ecological Vegetation Class (2005)

- Plains Grassland
- Plains Grassy Woodland

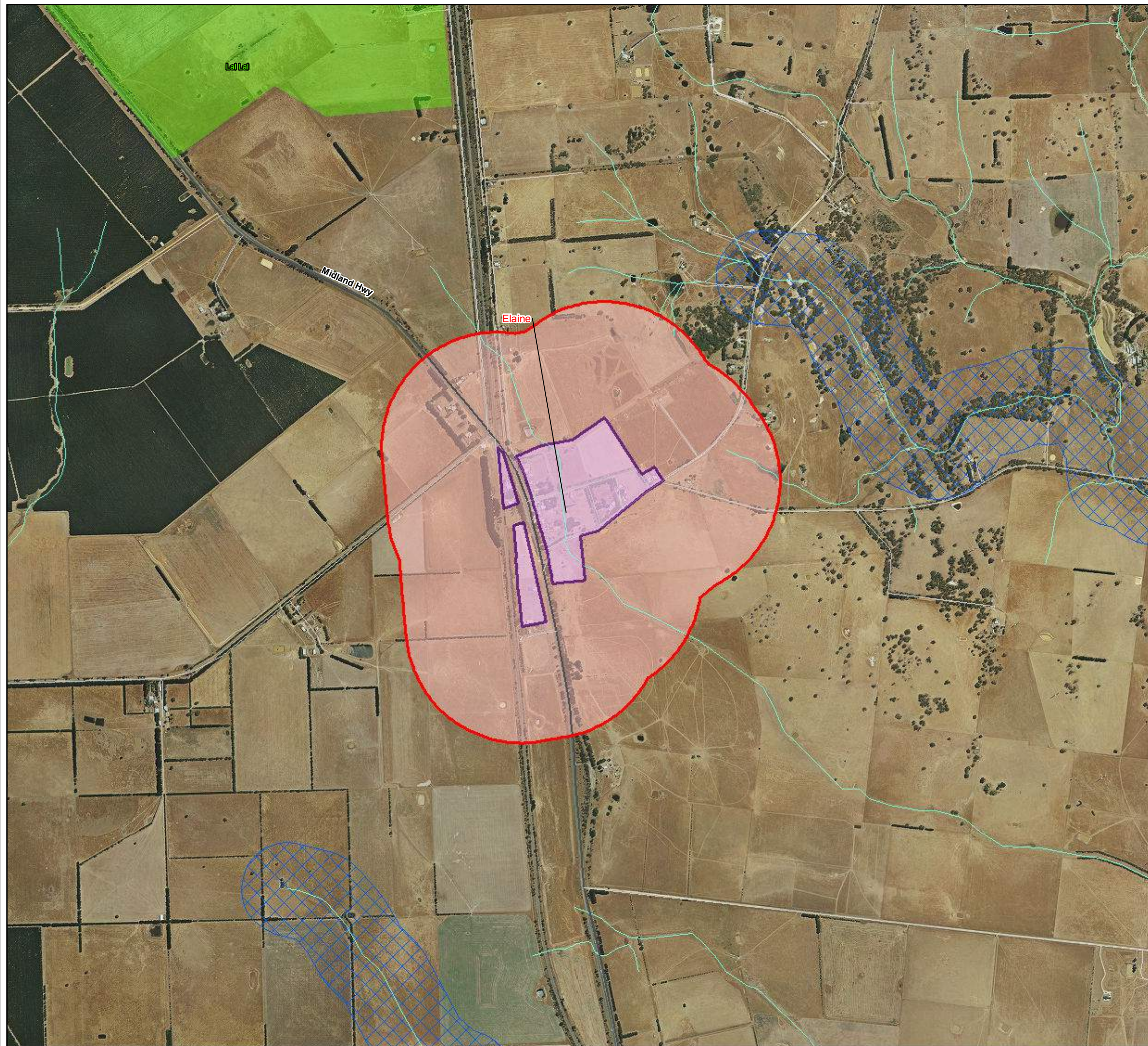
Significant Flora Records

- ★ Button Wrinklewort
- Spiny Rice-flower

Figure 3 -Elaine
Constraining ecological features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



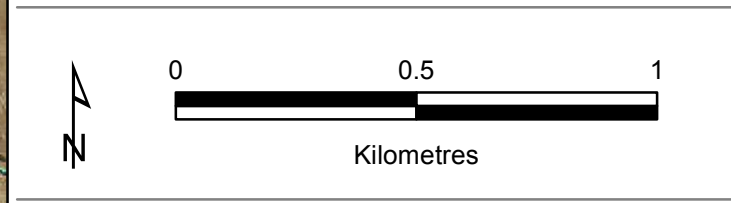
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.
Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

- Priority A Settlement
- Township Zone
- Cultural Heritage**
- Areas of Cultural Heritage Sensitivity
- Wind Farm**
- Approved

Figure 4 -Elaine
Constraining Aboriginal Heritage features, Extractive Licenses and Wind Farms within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority A

Ecological Vegetation Classes

Grassy Woodland

Scattered Trees

Watercourse

Minor Watercourse

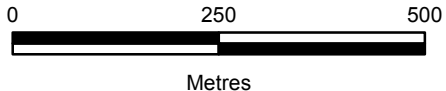
Water Area

Land Subject to Inundation

Figure 5 -Elaine

Ecological features recorded during the field assessment

*Environmental Assessment Project
Moorabool Shire Council*



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APPENDIX 1 – FLORA DATABASE RESULTS

Table A1 Significant flora recorded within 10 kilometres of the study area

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.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
NATIONAL SIGNIFICANCE							
# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	L	v	5
# <i>Dianella amoena</i>	Matted Flax-lily	1	2009	EN	L	e	4
# * <i>Glycine latrobeana</i>	Clover Glycine	5	2007	VU	L	v	5
# <i>Lachnagrostis adamsonii</i>	Adamson's Blown-grass	-	-	EN	L	v	5
# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	2	2010	CR	L	e	3
# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	-	-	EN	L	e	5
<i>Rutidosia leptorhynchoidea</i>	Button Wrinklewort	2	1984	EN	L	e	3
# <i>Thelymitra matthewsii</i>	Spiral Sun-orchid	-	-	VU	L	v	5
# <i>Xerochrysum palustre</i>	Swamp Everlasting	-	-	VU	L	v	4
STATE SIGNIFICANCE							
* <i>Cardamine gunnii</i> s.s.	Tuberous Bitter-cress	1	1883	-	L	x	5
* <i>Cardamine paucijuga</i> s.s.	Annual Bitter-cress	1	1982	-	-	v	5
<i>Cardamine tenuifolia</i>	Slender Bitter-cress	1	1770	-	-	k	5
<i>Eucalyptus yarraensis</i>	Yarra Gum	26	2011	-	-	r	5
<i>Grevillea chrysophaea</i>	Golden Grevillea	1	1770	-	-	r	5
<i>Grevillea steiglitziana</i>	Brisbane Range Grevillea	4	1992	-	-	r	5
<i>Hypoxis vaginata</i> var. <i>brevistigmata</i>	Yellow Star	2	2002	-	-	k	5
<i>Lachnagrostis robusta</i>	Salt Blown-grass	1	1996	-	-	r	4
* <i>Lomandra micrantha</i> subsp. <i>tuberculata</i>	Small-flower Mat-rush	1	1884	-	-	r	5

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>Lepidium pseudohyssopifolium</i>	Native Peppercress	1	1990	-	-	k	5
* <i>Lotus australis</i> var. <i>australis</i>	Austral Trefoil	1	1884	-	-	k	4
* <i>Nicotiana suaveolens</i>	Austral Tobacco	1	1883	-	-	r	5
<i>Olearia tubuliflora</i>	Rayless Daisy-bush	1	1770	-	-	r	5
<i>Poa amplexicaulis</i>	Red-sheath Tussock-grass	1	2011	-	-	r	5
<i>Pultenaea graveolens</i>	Scented Bush-pea	1	1885	-	L	v	5
* <i>Ranunculus papulentus</i>	Large River Buttercup	1	1883	-	-	k	5
<i>Rhagodia parabolica</i>	Fragrant Saltbush	2	1885	-	-	r	5
* <i>Senecio longicollaris</i>	Riverina Fireweed	1	1884	-	-	v	5
<i>Westringia glabra</i>	Violet Westringia	1	1982	-	-	r	5

Data source: Victorian Biodiversity Atlas (DEPI 2014; Protected Matters Search Tool (DoE 2015).

Taxonomic order: Alphabetical.

APPENDIX 2 – SIGNIFICANT FAUNA SPECIES

Table A2. Significant fauna within 10 kilometres of the study area.

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

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 (DEPI 2013b); 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

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
Growling Grass Frog	<i>Litoria raniformis</i>	1962	4	VU	EN	L	VU	3
Golden Sun Moth	<i>Synemon plana</i>	2011	4	CR	CR	L	-	3
# Australasian Bittern	<i>Botaurus poiciloptilus</i>	-	-	EN	EN	L	VU	4
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	4
# Australian Painted Snipe	<i>Rostratula australis</i>	-	-	VU	CR	L	VU	4
# Dwarf Galaxias	<i>Galaxiella pusilla</i>	-	-	VU	VU	L	VU	4
# Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	-	-	VU	VU	L	VU	3
# Regent Honeyeater	<i>Anthochaera phrygia</i>	-	-	EN	CR	L	EN	4
# Striped Legless Lizard	<i>Delma impar</i>	-	-	VU	EN	L	VU	4
# Swift Parrot	<i>Lathamus discolor</i>	-	-	EN	EN	L	EN	4
STATE SIGNIFICANCE								
Brush-tailed Phascogale	<i>Phascogale tapoatafa tapoatafa</i>	2005	3	-	VU	L	NT	4
Brolga	<i>Grus rubicunda</i>	2008	3	-	VU	L	-	3
Greater Glider	<i>Petauroides volans</i>	1969	2	-	VU	-	-	4
Musk Duck	<i>Biziura lobata</i>	1987	1	-	VU	-	-	4
Hardhead	<i>Aythya australis</i>	2001	4	-	VU	-	-	3
Grey Goshawk	<i>Accipiter novaehollandiae novaehollandiae</i>	2008	1	-	VU	L	-	2
Masked Owl	<i>Tyto novaehollandiae novaehollandiae</i>	1995	1	-	EN	L	NT	3
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	1979	5	-	NT	-	NT	4
Crested Bellbird	<i>Oreoica gutturalis gutturalis</i>	1800	1	-	NT	L	NT	4
Tussock Skink	<i>Pseudemoiapagenstecheri</i>	2008	7	-	VU	-	-	2

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Brown Toadlet	<i>Pseudophryne bibronii</i>	1978	1	-	EN	L	DD	4
Otway Burrowing Cray	<i>Engaeus fultoni</i>	1963	1	-	VU	-	-	4
Hairy Burrowing Cray	<i>Engaeus sericatus</i>	2008	1	-	VU	-	-	2

Data source: Victorian Biodiversity Atlas (DEPI 2014); Victorian Fauna Database (Viridans 2013b); Protected Matters Search Tool (DoE 2015).

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

6 MYRNIONG

6.1 Introduction

Myrniong is a small town approximately 10 kilometres east of Ballan, containing approximately 78 dwellings (Figure 1a). Myrniong is located along the Old Western Highway, adjacent the Western Freeway.

6.2 Physical Attributes of the Settlement

6.2.1 Landscape

The Myrniong study area occurs within the Central Victorian Uplands bioregion and falls within the jurisdiction of the Port Phillip and Westernport CMA (DELWP 2015b) (Figure 1b).

Myrniong is located beside the Myrniong Creek. A few small artificial waterbodies (farm dams) are located along creeklines and within grazing paddocks (DELWP 2015a) (Figure 2).

According to the DELWP Victorian Water Resources map (2015c), there are no salinity prone areas or Erosion Management Overlays within the study area. No salinity or erosion effected areas were recorded during the field assessment.

6.2.2 Flora and Fauna

6.2.2.1 Existing Conditions

Ecological Vegetation Classes

According to the DELWP pre-1750 EVC mapping (DELWP 2015b), the study area was likely to support Grassy Woodland (EVC 55), with Creekline Herb-rich Woodland (EVC 164) along the Myrniong Creek. Based on extant vegetation mapping, small fragmented patches of these EVCs are likely to be persisting within the study area (Figure 3).

No remnant vegetation patches were recorded within the study area during the site assessment. A small number of Scattered Trees (14) were recorded along roadsides, creeklines and within paddocks (Figure 5).

Dominant flora species

Scattered trees within the study area comprised of Eurabbie *Eucalyptus globulus* subsp. *bicostata* and Scentbark *Eucalyptus aromaphloia*.

Weeds present predominantly comprised pasture grasses (e.g. Cocksfoot *Dactylis glomerata*, Toowoomba Canary Grass *Phalaris aquatica*, Wild Oats *Avena fatua*), however African Boxthorn *Lycium ferocissimum* and Gorse *Ulex europaeus* was also present along roadsides and creeklines.

Fauna Habitat

The study area supports six broad habitat types, woodland, scattered trees, ephemeral creeklines, artificial waterbodies (farm dams), introduced grasslands and planted vegetation.

Woodland and scattered trees within the study area provides habitat to a range of native fauna, including birds, possums and microbats. Many of the Eucalypts recorded in this area are large, likely to contain hollows, and provide fruitful nectar yields that would attract a large number of native bird species in the immediate area. Scattered woodland remnants are also likely to facilitate fauna movement between habitats throughout the otherwise cleared landscape.

Ephemeral creeklines are likely to provide occasional habitat for common frog species. However, due to the variability in water levels, few fish or frog species are likely to use this habitat on a permanent basis.

Artificial waterbodies within the study area are likely to support occasional foraging habitat for common wetland species, including frogs, ducks and wading birds.

Introduced grassland and planted vegetation provide foraging resources for species adapted to modified environments such as Magpies, wattlebirds, and honeyeaters. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills, and fantails for nesting and foraging purposes.

6.2.2.2 Significant species and ecological communities

EPBC Act listed Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoE 2015):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain;
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains; and,
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Based on the results of the site assessment and landscape context, nationally listed ecological communities are unlikely to occur within the study area.

FFG Act listed Ecological Communities

According to the DELWP Biodiversity Interactive Map (DELWP 2015b), no state significant ecological communities are predicted to occur within the study area and based on the results of the site assessment, none are likely to occur.

Nationally Significant Flora

The VBA and FIS contain records of three nationally listed flora species previously recorded within 10 kilometres of the study area; Sunshine Diuris *Diuris fragrantissima*, Trailing Hop-bush *Dodonaea procumbens* and Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens* (DEPI 2014; Viridans 2013a; Appendix 1; Figure 3). The PMST nominated an additional eight nationally significant species which have not been recorded in the locality but have the potential to occur (DoE 2015).

Based on habitat within the study area, landscape context and the proximity of previous records, nationally significant flora species are unlikely to occur within the study area (Appendix 1).

State Significant Flora

The VBA and FIS contain records of 43 state significant flora species within 10 kilometres of the study area (DEPI 2014; Viridans 2013a) (Appendix 1; Figure 3).

Based on habitat within the study area, landscape context and the proximity of previous records, several state significant flora species may occur within the study area (Appendix 1), including Bacchus Marsh Wattle *Acacia rostriformis*, Tough Scurf-pea *Cullen tenax* and Melbourne Yellow-gum *Eucalyptus leucoxylon* subsp. *connata*.

Nationally Significant Fauna

The VBA and AVW contain records of two nationally listed fauna species previously recorded within 10 kilometres of the study area; Swift Parrot *Lathamus discolor* and Growling Grass Frog *Litoria raniformis* (DEPI 2014; Viridans 2013b; Appendix 2; Figure 3). The PMST nominated an additional 12 nationally significant species which have not been recorded in the locality but have the potential to occur due to the presence of suitable habitat (DoE 2015).

Based on previous records, extant EVC mapping and associated habitat within the study area, there is potential for one (albeit low likelihood) nationally significant fauna species to occur within the study area, Growling Grass Frog, as suitable habitat is present.

State Significant Fauna

The VBA and AVW contain records of 15 State significant fauna species within 10 kilometres of the study area (DEPI 2014; Viridans 2013b) (Appendix 2; Figure 4).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, six state significant fauna species may use habitat within the study area for foraging, purposes including, Diamond Firetail *Stagonopleura guttata*, Tussock Skink *Pseudemoia pagenstecheri*, Hooded Robin *Melanodryas cucullata cucullata*, Brown Treecreeper *Climacteris picumnus victoriae*, Eastern Great Egret *Ardea modesta* and Black Falcon *Falco subniger*.

A number of more mobile species (principally bird species) may pass over the study area en-route to more preferred habitats on an occasional basis. There is a low likelihood that other EPBC Act or State listed species reside within the study area on a permanent basis as there is no suitable habitat or they are presumed to be extinct in the local area (Appendix 2).

6.2.3 Cultural Heritage

6.2.3.1 Aboriginal Cultural Heritage

There are no registered Aboriginal archaeological places within the study area, and six sites registered within the surrounding 2km (Table 9; Figure 4). These comprise one artefact scatter and five isolated occurrences up to two artefacts, including cores and flakes manufactured from quartzite, trachyte, silcrete, quartz. All six sites were identified within 200m of the Myrning River.

Table 9: Aboriginal Cultural Heritage within or surrounding the Myrniong Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VAHR 7722-0678	W. James Whyte Island Reserve 1	Artefact Scatter	No, 1.5km south
VAHR 7722-0679	W. James Whyte Island Reserve 2	Isolated Artefact	No, 1.5km south
VAHR 7722-0680	W. James Whyte Island Reserve 3	Isolated Artefact	No, 1.5km south
VAHR 7722-0681	W. James Whyte Island Reserve 4	Isolated Artefact	No, 1.5km south
VAHR 7722-0682	W. James Whyte Island Reserve 5	Isolated Artefact	No, 1.5km south
VAHR 7722-0683	W. James Whyte Island Reserve 6	Isolated Artefact	No, 1.5km south

There is one area of Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, within the study area (Figure 4). Under Regulation 23(1) land within 200 metres of a named waterway is classified as being of Cultural Heritage Sensitivity. The following areas of sensitivity were identified within the study area.

- Myrniong Creek.

Aboriginal Heritage Act 2006

It is considered likely that Aboriginal heritage will be found in the study area. This conclusion is derived from the likelihood of areas of unmodified land in close proximity to waterways. A CHMP is used to assess the Aboriginal heritage and manage any heritage in the context of an impact such as a subdivision activity. Under Regulation 23, the study area is within an area of Cultural Heritage Sensitivity as it is located within 200 m of a waterway. Therefore, any future development within the above named areas of Cultural Heritage Sensitivity will require a mandatory CHMP.

6.2.3.2 Historical Cultural Heritage

Ten sites are listed on the Moorabool Shire Council Heritage Overlay within the study area, and two within the surrounding 2km (Table 10).

Table 10: Historical Cultural Heritage within or surrounding the Myrniong Study Area

Register & Site Number	Site Name	Site Type	Within study area?
HO181	Christ Church Anglican Church, Hardy Street	Built: Community	Yes
HO183	Avenue of Honour (WWI and WWII sections), Main Road (Old Western Highway)	Tree Planting	Yes
HO184	Myrniong Road Bridge, Main Road (Old Western Highway)	Built: Infrastructure	Yes
HO185	Plough Inn Hotel, 17 Main Road	Built: Commercial	Yes
HO186	Dwelling (Former Police Station and Gaol), 29 Main Street	Built: Residential	Yes
HO187	Dwelling "Girraween", 45 Main Street	Built: Residential	Yes
HO188	Former Myrniong Hotel, 55 Main Street	Built: Commercial	Yes
HO189	Milk Factory and Dwelling- Dairymen's Cooperative, 61 Main Street	Built: Commercial	Yes

HO192	Myrniong Primary School, 13 Muddy Lane	Built: Education	Yes
HO193	Farmhouse "Clifton", 61 Muddy Lane	Built: Residential	Yes
HO21	Uniting Church, Old Western Highway	Built: Community	No, 10m west
HO190	Dwelling "Millside", 90 Mt Blackwood Road	Built: Residential	No, 700m west

Heritage Act 1995

There are no sites listed on the Victorian Heritage Register or Victorian Heritage Inventory within the study area.

Planning and Environment Act 1987

There are ten heritage sites of local significance listed on the Heritage Overlay under the Moorabool Shire Council Planning Scheme within the study area. A planning permit from the Moorabool Shire Council will be required to remove, impact or destroy these sites.

6.3 Legislative and Policy Implications

6.3.1 Extractive Industry

There is one extractive industry tenement (Tag Number WA425) within the study area and several more to the north, east and west of the study area (Figure 6). There are no current mining licenses within the study area (DSDBI 2014).

6.3.2 Wind Farms

Based on aerial photography interpretation and GeoVic – Explore Victoria Online, there are no operating or proposed wind farms within two kilometres of the study area and none were recorded during the field assessment (DSDBI 2014) (Figure 6).

6.3.3 Intensive Agriculture

Based on aerial photography interpretation and the results of the field assessment, the predominant land use within the settlement is rural living and agricultural (grazing). The study does not include any intensive agricultural activities.

6.3.4 Schedule of Licenced Premises

The study area does not include any EPA licences (EPA 2014).

6.4 Bushfire Risk

Based upon aerial photography, extant EVC mapping and results of the field assessment, the bushfire risk for Myrniong is low (Tables 2 and 3), given:

- The study area and surrounding landscape predominantly contains low threat vegetation (managed pasture) with a 0-5° slope and the study area is located 2.5 kilometres from the closest contiguous area of high threat vegetation (Lerderderg Gorge State Park) (Figures 2 and 3);

- Long bushfire runs (>10 kilometres) are possible; however, given the agricultural environment and low number of surface rocks, the surrounding landscape easily accessed for fire fighting purposes; long bushfire runs are therefore unlikely;
- Extreme bushfire behaviour is not possible and the type and extent of vegetation is unlikely to result in neighbourhood scale destruction of property; and,
- Access and escape routes are limited to the east and west along the Old Western Highway, however, this route contains only occasional trees close to the road

6.5 Summary

Native vegetation within Myrniong is restricted to a small number of scattered trees.

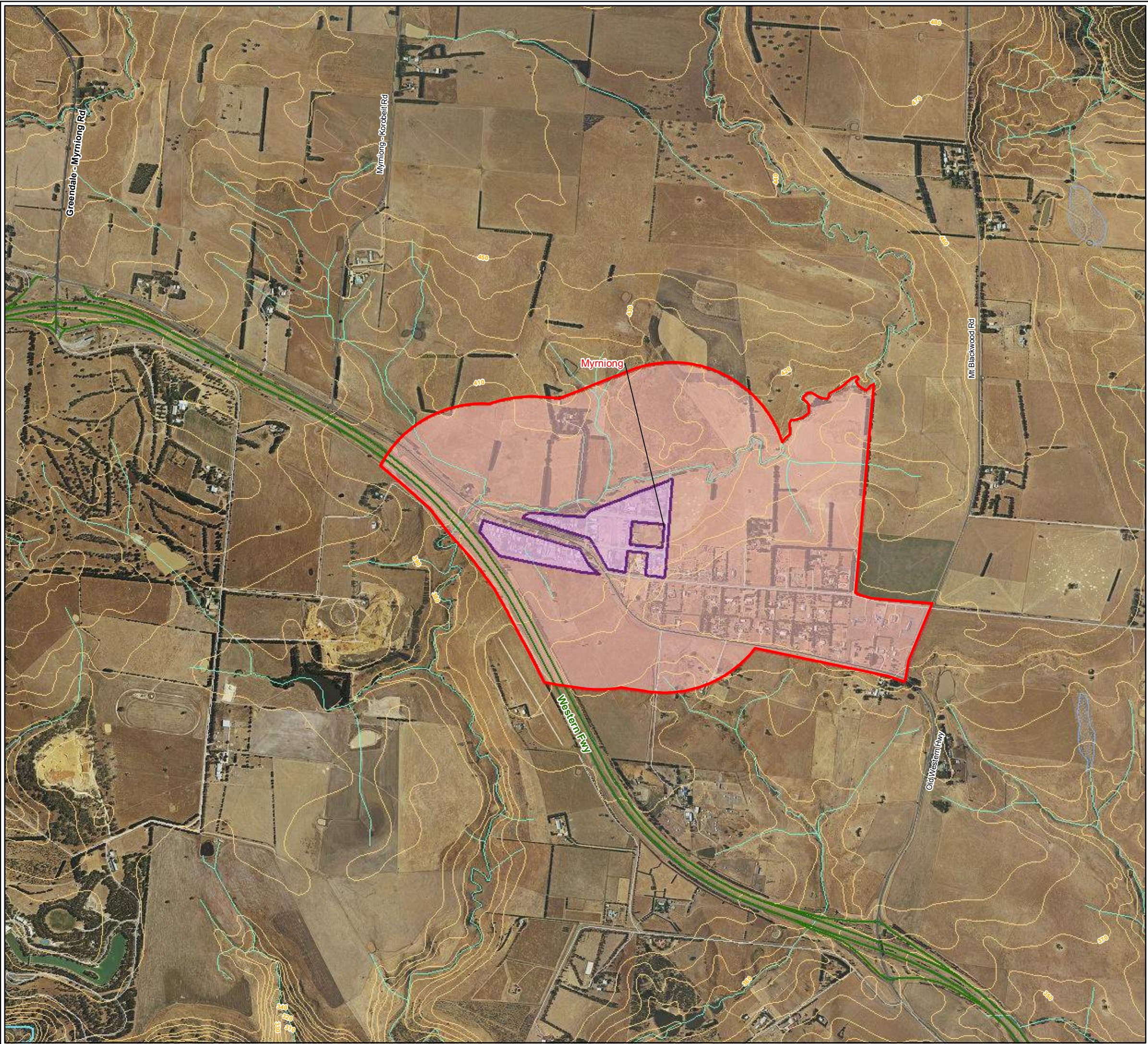
It is unlikely that nationally significant flora species occur within the study area. There is a low likelihood of the nationally significant Growling Frog occurring along creeklines and waterbodies (including farm dams). There is a low likelihood of several state significant flora and fauna species occurring within the study area.

A mandatory Cultural Heritage Management Plan would be required for future development within 200 metres of Myrniong Creek. Ten listed historical heritage sites are located within the study area, including an Avenue of Honour and built residential and community buildings (Table 10).

The bushfire risk for Myrniong is Low.

6.6 Recommendations

In order to mitigate degradation of environmental values, it is recommended that opportunities are investigated to protect remaining native vegetation within the study area (scattered trees) through planning controls (e.g. revision of planning zones or application of Environmental Significance Overlays/Vegetation Protection Overlays).

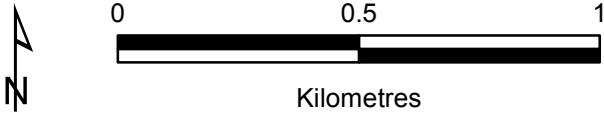


Legend

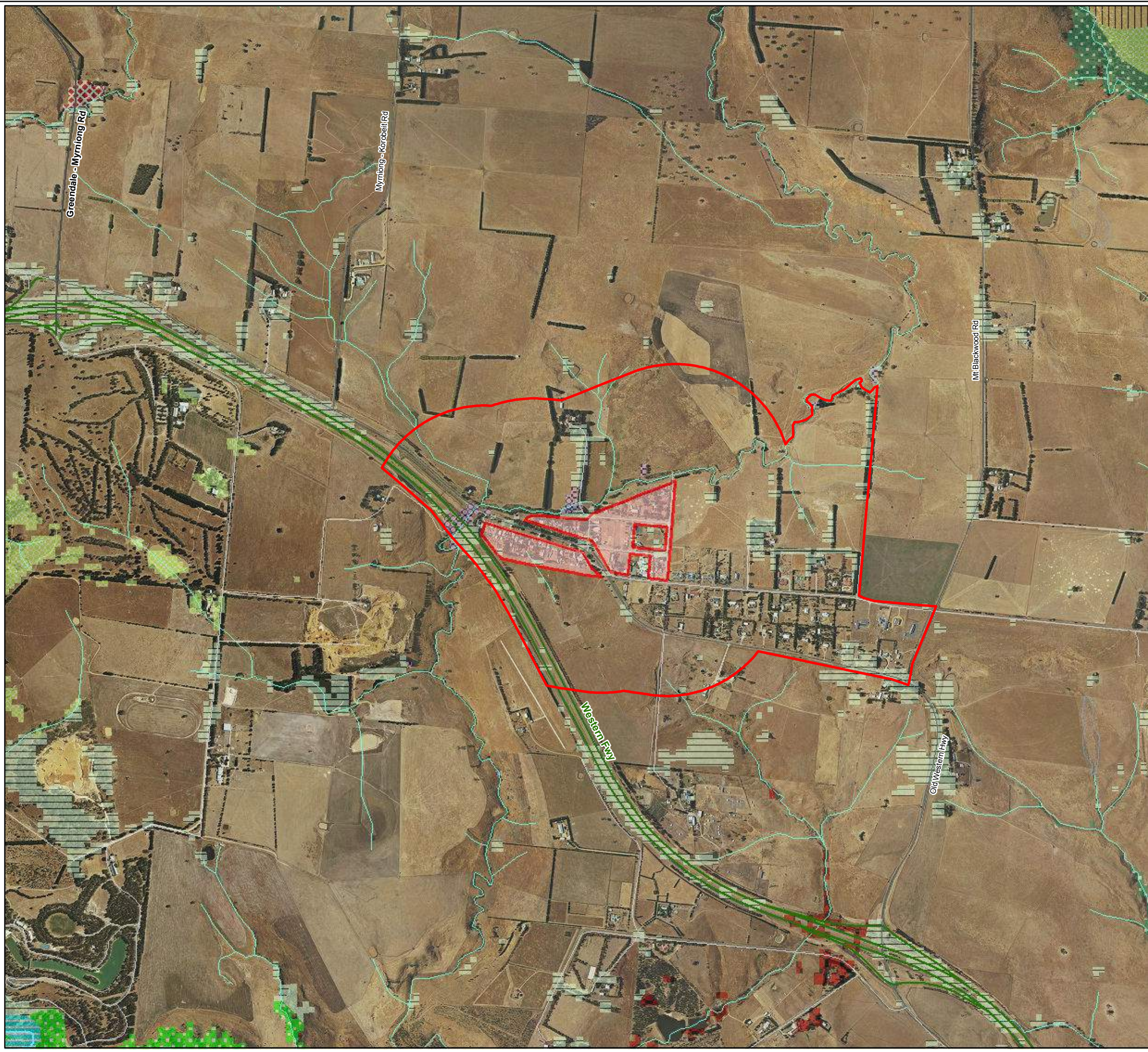
- Priority A Settlement
 - Township Zone
 - Contour (10m)
- Roads**
- Freeway
 - Major Road
 - Collector Road
 - Minor Road
- Water**
- Minor Watercourse
 - Major Watercourse
 - Land Subject to Inundation

Figure 2 -Myrniong

Physical features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



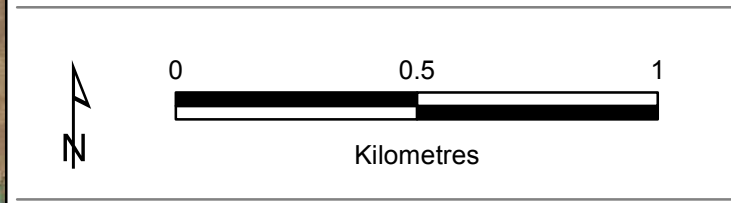
Legend

- Priority A Settlement
- Township Zone

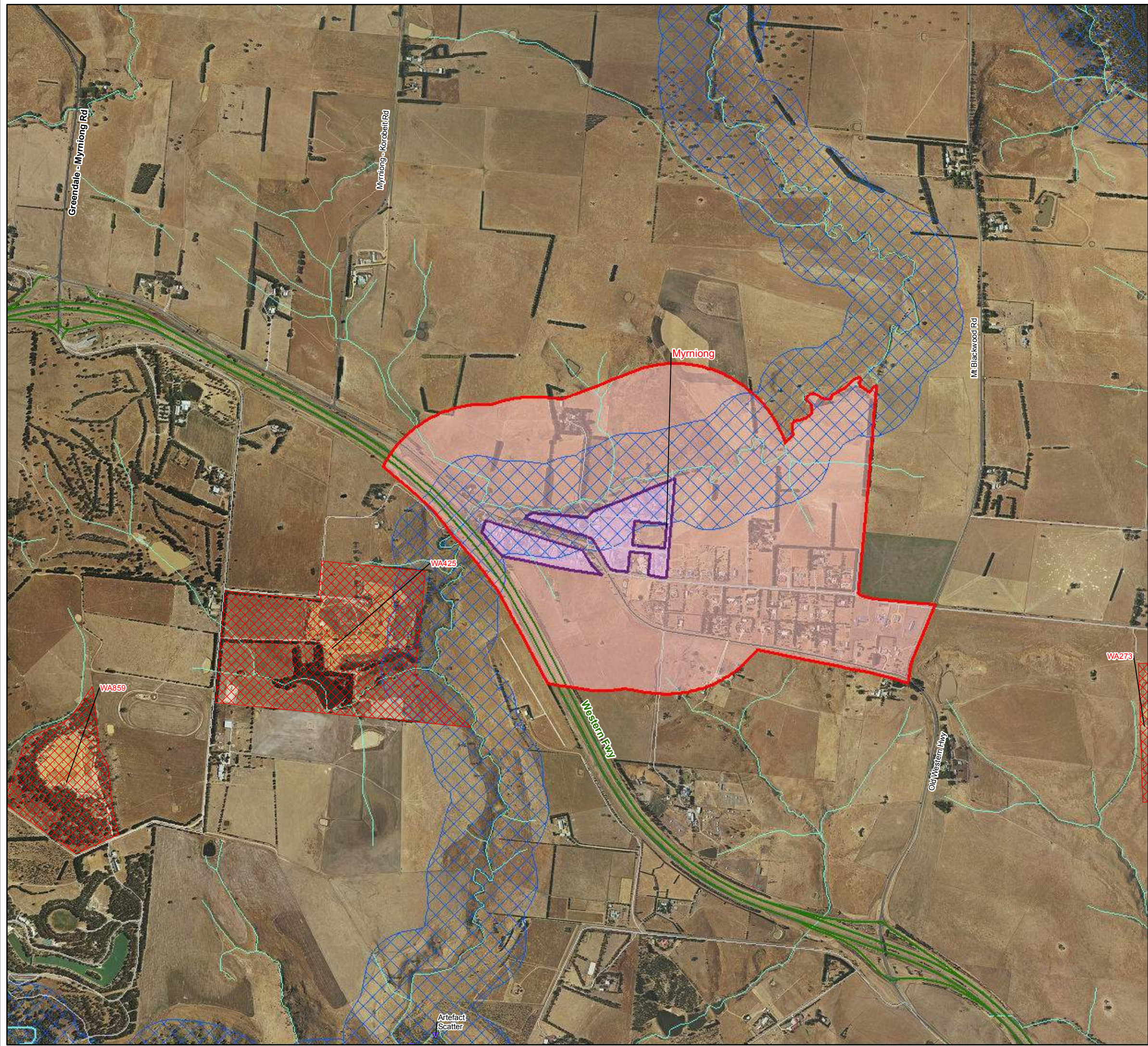
Ecological Vegetation Class (2005)

- Creekline Herb-rich Woodland
- Escarpment Shrubland
- Grassy Dry Forest
- Grassy Woodland
- Heathy Dry Forest
- Herb-rich Foothill Forest
- Plains Grassy Woodland
- Rocky Chenopod Woodland
- Stream Bank Shrubland
- Valley Grassy Forest

Figure 3 -Myrniong
Constraining ecological features within and surrounding the settlement
Environmental Assessment Project
 Moorabool Shire Council



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Legend

Priority A Settlement

Township Zone

Cultural Heritage

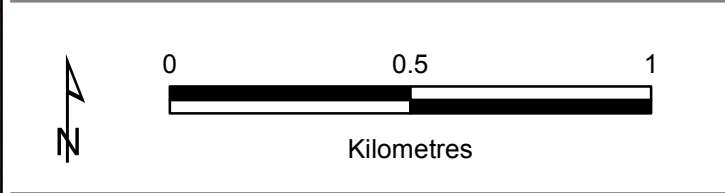
Areas of Cultural Heritage Sensitivity

Artefact Scatter

Mining and Extraction

Current Extractive Industry Tenements

Figure 4 -Myrniong
Constraining Aboriginal Heritage features, Extractive Licenses and Wind Farms within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority A

Ecological Vegetation Classes

Grassy Woodland

Scattered Trees

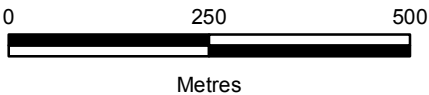
Watercourse

Minor Watercourse

Figure 5 -Myrniong

Ecological features recorded during the field assessment

*Environmental Assessment Project
Moorabool Shire Council*



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

APPENDIX 1 – FLORA DATABASE RESULTS

Table A1 Significant flora recorded within 10 kilometres of the study area

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.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
NATIONAL SIGNIFICANCE							
# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	L	v	5
# <i>Dianella amoena</i>	Matted Flax-lily	-	-	EN	L	e	5
<i>Diuris fragrantissima</i>	Sunshine Diuris	1	1770	EN	L	e	5
# <i>Dodonaea procumbens</i>	Trailing Hop-bush	1	2000	VU	-	v	5
# <i>Glycine latrobeana</i>	Clover Glycine	-	-	VU	L	v	5
# <i>Lepidium hyssopifolium</i>	Basalt Peppercross	-	-	EN	L	e	5
# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	2	2003	CR	L	e	5
# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	-	-	EN	L	e	5
# <i>Senecio psilocarpus</i>	Swamp Fireweed	-	-	VU	-	v	5
# <i>Thelymitra matthewsii</i>	Spiral Sun-orchid	-	-	VU	L	v	5
# <i>Xerochrysum palustre</i>	Swamp Everlasting	-	-	VU	L	v	5
STATE SIGNIFICANCE							
<i>Acacia aspera</i> subsp. <i>parviceps</i>	Rough Wattle	9	2001	-	-	r	5
* <i>Acacia leprosa</i> var. <i>graveolens</i>	Common Cinnamon-wattle	1	1882	-	-	k	5
<i>Acacia rostriformis</i>	Bacchus Marsh Wattle	1	2011	-	-	v	4
<i>Allocasuarina luehmannii</i>	Buloke	1	1980	-	L	-	4
<i>Austrostipa breviglumis</i>	Cane Spear-grass	3	1980	-	-	r	5
<i>Bolboschoenus fluviatilis</i>	Tall Club-sedge	1	1982	-	-	k	5
<i>Boronia anemonifolia</i> subsp. <i>aurifodina</i>	Goldfield Boronia	1	1917	-	-	r	5
* <i>Bossiaea cordigera</i>	Wiry Bossiaea	1	1980	-	-	r	5

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>Calotis lappulacea</i>	Yellow Burr-daisy	2	1910	-	-	r	5
<i>Cardamine papillata</i>	Forest Bitter-cress	1	1898	-	-	r	5
* <i>Clematis decipiens</i>	Slender Clematis	1	1980	-	-	k	5
<i>Cullen tenax</i>	Tough Scurf-pea	1	1853	-	L	e	4
<i>Desmodium varians</i>	Slender Tick-trefoil	3	1980	-	-	k	5
<i>Eucalyptus baueriana</i> subsp. <i>thalassina</i>	Werribee Blue-box	1	1980	-	-	e	5
<i>Eucalyptus leucoxylon</i> subsp. <i>connata</i>	Melbourne Yellow-gum	10	2011	-	-	v	4
<i>Eucalyptus yarraensis</i>	Yarra Gum	1	1996	-	-	r	5
<i>Euphrasia collina</i> subsp. <i>trichocalycina</i>	Purple Eyebright	1	1963	-	-	r	5
<i>Gahnia microstachya</i>	Slender Saw-sedge	7	2001	-	-	r	5
<i>Grevillea steiglitziana</i>	Brisbane Range Grevillea	4	2002	-	-	r	5
<i>Leionema lamprophyllum</i>	Shiny Leionema	1	1980	-	-	r	5
<i>Leionema lamprophyllum</i> subsp. <i>obovatum</i>	Shiny Leionema	1	1976	-	-	r	5
<i>Lepidium pseudohyssopifolium</i>	Native Peppercreess	1	2008	-	-	k	5
<i>Leucopogon microphyllus</i> var. <i>pilibundus</i>	Hairy Beard-heath	5	1995	-	-	r	5
* <i>Lotus australis</i> var. <i>australis</i>	Austral Trefoil	2	1903	-	-	k	5
<i>Maireana aphylla</i>	Leafless Bluebush	7	2006	-	-	k	5
<i>Myoporum montanum</i>	Waterbush	1	1853	-	-	r	5
<i>Nicotiana suaveolens</i>	Austral Tobacco	36	2012	-	-	r	5
<i>Olearia minor</i>	Satin Daisy-bush	1	1929	-	-	r	5

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>Pimelea hewardiana</i>	Forked Rice-flower	2	1963	-	-	r	5
<i>Poa amplexicaulis</i>	Red-sheath Tussock-grass	5	2011	-	-	r	5
<i>Prostanthera decussata</i>	Dense Mint-bush	4	2001	-	-	r	5
<i>Prostanthera nivea</i> var. <i>nivea</i>	Snowy Mint-bush	2	1980	-	-	r	5
<i>Pseudanthus orbicularis</i>	Tangled Pseudanthus	8	2011	-	-	r	5
<i>Pterostylis truncata</i>	Brittle Greenhood	2	2007	-	L	e	5
<i>Pultenaea reflexifolia</i>	Wombat Bush-pea	2	1994	-	-	r	5
<i>Pultenaea weindorferi</i>	Swamp Bush-pea	1	1980	-	-	r	5
<i>Rhagodia parabolica</i>	Fragrant Saltbush	76	2012	-	-	r	5
<i>Sclerolaena muricata</i> var. <i>muricata</i>	Black Roly-poly	2	1998	-	-	k	5
<i>Senecio cunninghamii</i> var. <i>cunninghamii</i>	Branching Groundsel	4	2008	-	-	r	5
<i>Westringia glabra</i>	Violet Westringia	5	1980	-	-	r	5

Data source: Victorian Biodiversity Atlas (DEPI 2014); Protected Matters Search Tool (DoE 2015).

Taxonomic order: Alphabetical.

APPENDIX 2 – SIGNIFICANT FAUNA SPECIES

Table A2. Significant fauna within 10 kilometres of the study area.

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

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 (DEPI 2013b); 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

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
Swift Parrot	<i>Lathamus discolor</i>	2006	3	EN	EN	L	EN	3
Growling Grass Frog	<i>Litoria raniformis</i>	2007	9	VU	EN	L	VU	2
# Australasian Bittern	<i>Botaurus poiciloptilus</i>	-	-	EN	EN	L	VU	4
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	4
# Australian Painted Snipe	<i>Rostratula australis</i>	-	-	VU	CR	L	VU	4
# Dwarf Galaxias	<i>Galaxiella pusilla</i>	-	-	VU	VU	L	VU	4
# Golden Sun Moth	<i>Synemon plana</i>	-	-	CR	EN	L	-	4
# Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	-	-	VU	VU	L	VU	3
# Pink-tailed Worm-Lizard	<i>Aprasia parapulchella</i>	-	-	VU	EN	L	-	4
# Regent Honeyeater	<i>Anthochaera phrygia</i>	-	-	EN	CR	L	EN	4
# Smoky Mouse	<i>Pseudomys fumeus</i>	-	-	EN	CR	L	RA	4
# Spot-tailed Quoll	<i>Dasyurus maculatus</i>	-	-	EN	EN	L	VU	4
# Striped Legless Lizard	<i>Delma impar</i>	-	-	VU	EN	L	VU	3
# Fairy Tern	<i>Sternula nereis</i>	-	-	VU	EN	L	-	4
STATE SIGNIFICANCE								
Brush-tailed Phascogale	<i>Phascogale tapoatafa tapoatafa</i>	1988	3	-	VU	L	NT	4
Greater Glider	<i>Petauroides volans</i>	1969	1	-	VU	-	-	4
Common Bent-wing Bat	<i>Miniopterus schreibersii</i> GROUP	1988	1	-	-	L	CD	3
Diamond Dove	<i>Geopelia cuneata</i>	1905	1	-	NT	L	-	4
White-throated Needletail	<i>Hirundapus caudacutus</i>	1990	3	-	VU	-	-	4
Eastern Great Egret	<i>Ardea modesta</i>	1977	1	-	VU	L	-	2
Black Falcon	<i>Falco subniger</i>	1986	3	-	VU	-	-	2

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Powerful Owl	<i>Ninox strenua</i>	2009	9	-	VU	L	-	4
Barking Owl	<i>Ninox connivens connivens</i>	1987	1	-	EN	L	NT	4
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2006	20	-	NT	-	NT	2
Speckled Warbler	<i>Chthonicola sagittatus</i>	2008	12	-	VU	L	NT	4
Hooded Robin	<i>Melanodryas cucullata cucullata</i>	1986	2	-	NT	L	NT	2
Diamond Firetail	<i>Stagonopleura guttata</i>	2005	6	-	NT	L	NT	2
Tussock Skink	<i>Pseudemoia pagenstecheri</i>	2007	1	-	VU	-	-	2
Brown Toadlet	<i>Pseudophryne bibronii</i>	1990	3	-	EN	L	DD	4

Data source: Victorian Biodiversity Atlas (DEPI 2014); Victorian Fauna Database (Viridans 2013b); Protected Matters Search Tool (DoE 2015).

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).

7 WALLACE

7.1 Introduction

Wallace is a small town approximately 15 kilometres east of Ballarat, containing approximately 65 dwellings (Figure 1a). Wallace is located along the Old Western Highway.

7.2 Physical Attributes of the Settlement

7.2.1 Landscape

The Wallace study area occurs within the Victorian Volcanic Plain bioregion and falls within the jurisdiction of the Corangamite CMA (DELWP 2015b) (Figure 1b).

Wallace is located on flat plains to the west of the Moorabool River West Branch. The study area includes a small number of wetlands and small artificial waterbodies (farm dams) (DELWP 2015a) (Figure 2).

According to the DELWP Victorian Water Resources map (2015c), there are no salinity prone areas or Erosion Management Overlays within the study area. No salinity or erosion effected areas were recorded during the field assessment.

7.2.2 Flora and Fauna

7.2.2.1 Existing Conditions

Ecological Vegetation Classes

According to the DELWP pre-1750 EVC mapping (DELWP 2015b), the study area was likely to support predominantly Plains Grassy Woodland (EVC 55), with Plains Grassy Wetland to the north-west of the settlement centre. Based on extant vegetation mapping, small fragmented areas of these EVCs are likely to be persisting within the settlement (Figure 3).

Two EVCs were recorded during the site assessment, Plains Grassy Woodland (EVC 55) and Plains Grassy Wetland (EVC 125). Plains Grassy Woodland occurred in moderately-small fragmented patches along the Old Western Highway. Large areas of Plains Grassy Wetland were recorded in the floodplain of the Moorabool River – West Branch. A number of scattered trees (approximately 60; Manna Gum *Eucalyptus viminalis* and Swamp Gum *Eucalyptus ovata*) were also present within the study area (Figure 5).

Dominant Flora Species

Plains Grassy Woodland with the study area was dominated by Manna Gum and Swamp Gum over a medium shrub layer of Blackwood *Acacia melanoxylon* and Silver Wattle *Acacia mearnsii*. The understorey was dominated by Hedge Wattle *Acacia paradoxa* and Austral Bracken *Pteridium esculentum*.

Plains Grassy Wetland within the study area was dominated by Swamp Wallaby-grass *Amphibromus* spp. and Rushes *Juncus* spp.

Weeds present predominantly comprised pasture grasses (e.g. Cocksfoot *Dactylis glomerata*, Toowoomba Canary Grass *Phalaris aquatica*, Wild Oats *Avena fatua*). Blackberry *Rubus fruticosus* sp. agg. and Gorse *Ulex europaeus* was also locally abundant along creeklines and fencelines.

Fauna habitat

The study area supports seven broad habitat types, woodland, scattered trees, permanent and ephemeral creeklines, wetlands, artificial waterbodies (farm dams) and introduced grasslands and planted vegetation.

Woodland and scattered trees within the study area provides habitat to a range of native fauna, including birds, possums and microbats. Many of the Eucalypts recorded in this area are large, likely to contain hollows, and provide fruitful nectar yields that would attract a large number of native bird species in the immediate area. Scattered remnants are also likely to facilitate fauna movement between habitats throughout the otherwise cleared landscape.

Permanent creeklines are considered to be of moderate value for fauna. Common native waterbirds, frogs and reptiles are likely to utilise the creek for breeding, foraging, dispersal and cover including Pacific Black Duck, Australian Wood Duck, Eastern Banjo Frog and Common Froglet. Ephemeral creeklines are likely to provide occasional habitat for common frog species. However, due to the variability in water levels, few fish or frog species are likely to use this habitat on a permanent basis.

Wetlands and artificial waterbodies within the study area are likely to support occasional foraging habitat for common wetland species, including frogs, ducks and wading birds. These wetlands also have the potential to support the nationally listed Growling Grass Frog.

Introduced grassland and planted vegetation provide foraging resources for species adapted to modified environments such as Magpies, wattlebirds, and honeyeaters. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills, and fantails for nesting and foraging purposes.

7.2.2.2 Significant species and ecological communities

EPBC Act listed Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoE 2015):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain;
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains; and,
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

The Plains Grassy Woodland EVC was recorded within the study area during the site assessment. This EVC correlates with the nationally listed *Grassy Eucalypt Woodland of the Victorian Volcanic Plain* ecological community, however, Plains Grassy Woodland within the study area failed to meet the condition thresholds that define this community (TSSC 2008).

The Plains Grassy Woodland EVC was recorded within the study area during the site assessment. This EVC correlates with the nationally listed *Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains* ecological community. At the time of the site assessment Plains Grassy Wetland within the study area was considered unlikely to meet the condition thresholds that define this community (TSSC 2012b). However, this assessment was made remotely from adjacent public land and the condition of wetlands change dramatically across seasons. This community may meet the condition thresholds for the *Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains* ecological community if reassessed in the future (Figure 5).

FFG Act listed Ecological Communities

One state significant ecological community was recorded within the study area, *Western Basalt Plains (River Red-gum) Grassy Woodland*. This community is associated with the Plains Grassy Woodland EVC (Figure 5).

Nationally Significant Flora

The VBA and FIS contain records of four nationally listed flora species previously recorded within 10 kilometres of the study area; Adamson's Blown-grass *Lachnagrostis adamsonii*, Basalt Peppercress *Lepidium hyssopifolium*, Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens* and Swamp Fireweed *Senecio psilocarpus* (DEPI 2014; Viridans 2013a; Appendix 1; Figure 3). The PMST nominated an additional five nationally significant species which have not been recorded in the locality but have the potential to occur (DoE 2015).

Based on habitat within the study area, landscape context and the proximity of previous records, several nationally significant flora species may occur within the study area (Appendix 1), including Adamson's Blown Grass, Basalt Peppercress, Swamp Fireweed and Swamp Everlasting.

State Significant Flora

The VBA and FIS contain records of 13 state significant flora species within 10 kilometres of the study area (DEPI 2014; Viridans 2013a) (Appendix 1; Figure 3).

Based on habitat within the study area, landscape context and the proximity of previous records, several state significant flora species may occur within the study area (Appendix 1), including Slender Tick-trefoil *Desmodium varians* and Yarra Gum *Eucalyptus yarraensis*.

Nationally Significant Fauna

The VBA and AVW contain records of two nationally listed fauna species previously recorded within 10 kilometres of the study area; Swift Parrot *Lathamus discolor* and Growling Grass Frog *Litoria raniformis* (DEPI 2014; Viridans 2013b; Appendix 2; Figure 4a). The PMST nominated an additional nine nationally significant species which have not been recorded in the locality but have the potential to occur due to the presence of suitable habitat (DoE 2015).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, two nationally significant fauna species, Grey-headed Flying Fox *Pteropus poliocephalus* and Growling Grass Frog, have the potential to occur within the study area as suitable habitat is present (Appendix 2; Figures 2a and 4a).

State Significant Fauna

The VBA and AVW contain records of 19 state significant fauna species within 10 kilometres of the study area (DEPI 2014; Viridans 2013b) (Appendix 2; Figure 4a).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, four state significant fauna species may use habitat within the study area for foraging, purposes including Tussock Skink *Pseudemoia pagenstecheri*, Grey Goshawk *Accipiter novaehollandiae novaehollandiae*, Black Falcon *Falco subniger* and Hardhead *Aythya australis* (Appendix 2; Figures 2a and 4a).

A number of more mobile species (principally bird species) may pass over the study area en-route to more preferred habitats on an occasional basis. There is a low likelihood that other nominated EPBC Act and State listed species reside within the study area on a permanent basis as there is no suitable habitat or they are presumed to be extinct in the local area (Appendix 2).

7.2.3 Cultural Heritage

7.2.3.1 Aboriginal Cultural Heritage

There are no registered Aboriginal archaeological places within the study area, or the surrounding 2km.

There are no areas of Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, within the study area. Moorabool River West Branch, and area of Cultural Heritage Sensitivity, passes 250m east of the study area, and Lal Lal Creek, also an area of Cultural Heritage Sensitivity, starts 500m west of the study area.

Aboriginal Heritage Act 2006

As the study area is not located within an area of Cultural Heritage Sensitivity, a mandatory Cultural Heritage Management Plan (CHMP) would not be required for future development.

However, it is considered likely that Aboriginal heritage is located in the study area. This conclusion is derived from the proximity of two areas of Cultural Heritage Sensitivity to the study area. It is recommended preliminary cultural heritage investigation or a voluntary CHMP be undertaken prior to development in the study area.

7.2.3.2 Historical Cultural Heritage

There are no historical cultural heritage sites listed within the study area, or the surrounding 2km.

Heritage Act 1995

There are no sites listed on the Victorian Heritage Register or Victorian Heritage Inventory within the study area.

Planning and Environment Act 1987

There are no heritage sites of local significance listed on the Heritage Overlay under the Moorabool Shire Council Planning Scheme within the study area.

7.3 Legislative and Policy Implications

7.3.1 Extractive Industry

There are no current mining licenses or extractive industry tenements within the study area (DSDBI 2014) (Figure 6).

7.3.2 Wind Farms

Based on aerial photography interpretation and GeoVic – Explore Victoria Online, there are no operating or proposed wind farms within two kilometres of the study area and none were recorded during the site assessment (DSDBI 2014) (Figure 6).

7.3.3 Intensive Agriculture

Based on aerial photography interpretation and the results of the site assessment, the predominant land use within the settlement is rural living and agriculture (grazing). The study does not include any intensive agricultural activities.

7.3.4 Schedule of Licenced Premises

The study area does not include any EPA licences (EPA 2014).

7.4 Bushfire Risk

Based upon aerial photography, extant EVC mapping and results of the field assessment, the bushfire risk for Wallace is low (Tables 2 and 3), given:

- The study area and surrounding landscape predominantly contains low threat vegetation (crops and managed pasture) with a 0-5° slope and the study area is 4.5 kilometres from the closest contiguous area of high threat vegetation (forest or woodland vegetation within the Wombat State Forest) (Figures 2 and 3);
- Long bushfire runs (>10 kilometres) are possible; however, given the agricultural environment and low number of surface rocks, the surrounding landscape easily accessed for fire fighting purposes; long bushfire runs are therefore unlikely;
- Extreme bushfire behaviour is not possible and the type and extent of vegetation is unlikely to result in neighbourhood scale destruction of property; and,
- There are at least four access or escape routes from Wallace, to the north, east, south and west, with direct access to a major freeway to the east and west. All routes predominantly contain low threat vegetation to places that provide shelter from bushfire.

7.5 Summary

Native vegetation within Wallace is restricted to the floodplain of the Moorabool River and the Old Western Highway road reserve, in addition to scattered trees throughout the study area.

Areas of Plains Grassy Wetland did not meet the condition thresholds for the nationally listed *Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains* ecological community at the time of assessment. However, it may meet the condition thresholds if reassessed during different conditions. The state significant *Western Basalt Plains (River Red-gum) Grassy Woodland* ecological community was recorded within the study area along the Old Western Highway.

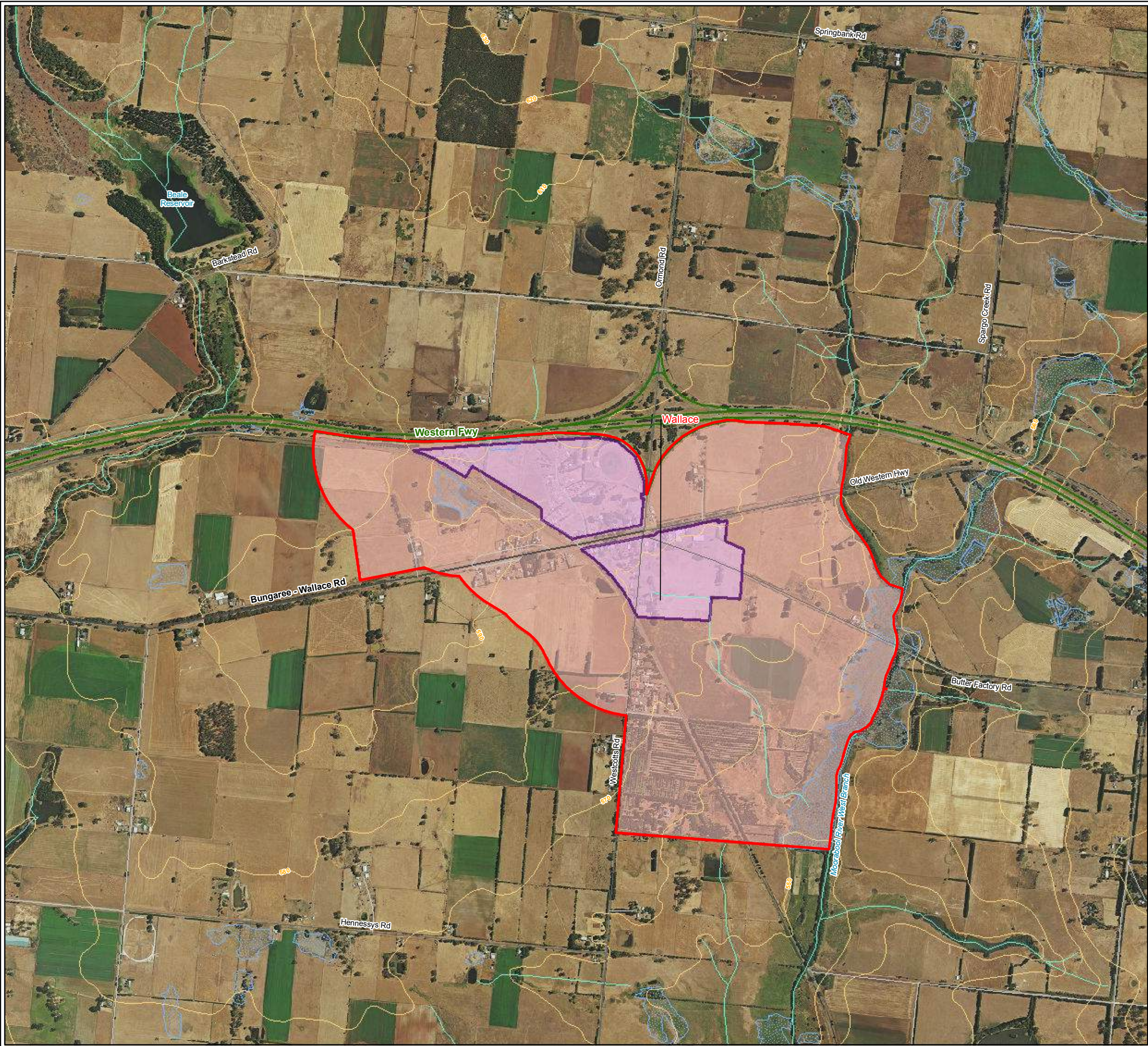
Several nationally significant flora and fauna may occur within the study area, including Adamson's Blown Grass, Basalt Peppercreess, Swamp Fireweed, Swamp Everlasting, Grey-headed Flying Fox and Growling Grass Frog. Habitat is also present for several state significant flora and fauna species.

A mandatory Cultural Heritage Management Plan would not be required for future development; however, it is considered likely that Aboriginal heritage is located in the study area. No listed historical heritage sites are located within the study area.

The bushfire risk for Wallace is Low.

7.6 Recommendations

In order to mitigate degradation of environmental values, it is recommended that opportunities are investigated to protect remnant vegetation (Plains Grassy Woodland, Plains Grassy Wetland and scattered trees) through planning controls (e.g. revision of planning zones or application of Environmental Significance Overlays/Vegetation Protection Overlays).



Legend

- Priority A Settlement
- Township Zone
- Contour (10m)

Roads

- Freeway
- Major Road
- Collector Road
- Minor Road

Water

- Minor Watercourse
- Land Subject to Inundation

Figure 2 -Wallace

Physical features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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.
Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority A Settlement

Township Zone

Ecological Vegetation Class (2005)

Creekline Herb-rich Woodland

Herb-rich Foothill Forest

Plains Grassy Wetland

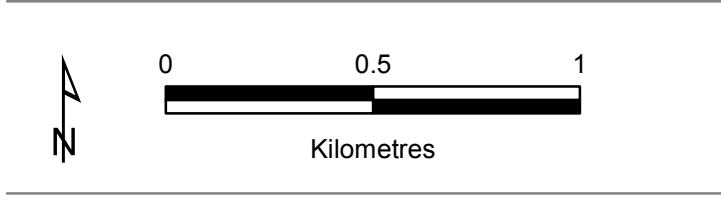
Plains Grassy Woodland

Plains Sedgy Wetland

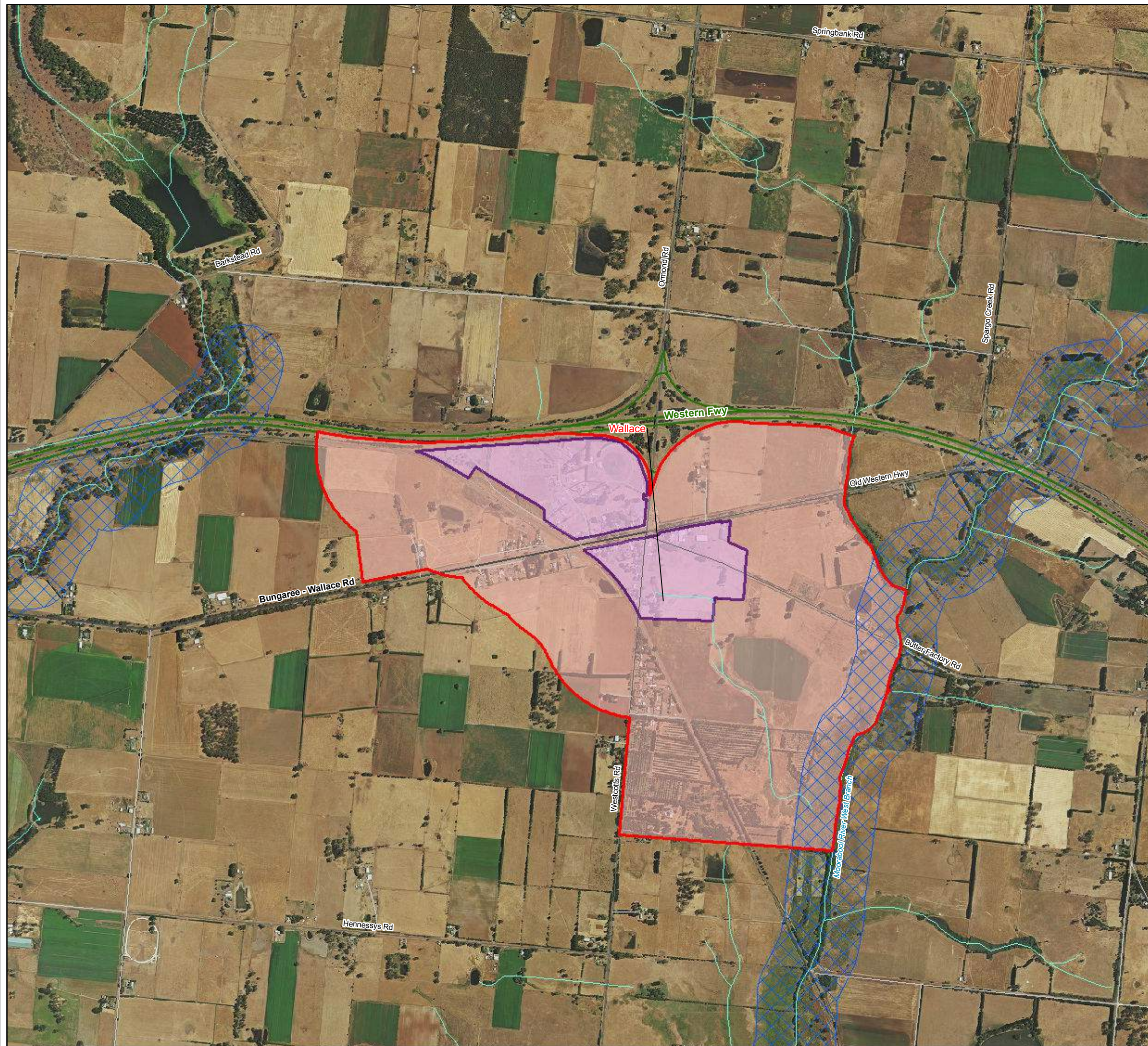
Significant Fauna Records

Blue-billed Duck

Figure 3 -Wallace
Constraining ecological features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



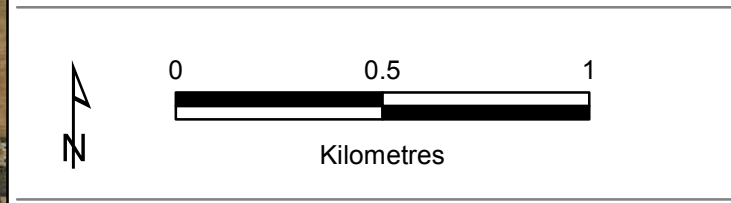
Legend

- Priority A Settlement
- Township Zone

Cultural Heritage

- Areas of Cultural Heritage Sensitivity

Figure 4 -Wallace
Constraining Aboriginal Heritage features, Extractive Licenses and Wind Farms within and surrounding the settlement
Environmental Assessment Project
 Moorabool Shire Council



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 Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority A Settlement

Ecological Vegetation Classes

Plains Grassy Wetland

Plains Grassy Woodland

Scattered Trees

Watercourse

Minor Watercourse

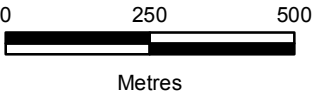
Water Area

Land Subject to Inundation

Figure 5 -Wallace

Ecological features recorded during the field assessment

*Environmental Assessment Project
Moorabool Shire Council*



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

APPENDIX 1 – FLORA DATABASE RESULTS

Table A1 Significant flora recorded within 10 kilometres of the study area

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.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
NATIONAL SIGNIFICANCE							
# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	L	v	4
# <i>Dianella amoena</i>	Matted Flax-lily	-	-	EN	L	e	5
# <i>Glycine latrobeana</i>	Clover Glycine	-	-	VU	L	v	5
<i>Lachnagrostis adamsonii</i>	Adamson's Blown-grass	1	1997	EN	L	v	4
# <i>Lepidium hyssopifolium</i>	Basalt Peppercross	21	2013	EN	L	e	4
# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	3	2010	CR	L	e	4
# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	-	-	EN	L	e	5
# <i>Senecio psilocarpus</i>	Swamp Fireweed	1	1996	VU	-	v	4
# <i>Xerochrysum palustre</i>	Swamp Everlasting	-	-	VU	L	v	4
STATE SIGNIFICANCE							
* <i>Bossiaea cordigera</i>	Wiry Bossiaea	1	1900	-	-	r	5
<i>Cardamine tenuifolia</i>	Slender Bitter-cress	1	1964	-	-	k	5
<i>Coronidium gunnianum</i>	Pale Swamp Everlasting	1	1996	-	-	v	5
<i>Desmodium varians</i>	Slender Tick-trefoil	2	1992	-	-	k	4
<i>Discaria pubescens</i>	Australian Anchor Plant	9	2001	-	L	r	5
<i>Encalypta vulgaris</i>	Common Extinguisher-moss	1	1996	-	-	r	5
<i>Eucalyptus brookeriana</i>	Brooker's Gum	5	2002	-	-	r	5
<i>Eucalyptus yarraensis</i>	Yarra Gum	17	2000	-	-	r	4
<i>Hypoxis vaginata</i> var. <i>brevistigmata</i>	Yellow Star	1	1882	-	-	k	5

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>Pultenaea reflexifolia</i>	Wombat Bush-pea	1	1770	-	-	r	5
<i>*Scleranthus brockei</i>	Brock Knawel	1	1876	-	-	r	5
<i>Westringia glabra</i>	Violet Westringia	1	1996	-	-	r	5
<i>Xanthosia leiophylla</i>	Parsley Xanthosia	1	1978	-	-	r	5

Data source: Victorian Biodiversity Atlas (DEPI 2014); Protected Matters Search Tool (DoE 2015).

Taxonomic order: Alphabetical.

APPENDIX 2 – SIGNIFICANT FAUNA SPECIES

Table A2. Significant fauna within 10 kilometres of the study area.

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

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 (DEPI 2013b); 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

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
Swift Parrot	<i>Lathamus discolor</i>	1971	1	EN	EN	L	EN	4
Growling Grass Frog	<i>Litoria raniformis</i>	1788	1	VU	EN	L	VU	3
# Australasian Bittern	<i>Botaurus poiciloptilus</i>	-	-	EN	EN	L	VU	4
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	4
# Australian Painted Snipe	<i>Rostratula australis</i>	-	-	VU	CR	L	VU	4
# Dwarf Galaxias	<i>Galaxiella pusilla</i>	-	-	VU	VU	L	VU	4
# Golden Sun Moth	<i>Synemon plana</i>	-	-	CR	EN	L	-	4
# Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	-	-	VU	VU	L	VU	2
# Macquarie Perch	<i>Macquaria australasica</i>	-	-	EN	EN	L	DD	4
# Murray Cod	<i>Maccullochella peelii peelii</i>	-	-	VU	EN	L	-	4
# Smoky Mouse	<i>Pseudomys fumeus</i>	-	-	EN	CR	L	RA	4
STATE SIGNIFICANCE								
Brush-tailed Phascogale	<i>Phascogale tapoatafa tapoatafa</i>	1933	1	-	VU	L	NT	4
Australasian Shoveler	<i>Anas rhynchos</i>	2009	13	-	VU	-	-	3
King Quail	<i>Coturnix chinensis victoriae</i>	1995	1	-	EN	L	-	4
Musk Duck	<i>Biziura lobata</i>	2009	35	-	VU	-	-	3
Freckled Duck	<i>Stictonetta naevosa</i>	2009	1	-	EN	L	-	3
Hardhead	<i>Aythya australis</i>	2009	22	-	VU	-	-	2
Blue-billed Duck	<i>Oxyura australis</i>	2009	11	-	EN	L	-	3
White-throated Needletail	<i>Hirundapus caudacutus</i>	2003	9	-	VU	-	-	4
Eastern Great Egret	<i>Ardea modesta</i>	2001	10	-	VU	L	-	2

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Grey Goshawk	<i>Accipiter novaehollandiae</i>	2001	2	-	VU	L	-	2
Black Falcon	<i>Falco subniger</i>	1958	1	-	VU	-	-	2
Lewin's Rail	<i>Lewinia pectoralis pectoralis</i>	1992	2	-	VU	L	NT	4
Powerful Owl	<i>Ninox strenua</i>	2001	5	-	VU	L	-	4
Barking Owl	<i>Ninox connivens connivens</i>	1995	2	-	EN	L	NT	4
Masked Owl	<i>Tyto novaehollandiae</i>	1995	1	-	EN	L	NT	3
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2000	2	-	NT	-	NT	3
Speckled Warbler	<i>Chthonicola sagittatus</i>	1960	2	-	VU	L	NT	4
Diamond Firetail	<i>Stagonopleura guttata</i>	1996	3	-	NT	L	NT	3
Tussock Skink	<i>Pseudemoia pagenstecheri</i>	2007	2	-	VU	-	-	2

Data source: Victorian Biodiversity Atlas (DEPI 2014); Victorian Fauna Database (Viridans 2013b); Protected Matters Search Tool (DoE 2015).

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).

PRIORITY B SETTLEMENTS

Balliang

Balliang East

Barkstead

Blackwood

Clarendon

Greendale

Hopetoun Park

Korweinguboorra/Spargo Creek

Lal Lal

Mt Egerton

Yendon

8 BALLIANG

8.1 Introduction

Balliang is a small low density rural lifestyle and agricultural locality approximately 20 kilometres south of Bacchus Marsh, containing approximately four dwellings (Figure 1a). The settlement centre is located along Bacchus Marsh-Balliang Road and is within a grassland/woodland setting.

8.2 Physical Attributes of the Settlement

8.2.1 Landscape

The Balliang study area occurs within the Victorian Volcanic Plain bioregion and falls within the jurisdiction of the Corangamite CMA (DELWP 2015b) (Figure 1b).

The study area is located on flat plains predominantly within a cropping/grazing agricultural environment. A minor creek is located approximately 400 metres to the west of the settlement, running south into the Little River approximately 1.5 kilometres downstream of the settlement (Figure 2). The creek includes a number of small to moderate sized artificial waterbodies (farm dams) along its length (DELWP 2015a).

According to the DELWP Victorian Water Resources map (2015c), there are no salinity prone areas or Erosion Management Overlays within the study area. No salinity or erosion effected areas were recorded during the field assessment.

8.2.2 Flora and Fauna

8.2.2.1 Existing Conditions

Ecological Vegetation Classes

According to the DELWP pre-1750 EVC mapping (DELWP 2015b), the study area was likely to support Plains Grassland (EVC 132). According to extant vegetation mapping, its current distribution is predicted to be depleted to small fragmented areas (Figure 3).

One EVC was recorded during the site assessment, Plains Woodland (EVC 803; syn. Riverina Plains Grassy Woodland EVC 55_62). Fragmented occurrences of this EVC were recorded within and immediately surrounding the township zone. In addition a larger patch of approximately 6.5 hectares was recorded west of the township. Several Scattered Trees (Buloke *Allocasuarina luehmannii*, Grey Box *Eucalyptus microcarpa* and Melbourne Yellow-gum *Eucalyptus leucoxylon* subsp. *connata*) were also recorded within the study area, within and surrounding the township zone (Figure 5).

Dominant flora species

Plains Woodland within the study area was dominated by Buloke, Grey Box and Melbourne Yellow-gum. The understorey was dominated by Lightwood *Acacia implexa*, Golden Wattle *Acacia pycnantha*, Spear-grasses

Austrostipa spp, Wallaby-grasses *Rytidosperma* spp, Nodding Saltbush *Einadia nutans*, Berry Saltbush *Atriplex semibaccata* and Ruby Salt-bush *Enchylaena tomentosa* subsp. *tomentosa*.

Weeds present predominantly comprised pasture grasses (e.g. Cocksfoot *Dactylis glomerata*, Toowoomba Canary Grass *Phalaris aquatica*, Wild Oats *Avena fatua*), however African Boxthorn *Lycium ferocissimum* was also present within woodland environments and under planted trees.

Fauna habitat

The study area supports six broad habitat types, woodland, scattered trees, ephemeral creeklines, artificial waterbodies (farm dams), introduced grasslands and planted vegetation.

Woodland and scattered trees within the study area provides habitat to a range of native fauna, including birds, possums and microbats. Many of the Eucalypts recorded in this area are large, likely to contain hollows, and provide fruitful nectar yields that would attract a large number of native bird species in the immediate area. Scattered remnants are also likely to facilitate fauna movement between habitats throughout the otherwise cleared landscape.

Ephemeral creeklines are likely to provide occasional habitat for common frog species. However, due to the variability in water levels, few fish or frog species are likely to use this habitat on a permanent basis.

Artificial waterbodies within the study area are likely to support occasional foraging habitat for common wetland species, including frogs, ducks and wading birds.

Introduced grassland and planted vegetation provide foraging resources for species adapted to modified environments such as Magpies, wattlebirds, and honeyeaters. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills, and fantails for nesting and foraging purposes.

8.2.2.2 Significant species and ecological communities

EPBC Act listed Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoE 2015):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain;
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains; and,
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Plains Woodland was recorded within the study area; this EVC correlates with the diagnostic characteristics for the nationally listed ecological community Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia. One patch of Plains Woodland recorded during the field assessment (approximately 6.5 hectares) was considered likely to meet the condition thresholds of this nationally listed ecological community (Figure 5; TSSC 2012a).

While Plains Grassland was not recorded during the field assessment, this EVC is predicted to occur within the study area and correlates with the nationally listed ecological community *Natural Temperate Grassland of the Victorian Volcanic Plain*. There is a low likelihood that *Natural Temperate Grassland of the Victorian Volcanic Plain* is present within the study area. Presence of this community will depend on the size and quality of any Plains Grassland present, according to the condition thresholds set for inclusion under the EPBC Act (SEWPaC 2011).

There is a low likelihood that seasonally inundated areas may support *Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains*.

FFG Act listed Ecological Communities

According to the DELWP Biodiversity Interactive Map (DELWP 2015b), no state significant ecological communities are predicted to occur within the study area and none were recorded during the site assessment. However, Plains Grassland is predicted to occur within the study area, this EVC correlates with the state listed *Western (Basalt) Plains Grassland Community* (Figure 5).

Nationally Significant Flora

The VBA and FIS contain records of two nationally listed flora species previously recorded within 10 kilometres of the study area; Ornate Pink Fingers *Caladenia ornata* and Clover Glycine *Glycine latrobeana* (DEPI 2014; Viridans 2013a; Appendix 1; Figure 3). The PMST nominated an additional seven nationally significant species which have not been recorded in the locality but have the potential to occur (DoE 2015).

No nationally listed flora species were recorded during the field assessment.

Based on habitat within the study area, landscape context and the proximity of previous records, there is a low likelihood that nationally significant flora species occur within the study area (Appendix 1), including Curly Sedge *Carex tasmanica*, Matted Flax-lily *Dianella amoena* *Dianella amoena*, Clover Glycine, Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*, Maroon Leek-orchid *Prasophyllum frenchii*, Large-headed Fireweed *Senecio macrocarpus* and Swamp Everlasting *Xerochrysum palustre*.

State Significant Flora

The VBA and FIS contain records of 47 state significant flora species within 10 kilometres of the study area (DEPI 2014; Viridans 2013a) (Appendix 1; Figure 3).

Three state significant flora species were recorded during the field assessment, Buloke, Buloke Mistletoe *Amyema linophylla* subsp. *orientale* and Melbourne Yellow-gum (Figure 5).

Based on habitat within the study area, landscape context and the proximity of previous records, there is a moderate likelihood of additional state significant flora species occurring within the study area (Appendix 1), including, Black Roly-poly *Sclerolaena muricata* var. *muricata*, Slender Bindweed *Convolvulus angustissimus* subsp. *omnigracilis*, Pale-flower Crane's-bill *Geranium* sp. 3 and Basalt Tussock-grass *Poa labillardierei* var. (Volcanic Plains).

Nationally Significant Fauna

The VBA and AVW contain records of five nationally listed fauna species previously recorded within 10 kilometres of the study area; Australian Bittern *Botaurus poiciloptilus*, Plains-wanderer *Pedionomus*

torquatus, Swift Parrot *Lathamus discolor*, Growling Grass Frog *Litoria raniformis* and Australian Painted Snipe *Rostratula australis* (DEPI 2014; Viridans 2013b; Appendix 2; Figure 3).

The PMST nominated an additional 10 nationally significant species which have not been recorded in the locality but have the potential to occur due to the presence of suitable habitat (DoE 2015).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, four nationally significant fauna species may occur within the study area (albeit a low likelihood), including; Plains Wanderer *Pedionomus torquatus*, Growling Grass Frog, Golden Sun Moth *Synemon plana* and Striped Legless Lizard *Delma impar* (Appendix 2; Figures 3).

State Significant Fauna

The VBA and AVW contain records of 28 State significant fauna species within 10 kilometres of the study area (DEPI 2014; Viridans 2013b) (Appendix 2; Figure 3).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat predicted to occur within the study area, three State significant fauna species may use habitat within the study area on a frequent basis for foraging purposes, including Eastern Great Egret *Ardea modesta*, Little Egret *Egretta garzetta nigripes* and Black Falcon *Falco subniger*.

A number of more mobile species (principally bird species) may pass over the study area en-route to more preferred habitats on an occasional basis. However, there is a low likelihood that other nominated EPBC Act or State listed species reside within the study area on a permanent basis as there is no suitable habitat or they are presumed to be extinct in the local area (Appendix 2).

8.2.3 Cultural Heritage

8.2.3.1 Aboriginal Cultural Heritage

There are no registered Aboriginal archaeological places within the study area or the surrounding 2km (Figure 4).

There are no areas of Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, within the study area. Little River, an area of Cultural Heritage Sensitivity, passes 337m south of the study area. A south flowing unnamed tributary to Little River is located within the study area.

Aboriginal Heritage Act 2006

As the study area is not located within an area of Cultural Heritage Sensitivity, a mandatory Cultural Heritage Management Plan (CHMP) would not be required for future development.

However, it is considered likely that Aboriginal heritage is located in the study area. This conclusion is derived from the presence of the unnamed tributaries located within the study area and the proximity of Little River to the study area. It is recommended preliminary cultural heritage investigation or a voluntary CHMP be undertaken prior to development in the study area.

8.2.3.2 Historical Cultural Heritage

Three sites listed on the Moorabool Shire Council Heritage Overlay are located within the study area (Table 11).

Table 11: Historical Cultural Heritage within or surrounding the Balliang Study Area

Register & Site Number	Site Name	Site Type	Within study area?
HO126	Former Balliang Primary School, 1272 Bacchus Marsh-Balliang Road	Built: Education	Yes
HO127	Saint George's Balliang Anglican Church, 1281 Bacchus Marsh-Balliang Road	Built: Community	Yes
HO128	"The Gables" Farmhouse, 1419 Bacchus Marsh-Balliang Road	Built: Residential	Yes

Heritage Act 1995

There are no sites listed on the Victorian Heritage Register or Victorian Heritage Inventory within the study area.

Planning and Environment Act 1987

Within the study area there are three heritage sites of local significance listed on the Heritage Overlay under the Moorabool Shire Council Planning Scheme. A planning permit from the Moorabool Shire Council will be required to remove, impact or destroy these sites.

8.3 Legislative and Policy Implications

8.3.1 Extractive Industry

There are no current mining licenses or extractive industry tenements within the study area (DSDBI 2014) (Figure 6).

8.3.2 Wind Farms

Based on aerial photography interpretation and GeoVic – Explore Victoria Online, there are no operating or proposed wind farms within two kilometres of the study area and none were recorded during the field assessment (DSDBI 2014) (Figure 6).

8.3.3 Intensive Agriculture

Based on aerial photography interpretation and results of the field assessment, the predominant land use within the study area is agricultural grazing and/or non-irrigated cropping. The study does not include any intensive agricultural activities.

8.3.4 Schedule of Licenced Premises

The study area does not include any EPA licences (EPA 2014).

8.4 Bushfire Risk

Based upon aerial photography, extant EVC mapping and results of the field assessment, the bushfire risk for Balliang is low (Tables 2 and 3), given:

- The study area and surrounding landscape predominantly contains low threat vegetation (crops and managed pasture) with a 0-5° slope and the study area is five kilometres from the closest contiguous area of high threat vegetation (forest or woodland vegetation within the Brisbane Ranges National Park) (Figures 2 and 3);
- Long bushfire runs (>10 kilometres) are possible; however, given the agricultural environment and low number of surface rocks, the surrounding landscape easily accessed for fire fighting purposes; long bushfire runs are therefore unlikely;
- Extreme bushfire behaviour is not possible and the type and extent of vegetation is unlikely to result in neighbourhood scale destruction of property; and,
- There are at least four access or escape routes from Balliang along roads predominantly containing low threat vegetation to places that provide shelter from bushfire.

8.5 Summary

Native vegetation within Balliang is restricted to small fragmented occurrences. One patch is likely to meet the condition thresholds of the nationally significant ecological community, *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia*.

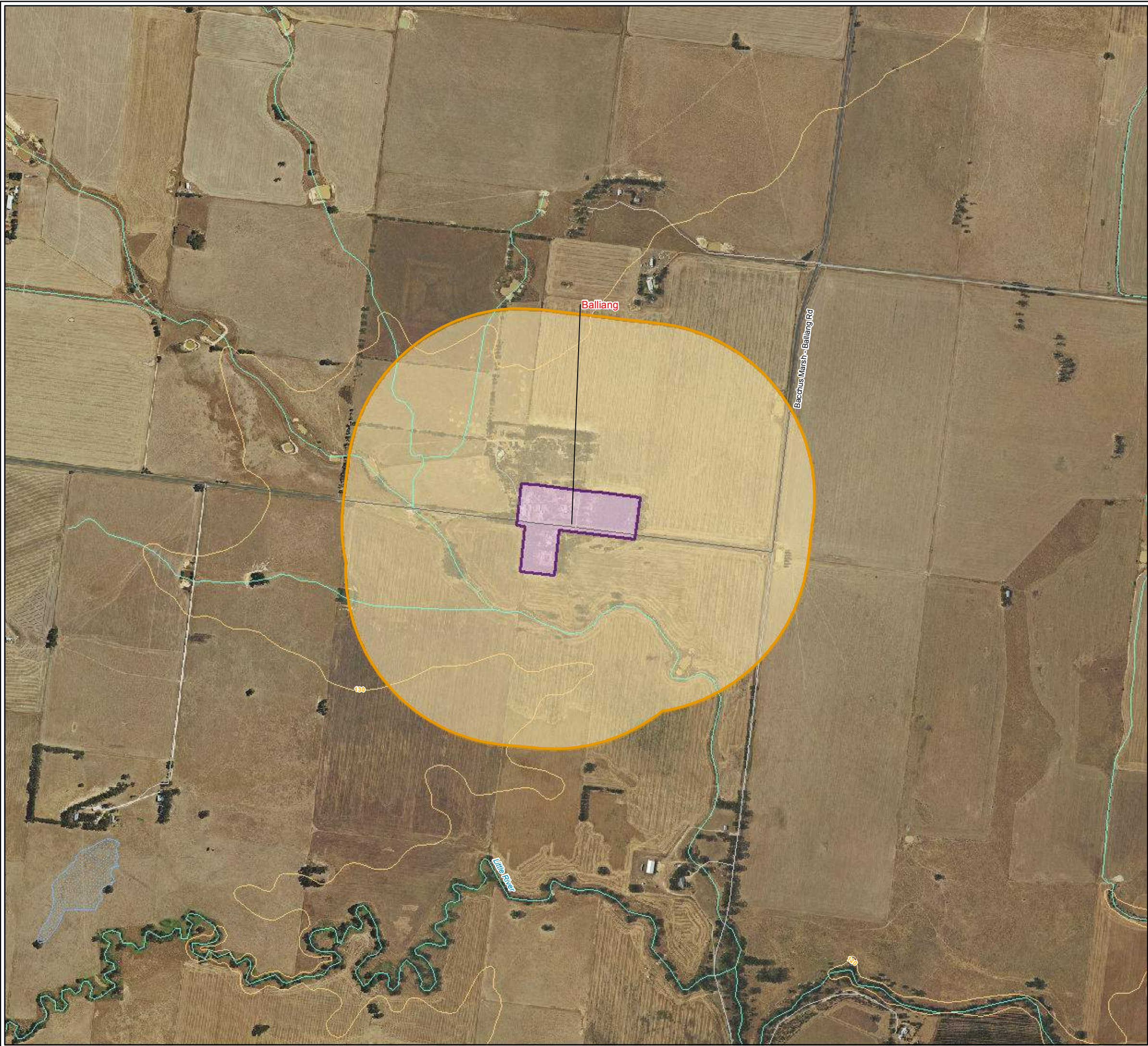
There is a low likelihood that nationally significant flora and fauna species occur within the study area. Three state significant flora species were recorded during the field assessment, Buloke, Buloke Mistletoe and Melbourne Yellow-gum.

A mandatory Cultural Heritage Management Plan would not be required for future development; however, it is considered likely that Aboriginal heritage is located in the study area. Three listed historical heritage sites are located within the study area (Former Balliang Primary School, Saint George's Balliang Anglican Church and "The Gables" Farmhouse).

The bushfire risk for Balliang is Low.

8.6 Recommendations

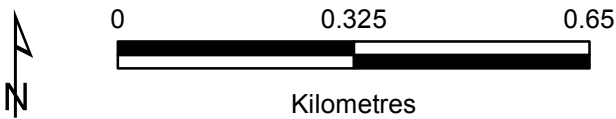
In order to mitigate degradation of environmental values, it is recommended that opportunities are investigated to protect significant flora (e.g. Buloke and Melbourne Yellow-gum) and ecological communities (*Grey Box [Eucalyptus microcarpa] Grassy Woodlands and Derived Native Grasslands of South-eastern Australia*) through planning controls (e.g. revision of planning zones or application of Environmental Significance Overlays/Vegetation Protection Overlays).



Legend

- Priority B Settlement
 - Township Zone
 - Contour (10m)
- Roads**
- Collector Road
 - Minor Road
- Water**
- Minor Watercourse
 - Land Subject to Inundation

Figure 2 -Balliang
Physical features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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.
Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority B Settlement

Township Zone

Ecological Vegetation Class (2005)

Creekline Grassy Woodland

Plains Grassland

Plains Grassy Woodland

Significant Flora Records

Buloke

Significant Fauna Records

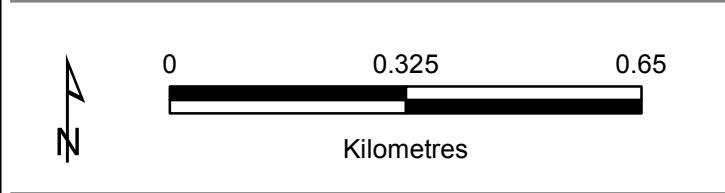
Brush-tailed Phascogale

Figure 3 -Balliang

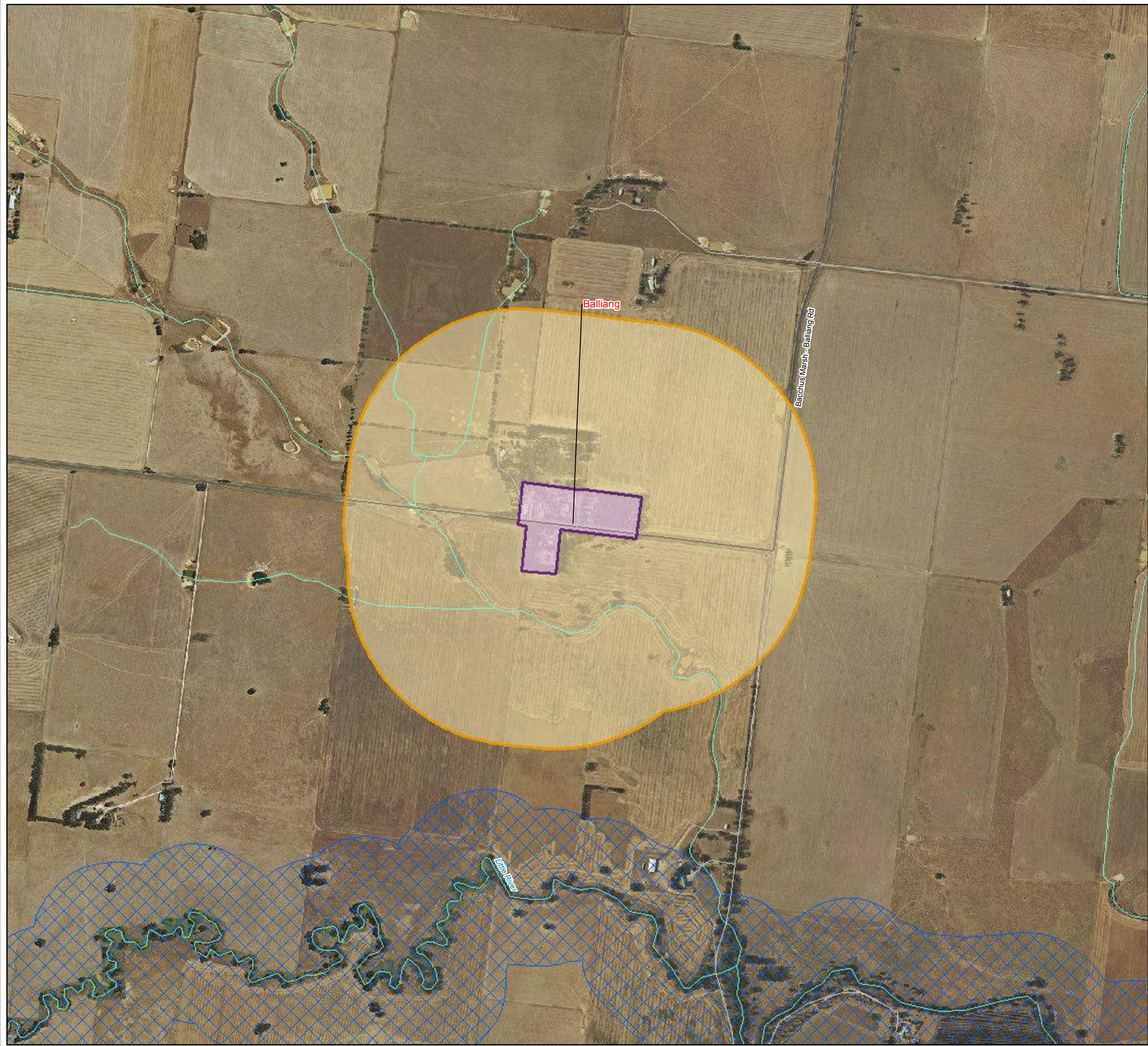
Constraining ecological features within and surrounding the settlement

Environmental Assessment Project


Moorabool Shire Council




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Legend

 Priority B Settlement

 Township Zone

Cultural Heritage


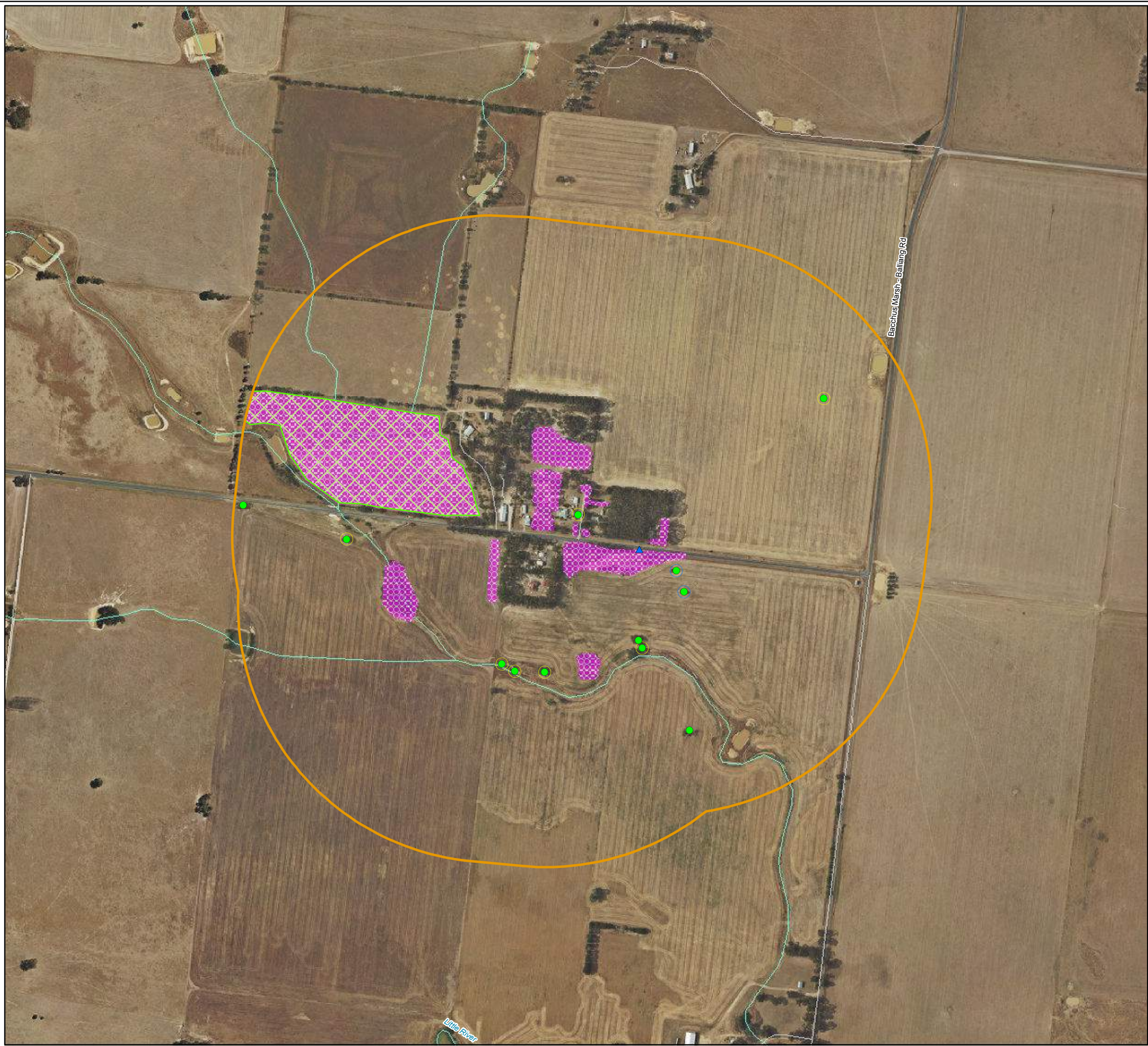
 Areas of Cultural Heritage Sensitivity

Figure 4 -Balliang
Constraining Aboriginal Heritage features, Extractive Licenses and Wind Farms within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority B Settlement

Ecological Vegetation Classes

Plains Woodland

Scattered Trees

EPBC Act listed communities

Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions

Threatened Flora Species recorded

Buloke

Buloke Mistletoe

Melbourne Yellow Gum

Watercourse

Minor Watercourse

Figure 5 -Balliang

Ecological features recorded during the field assessment

*Environmental Assessment Project
Moorabool Shire Council*



0

250

500

Metres



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

APPENDIX 1 – FLORA DATABASE RESULTS

Table A1 Significant flora recorded within 10 kilometres of the study area

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.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
NATIONAL SIGNIFICANCE							
# <i>Caladenia ornata</i>	Ornate Pink-fingers	1	1996	VU	L	v	5
# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	L	v	4
# <i>Dianella amoena</i>	Matted Flax-lily	-	-	EN	L	e	4
# <i>Glycine latrobeana</i>	Clover Glycine	3	1992	VU	L	v	4
# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	-	-	CR	L	e	4
# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	-	-	EN	L	e	4
# <i>Senecio macrocarpus</i>	Large-headed Fireweed	-	-	VU	L	e	4
# <i>Thelymitra matthewsii</i>	Spiral Sun-orchid	-	-	VU	L	v	5
# <i>Xerochrysum palustre</i>	Swamp Everlasting	-	-	VU	L	v	4
STATE SIGNIFICANCE							
<i>Acacia aspera</i> subsp. <i>parviceps</i>	Rough Wattle	15	2000	-	-	r	5
<i>Allocasuarina luehmannii</i>	Buloke	47	2011	-	L	-	1
<i>Amyema linophylla</i> subsp. <i>orientale</i>	Buloke Mistletoe	-	-	-	-	v	1
<i>Aristida calycina</i> var. <i>calycina</i>	Dark Wire-grass	1	2012	-	-	r	5
<i>Caladenia prolata</i>	Fertile Finger-orchid	1	1991	-	-	k	5
<i>Caladenia vulgaris</i>	Slender Pink-fingers	1	1998	-	-	r	5
<i>Calochilus imberbis</i>	Naked Beard-orchid	1	1998	-	-	r	5
<i>Cardamine papillata</i>	Forest Bitter-cress	2	2005	-	-	r	5
<i>Convolvulus angustissimus</i> subsp. <i>omnigracilis</i>	Slender Bindweed	1	2011	-	-	k	2
<i>Corunastylis ciliata</i>	Fringed Midge-orchid	1	1998	-	-	k	5
* <i>Dipodium pardalinum</i>	Spotted Hyacinth-orchid	1	1998	-	-	r	5

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>Eucalyptus</i> aff. <i>aromaphloia</i> (Brisbane Ranges)	Brisbane Range Scentbark	1	1996	-	-	e	5
<i>Eucalyptus leucoxylon</i> subsp. <i>connata</i>	Melbourne Yellow-gum	8	2011	-	-	v	1
<i>Eucalyptus yarraensis</i>	Yarra Gum	7	1997	-	-	r	4
<i>Geranium</i> sp. 3	Pale-flower Crane's-bill	2	2008	-	-	r	3
<i>Grevillea chrysophaea</i>	Golden Grevillea	21	1996	-	-	r	5
* <i>Grevillea rosmarinifolia</i> subsp. <i>glabella</i>	Smooth Grevillea	1	1980	-	-	r	5
<i>Grevillea steiglitziana</i>	Brisbane Range Grevillea	27	2000	-	-	r	5
<i>Leionema lamprophyllum</i>	Shiny Leionema	1	1980	-	-	r	5
<i>Leionema lamprophyllum</i> subsp. <i>obovatum</i>	Shiny Leionema	2	1991	-	-	r	5
<i>Nicotiana suaveolens</i>	Austral Tobacco	1	1980	-	-	r	4
<i>Nyctalis mirabilis</i>	Beech Nyctalis	1	1996	-	-	r	5
<i>Olearia minor</i>	Satin Daisy-bush	1	1959	-	-	r	5
<i>Olearia pannosa</i> subsp. <i>cardiophylla</i>	Velvet Daisy-bush	17	1989	-	L	v	5
<i>Poa amplexicaulis</i>	Red-sheath Tussock-grass	7	2011	-	-	r	5
<i>Poa labillardierei</i> var. (Volcanic Plains)	Basalt Tussock-grass	1	2008	-	-	k	2
<i>Poranthera corymbosa</i>	Clustered Poranthera	4	1980	-	-	r	5
* <i>Prasophyllum maccanii</i>	Inland Leek-orchid	1	1998	-	L	v	5
<i>Prostanthera decussata</i>	Dense Mint-bush	3	1997	-	-	r	5
<i>Prostanthera nivea</i> var. <i>nivea</i>	Snowy Mint-bush	5	2008	-	-	r	5
<i>Pterostylis aciculiformis</i>	Slender Ruddyhood	2	1998	-	-	k	5
<i>Pterostylis smaragdina</i>	Emerald-lip Greenhood	1	1998	-	-	r	5

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>*Pterostylis</i> sp. aff. <i>plumosa</i> (Woodland)	Woodland Plume-orchid	1	1998	-	-	r	5
<i>Pterostylis tasmanica</i>	Southern Plume-orchid	1	1998	-	-	k	5
<i>Pterostylis truncata</i>	Brittle Greenhood	3	2005	-	L	e	5
<i>Pterostylis</i> X <i>ingens</i>	Sharp Greenhood	1	1998	-	-	r	5
<i>Pterostylis</i> X <i>toveyana</i>	Mentone Greenhood	1	1998	-	-	v	5
<i>Ptilotus erubescens</i>	Hairy Tails	1	1993	-	L	-	4
<i>Pultenaea daltonii</i>	Hoary Bush-pea	3	1996	-	-	r	5
<i>Pultenaea graveolens</i>	Scented Bush-pea	1	1980	-	L	v	5
<i>Pultenaea gunnii</i> subsp. <i>tuberculata</i>	Golden Bush-pea	8	2011	-	-	r	5
<i>Sclerolaena muricata</i> var. <i>muricata</i>	Black Roly-poly	2	1998	-	-	k	3
<i>Swainsona behriana</i>	Southern Swainson-pea	1	1926	-	-	r	4
<i>Thelymitra circumsepta</i>	Naked Sun-orchid	3	1998	-	-	v	5
<i>Thelymitra hiemalis</i>	Winter Sun-orchid	1	1998	-	L	e	5
<i>Thelymitra lucida</i>	Glistening Sun-orchid	1	1991	-	-	e	5
<i>Thelymitra malvina</i>	Mauve-tuft Sun-orchid	1	1998	-	-	v	5
<i>Thelymitra</i> X <i>macmillanii</i>	Crimson Sun-orchid	1	1998	-	-	v	5

Data source: Victorian Biodiversity Atlas (DSE 2011); Protected Matters Search Tool (DoE 2015).

Taxonomic order: Alphabetical.

APPENDIX 2 – SIGNIFICANT FAUNA SPECIES

Table A2. Significant fauna within 10 kilometres of the study area.

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

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 (DEPI 2013b); 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

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
Australasian Bittern	<i>Botaurus poiciloptilus</i>	1987	4	EN	EN	L	VU	4
Plains-wanderer	<i>Pedionomus torquatus</i>	1989	6	VU	CR	L	EN	4
Swift Parrot	<i>Lathamus discolor</i>	2008	8	EN	EN	L	EN	4
Growling Grass Frog	<i>Litoria raniformis</i>	1990	10	VU	EN	L	VU	3
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	4
# Australian Painted Snipe	<i>Rostratula australis</i>	1987	3	VU	CR	L	VU	4
# Dwarf Galaxias	<i>Galaxiella pusilla</i>	-	-	VU	VU	L	VU	4
# Golden Sun Moth	<i>Synemon plana</i>	-	-	CR	EN	L	-	3
# Grassland Earless Dragon	<i>Tympanocryptis pinguicolla</i>	-	-	EN	CR	L	VU	4
# Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	-	-	VU	VU	L	VU	4
# Pink-tailed Worm-Lizard	<i>Aprasia parapulchella</i>	-	-	VU	EN	L	-	4
# Regent Honeyeater	<i>Anthochaera phrygia</i>	-	-	EN	CR	L	EN	4
# Spot-tailed Quoll	<i>Dasyurus maculatus</i>	-	-	EN	EN	L	VU	4
# Striped Legless Lizard	<i>Delma impar</i>	-	-	VU	EN	L	VU	3
# Fairy Tern	<i>Sternula nereis</i>	-	-	VU	EN	L	-	4
STATE SIGNIFICANCE								
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	2005	4	-	VU	L	NT	3
Common Dunnart	<i>Sminthopsis murina murina</i>	1987	1	-	VU	-	-	3
Common Bent-wing Bat	<i>Miniopterus schreibersii</i> GROUP	1989	1	-	-	L	CD	4
Southern Myotis	<i>Myotis macropus</i>	1990	2	-	NT	-	NT	4
Magpie Goose	<i>Anseranas semipalmata</i>	1977	1	-	NT	L	-	4

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Musk Duck	<i>Biziura lobata</i>	1980	26	-	VU	-	-	4
Australasian Shoveler	<i>Anas rhynchos</i>	1990	11	-	VU	-	-	4
Hardhead	<i>Aythya australis</i>	2000	10	-	VU	-	-	4
Blue-billed Duck	<i>Oxyura australis</i>	1973	1	-	EN	L	-	4
White-throated Needletail	<i>Hirundapus caudacutus</i>	1996	11	-	VU	-	-	4
Eastern Great Egret	<i>Ardea modesta</i>	1973	4	-	VU	L	-	2
Little Egret	<i>Egretta garzetta nigripes</i>	1989	2	-	EN	L	-	2
Black Falcon	<i>Falco subniger</i>	2000	4	-	VU	-	-	2
Brolga	<i>Grus rubicunda</i>	1989	2	-	VU	L	-	3
Lewin's Rail	<i>Lewinia pectoralis pectoralis</i>	1995	1	-	VU	L	NT	4
Bush Stone-curlew	<i>Burhinus grallarius</i>	1960	2	-	EN	L	NT	4
Red-chested Button-quail	<i>Turnix pyrrhothorax</i>	1990	2	-	VU	L	-	4
Powerful Owl	<i>Ninox strenua</i>	2005	36	-	VU	L	-	3
Barking Owl	<i>Ninox connivens connivens</i>	1990	3	-	EN	L	NT	3
Masked Owl	<i>Tyto novaehollandiae novaehollandiae</i>	1992	1	-	EN	L	NT	3
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2011	83	-	NT	-	NT	3
Chestnut-rumped Heathwren	<i>Calamanthus pyrrhopygius</i>	2000	7	-	VU	L	-	4
Speckled Warbler	<i>Chthonicola sagittatus</i>	2000	9	-	VU	L	NT	4
Painted Honeyeater	<i>Grantiella picta</i>	2008	4	-	VU	L	NT	3
Hooded Robin	<i>Melanodryas cucullata</i>	2008	5	-	NT	L	NT	3

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Diamond Firetail	<i>Stagonopleura guttata</i>	2008	43	-	NT	L	NT	3
Bearded Dragon	<i>Pogona barbata</i>	1989	1	-	VU	-	-	4
Brown Toadlet	<i>Pseudophryne bibronii</i>	1989	5	-	EN	L	DD	4

Data source: Victorian Biodiversity Atlas (DEPI 2014); Victorian Fauna Database (Viridans 2013b); Protected Matters Search Tool (DoE 2015).

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).

9 BALLIANG EAST

9.1 Introduction

Balliang East is a small settlement approximately 14 kilometres south of Bacchus Marsh, containing approximately 44 dwellings (Figure 1a). The settlement centre is located along Geelong-Bacchus Marsh Road and is within a grassland setting.

9.2 Physical Attributes of the Settlement

9.2.1 Landscape

According to the DELWP Biodiversity Interactive Map (DELWP 2015b), the study area occurs within the Victorian Volcanic Plain bioregion. The study area also falls within the jurisdiction of the Port Phillip and Westernport CMA (Figure 1b).

The study area is located on flat plains predominantly within a cropping/grazing agricultural environment and rural living properties. A minor creek (named Dry Creek) runs south-west through the settlement into Balliang Creek. The creek includes two moderately sized ephemeral wetlands, and a small number of small artificial waterbodies (farm dams) are located elsewhere throughout the study area (DELWP 2015a) (Figure 2).

According to the DELWP Victorian Water Resources map (2015c), there are no salinity prone areas or Erosion Management Overlays within the study area. No salinity or erosion effected areas were recorded during the field assessment.

9.2.2 Flora and Fauna

9.2.2.1 Existing Conditions

Ecological Vegetation Classes

According to the DELWP pre-1750 EVC mapping (DELWP 2015b), the study area was likely to predominantly support Plains Grassland (EVC 132), with Plains Grassy Wetland (EVC 125) occurring within the floodplain of Balliang Creek. Based on extant vegetation mapping and aerial photography, the distribution of these communities are likely to be depleted to fragmented areas up to five hectares in size, with the exception of a large remnant of Plains Grassland (approximately 75 hectares) predicted to occur within the east of the study area (Figure 3).

Two EVCs were recorded during the site assessment, Plains Woodland (EVC 803; syn. Riverina Plains Grassy Woodland EVC55_62) and Plains Grassland. Fragmented occurrences of these EVCs were recorded within and surrounding the township zone ranging in size from approximately 0.5 to 50 hectares; a large remnant patch of Plains Grassland, approximately 170 hectares in size, was also recorded within the east of the study area. A number of Scattered Trees (Buloke *Allocasuarina luehmannii*, Grey Box *Eucalyptus microcarpa* and

Melbourne Yellow-gum *Eucalyptus leucoxylon* subsp. *connata*) were also recorded within and surrounding the township zone (Figure 5).

Dominant flora species

Plains Woodland within the study area was dominated by Buloke, Grey Box and Melbourne Yellow-gum. The understorey was dominated by Black Wattle *Acacia mearnsii*, Spear-grasses *Austrostipa* spp, Wallaby-grasses *Rytidosperma* spp, Nodding Saltbush *Einadia nutans*, Berry Saltbush *Atriplex semibaccata* and Ruby Salt-bush *Enchylaena tomentosa* subsp. *tomentosa*.

Plains Grassland within the study area was dominated by Spear-grasses, Wallaby-grasses, Kangaroo Grass *Themeda triandra*, Nodding Saltbush *Einadia nutans*, Berry Saltbush and Ruby Salt-bush with occasional Drooping Cassinia *Cassinia arcuata*.

Weeds present predominantly comprised pasture grasses (e.g. Cocksfoot *Dactylis glomerata*, Toowoomba Canary Grass *Phalaris aquatica*, Wild Oats *Avena fatua*), however African Boxthorn *Lycium ferocissimum* was also present within woodland environments and under planted trees.

Fauna habitat

The study area supports seven broad habitat types, grasslands, woodland, scattered trees, ephemeral creeklines/wetlands, artificial waterbodies (farm dams), introduced grasslands and planted vegetation.

Grasslands within the study area provides habitat to a range of common open country species (primarily birds). Larger patches are likely to support a suite of indigenous grassland birds such as Magpies, Ravens, Magpie-larks and Willie Wagtails. Raptors would search for prey items over these areas, and introduced grassland species would also be prevalent within these areas. Grassland would also provide dispersal opportunities (cover) for reptiles, frogs and other species as well as potentially suitable habitat for several nationally listed fauna species.

Woodland and scattered trees within the study area provides habitat to a range of native fauna, including birds, possums and microbats. Eucalypts and Bulokes recorded in this area provide fruitful nectar yields that would attract a large number of native bird species in the immediate area. Scattered woodland remnants are also likely to facilitate fauna movement between habitats throughout the otherwise cleared landscape.

Ephemeral creeklines/wetlands are likely to provide occasional habitat for common frog species. However, due to the variability in water levels, few fish or frog species are likely to use this habitat on a permanent basis.

Artificial waterbodies within the study area are likely to support occasional foraging habitat for common wetland species, including frogs, ducks and wading birds.

Introduced grassland and planted vegetation provide foraging resources for species adapted to modified environments such as Magpies, wattlebills, and honeyeaters. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills, and fantails for nesting and foraging purposes.

9.2.2.2 Significant species and ecological communities

EPBC Act listed Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoE 2015):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain;
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains; and,
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Plains Woodland was recorded within the study area; this EVC correlates with the diagnostic characteristics for the nationally listed ecological community *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia*. One patch of Plains Woodland recorded during the field assessment (approximately 10 hectares) was considered likely to meet the condition thresholds of this nationally listed ecological community (Figure 5; TSSC 2012a).

Plains Grassland EVC was recorded within the study area; this EVC correlates with the diagnostic characteristics for the nationally listed ecological community *Natural Temperate Grassland of the Victorian Volcanic Plain*. Three patches of Plains Grassland recorded during the site assessment (totalling approximately 230 hectares) were considered likely to meet the condition thresholds of this nationally listed ecological community (Figure 5).

Plains Grassy Wetland is also predicted to occur within the study area, which correlates with the nationally listed ecological community *Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains*. Presence of this community will depend on the size and quality of the vegetation according to the condition thresholds set for inclusion under the EPBC Act (SEWPaC 2011).

FFG Act listed Ecological Communities

One state listed ecological community was recorded within the study area, *Western (Basalt) Plains Grassland*, which correlates with areas mapped as Plains Grassland (Figure 5). No additional state listed ecological communities are predicted to occur within the study area (DELWP 2015b).

Nationally Significant Flora

One nationally listed flora species, Clover Glycine *Glycine latrobeana*, has previously been recorded within the study area. The VBA and FIS contain records of four additional nationally listed flora species previously recorded within 10 kilometres of the study area, Matted Flax-lily *Dianella amoena*, Narrow Goodenia *Goodenia macbarronii*, Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens* and Small Golden Moths *Diuris basaltica* (DEPI 2014; Viridans 2013a; Appendix 1; Figure 3). The PMST nominated an additional three nationally significant species which have not been recorded in the locality but have the potential to occur (DoE 2015).

Based on habitat within the study area, landscape context and the proximity of previous records, there is a moderate likelihood of several nationally significant flora species occurring within the study area (Appendix 1), including Clover Glycine, Matted Flax-lily and Spiny Rice-flower.

State Significant Flora

The VBA and FIS contain records of one state significant species within the study area, Black Roly-poly *Sclerolaena muricata* var. *muricata*, and an additional 31 within 10 kilometres of the study area (DEPI 2014; Viridans 2013a) (Appendix 1; Figure 3).

Two state significant flora species, Buloke and Melbourne Yellow-gum, were recorded within the study area during the field assessment (Figure 5).

Based on habitat within the study area, landscape context and the proximity of previous records, there is a high likelihood that additional state significant flora species occur within the study area (Appendix 1), including Black Roly-poly, Slender Bindweed *Convolvulus angustissimus* subsp. *omnigracilis*, Basalt Tussock-grass *Poa labillardierei* var. (Volcanic Plains), Plains Joyweed *Alternanthera* sp. 1 (Plains), Buloke Mistletoe *Amyema linophylla* subsp. *orientale*, Perennial Blown-grass *Lachnagrostis perennis* spp. agg., Brittle Greenhood *Pterostylis truncata*, Fragrant Saltbush *Rhagodia parabolica* and Rye Beetle-grass *Tripogon loliiformis*.

Nationally Significant Fauna

The VBA and AVW contain records of 10 nationally listed fauna species previously recorded within 10 kilometres of the study area; Australasian Bittern *Botaurus poiciloptilus*, Eastern Barred Bandicoot *Perameles gunnii*, Grey-headed Flying-fox *Pteropus poliocephalus*, Plains-wanderer *Pedionomus torquatus*, Superb Parrot *Polytelis swainsonii*, Swift Parrot *Lathamus discolor*, Striped Legless Lizard *Delma impar*, Growling Grass Frog *Litoria raniformis*, Golden Sun Moth *Synemon plana* and Australian Painted Snipe *Rostratula australis* (DEPI 2014; Viridans 2013b; Appendix 2; Figure 3). The PMST nominated an additional six nationally significant species which have not been recorded in the locality but have the potential to occur due to the presence of suitable habitat (DoE 2015).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, four nationally significant fauna species may occur within the study area (albeit a low to moderate likelihood) including, Plains Wanderer *Pedionomus torquatus*, Growling Grass Frog, Golden Sun Moth *Synemon plana* and Striped Legless Lizard *Delma impar*.

State Significant Fauna

The VBA and AVW contain records of 37 State significant fauna species within 10 kilometres of the study area (DEPI 2014; Viridans 2013b) (Appendix 2; Figure 3).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, three State significant fauna species may use habitat within the study area for foraging purposes, Masked Owl *Tyto novaehollandiae novaehollandiae*, Grey Goshawk *Accipiter novaehollandiae novaehollandiae*, Black Falcon *Falco subniger*, Eastern Great Egret *Ardea modesta*, Little Egret *Egretta garzetta nigripes* and Hardhead *Aythya australis*.

A number of more mobile species (principally bird species) may pass over the study area en-route to more preferred habitats on an occasional basis. However, there is a low likelihood that other nominated EPBC Act or State listed species reside within the study area on a permanent basis as there is no suitable habitat or they are presumed to be extinct in the local area (Appendix 2).

9.2.3 Cultural Heritage

9.2.3.1 *Aboriginal Cultural Heritage*

There are no registered Aboriginal archaeological places within the study area or the surrounding 2km (Figure 4).

There are no areas of Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, within the study area. Balliang Creek, an area of Cultural Heritage Sensitivity, passes 223 metres south of the study area. Dry Creek, a south flowing tributary to Balliang Creek is located within the study area.

Aboriginal Heritage Act 2006

As the study area is not located within an area of Cultural Heritage Sensitivity, a mandatory Cultural Heritage Management Plan (CHMP) would not be required for future development.

However, it is considered likely that Aboriginal heritage is located in the study area. This conclusion is derived from the presence of Dry Creek and two unnamed tributaries located within the study area, and the proximity of Balliang Creek to the study area. It is recommended preliminary cultural heritage investigation or a voluntary CHMP be undertaken prior to development in the study area.

9.2.3.2 *Historical Cultural Heritage*

There are no historical cultural heritage sites listed within the study area, or the surrounding 2km.

Heritage Act 1995

There are no sites listed on the Victorian Heritage Register or Victorian Heritage Inventory within the study area.

Planning and Environment Act 1987

There are no heritage sites of local significance listed on the Heritage Overlay under the Moorabool Shire Council Planning Scheme within the study area.

9.3 Legislative and Policy Implications

9.3.1 Extractive Industry

There are no current mining licenses or extractive industry tenements within the study area (DSDBI 2014) (Figure 6).

9.3.2 Wind Farms

Based on the results of the field assessment, aerial photography interpretation and GeoVic – Explore Victoria Online, there are no operating or proposed wind farms within two kilometres of the study area (DSDBI 2014) (Figure 6).

9.3.3 Intensive Agriculture

Based on the results of the field assessment, the predominant land use within the study area is agricultural grazing and/or non-irrigated cropping. The study is unlikely to include any intensive agricultural activities.

9.3.4 Schedule of Licenced Premises

The study area does not include any EPA licences (EPA 2014).

9.4 Bushfire Risk

Based upon aerial photography, extant EVC mapping and results of the field assessment, the bushfire risk for Balliang East is low (Tables 2 and 3), given:

- The study area and surrounds contains areas of moderate threat vegetation (unmanaged grassland) interspersed with low threat vegetation (crops and managed pasture) with a 0-5° slope (Figures 2 and 3);
- Balliang East is within a grassland/agricultural environment; however some areas contain a low to moderate density of surface rocks which may limit access for fire fighting purposes within localised areas. Nevertheless, given the agricultural environment long bushfire runs (>10 kilometres) are unlikely;
- Extreme bushfire behaviour is not possible and the type and extent of vegetation is unlikely to result in neighbourhood scale destruction of property;
- The main access or escape routes from Balliang East is via Geelong-Bacchus Marsh Road to the north and south and Ballan Road to the east. The roads are well maintained and predominantly low threat vegetation to places that provide shelter from bushfire.

9.5 Summary

Native vegetation within Balliang East is fragmented throughout the study area with several large areas of remnant grassland present. Some areas are likely to meet the condition thresholds of the nationally significant ecological communities, *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia* and *Natural Temperate Grassland of the Victorian Volcanic Plain*.

One nationally listed flora species, Clover Glycine *Glycine latrobeana*, has previously been recorded within the study area and there is a moderate likelihood of several additional nationally significant flora species occurring within the study area, including Matted Flax-lily and Spiny Rice-flower. There is a low likelihood of several nationally significant fauna species occurring within the study area, including, Plains Wanderer, Growling Grass Frog, Golden Sun Moth and Striped Legless Lizard.

Two state significant flora species (Buloke, Melbourne Yellow-gum) and one state significant ecological community (*Western [Basalt] Plains Grassland*) was recorded during the field assessment.

A mandatory Cultural Heritage Management Plan would not be required for future development; however, it is considered likely that Aboriginal heritage is located in the study area. There are no listed historical heritage sites within the study area.

The bushfire risk for Balliang East is Low.

9.6 Recommendations

In order to mitigate degradation of environmental values, it is recommended that opportunities are investigated to protect significant flora (e.g. Buloke, Melbourne Yellow-gum) and ecological communities (*Grey Box [Eucalyptus microcarpa] Grassy Woodlands and Derived Native Grasslands of South-eastern Australia* and *Natural Temperate Grassland of the Victorian Volcanic Plain*) through planning controls (e.g. revision of planning zones or application of Environmental Significance Overlays/Vegetation Protection Overlays).



Legend

- Priority B Settlement
- Township Zone
- Contour (10m)

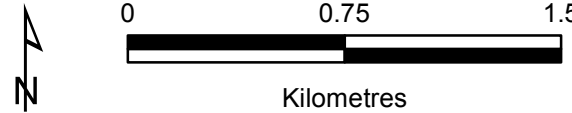
Roads

- Major Road
- Collector Road
- Minor Road

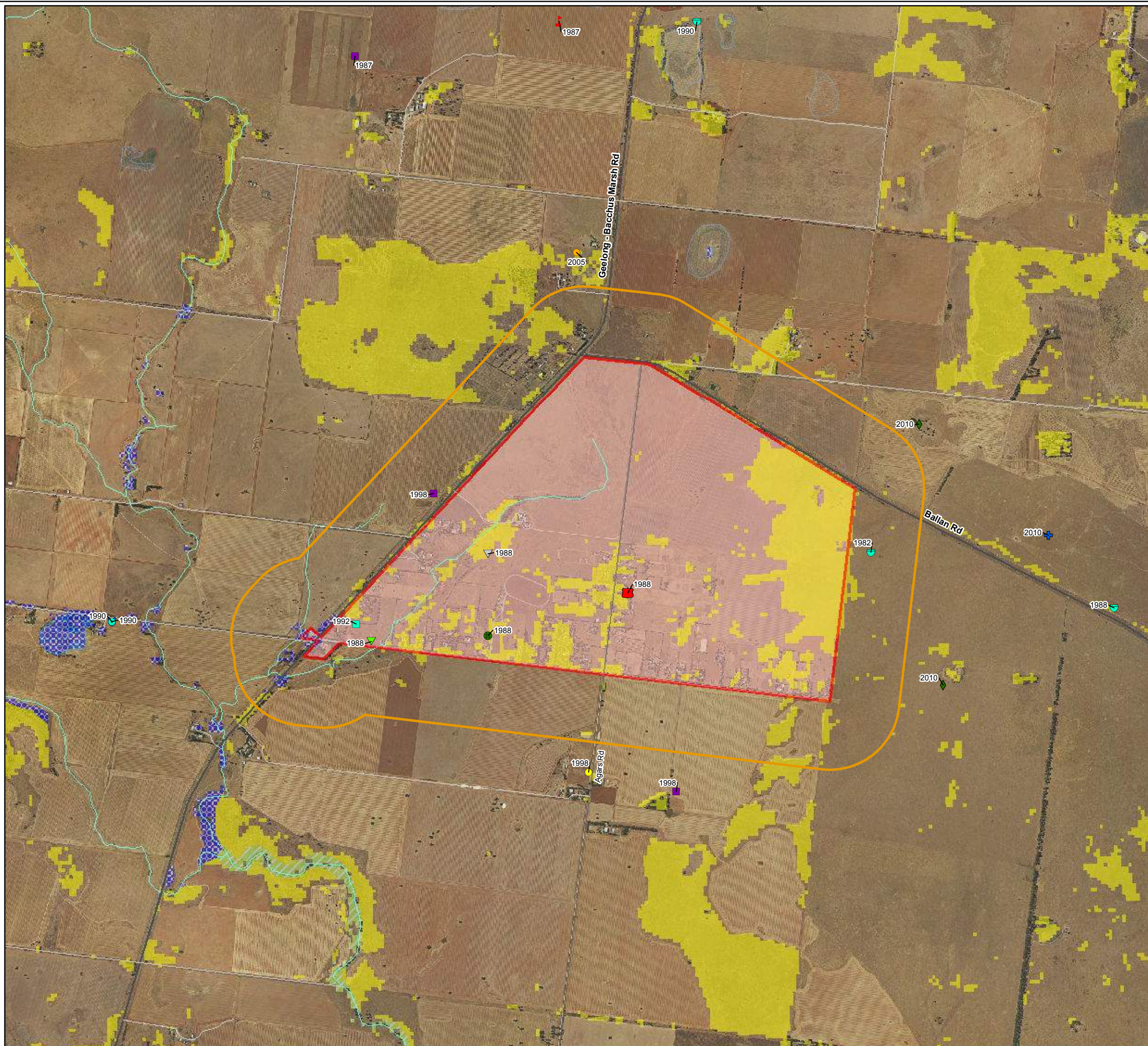
Water

- Minor Watercourse
- Land Subject to Inundation
- Wetland/Swamp

Figure 2 -Balliang East
Physical features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



- Legend**
- Priority B Settlement
 - Township Zone
- Ecological Vegetation Class (2005)**
- Creekline Grassy Woodland
 - Plains Grassland
 - Plains Grassy Wetland
- Significant Flora Records**
- Black Roly-poly
 - Brittle Greenhood
 - Buloke
 - Clover Glycine
 - Plains Joyweed
- Significant Fauna Records**
- Australian Painted Snipe
 - Baillon's Crake
 - Diamond Firetail
 - Eastern Great Egret
 - Golden Sun Moth
 - Growing Grass Frog
 - Latham's Snipe
 - Little Egret
 - Magpie Goose
 - Nankeen Night Heron

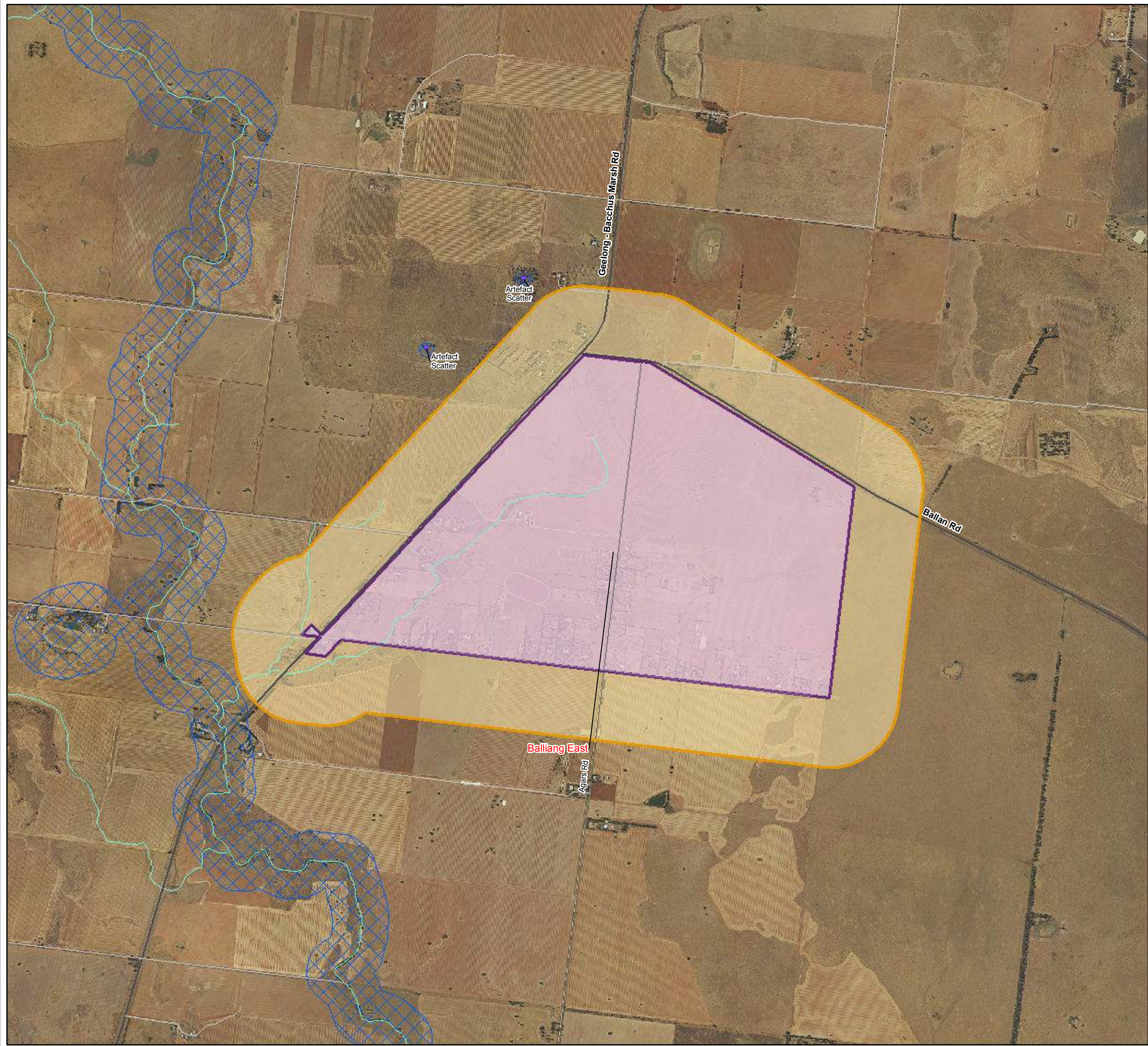
Figure 3 -Balliang East
Constraining ecological features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



Kilometres



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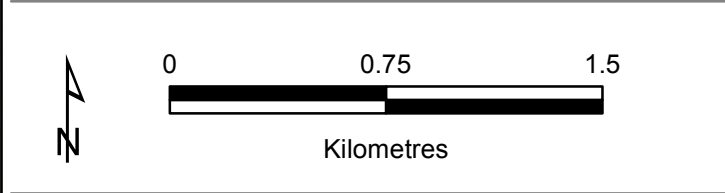
Legend

- Priority B Settlement
- Township Zone

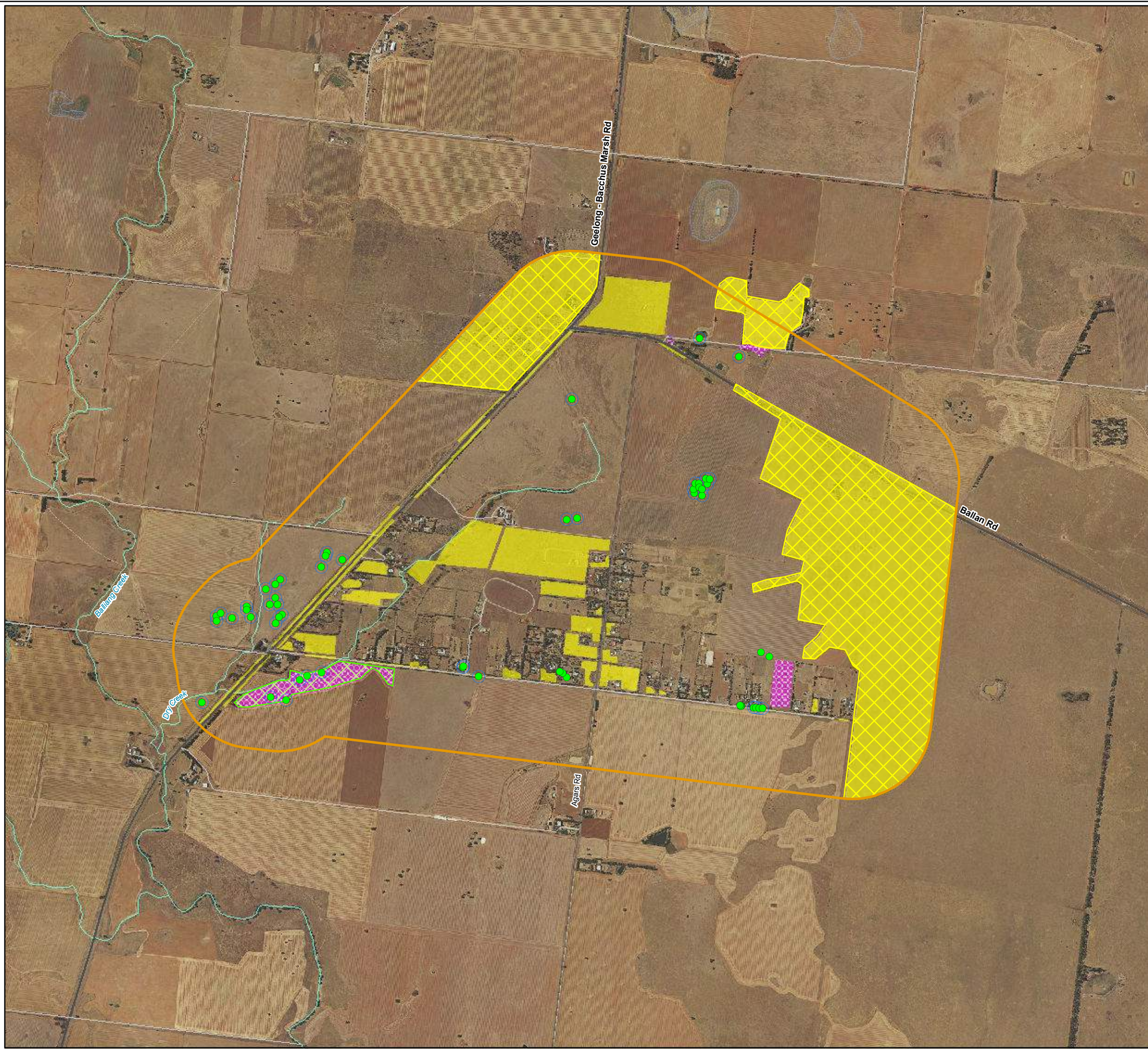
Cultural Heritage

- Areas of Cultural Heritage Sensitivity
- Artefact Scatter

Figure 4 -Balliang East
Constraining Aboriginal Heritage features, Extractive Licenses and Wind Farms within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority B Settlement

Ecological Vegetation Classes

Lignum Swamp

Plains Grassland

Plains Woodland

Scattered Trees

EPBC Act listed communities

Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions

Natural Temperate Grassland of the Victorian Volcanic Plain

Threatened Flora Species recorded

Buloke

Watercourse

Minor Watercourse

Water Area

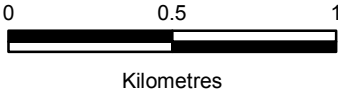
Land Subject to Inundation

Wetland/Swamp

Figure 5 -Balliang East

Ecological features recorded during the field assessment

*Environmental Assessment Project
Moorabool Shire Council*



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

APPENDIX 1 – FLORA DATABASE RESULTS

Table A1 Significant flora recorded within 10 kilometres of the study area

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.

Scientific name	Common name	Total # of records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
NATIONAL SIGNIFICANCE							
# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	L	v	4
# <i>Dianella amoena</i>	Matted Flax-lily	1	2010	EN	L	e	4
# <i>Diuris basaltica</i>	Small Golden Moths	4	2006	EN	L	v	5
# <i>Glycine latrobeana</i>	Clover Glycine	1	1992	VU	L	v	1
<i>Goodenia macbarronii</i>	Narrow Goodenia	2	2009	VU	L	v	5
# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	12	2010	CR	L	e	3
# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	-	-	EN	L	e	5
# <i>Senecio macrocarpus</i>	Large-headed Fireweed	-	-	VU	L	e	4
STATE SIGNIFICANCE							
<i>Acacia aspera</i> subsp. <i>parviceps</i>	Rough Wattle	7	2002	-	-	r	5
<i>Acacia rostriformis</i>	Bacchus Marsh Wattle	1	2010	-	-	v	5
<i>Allocasuarina luehmannii</i>	Buloke	389	2011	-	L	-	1
<i>Amyema linophylla</i> subsp. <i>orientale</i>	Buloke Mistletoe	-	-	-	-	v	3
<i>Alternanthera</i> sp. 1 (Plains)	Plains Joyweed	25	2010	-	-	k	2
<i>Amyema linophylla</i> subsp. <i>orientale</i>	Buloke Mistletoe	13	2010	-	-	v	3
<i>Austrostipa exilis</i>	Heath Spear-grass	5	2006	-	-	r	5
<i>Calotis lappulacea</i>	Yellow Burr-daisy	4	2001	-	-	r	5
<i>Clematis leptophylla</i>	Skeleton Vine	1	2010	-	-	k	5
<i>Convolvulus angustissimus</i> subsp. <i>omnigracilis</i>	Slender Bindweed	1	2011	-	-	k	2
<i>Desmodium varians</i>	Slender Tick-trefoil	4	2010	-	-	k	5
<i>Dianella</i> sp. aff. <i>longifolia</i> (Benambra)	Arching Flax-lily	7	2011	-	-	v	4

Scientific name	Common name	Total # of records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>Eleocharis pallens</i>	Pale Spike-sedge	2	2010	-	-	k	5
* <i>Eleocharis plana</i>	Flat Spike-sedge	4	2010	-	-	v	5
<i>Eucalyptus baueriana</i> subsp. <i>thalassina</i>	Werribee Blue-box	3	2010	-	-	e	5
<i>Eucalyptus leucoxylon</i> subsp. <i>connata</i>	Melbourne Yellow-gum	1	2011	-	-	v	5
<i>Grevillea steiglitziana</i>	Brisbane Range Grevillea	3	1966	-	-	r	5
<i>Lachnagrostis perennis</i> spp. agg.	Perennial Blown-grass	2	1990	-	-	k	3
<i>Lasiopetalum ferrugineum</i>	Rusty Velvet-bush	1	2010	-	-	v	5
<i>Leionema lamprophyllum</i> subsp. <i>obovatum</i>	Shiny Leionema	2	1991	-	-	r	5
<i>Lepidium pseudohyssopifolium</i>	Native Peppercress	1	1984	-	-	k	4
<i>Nicotiana suaveolens</i>	Austral Tobacco	4	2013	-	-	r	5
<i>Pimelea curviflora</i> var. aff. <i>subglabrata</i>	Curved Rice-flower	4	2001	-	-	k	4
<i>Poa amplexicaulis</i>	Red-sheath Tussock-grass	2	1996	-	-	r	5
* <i>Poa labillardierei</i> var. (Volcanic Plains)	Basalt Tussock-grass	1	2010	-	-	k	2
<i>Poranthera corymbosa</i>	Clustered Poranthera	1	1977	-	-	r	5
<i>Pterostylis bicolor</i>	Black-tip Greenhood	1	1996	-	-	k	5
<i>Pterostylis truncata</i>	Brittle Greenhood	1	2005	-	L	e	2
<i>Ptilotus erubescens</i>	Hairy Tails	1	1984	-	L	-	4
<i>Rhagodia parabolica</i>	Fragrant Saltbush	19	2013	-	-	r	3
<i>Sclerolaena muricata</i> var. <i>muricata</i>	Black Roly-poly	4	2010	-	-	k	1
<i>Swainsona behriana</i>	Southern Swainson-pea	1	1926	-	-	r	5
<i>Tripogon loliiformis</i>	Rye Beetle-grass	6	2009	-	-	r	3

Data source: Victorian Biodiversity Atlas (DEPI 2014); Protected Matters Search Tool (DoE 2015).

Taxonomic order: Alphabetical.

APPENDIX 2 – SIGNIFICANT FAUNA SPECIES

Table A2. Significant fauna within 10 kilometres of the study area.

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

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 (DEPI 2013b); 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

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
Australasian Bittern	<i>Botaurus poiciloptilus</i>	1990	7	EN	EN	L	VU	4
Eastern Barred Bandicoot	<i>Perameles gunnii</i>	1883	15	EN	RX	L	CR	4
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	2002	2	VU	VU	L	VU	3
Plains-wanderer	<i>Pedionomus torquatus</i>	1989	15	VU	CR	L	EN	3
Superb Parrot	<i>Polytelis swainsonii</i>	1881	1	VU	EN	L	VU	4
Swift Parrot	<i>Lathamus discolor</i>	2008	9	EN	EN	L	EN	3
Striped Legless Lizard	<i>Delma impar</i>	2011	5	VU	EN	L	VU	2
Growling Grass Frog	<i>Litoria raniformis</i>	2011	29	VU	EN	L	VU	2
Golden Sun Moth	<i>Synemon plana</i>	2011	34	CR	CR	L	-	2
Australian Painted Snipe	<i>Rostratula australis</i>	1989	5	VU	CR	L	VU	4
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	4
# Dwarf Galaxias	<i>Galaxiella pusilla</i>	-	-	VU	VU	L	VU	4
# Grassland Earless Dragon	<i>Tympanocryptis pinguicollis</i>	-	-	EN	CR	L	VU	4
# Pink-tailed Worm-Lizard	<i>Aprasia parapulchella</i>	-	-	VU	EN	L	-	4
# Regent Honeyeater	<i>Anthochaera phrygia</i>	-	-	EN	CR	L	EN	4
# Fairy Tern	<i>Sternula nereis</i>	-	-	VU	EN	L	-	4
STATE SIGNIFICANCE								
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	1984	3	-	VU	L	NT	4
Common Dunnart	<i>Sminthopsis murina murina</i>	1987	1	-	VU	-	-	4
Southern Myotis	<i>Myotis macropus</i>	1990	2	-	NT	-	NT	3
Magpie Goose	<i>Anseranas semipalmata</i>	1977	1	-	NT	L	-	3

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Musk Duck	<i>Biziura lobata</i>	2011	23	-	VU	-	-	3
Freckled Duck	<i>Stictonetta naevosa</i>	1996	4	-	EN	L	-	3
Australasian Shoveler	<i>Anas rhynchos</i>	2002	30	-	VU	-	-	3
Hardhead	<i>Aythya australis</i>	2011	22	-	VU	-	-	2
Blue-billed Duck	<i>Oxyura australis</i>	2011	9	-	EN	L	-	3
Diamond Dove	<i>Geopelia cuneata</i>	1905	1	-	NT	L	-	4
White-throated Needletail	<i>Hirundapus caudacutus</i>	1990	9	-	VU	-	-	4
Little Bittern	<i>Ixobrychus minutus dubius</i>	1990	1	-	EN	L	-	3
Eastern Great Egret	<i>Ardea modesta</i>	2002	11	-	VU	L	-	2
Little Egret	<i>Egretta garzetta nigripes</i>	1990	3	-	EN	L	-	3
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	1999	1	-	VU	L	-	4
Grey Goshawk	<i>Accipiter novaehollandiae novaehollandiae</i>	1944	1	-	VU	L	-	2
Black Falcon	<i>Falco subniger</i>	2000	8	-	VU	-	-	2
Brolga	<i>Grus rubicunda</i>	1989	4	-	VU	L	-	3
Baillon's Crake	<i>Porzana pusilla palustris</i>	1990	2	-	VU	L	-	4
Major Mitchell's Cockatoo	<i>Lophocroa leadbeateri</i>	2004	1	-	VU	L	-	3
Australian Bustard	<i>Ardeotis australis</i>	1911	1	-	CR	L	NT	4
Bush Stone-curlew	<i>Burhinus grallarius</i>	1960	3	-	EN	L	NT	4
Common Greenshank	<i>Tringa nebularia</i>	1990	1	-	VU	-	-	4
Marsh Sandpiper	<i>Tringa stagnatilis</i>	1990	1	-	VU	-	-	4
Wood Sandpiper	<i>Tringa glareola</i>	1988	1	-	VU	-	-	4

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Red-chested Button-quail	<i>Turnix pyrrhorthorax</i>	1990	7	-	VU	L	-	4
Powerful Owl	<i>Ninox strenua</i>	1983	1	-	VU	L	-	4
Barking Owl	<i>Ninox connivens connivens</i>	1986	3	-	EN	L	NT	4
Masked Owl	<i>Tyto novaehollandiae novaehollandiae</i>	1992	2	-	EN	L	NT	2
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2010	41	-	NT	-	NT	4
Chestnut-rumped Heathwren	<i>Calamanthus pyrrhopygius</i>	1987	2	-	VU	L	-	4
Speckled Warbler	<i>Chthonicola sagittatus</i>	2006	14	-	VU	L	NT	4
Painted Honeyeater	<i>Grantiella picta</i>	1920	2	-	VU	L	NT	4
Grey-crowned Babbler	<i>Pomatostomus temporalis temporalis</i>	1987	4	-	EN	L	NT	4
Hooded Robin	<i>Melanodryas cucullata cucullata</i>	1999	3	-	NT	L	NT	3
Diamond Firetail	<i>Stagonopleura guttata</i>	2010	38	-	NT	L	NT	3
Bearded Dragon	<i>Pogona barbata</i>	1989	1	-	VU	-	-	4
Brown Toadlet	<i>Pseudophryne bibronii</i>	1990	4	-	EN	L	DD	4

Data source: Victorian Biodiversity Atlas (DEPI 2014); Victorian Fauna Database (Viridans 2013b); Protected Matters Search Tool (DoE 2015).

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).

10 BARKSTEAD

10.1 Introduction

Barkstead is a scattered low density rural lifestyle locality approximately 20 kilometres north-west of Ballan, containing approximately twenty five dwellings (Figure 1a). The settlement centre is located along Barkstead Road and is within a forest setting surrounded by the Wombat State Forest.

10.2 Physical Attributes of the Settlement

10.2.1 Landscape

The Barkstead study area occurs within the Central Victorian Uplands bioregion and falls within the jurisdiction of the Corangamite CMA (DELWP 2015b) (Figure 1b).

Barkstead is located on a south east facing slope of 5-10°. Cave Creek is located within the north-east of the study area, running south into the Moorabool River East Branch. A small drainage line is also present within the settlement centre which includes a moderate sized waterbody along its length (DELWP 2015a) (Figure 2).

According to the DELWP Victorian Water Resources map (2015c), there are no salinity prone areas or Erosion Management Overlays within the study area.

10.2.2 Flora and Fauna

Ecological Vegetation Classes

According to the DELWP pre-1750 EVC mapping (DELWP 2015b), the study area was likely to support Herb-rich Foothill Forest (EVC 178), with Sedgy Riparian Woodland (EVC 198) occurring along Cave Creek. Based on extant vegetation mapping and aerial photography, large contiguous areas of remnant Herb-rich Foothill Forest are likely to be present surrounding the settlement centre within the Wombat State Forest and private land (Figure 3). Sedgy Riparian Woodland remnants are also likely to be present along waterways. Crown land within the east of the study area contains timber plantation, but is likely to contain remnant vegetation along creeklines.

10.2.2.1 Significant species and ecological communities

EPBC Act listed Ecological Communities

Four nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoE 2015):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain;

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

The EVCs predicted to occur do not correspond with EVCs likely to form part of any nationally listed ecological communities (TSSC 2010; TSSC 2006; TSSC 2008a, b).

FFG Act listed Ecological Communities

According to the DELWP Biodiversity Interactive Map (DELWP 2015b), no state significant ecological communities are predicted to occur within the study area and based on the predicted EVCs present, none are likely to occur.

Nationally Significant Flora

The VBA and FIS contain records of two nationally listed flora species previously recorded within 10 kilometres of the study area; Adamson's Blown Grass *Lachnagrostis adamsonii* and Basalt Peppercress *Lepidium hyssopifolium* (DEPI 2014; Viridans 2013a; Appendix 1; Figure 3). The PMST nominated an additional five nationally significant species which have not been recorded in the locality but have the potential to occur (DoE 2015).

Based on habitat predicted to occur within the study area, landscape context and the proximity of previous records, no nationally significant flora species are likely to occur within the study area.

State Significant Flora

The VBA and FIS contain records of 17 state significant flora species within 10 kilometres of the study area (DEPI 2014; Viridans 2013a) (Appendix 1; Figure 3).

Based on habitat predicted to occur within the study area, landscape context and the proximity of previous records, several state significant flora species may occur within the study area (Appendix 1), including Creeping Grevillea *Grevillea repens*, Satinwood *Nematolepis squamea*, Netted Daisy-bush *Olearia speciosa*, Spotted Hyacinth-orchid *Dipodium pardalinum*, Slender Tick-trefoil *Desmodium varians*, and Dwarf Silver Wattle *Acacia nano-dealbata*.

Nationally Significant Fauna

The VBA and AVW contain records of two nationally listed fauna species previously recorded within 10 kilometres of the study area, Grey-headed Flying-fox *Pteropus poliocephalus* and Growling Grass Frog *Litoria raniformis* (DEPI 2014; Viridans 2013b; Appendix 2; Figure 3). The PMST nominated an additional 10 nationally significant species which have not been recorded in the locality but have the potential to occur due to the presence of suitable habitat (DoE 2015).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat predicted to occur within the study area, no nationally significant fauna species are likely to occur within the study area on a permanent basis as no suitable habitat is present.

State Significant Fauna

The VBA and AVW contain records of 23 State significant fauna species within 10 kilometres of the study area (DEPI 2014; Viridans 2013b) (Appendix 2; Figure 3).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat predicted to occur within the study area, three State significant fauna species may use habitat within the study area for foraging or breeding purposes, including Powerful Owl *Ninox strenua*, Barking Owl *Ninox connivens connivens*, Masked Owl *Tyto novaehollandiae novaehollandiae* and Greater Glider *Petauroides volans*.

A number of more mobile species (principally bird species) may pass over the study area en-route to more preferred habitats on an occasional basis. There is a low likelihood that other nominated State significant species reside within the study area on a permanent basis as there is no suitable habitat or they are presumed to be extinct in the local area (Appendix 2).

10.2.3 Cultural Heritage

10.2.3.1 Aboriginal Cultural Heritage

There are no registered Aboriginal archaeological places within the study area or the surrounding 2km (Figure 4).

There is one area of Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, within the study area. Under Regulation 23(1) land within 200 metres of a named waterway is classified as being of Cultural Heritage Sensitivity. One area of sensitivity was identified within the study area, Cave Creek.

Aboriginal Heritage Act 2006

It is considered likely that Aboriginal heritage will be found in the study area. This conclusion is derived from the likelihood of areas of unmodified land in close proximity to waterways. A CHMP is used to assess the Aboriginal heritage and manage any heritage in the context of an impact such as a subdivision activity. Under Regulation 23, the study area is within an area of Cultural Heritage Sensitivity as it is located within 200 m of a waterway. Therefore, any future development within the above named areas of Cultural Heritage Sensitivity will require a mandatory CHMP.

10.2.3.2 Historical Cultural Heritage

There is one site registered on the Victorian Heritage Inventory within the study area (Table 12). Within the surrounding 2km, there is one site registered on the Victorian Heritage Register and the Victorian Heritage Inventory (Table 12).

Table 12: Historical Cultural Heritage within or surrounding the Barkstead Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VHI H7723-0007	Barkstead Town	Built: Township	Yes
VHR H2014 VHI H7723-1135	Graves and Fraser's Saw Mill	Built: Industrial	No, 1km west

Heritage Act 1995

There is one site listed on the Victorian Heritage Inventory within the study area. Under the *Heritage Act 1995*, this site will require a Consent from Heritage Victoria prior to any future development.

Planning and Environment Act 1987

There are no sites listed on the Heritage Overlay under the Moorabool Shire Council Planning Scheme within the study area.

10.3 Legislative and Policy Implications

10.3.1 Extractive Industry

There are no current mining licenses or extractive industry tenements within the study area (DSDBI 2014) (Figure 6).

10.3.2 Wind Farms

Based on aerial photography interpretation and GeoVic – Explore Victoria Online, there are no operating or proposed wind farms within two kilometres of the study area (DSDBI 2014) (Figure 6). The Leonards Hill Wind Farm is located approximately 3.5 kilometres north-east of the Barkstead settlement (Figure 6).

10.3.3 Intensive Agriculture

Based on aerial photography interpretation, the predominant land use within the settlement is rural living. There is a large scale forestry block within the east of the study area, approximately 500 metres west of the settlement centre.

10.3.4 Schedule of Licenced Premises

The study area does not include any EPA licences (EPA 2014).

10.4 Bushfire Risk

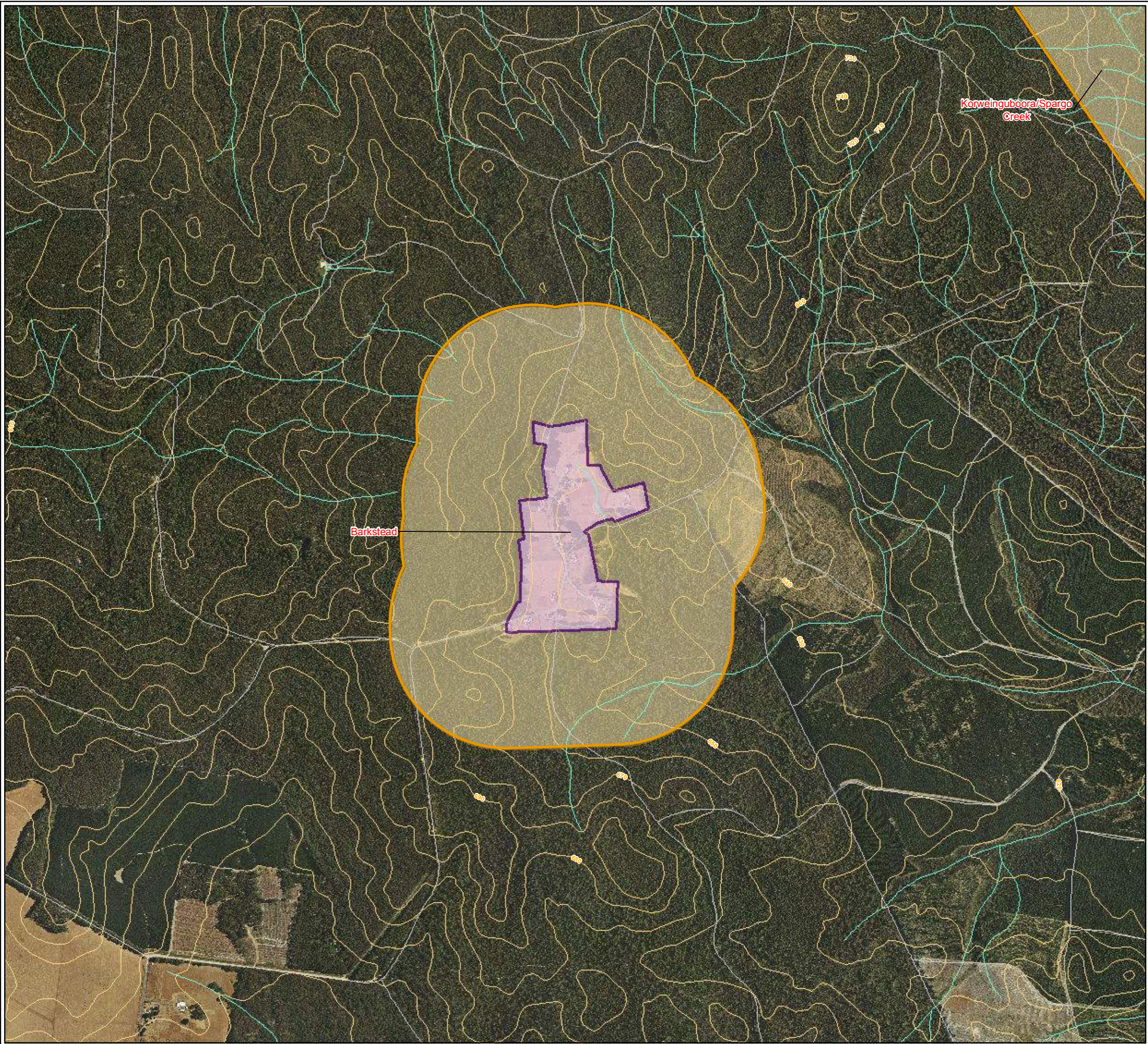
Based upon aerial photography and extant EVC mapping, the study area contains extensive forest vegetation cover surrounding the settlement centre and the topography is likely to be 5-10° downslope or upslope (Figures 2 and 3). Access and escape routes are limited to four minor roads through forest vegetation, with remnant forest likely to be close to the road on all four routes.

Based on the Bushfire Risk Matrix in Table 2 and 3, the bushfire risk for Barkstead is likely to be Extreme.

10.5 Recommendation

Based on the information presented above, there was a low likelihood of occurrence for any threatened species or ecological communities within the Barkstead settlement, and therefore a field assessment was not recommended. Further assessment may be undertaken in the future to determine ecological values present within the study area.

Despite the lack of on-ground assessment, the majority of the study area contains native vegetation and in order to mitigate degradation of environmental values, it is recommended that opportunities are investigated to protect remnant vegetation through planning controls (e.g. revision of planning zones or application of Environmental Significance Overlays/Vegetation Protection Overlays).



Legend

- Priority B Settlement
 - Township Zone
 - Contour (10m)
- Roads**
- Collector Road
 - Minor Road
- Water**
- Minor Watercourse

Figure 2 -Barkstead

Physical features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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.
Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

- Priority B Settlement
- Township Zone

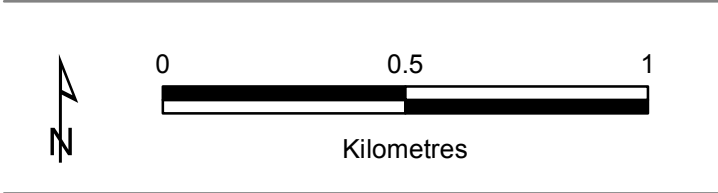
Ecological Vegetation Class (2005)

- Herb-rich Foothill Forest
- Herb-rich Foothill Forest/Shrubby Foothill Forest Complex
- Sedgy Riparian Woodland
- Shrubby Dry Forest

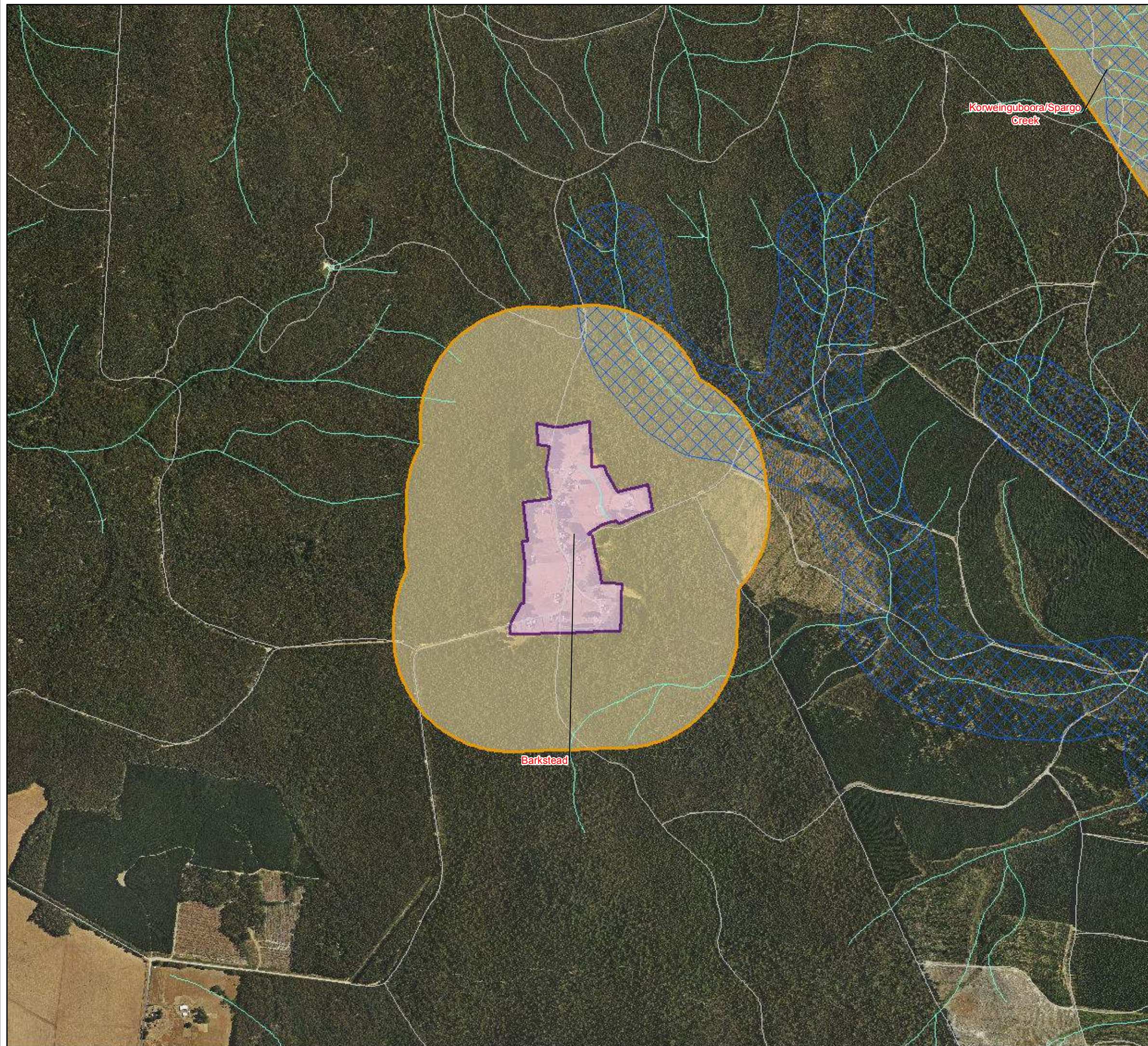
Significant Flora Records

- Creeping Grevillea
- Satinwood


Figure 3 -Barkstead
Constraining ecological features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council




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 Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

 Priority B Settlement

 Township Zone

Cultural Heritage


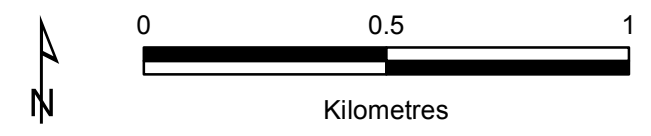
 Areas of Cultural Heritage Sensitivity

Figure 4 -Barkstead

Constraining Aboriginal Heritage features, Extractive Licenses and Wind Farms within and surrounding the settlement

Environmental Assessment Project

Moorabool Shire Council



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

APPENDIX 1 – FLORA DATABASE RESULTS

Table A1 Significant flora recorded within 10 kilometres of the study area

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.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
NATIONAL SIGNIFICANCE							
# <i>Caladenia ornata</i>	Ornate Pink-fingers	1	1996	VU	L	v	5
# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	L	v	4
# <i>Dianella amoena</i>	Matted Flax-lily	-	-	EN	L	e	4
# <i>Glycine latrobeana</i>	Clover Glycine	3	1992	VU	L	v	4
# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	-	-	CR	L	e	4
# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	-	-	EN	L	e	4
# <i>Senecio macrocarpus</i>	Large-headed Fireweed	-	-	VU	L	e	4
# <i>Thelymitra matthewsii</i>	Spiral Sun-orchid	-	-	VU	L	v	5
# <i>Xerochrysum palustre</i>	Swamp Everlasting	-	-	VU	L	v	4
STATE SIGNIFICANCE							
<i>Acacia aspera</i> subsp. <i>parviceps</i>	Rough Wattle	15	2000	-	-	r	5
<i>Allocasuarina luehmannii</i>	Buloke	47	2011	-	L	-	3
<i>Aristida calycina</i> var. <i>calycina</i>	Dark Wire-grass	1	2012	-	-	r	5
<i>Caladenia prolata</i>	Fertile Finger-orchid	1	1991	-	-	k	5
<i>Caladenia vulgaris</i>	Slender Pink-fingers	1	1998	-	-	r	5
<i>Calochilus imberbis</i>	Naked Beard-orchid	1	1998	-	-	r	5
<i>Cardamine papillata</i>	Forest Bitter-cress	2	2005	-	-	r	5
<i>Convolvulus angustissimus</i> subsp. <i>omnigracilis</i>	Slender Bindweed	1	2011	-	-	k	2
<i>Corunastylis ciliata</i>	Fringed Midge-orchid	1	1998	-	-	k	5
* <i>Dipodium pardalinum</i>	Spotted Hyacinth-orchid	1	1998	-	-	r	5
<i>Eucalyptus</i> aff. <i>aromaphloia</i> (Brisbane	Brisbane Range	1	1996	-	-	e	5

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
Ranges)	Scentbark						
<i>Eucalyptus leucoxylon</i> subsp. <i>connata</i>	Melbourne Yellow-gum	8	2011	-	-	v	4
<i>Eucalyptus yarraensis</i>	Yarra Gum	7	1997	-	-	r	4
<i>Geranium</i> sp. 3	Pale-flower Crane's-bill	2	2008	-	-	r	3
<i>Grevillea chrysophaea</i>	Golden Grevillea	21	1996	-	-	r	5
* <i>Grevillea rosmarinifolia</i> subsp. <i>glabella</i>	Smooth Grevillea	1	1980	-	-	r	5
<i>Grevillea steiglitziana</i>	Brisbane Range Grevillea	27	2000	-	-	r	5
<i>Leionema lamprophyllum</i>	Shiny Leionema	1	1980	-	-	r	5
<i>Leionema lamprophyllum</i> subsp. <i>obovatum</i>	Shiny Leionema	2	1991	-	-	r	5
<i>Nicotiana suaveolens</i>	Austral Tobacco	1	1980	-	-	r	4
<i>Nyctalis mirabilis</i>	Beech Nyctalis	1	1996	-	-	r	5
<i>Olearia minor</i>	Satin Daisy-bush	1	1959	-	-	r	5
<i>Olearia pannosa</i> subsp. <i>cardiophylla</i>	Velvet Daisy-bush	17	1989	-	L	v	5
<i>Poa amplexicaulis</i>	Red-sheath Tussock-grass	7	2011	-	-	r	5
<i>Poa labillardierei</i> var. (Volcanic Plains)	Basalt Tussock-grass	1	2008	-	-	k	2
<i>Poranthera corymbosa</i>	Clustered Poranthera	4	1980	-	-	r	5
* <i>Prasophyllum maccanii</i>	Inland Leek-orchid	1	1998	-	L	v	5
<i>Prostanthera decussata</i>	Dense Mint-bush	3	1997	-	-	r	5
<i>Prostanthera nivea</i> var. <i>nivea</i>	Snowy Mint-bush	5	2008	-	-	r	5
<i>Pterostylis aciculiformis</i>	Slender Ruddyhood	2	1998	-	-	k	5
<i>Pterostylis smaragdina</i>	Emerald-lip Greenhood	1	1998	-	-	r	5
* <i>Pterostylis</i> sp. aff. <i>plumosa</i> (Woodland)	Woodland Plume-orchid	1	1998	-	-	r	5

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>Pterostylis tasmanica</i>	Southern Plume-orchid	1	1998	-	-	k	5
<i>Pterostylis truncata</i>	Brittle Greenhood	3	2005	-	L	e	5
<i>Pterostylis X ingens</i>	Sharp Greenhood	1	1998	-	-	r	5
<i>Pterostylis X toveyana</i>	Mentone Greenhood	1	1998	-	-	v	5
<i>Ptilotus erubescens</i>	Hairy Tails	1	1993	-	L	-	4
<i>Pultenaea daltonii</i>	Hoary Bush-pea	3	1996	-	-	r	5
<i>Pultenaea graveolens</i>	Scented Bush-pea	1	1980	-	L	v	5
<i>Pultenaea gunnii</i> subsp. <i>tuberculata</i>	Golden Bush-pea	8	2011	-	-	r	5
<i>Sclerolaena muricata</i> var. <i>muricata</i>	Black Roly-poly	2	1998	-	-	k	3
<i>Swainsona behriana</i>	Southern Swainson-pea	1	1926	-	-	r	4
<i>Thelymitra circumsepta</i>	Naked Sun-orchid	3	1998	-	-	v	5
<i>Thelymitra hiemalis</i>	Winter Sun-orchid	1	1998	-	L	e	5
<i>Thelymitra lucida</i>	Glistening Sun-orchid	1	1991	-	-	e	5
<i>Thelymitra malvina</i>	Mauve-tuft Sun-orchid	1	1998	-	-	v	5
<i>Thelymitra X macmillanii</i>	Crimson Sun-orchid	1	1998	-	-	v	5

Data source: Victorian Biodiversity Atlas (DSE 2011); Protected Matters Search Tool (DoE 2015).

Taxonomic order: Alphabetical.

APPENDIX 2 – SIGNIFICANT FAUNA SPECIES

Table A2. Significant fauna within 10 kilometres of the study area.

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

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 (DEPI 2013b); 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

RX Regionally extinct

CR Critically endangered

EN Endangered

VU Vulnerable

RA Rare

NT Near threatened

CD Conservation dependent

LC least concern

DD Data deficient (insufficiently or poorly known)

L Listed as threatened under FFG Act

I Invalid or ineligible for listing under the FFG Act

Listed on the Protected Matters Search Tool

* Additional information from the Victorian Fauna Database

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
Australasian Bittern	<i>Botaurus poiciloptilus</i>	1987	4	EN	EN	L	VU	4
Plains-wanderer	<i>Pedionomus torquatus</i>	1989	6	VU	CR	L	EN	4
Swift Parrot	<i>Lathamus discolor</i>	2008	8	EN	EN	L	EN	4
Growling Grass Frog	<i>Litoria raniformis</i>	1990	10	VU	EN	L	VU	2
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	4
# Australian Painted Snipe	<i>Rostratula australis</i>	1987	3	VU	CR	L	VU	4
# Dwarf Galaxias	<i>Galaxiella pusilla</i>	-	-	VU	VU	L	VU	4
# Golden Sun Moth	<i>Synemon plana</i>	-	-	CR	EN	L	-	3
# Grassland Earless Dragon	<i>Tympanocryptis pinguicolla</i>	-	-	EN	CR	L	VU	4
# Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	-	-	VU	VU	L	VU	4
# Pink-tailed Worm-Lizard	<i>Aprasia parapulchella</i>	-	-	VU	EN	L	-	4
# Regent Honeyeater	<i>Anthochaera phrygia</i>	-	-	EN	CR	L	EN	4
# Spot-tailed Quoll	<i>Dasyurus maculatus</i>	-	-	EN	EN	L	VU	4
# Striped Legless Lizard	<i>Delma impar</i>	-	-	VU	EN	L	VU	3
# Fairy Tern	<i>Sternula nereis</i>	-	-	VU	EN	L	-	4
STATE SIGNIFICANCE								
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	2005	4	-	VU	L	NT	3
Common Dunnart	<i>Sminthopsis murina murina</i>	1987	1	-	VU	-	-	3
Common Bent-wing Bat	<i>Miniopterus schreibersii</i>	1989	1	-	-	L	CD	4
Southern Myotis	<i>Myotis macropus</i>	1990	2	-	NT	-	NT	4

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Magpie Goose	<i>Anseranas semipalmata</i>	1977	1	-	NT	L	-	4
Musk Duck	<i>Biziura lobata</i>	1980	26	-	VU	-	-	4
Australasian Shoveler	<i>Anas rhynchos</i>	1990	11	-	VU	-	-	4
Hardhead	<i>Aythya australis</i>	2000	10	-	VU	-	-	4
Blue-billed Duck	<i>Oxyura australis</i>	1973	1	-	EN	L	-	4
White-throated Needletail	<i>Hirundapus caudacutus</i>	1996	11	-	VU	-	-	4
Eastern Great Egret	<i>Ardea modesta</i>	1973	4	-	VU	L	-	2
Little Egret	<i>Egretta garzetta nigripes</i>	1989	2	-	EN	L	-	2
Black Falcon	<i>Falco subniger</i>	2000	4	-	VU	-	-	2
Brolga	<i>Grus rubicunda</i>	1989	2	-	VU	L	-	3
Lewin's Rail	<i>Lewinia pectoralis pectoralis</i>	1995	1	-	VU	L	NT	4
Bush Stone-curlew	<i>Burhinus grallarius</i>	1960	2	-	EN	L	NT	4
Red-chested Button-quail	<i>Turnix pyrrhorthorax</i>	1990	2	-	VU	L	-	4
Powerful Owl	<i>Ninox strenua</i>	2005	36	-	VU	L	-	3
Barking Owl	<i>Ninox connivens connivens</i>	1990	3	-	EN	L	NT	3
Masked Owl	<i>Tyto novaehollandiae novaehollandiae</i>	1992	1	-	EN	L	NT	3
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2011	83	-	NT	-	NT	3
Chestnut-rumped Heathwren	<i>Calamanthus pyrrhopygius</i>	2000	7	-	VU	L	-	4
Speckled Warbler	<i>Chthonicola sagittatus</i>	2000	9	-	VU	L	NT	4
Painted Honeyeater	<i>Grantiella picta</i>	2008	4	-	VU	L	NT	3

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Hooded Robin	<i>Melanodryas cucullata</i>	2008	5	-	NT	L	NT	3
Diamond Firetail	<i>Stagonopleura guttata</i>	2008	43	-	NT	L	NT	3
Bearded Dragon	<i>Pogona barbata</i>	1989	1	-	VU	-	-	4
Brown Toadlet	<i>Pseudophryne bibronii</i>	1989	5	-	EN	L	DD	4

Data source: Victorian Biodiversity Atlas (DEPI 2014); Victorian Fauna Database (Viridans 2013b); Protected Matters Search Tool (DoE 2015).

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).

11 BLACKWOOD

11.1 Introduction

Blackwood is a small town approximately 15 kilometres north-west of Ballan, containing approximately 273 dwellings (Figure 1a). The study area also includes the smaller satellite settlements of Barry's Reef, Simmons Reef and Golden Point. Blackwood is located along Greendale Trentham Road and is within a forest setting surrounded by the Wombat State Forest and Lerderderg State Park.

11.2 Physical Attributes of the Settlement

11.2.1 Landscape

The Blackwood study area occurs within the Central Victorian Uplands bioregion and falls within the jurisdiction of the Port Phillip and Westernport CMA (DELWP 2015b) (Figure 1b).

Blackwood is located within the slopes and gullies of the Lerderderg River and tributaries on slopes of 10-15°. A small water treatment or storage basin is located at Barry's Reef and a small lake (Shaws Lake) is located approximately one kilometre to the east of Blackwood town centre (DELWP 2015a) (Figure 2).

According to the DELWP Victorian Water Resources map (2015c), there are no salinity prone areas or Erosion Management Overlays within the study area. No salinity or erosion effected areas were recorded during the field assessment.

11.2.2 Flora and Fauna

11.2.2.1 Existing Conditions

Ecological Vegetation Classes

According to the DELWP pre-1750 EVC mapping (DELWP 2015b), the study area was likely to support a mosaic of Shrubby Foothill Forest (EVC 45) and Heathy Dry Forest (EVC 20), with Riparian Forest (EVC 18) occurring along the Lerderderg River. Based on extant vegetation mapping and aerial photography, large contiguous areas of these EVCs are likely to be persisting within the settlement and within adjoining public land (Figure 3).

Three EVCs were recorded within the study area during the site assessment, Shrubby Foothill Forest, Heathy Dry Forest and Riparian Forest. Large contiguous areas of these EVCs were present throughout the study area, with only small areas containing predominantly introduced vegetation with occasional scattered trees (Messmate *Eucalyptus obliqua*, Swamp Gum *Eucalyptus ovata*, Narrow-leaf Peppermint *Eucalyptus radiata*). Riparian Forest was recorded along creek lines, with Shrubby Foothill Forest and Heathy Dry Forest occurring on the slopes and ridges (Figure 5).

Dominant flora species

Remnant vegetation within Blackwood was dominated by Messmate, Swamp Gum, and Narrow-leaf Peppermint. The understorey was dominated by Blackwood *Acacia melanoxylon*, Silver Wattle *Acacia dealbata*, Cherry Ballart *Exocarpos cupressiformis*, Drooping Cassinia *Cassinia arcuata*, Austral Bracken *Pteridium esculentum* and Red-anther Wallaby-grass *Rytidosperma pallidum*.

Weeds present predominantly comprised pasture grasses (e.g. Panic Veldt-grass *Ehrharta erecta*, Wild Oats *Avena fatua*), however Blackberry *Rubus fruticosus* spp. agg. was common along waterways.

Fauna habitat

The study area supports five broad habitat types, woodland, scattered trees, permanent and ephemeral creeklines, lakes and basins, and planted vegetation.

Woodland and scattered trees within the study area provide valuable habitat for a variety of fauna including arboreal mammals, woodland birds, birds of prey, microbats and reptiles. The abundance of large tree hollows, along with connectivity of the tree canopy is important for arboreal mammals such as possums and gliders. These patches provide important foraging and nesting habitat for a variety of woodland birds and birds of prey and the eucalypts provide an important source of nectar for many birds. A suite of microbat species are likely to utilise small hollows and fissures as roosts and to forage within and around the patches. Fallen logs and the dense grassy understorey present within some of these areas provides suitable foraging and refuge habitat for a variety of reptiles.

Permanent creeklines are considered to be of moderate value for fauna. Common native waterbirds, frogs and reptiles are likely to utilise the creeks for breeding, foraging, dispersal and cover. Ephemeral creeklines are likely to provide occasional habitat for common frog species. However, due to the variability in water levels, few fish or frog species are likely to use this habitat on a permanent basis.

The storage basin and small lake are likely to provide moderate quality habitat when full of water. While locally common frog, reptile and bird species may use these water bodies on an occasional or permanent basis, the dependence on a clean permanent water source is likely to limit the suitability for rare or threatened fauna to use the basin for breeding or foraging purposes. Depending on the water levels present throughout the year, these waterbodies may support occasional foraging habitat for common fauna species as well as a range of other wetland adapted species including frogs, ducks and wading birds.

Planted trees and shrubs around existing dwellings provide foraging resources for species adapted to modified environments such as Magpies, wattlebirds, and honeyeaters. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills, and fantails for nesting and foraging purposes.

11.2.2.2 Significant species and ecological communities

EPBC Act listed Ecological Communities

Four nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoE 2015):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;

- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain;
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

The EVCs within the study area do not correspond with the descriptions for any nationally listed ecological communities (TSSC 2010; TSSC 2006; TSSC 2008a, b).

FFG Act listed Ecological Communities

No state significant ecological communities were recorded within the study area during the site assessment and none are considered likely to occur.

Nationally Significant Flora

The VBA and FIS contain records of two nationally listed flora species previously recorded within 10 kilometres of the study area, Clover Glycine *Glycine latrobeana* and Basalt Peppercross *Lepidium hyssopifolium* (DEPI 2014; Viridans 2013a; Appendix 1; Figure 3). The PMST nominated an additional five nationally significant species which have not been recorded in the locality but have the potential to occur (DoE 2015).

Based on habitat within the study area, landscape context and the proximity of previous records, several nationally significant flora species may occur within the study area (Appendix 1), including Curly Sedge and Clover Glycine.

State Significant Flora

The VBA and FIS contain records of 38 state significant flora species within 10 kilometres of the study area; of these species, two have been recorded within the study area, Dwarf Silver Wattle and Orange Dermocybe *Dermocybe crame* (DEPI 2014; Viridans 2013a) (Appendix 1; Figure 3).

Based on habitat within the study area, landscape context and the proximity of previous records, several additional state significant flora species may to occur within the study area (Appendix 1), including Rough Wattle *Acacia aspera* subsp. *parviceps*, Slender Tick-trefoil *Desmodium varians*, Fryerstown Grevillea *Grevillea obtecta*, Creeping Grevillea *Grevillea repens*, Hairy Beard-heath *Leucopogon microphyllus* var. *pilibundus*, Forked Rice-flower *Pimelea hewardiana*, Swamp Bush-pea *Pultenaea weindorferi*.

Nationally Significant Fauna

The VBA and AVW contain records of two nationally listed fauna species previously recorded within 10 kilometres of the study area, Dwarf Galaxias *Galaxiella pusilla* and Growling Grass Frog *Litoria raniformis* (DEPI 2014; Viridans 2013b; Appendix 2; Figure 3). The PMST nominated an additional 10 nationally significant species which have not been recorded in the locality but have the potential to occur due to the presence of suitable habitat (DoE 2015).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, no nationally significant fauna species are likely to occur within the study area on a permanent basis as no suitable habitat is present.

State Significant Fauna

The VBA and AVW contain records of 15 State significant fauna species within 10 kilometres of the study area (DEPI 2014; Viridans 2013b) (Appendix 2; Figure 3).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, five state significant fauna species may use habitat within the study area for foraging or breeding purposes, including Powerful Owl *Ninox strenua*, Common Bent-wing Bat *Miniopterus schreibersii* (GROUP), Common Bent-wing Bat (eastern ssp.) *Miniopterus schreibersii oceanensis*, Brush-tailed Phascogale *Phascogale tapoatafa tapoatafa* and Greater Glider *Petauroides volans*.

A number of more mobile species (principally bird species) may pass over the study area en-route to more preferred habitats on an occasional basis. There is a low likelihood that other nominated State listed species reside within the study area on a permanent basis as there is no suitable habitat or they are presumed to be extinct in the local area (Appendix 2).

11.2.3 Cultural Heritage

11.2.3.1 Aboriginal Cultural Heritage

There are no registered Aboriginal archaeological places within the study area, and one within the surrounding 2km (Table 13; Figure 4), comprising a scarred tree.

There are ten areas of Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, within the study area. Under Regulations 23(1) and 29(1), land within 200 metres of a named waterway and Parks and Nature Reserves are classified as being of Cultural Heritage Sensitivity. The following areas of sensitivity were identified within the study area:

- Lerderderg River;
- Back Creek;
- Whipstick Creek;
- Garden Gully;
- Jacksons Gully;
- Camerons Gully;
- Long Gully;
- Nugget Creek;
- Yankee Creek; and
- Lerderderg State Park.

Table 13: Aboriginal Cultural Heritage within or surrounding the Blackwood Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VAHR 7723-0003	Nuggety Gully 1	Scarred Tree	No. 1.5km north

Aboriginal Heritage Act 2006

It is considered likely that Aboriginal heritage will be found in the study area. This conclusion is derived from the likelihood of areas of unmodified land in close proximity to waterways. A CHMP is used to assess the Aboriginal heritage and manage any heritage in the context of an impact such as a subdivision activity. Under Regulation 23, the study area is within an area of Cultural Heritage Sensitivity as it is located within 200 m of a waterway and a Parks and Nature Reserve. Therefore, any future development within the above named areas of Cultural Heritage Sensitivity will require a mandatory CHMP.

11.2.3.2 Historical Cultural Heritage

There are four sites listed on the Victorian Heritage Inventory and four sites listed on the Heritage Overlay within the study area. Within the surrounding 2km, there is one site listed on the Victorian Heritage Register, two sites on the Victorian Heritage Inventory and two sites on the Moorabool Shire Council Heritage Overlay within 2km of the study area (Table 14). These sites reflect the gold rush settlement of the region.

Table 14: Historical Cultural Heritage within or surrounding the Blackwood Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VHR H2015 HO53	Wheelers Tramway, Wombat State Forest	Built: Industrial	No, 1.5km west
VHI H7723-0003	Easter Monday Mill	Archaeological: Mining	Yes
VHI 7723-1141	Haydens Mill Blackwood	Archaeological: Mining	No, 1.8km north east
VHI H7723-0198	Poveys Grave	Archaeological: Burial	Yes
VHI H7723-0199	Simmons Reef	Archaeological: Mining	Yes
VHI H7723-0200	Tryconnel Tunnel	Archaeological: Mining	No, 1km north
VHI H7723-0498	Crown Company	Archaeological: Mining	Yes
VHI H7723-1229	Simmons Reef Gold Mining Area	Archaeological: Mining	Yes
VHI H7723-1233	Royal Mail Hotel	Archaeological: Commercial	Yes
VHI H7723-0201	Dillons Tunnel	Archaeological: Mining	Yes
VHI H7723-1230	Golden Point Gold Mining Area	Archaeological: Mining	Yes
HO27	Guggenheimer Historical Cottage, Greendale-Trentham Road	Built: Residential	No, 400m north
HO28	All Saints Anglican Church, Byers Road	Built: Community	Yes
HO29	Former Royal Mail Hotel, Golden Point Road	Built: Commercial	Yes
HO30	Mine Managers House, Simmons Reef Road	Built: Residential	Yes
HO51	Garden of Saint Erth, Simmons Reef Road	Built: residential and Garden	Yes

Heritage Act 1995

There are eight heritage sites listed on the VHI. Under the *Heritage Act 1995*, this site will require a Consent from Heritage Victoria prior to any future development.

Planning and Environment Act 198

There are four heritage sites of local significance listed on the Heritage Overlay under the Moorabool Shire Council Planning Scheme within the study area. A planning permit from the Moorabool Shire Council will be required to remove, impact or destroy these sites.

11.3 Legislative and Policy Implications

11.3.1 Extractive Industry

There are no current mining licenses or extractive industry tenements within the study area (DSDBI 2014) (Figure 6).

11.3.2 Wind Farms

Based on aerial photography interpretation and GeoVic – Explore Victoria Online, there are no operating or proposed wind farms within two kilometres of the study area and none were recorded during the site assessment (DSDBI 2014) (Figure 6).

11.3.3 Intensive Agriculture

Based on aerial photography interpretation and the results of the site assessment, the predominant land use within the settlement is rural living. The Wombat State Forest is harvested for timber, however, there is no planted timber coupes within the study area.

11.3.4 Schedule of Licenced Premises

The study area does not include any EPA licences (EPA 2014).

11.4 Bushfire Risk

Based upon aerial photography, extant EVC mapping and results of the field assessment, the bushfire risk for Blackwood is extreme (Tables 2 and 3), given:

- The broader landscape presents an extreme risk:
 - The study area and surrounding landscape contain extensive areas of contiguous high threat (Forest) vegetation (Figures 2 and 3);
 - The township is located on slopes of 10-15°;
 - Long bushfire runs of >10 kilometres are possible, with limited access for fire fighting purposes.
- Evacuation options are limited:
 - Access and escape routes are limited to two roads (Greenvale-Trentham Road [escapes routes via north or south]) through high threat (Forest) vegetation growing close to, or overhanging, the road.

11.5 Summary

Large contiguous areas of native vegetation was recorded within Blackwood, within and surrounding the township.

Habitat for several nationally significant flora species occurred within the study area. There is a low likelihood that nationally significant fauna species occur within the study area on a frequent or permanent basis. There is habitat within the study area for several state significant flora and fauna species.

No national or state significant ecological communities are considered likely to occur within the study area.

Ten areas of known Cultural Heritage Sensitivity occur within the study area (several creeks, rivers and gullies and the Lerderderg State Park). As such a mandatory Cultural Heritage Management Plan is likely to be required for future development. Several listed historical heritage sites are located within the study area, including archaeological sites (graves and mines) and community, commercial and residential buildings and gardens.

The bushfire risk for Blackwood is Extreme.

11.6 Recommendations

In order to mitigate degradation of environmental values, it is recommended that opportunities are investigated to protect remnant vegetation within the study area through planning controls (e.g. revision of planning zones or application of Environmental Significance Overlays/Vegetation Protection Overlays).

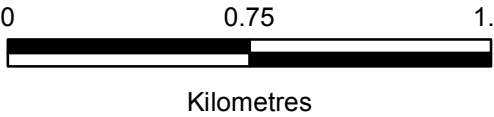


Legend

- Priority B Settlement
 - Township Zone
 - Contour (10m)
- Roads**
- Major Road
 - Minor Road
- Water**
- Minor Watercourse

Figure 2 -Blackwood

Physical features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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.
Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

- Priority B Settlement
- Township Zone

Ecological Vegetation Class (2005)

- Damp Forest
- Heathy Dry Forest
- Herb-rich Foothill Forest
- Riparian Forest
- Shrubby Foothill Forest

Significant Flora Records

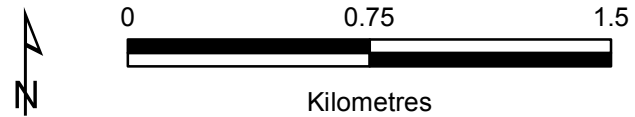
- Canary Dermocybe
- Cane Spear-grass
- Creeping Grevillea
- Dwarf Silver Wattle
- Fragrant Saltbush
- Hairy Beard-heath
- Orange Dermocybe
- Small-flower Mat-rush
- Southern Blue-gum
- Swamp Bush-pea

Significant Fauna Records

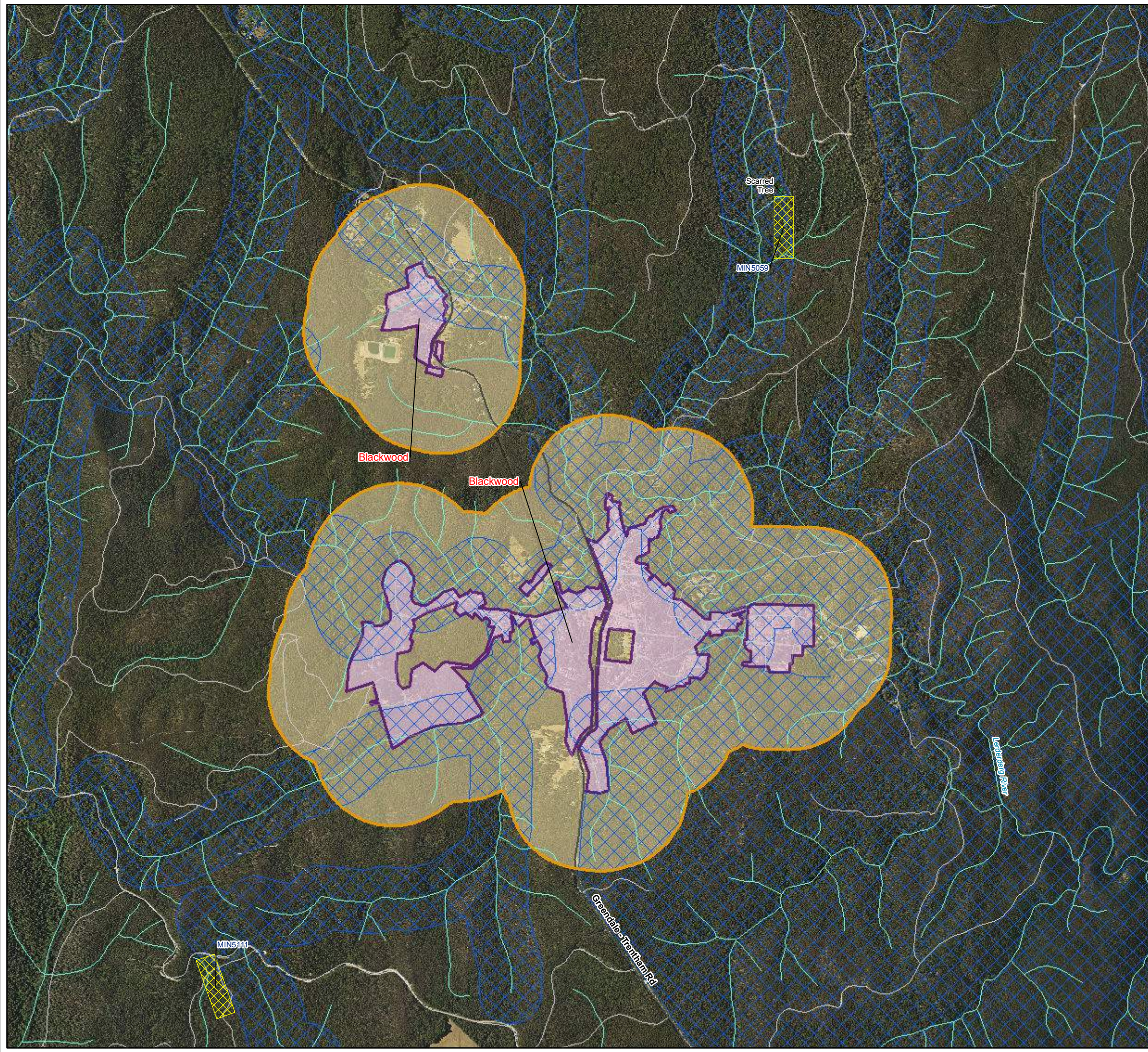
- Common Bent-wing Bat
- Common Bent-wing Bat (eastern ssp.)

Figure 3 -Blackwood

Constraining ecological features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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.
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Legend

Priority B Settlement

Township Zone

Cultural Heritage

Areas of Cultural Heritage Sensitivity

Scarred Tree

Mining, Extraction

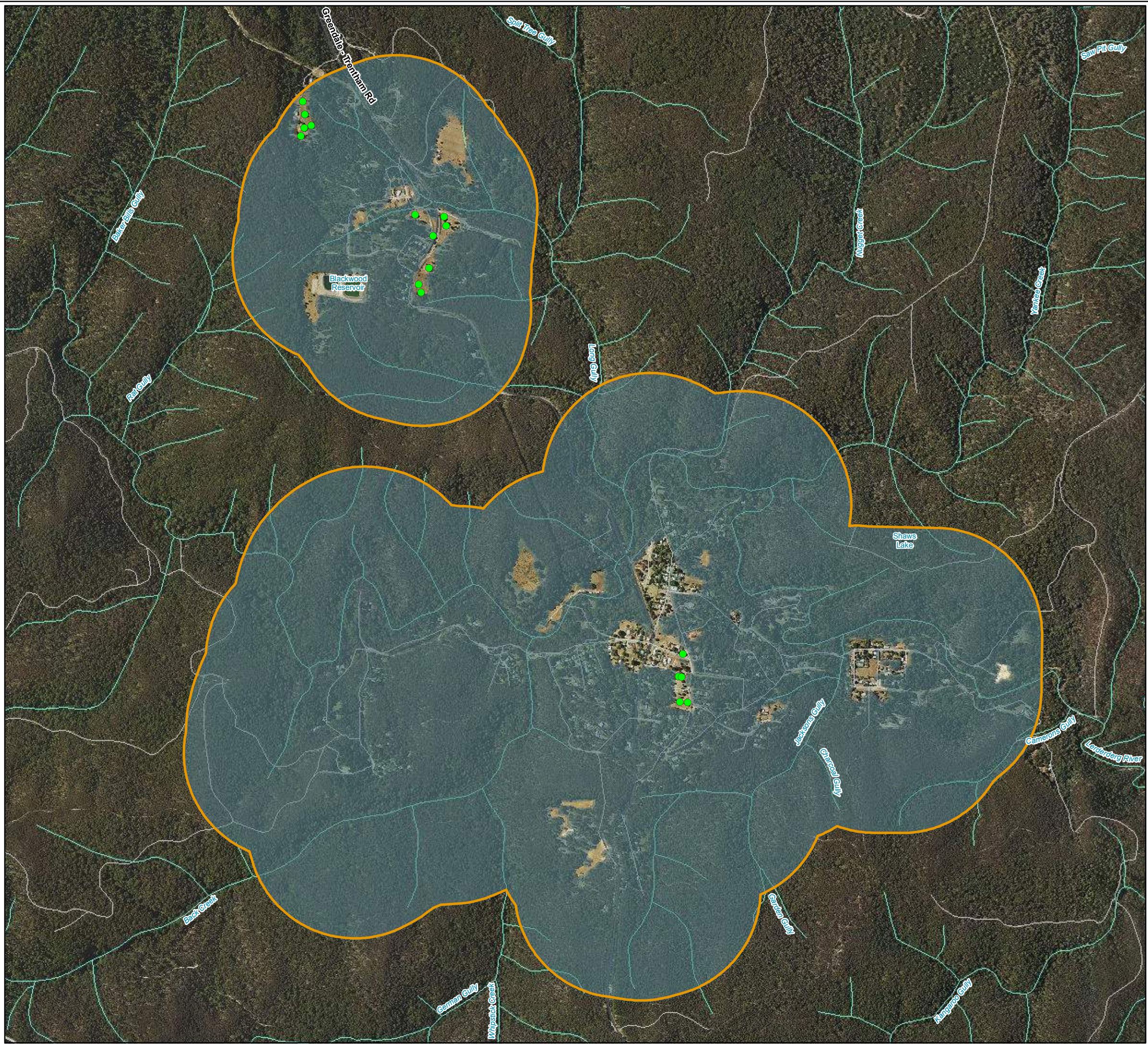
Current Mining Licenses and Leases

Figure 4 -Blackwood

Constraining Aboriginal Heritage features, Extractive Licenses and Wind Farms within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council




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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

 Priority B Settlement

Ecological Vegetation Classes

 Shrubby Foothill Forest/Heathy Dry Forest/Riparian Forest mosaic

 Scattered Trees

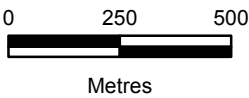
Watercourse

 Minor Watercourse

Figure 5 -Blackwood

Ecological features recorded during the field assessment

*Environmental Assessment Project
Moorabool Shire Council*



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

APPENDIX 1 – FLORA DATABASE RESULTS

Table A1 Significant flora recorded within 10 kilometres of the study area

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.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
NATIONAL SIGNIFICANCE							
# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	L	v	4
# <i>Dianella amoena</i>	Matted Flax-lily	-	-	EN	L	e	5
# <i>Glycine latrobeana</i>	Clover Glycine	3	1992	VU	L	v	2
# <i>Lepidium hyssopifolium</i>	Basalt Peppercress	6	2013	EN	L	e	5
# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	-	-	CR	L	e	5
# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	-	-	EN	L	e	5
# <i>Thelymitra matthewsii</i>	Spiral Sun-orchid	-	-	VU	L	v	5
STATE SIGNIFICANCE							
<i>Acacia aspera</i> subsp. <i>parviceps</i>	Rough Wattle	2	1998	-	-	r	3
<i>Acacia nano-dealbata</i>	Dwarf Silver Wattle	11	2012	-	-	r	1
<i>Acacia williamsonii</i>	Whirrakee Wattle	1	1994	-	-	r	5
<i>Austrostipa breviglumis</i>	Cane Spear-grass	1	1994	-	-	r	4
* <i>Bossiaea cordigera</i>	Wiry Bossiaea	14	2003	-	-	r	5
<i>Bossiaea vomkata</i>	Wombat Bossiaea	2	2010	-	-	e	5
<i>Caladenia dilatata</i> s.s.	Green-comb Spider-orchid	1	1994	-	-	k	5
<i>Dermocybe canaria</i>	Canary Dermocybe	1	2006	-	-	r	5
<i>Dermocybe cramesina</i>	Orange Dermocybe	1	2006	-	-	r	1
<i>Desmodium varians</i>	Slender Tick-trefoil	2	1994	-	-	k	3
<i>Discaria pubescens</i>	Australian Anchor Plant	1	1937	-	L	r	5
<i>Encalypta vulgaris</i>	Common Extinguisher-moss	1	1961	-	-	r	5
<i>Entolasia stricta</i>	Upright Panic	1	1999	-	-	k	5

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>*Eucalyptus</i> aff. <i>ignorabilis</i> (Lerderderg)	Lerderderg Scentbark	1	2007	-	-	e	5
<i>Eucalyptus brookeriana</i>	Brooker's Gum	17	2008	-	-	r	5
<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	1	1994	-	-	r	5
<i>Eucalyptus yarraensis</i>	Yarra Gum	3	2008	-	-	r	5
<i>Gahnia microstachya</i>	Slender Saw-sedge	3	1994	-	-	r	5
<i>Grevillea obtecta</i>	Fryerstown Grevillea	1	1994	-	-	r	3
<i>Grevillea repens</i>	Creeping Grevillea	8	2007	-	-	r	3
<i>Leucopogon microphyllus</i> var. <i>pilibundus</i>	Hairy Beard-heath	7	2001	-	-	r	3
<i>Lomandra micrantha</i> subsp. <i>tuberculata</i>	Small-flower Mat-rush	1	1994	-	-	r	5
<i>Luzula ovata</i>	Oval Woodrush	3	1989	-	-	k	5
<i>Olearia speciosa</i>	Netted Daisy-bush	1	1980	-	-	k	5
<i>Phebalium stenophyllum</i>	Narrow-leaf Phebalium	1	1968	-	-	r	5
<i>Philotheca scabra</i> subsp. <i>scabra</i>	Rough Wax-flower	1	1994	-	-	k	5
<i>*Pimelea hewardiana</i>	Forked Rice-flower	1	1980	-	-	r	3
<i>Platylobium alternifolium</i>	Victorian Flat-pea	1	1994	-	-	r	5
<i>Prostanthera decussata</i>	Dense Mint-bush	1	1994	-	-	r	5
<i>Pterostylis lustra</i>	Small Sickie Greenhood	1	1999	-	L	e	5
<i>Pultenaea reflexifolia</i>	Wombat Bush-pea	62	2007	-	-	r	5
<i>Pultenaea weindorferi</i>	Swamp Bush-pea	13	2001	-	-	r	3
<i>Rhagodia parabolica</i>	Fragrant Saltbush	1	1994	-	-	r	4

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>*Scleranthus fascicularis</i>	Spreading Knawel	1	1991	-	-	r	5
<i>*Sticherus tener</i> s.s.	Spreading Fan-fern	2	2000	-	-	r	5
<i>Westringia glabra</i>	Violet Westringia	3	1982	-	-	r	5
<i>Westringia glabra</i> var. <i>bacchi</i>	Violet Westringia	1	1994	-	-	r	5
<i>Wurmbea uniflora</i>	One-flower Early Nancy	1	1994	-	-	r	4

Data source: Victorian Biodiversity Atlas (DEPI 2014); Protected Matters Search Tool (DoE 2015).

Taxonomic order: Alphabetical.

APPENDIX 2 – SIGNIFICANT FAUNA SPECIES

Table A2. Significant fauna within 10 kilometres of the study area.

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

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 (DEPI 2013b); 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

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
Growling Grass Frog	<i>Litoria raniformis</i>	2001	2	VU	EN	L	VU	4
Dwarf Galaxias	<i>Galaxiella pusilla</i>	1979	1	VU	EN	L	VU	4
# Australasian Bittern	<i>Botaurus poiciloptilus</i>	-	-	EN	EN	L	VU	4
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	4
# Australian Painted Snipe	<i>Rostratula australis</i>	-	-	VU	CR	L	VU	4
# Golden Sun Moth	<i>Synemon plana</i>	-	-	CR	EN	L	-	4
# Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	-	-	VU	VU	L	VU	3
# Macquarie Perch	<i>Macquaria australasica</i>	-	-	EN	EN	L	DD	4
# Murray Cod	<i>Maccullochella peelii peelii</i>	-	-	VU	EN	L	-	4
# Smoky Mouse	<i>Pseudomys fumeus</i>	-	-	EN	CR	L	RA	4
# Spot-tailed Quoll	<i>Dasyurus maculatus</i>	-	-	EN	EN	L	VU	4
# Swift Parrot	<i>Lathamus discolor</i>	-	-	EN	EN	L	EN	4
STATE SIGNIFICANCE								
Brush-tailed Phascogale	<i>Phascogale tapoatafa tapoatafa</i>	2010	2	-	VU	L	NT	2
Barking Owl	<i>Ninox connivens connivens</i>	1981	1	-	EN	L	NT	3
Greater Glider	<i>Petauroides volans</i>	2005	66	-	VU	-	-	2
Common Bent-wing Bat	<i>Miniopterus schreibersii</i> GROUP	1998	5	-	-	L	CD	2
Common Bent-wing Bat (eastern ssp.)	<i>Miniopterus schreibersii oceanensis</i>	2011	4	-	VU	L	-	2
Musk Duck	<i>Biziura lobata</i>	2001	1	-	VU	-	-	4
Hardhead	<i>Aythya australis</i>	2008	1	-	VU	-	-	4
White-throated Needletail	<i>Hirundapus caudacutus</i>	2001	17	-	VU	-	-	4

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Square-tailed Kite	<i>Lophoictinia isura</i>	1991	10	-	VU	L	-	3
Grey Goshawk	<i>Accipiter novaehollandiae</i>	1976	2	-	VU	L	-	3
Powerful Owl	<i>Ninox strenua</i>	2007	278	-	VU	L	-	2
Sooty Owl	<i>Tyto tenebricosa tenebricosa</i>	1981	1	-	VU	L	-	3
Masked Owl	<i>Tyto novaehollandiae novaehollandiae</i>	1985	1	-	EN	L	NT	3
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2006	7	-	NT	-	NT	3
Brown Toadlet	<i>Pseudophryne bibronii</i>	1968	1	-	EN	L	DD	4

Data source: Victorian Biodiversity Atlas (DEPI 2014); Victorian Fauna Database (Viridans 2013b); Protected Matters Search Tool (DoE 2015).

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).

12 CLARENDON

12.1 Introduction

Clarendon is a small settlement within a farmland setting approximately 20 kilometres south of Ballarat, containing approximately 21 dwellings (Figure 1a).

12.2 Physical Attributes of the Settlement

12.2.1 Landscape

The Clarendon study area occurs within the Central Victorian Uplands bioregion and falls within the jurisdiction of the Corangamite CMA (DELWP 2015b) (Figure 1b).

Clarendon is located within the slopes, gullies and hills of Williamson Creek and Back Creek. Several medium to large artificial water bodies (dams) are located along the length of the creeks (DELWP 2015a) (Figure 2).

According to the DELWP Victorian Water Resources map (2015c), there are no salinity prone areas or Erosion Management Overlays within the study area. No salinity or erosion effected areas were recorded during the field assessment.

12.2.2 Flora and Fauna

12.2.2.1 Existing conditions

Ecological Vegetation Classes

According to the DELWP pre-1750 EVC mapping (DELWP 2015b), the study area was likely to support Valley Grassy Forest (EVC 47) and Herb-rich Foothill Forest (EVC 23) within the gullies and Plains Grassy Woodland (EVC 55) and Grassy Dry Forest (EVC 22) on the upper slopes and ridges. Based on extant vegetation mapping and aerial photography, small fragmented occurrences of these EVCs are likely to be persisting (Figure 3).

Three EVCs were recorded during the site assessment, Creekline Grassy Woodland (EVC 68), Grassy Dry Forest and Plains Grassy Woodland. Plains Grassy Woodland was recorded in moderately small fragmented patches within the south of the study area, either side of the Midland Highway. Creekline Grassy Woodland was recorded in small fragmented patches along Back Creek. Grassy Dry Forest was recorded along Clarendon-Lal Lal Road and private property to the south-east, contiguous with larger areas on native vegetation within the Mount Doran State Forest. Several scattered trees (Swamp Gums, Manna Gums, Narrow-leaf Peppermint and Grey Box) were also recorded throughout the study area (Figure 5).

Dominant flora species

Plains Grassy Woodland within Clarendon was dominated by Swamp Gum *Eucalyptus ovata* and Manna Gum *Eucalyptus viminalis*. Blackwood *Acacia melanoxylon* and Black Wattle *Acacia mearnsii* were present within the understorey. Creekline Grassy Woodland was dominated by Swamp Gum, Rushes *Juncus* spp. and

Common Tussock-grass *Poa labillardierei*. Grassy Dry Forest was dominated by Grey Box *Eucalyptus microcarpa*, Narrow-leaf Peppermint *Eucalyptus radiata*, Drooping Cassinia *Cassinia arcuata*, Austral Bracken *Pteridium esculentum* and Wallaby-grasses *Rytidosperma* spp.

Weeds present predominantly comprised pasture grasses (e.g. Cocksfoot *Dactylis glomerata*, Toowoomba Canary Grass *Phalaris aquatica*, Wild Oats *Avena fatua*), however Gorse *Ulex europaeus* and Blackberry *Rubus fruticosus* were present along creeklines and within woodland environments in addition to Willows *Salix* spp. present along waterways.

Fauna habitat

The study area supports six broad habitat types, woodland/forest, scattered trees, ephemeral creeklines, artificial waterbodies (farm dams), introduced grasslands and planted vegetation.

Woodland and scattered trees within the study area provides habitat to a range of native fauna, including birds, possums and microbats. Many of the Eucalypts recorded in this area are large, likely to contain hollows, and provide fruitful nectar yields that would attract a large number of native bird species in the immediate area. Scattered remnants of woodland are also likely to facilitate fauna movement between habitats throughout the otherwise cleared landscape.

Permanent creeklines are considered to be of moderate value for fauna. Common native waterbirds, frogs and reptiles are likely to utilise the creek for breeding, foraging, dispersal. Ephemeral creeklines are likely to provide occasional habitat for common frog species. However, due to the variability in water levels, few fish or frog species are likely to use this habitat on a permanent basis.

Artificial waterbodies within the study area are likely to support occasional foraging habitat for common wetland species, including frogs, ducks and wading birds.

Introduced grassland and planted vegetation provide foraging resources for species adapted to modified environments such as Magpies, wattlebirds, and honeyeaters. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills, and fantails for nesting and foraging purposes.

12.2.2.2 Significant species and ecological communities

EPBC Act listed Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoE 2015):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain;
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains; and,
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

No nationally significant communities were recorded within the study area and, based on the landscape context, nationally listed ecological communities are unlikely to occur within the study area.

FFG Act listed Ecological Communities

No state significant ecological communities were recorded within the study area, and none are considered likely to occur.

Nationally Significant Flora

The VBA and FIS contain records of six nationally listed flora species previously recorded within 10 kilometres of the study area; Clover Glycine *Glycine latrobeana*, Basalt Peppercress *Lepidium hyssopifolium*, Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*, Maroon Leek-orchid *Prasophyllum frenchii*, Swamp Fireweed *Senecio psilocarpus* and Swamp Everlasting *Xerochrysum palustre* (DEPI 2014; Viridans 2013a; Appendix 1; Figure 3). The PMST nominated an additional three nationally significant species which have not been recorded in the locality but have the potential to occur (DoE 2015).

Based on habitat within the study area, landscape context and the proximity of previous records, several nationally significant flora species may occur within the study area (Appendix 1), including Clover Glycine, Spiny Rice-flower, Maroon Leek-orchid, Swamp Fireweed and Swamp Everlasting.

State Significant Flora

The VBA and FIS contain records of 14 state significant flora species within 10 kilometres of the study area (DEPI 2014; Viridans 2013a) (Appendix 1; Figure 3).

Based on habitat within the study area, landscape context and the proximity of previous records, several state significant flora species may occur within the study area (Appendix 1), including Tall Club-sedge *Bolboschoenus fluviatilis*, Pale Swamp Everlasting *Coronidium gunnianum*, Perennial Blown-grass *Lachnagrostis perennis* spp. agg., Native Peppercress *Lepidium pseudohyssopifolium*.

Nationally Significant Fauna

The VBA and AVW contain records of two nationally listed fauna species previously recorded within 10 kilometres of the study area; Plains-wanderer *Pedionomus torquatus* and Growling Grass Frog *Litoria raniformis* (DEPI 2014; Viridans 2013b; Appendix 2; Figure 3). The PMST nominated an additional 10 nationally significant species which have not been recorded in the locality but have the potential to occur due to the presence of suitable habitat (DoE 2015).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, one nationally significant fauna species, Growling Grass Frog, has the potential to occur (albeit a low likelihood) within the study area as suitable habitat is present (Appendix 2; Figures 2c and 3).

State Significant Fauna

The VBA and AVW contain records of 20 state significant fauna species within 10 kilometres of the study area (DEPI 2014; Viridans 2013b) (Appendix 2; Figure 3).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, three state significant fauna species may use habitat within the study area for foraging purposes including Black Falcon *Falco subniger*, Eastern Great Egret *Ardea modesta* and Tussock Skink *Pseudemoiapagenstecheri*.

A number of more mobile species (principally bird species) may pass over the study area en-route to more preferred habitats on an occasional basis. There is a low likelihood that other nominated EPBC Act and State listed species reside within the study area on a permanent basis as there is no suitable habitat or they are presumed to be extinct in the local area (Appendix 2).

12.2.3 Cultural Heritage

12.2.3.1 Aboriginal Cultural Heritage

There are no registered Aboriginal archaeological places within the study area, or the surrounding 2km (Figure 4).

There are two areas of Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, within the study area. Under Regulation 23(1) land within 200 metres of a named waterway is classified as being of Cultural Heritage Sensitivity. The following areas of sensitivity were identified within the study area:

- Back Creek;
- Williamson Creek.

Aboriginal Heritage Act 2006

It is considered likely that Aboriginal heritage will be found in the study area. This conclusion is derived from the likelihood of areas of unmodified land in close proximity to waterways. A CHMP is used to assess the Aboriginal heritage and manage any heritage in the context of an impact such as a subdivision activity. Under Regulation 23, the study area is within an area of Cultural Heritage Sensitivity as it is located within 200 m of a waterway. Therefore, any future development within the above named areas of Cultural Heritage Sensitivity will require a mandatory CHMP.

12.2.3.2 Historical Cultural Heritage

There are no historical cultural heritage sites listed within the study area, or the surrounding 2km.

Heritage Act 1995

There are no sites listed on the Victorian Heritage Register or Victorian Heritage Inventory within the study area.

Planning and Environment Act 1987

There are no heritage sites of local significance listed on the Heritage Overlay under the Moorabool Shire Council Planning Scheme within the study area.

12.3 Legislative and Policy Implications

12.3.1 Extractive Industry

There are no current mining licenses or extractive industry tenements within the study area (DSDBI 2014) (Figure 6).

12.3.2 Wind Farms

Based on the results of the site assessment, aerial photography interpretation and GeoVic – Explore Victoria Online, there are no operating or proposed wind farms within two kilometres of the study area (DSDBI 2014) (Figure 6). However, the approved Lal Lal Wind Farm is located approximately 4.5 kilometres to the north and approximately 3.8 kilometres to the south of the Clarendon settlement (DSDBI 2014).

12.3.3 Intensive Agriculture

Based on aerial photography interpretation and the results of the site assessment, the predominant land use within the settlement is rural living and agriculture (grazing) and no intensive agriculture occurs within the study area.

12.3.4 Schedule of Licenced Premises

The study area does not include any EPA licences (EPA 2014).

12.4 Bushfire Risk

Based upon aerial photography, extant EVC mapping and results of the field assessment, the bushfire risk for Clarendon is moderate (Tables 2 and 3), given:

- The study area contains predominantly low threat vegetation (crops and managed pasture) with a 0-5° slope. However, there are large areas of contiguous woodland/forest to the south-west and north-east of the study area.
- Long bushfire runs (>10 kilometres) are possible, particularly from the south-west and north-east; however, the immediate vicinity of the township is easily accessed for fire fighting purposes;
- Extreme bushfire behaviour is unlikely and the type and extent of vegetation is unlikely to result in neighbourhood scale destruction of property; and,
- There are two access or escape routes from Clarendon along a major highway to the north and south to places that provide shelter from bushfire and two additional routes along lesser maintained roads containing vegetation close to the road.

12.5 Summary

Fragmented areas of native vegetation were recorded around and south of the Clarendon township, larger patches to the north-east of the township were contiguous with larger areas of forest outside the study area.

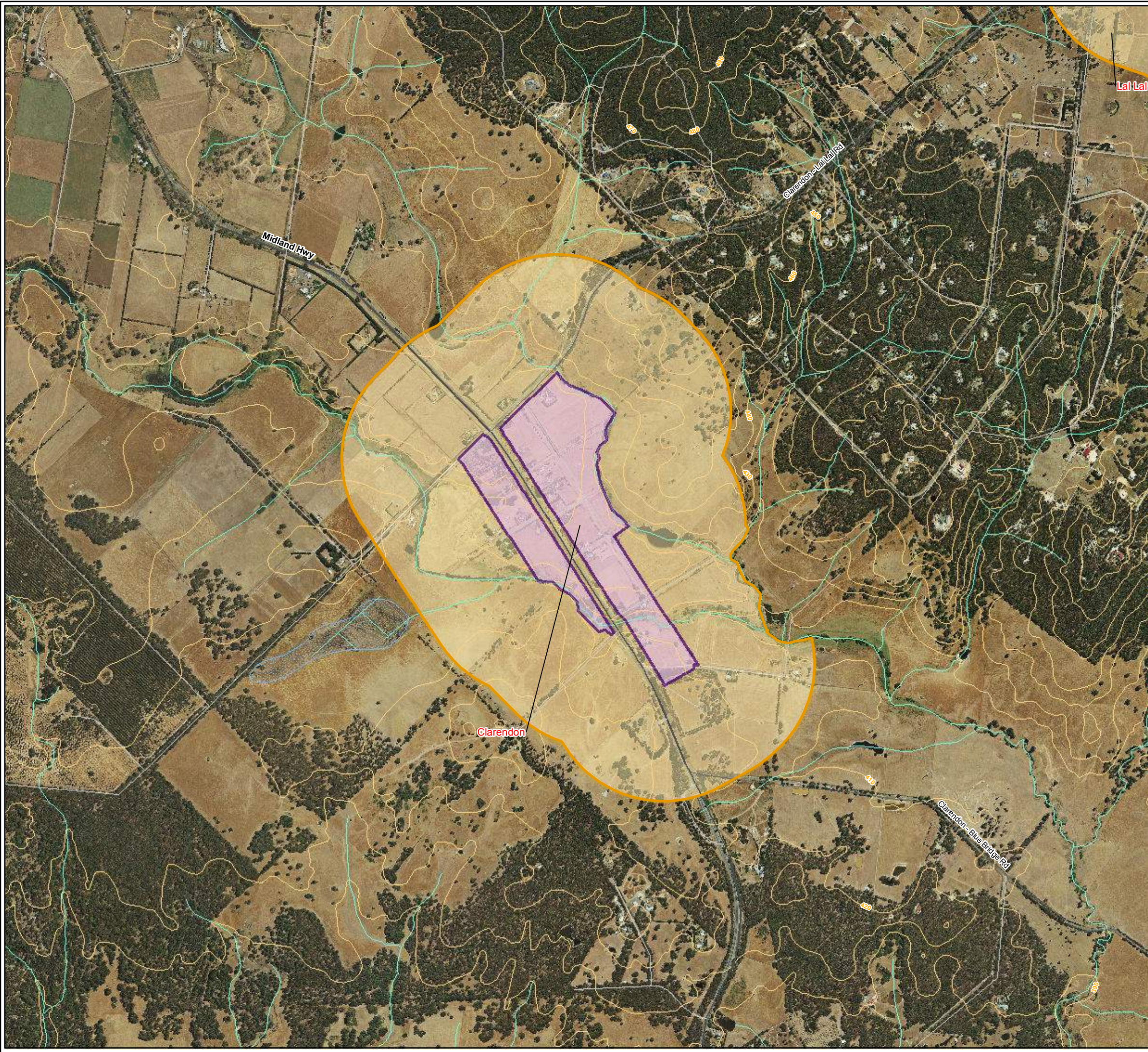
There is a low likelihood that national or state significant flora and fauna species occur within the study area. No national or state significant ecological communities are considered likely to occur within the study area.

Two areas of known Cultural Heritage Sensitivity occur within the study area (Back Creek and Williamson Creek). As such a mandatory Cultural Heritage Management Plan is likely to be required for future development. No listed historical heritage sites are located within the study area.

The bushfire risk for Clarendon is Moderate.

12.6 Recommendations

In order to mitigate degradation of environmental values, it is recommended that opportunities are investigated to protect larger remnant vegetation patches through planning controls (e.g. revision of planning zones or application of Environmental Significance Overlays/Vegetation Protection Overlays).



Legend

- Priority B Settlement
- Township Zone
- Contour (10m)

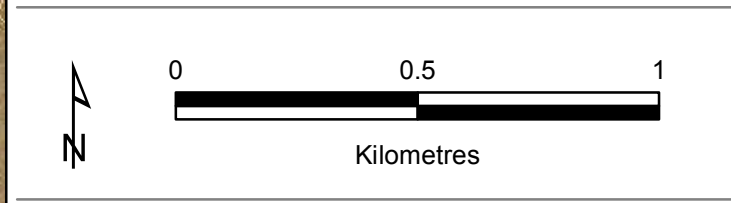
Roads

- Major Road
- Collector Road
- Minor Road

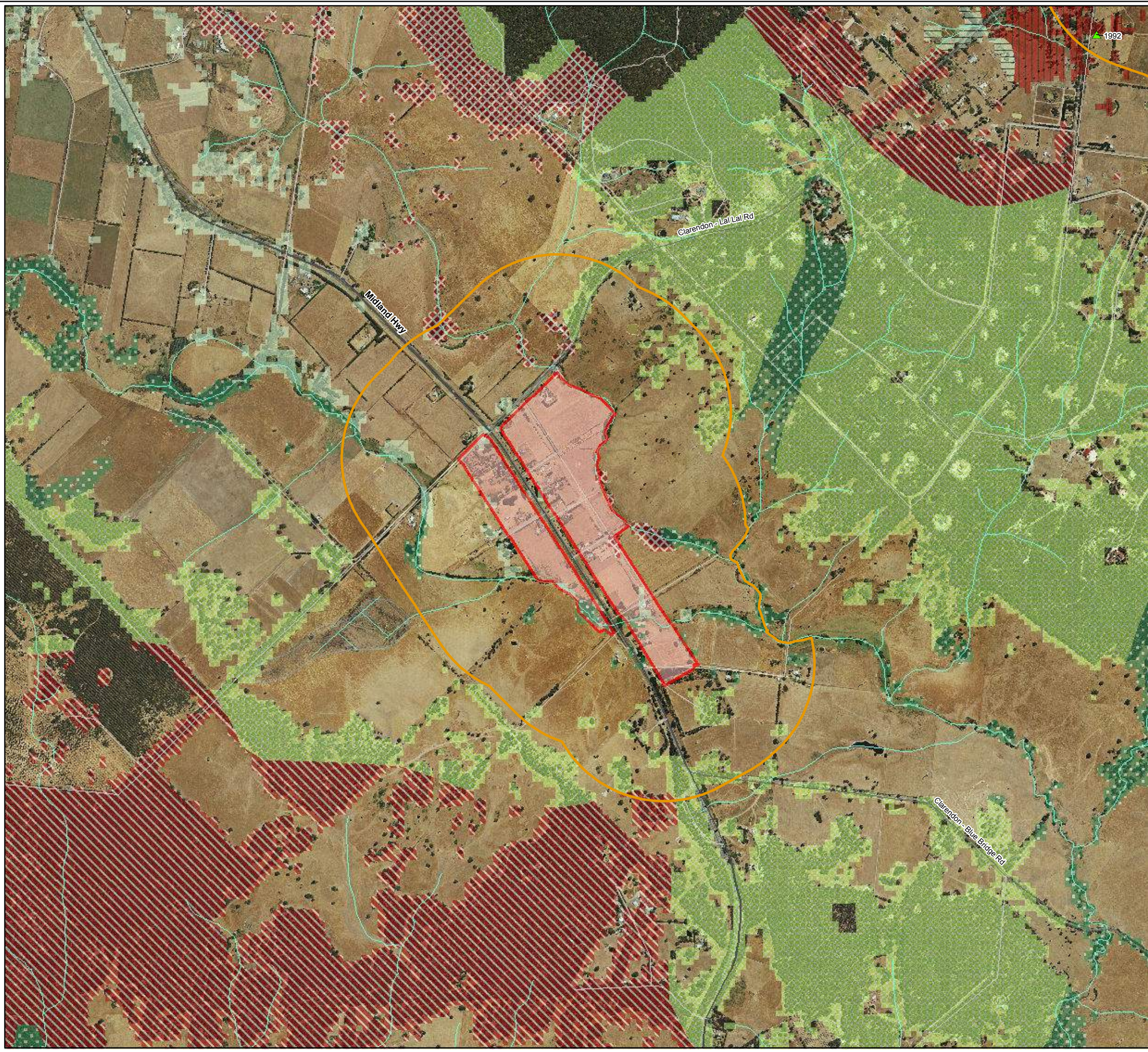
Water

- Minor Watercourse
- Land Subject to Inundation

Figure 2 -Clarendon
Physical features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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.
Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority B Settlement

Township Zone

Ecological Vegetation Class (2005)

Aquatic Herbland/Plains Sedgey Wetland Mosaic

Grassy Dry Forest

Grassy Forest

Grassy Woodland

Herb-rich Foothill Forest

Plains Grassy Woodland

Valley Grassy Forest

Significant Flora Records

Perennial Blown-grass

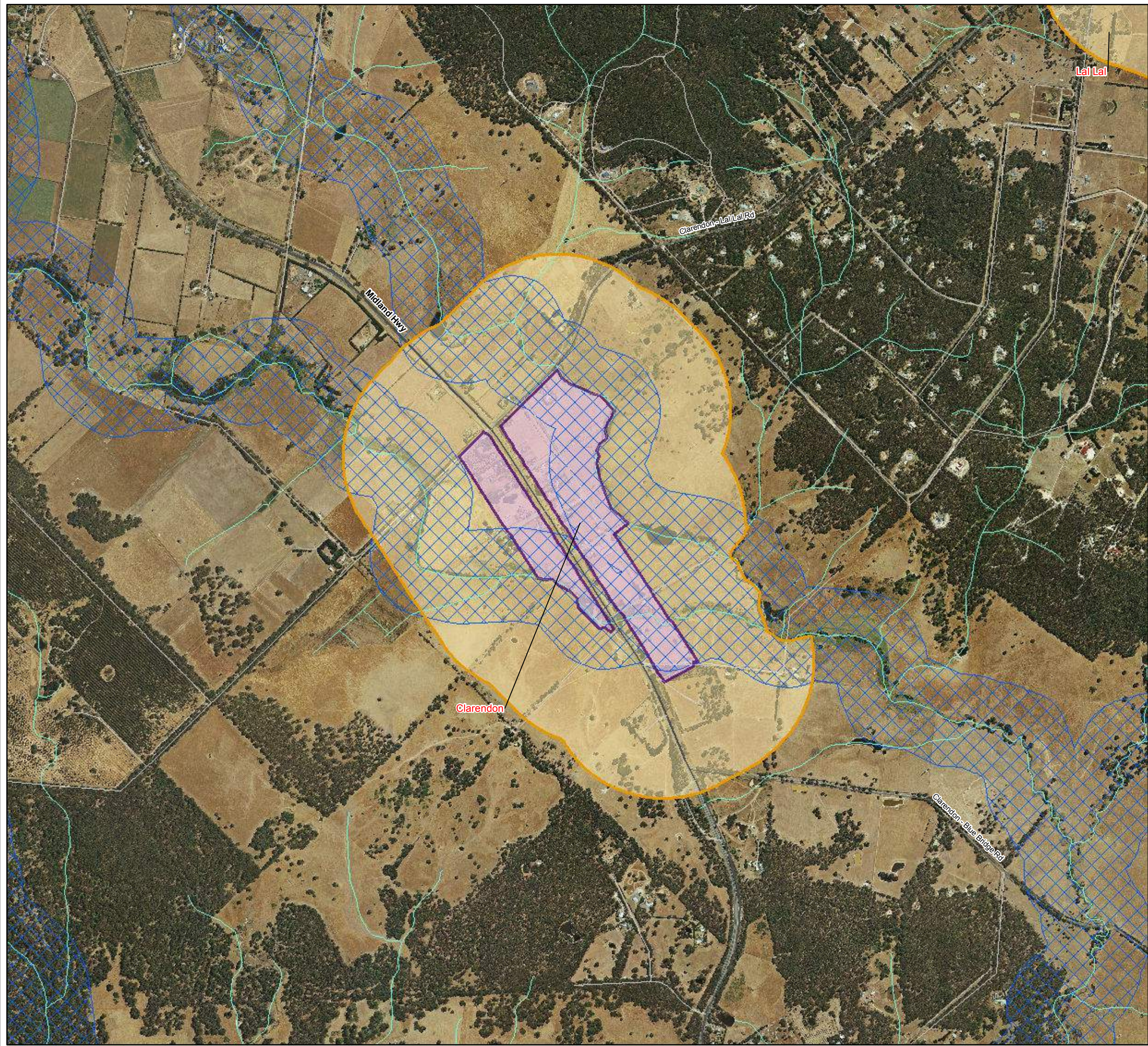
Figure 3 -Clarendon
Constraining ecological features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council

N

00.51

Kilometres

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.
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Legend

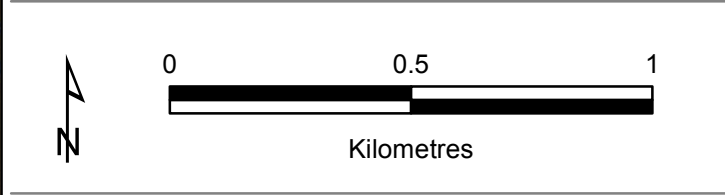
Priority B Settlement

Township Zone

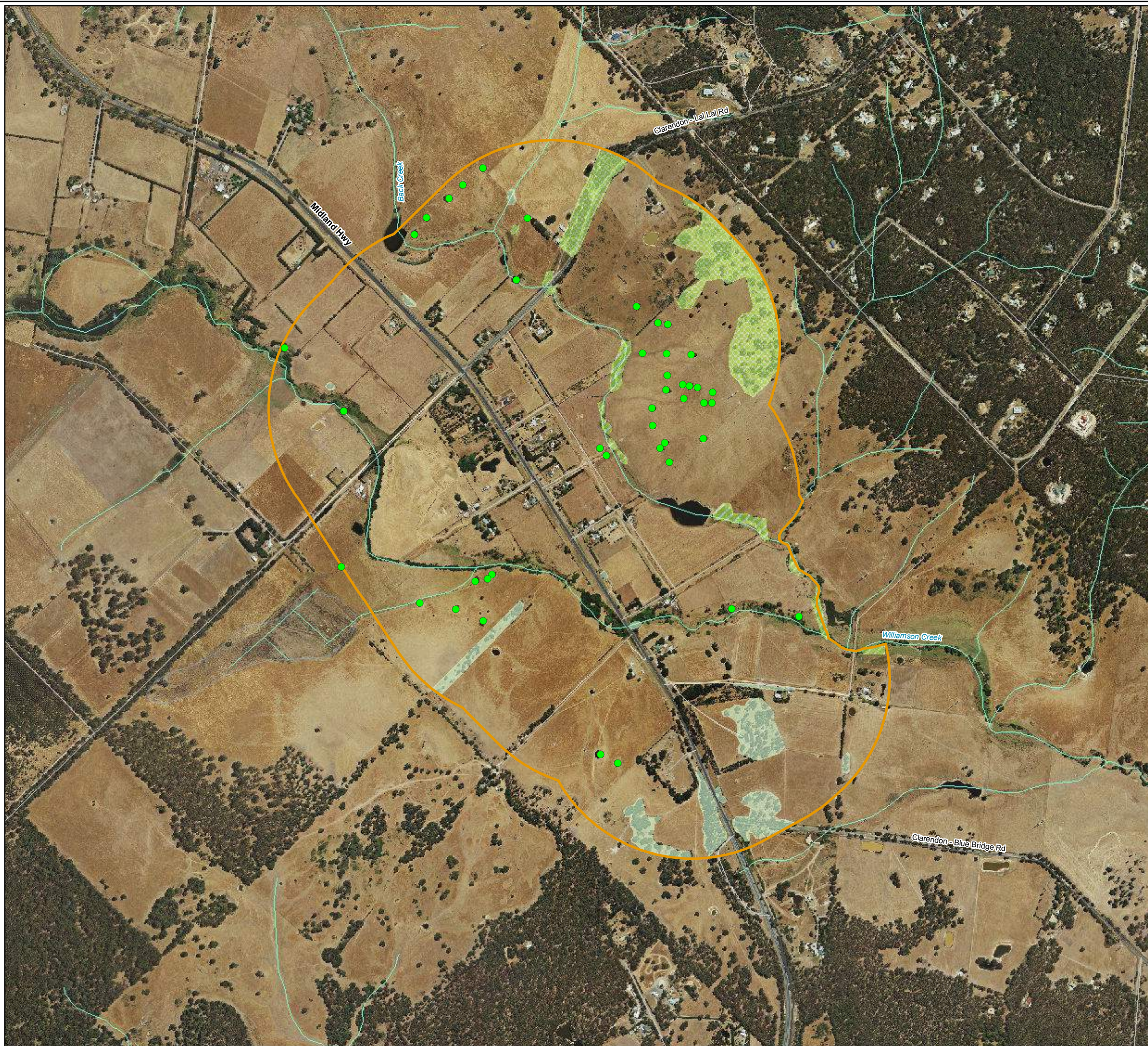
Cultural Heritage

Areas of Cultural Heritage Sensitivity

Figure 4 -Clarendon
Constraining Aboriginal Heritage features, Extractive Licenses and Wind Farms within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority B Settlement

Ecological Vegetation Classes

Creekline Grassy Woodland

Grassy Dry Forest

Plains Grassy Woodland

Scattered Trees

Watercourse

Minor Watercourse

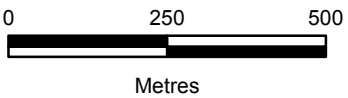
Water Area

Land Subject to Inundation

Figure 5 -Clarendon

Ecological features recorded during the field assessment

*Environmental Assessment Project
Moorabool Shire Council*



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

APPENDIX 1 – FLORA DATABASE RESULTS

Table A1 Significant flora recorded within 10 kilometres of the study area

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.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence
NATIONAL SIGNIFICANCE							
# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	L	v	5
# <i>Dianella amoena</i>	Matted Flax-lily	-	-	EN	L	e	5
# * <i>Glycine latrobeana</i>	Clover Glycine	1	2011	VU	L	v	4
# <i>Lepidium hyssopifolium</i>	Basalt Peppercross	6	2013	EN	L	e	5
# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	5	2010	CR	L	e	4
# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	1	1992	EN	L	e	4
# <i>Senecio psilocarpus</i>	Swamp Fireweed	7	1996	VU	-	v	4
# <i>Thelymitra matthewsii</i>	Spiral Sun-orchid	-	-	VU	L	v	5
# <i>Xerochrysum palustre</i>	Swamp Everlasting	9	2008	VU	L	v	4
STATE SIGNIFICANCE							
<i>Bolboschoenus fluviatilis</i>	Tall Club-sedge	1	1982	-	-	k	4
* <i>Cardamine paucijuga</i> s.s.	Annual Bitter-cress	1	1982	-	-	r	5
<i>Cardamine tenuifolia</i>	Slender Bitter-cress	1	1895	-	-	k	5
<i>Coronidium gunnianum</i>	Pale Swamp Everlasting	2	1996	-	-	v	4
<i>Discaria pubescens</i>	Australian Anchor Plant	14	2003	-	L	r	5
<i>Encalypta vulgaris</i>	Common Extinguisher-moss	1	1996	-	-	r	5
<i>Eucalyptus yarraensis</i>	Yarra Gum	46	2002	-	-	r	5
<i>Grevillea steiglitziana</i>	Brisbane Range Grevillea	1	1977	-	-	r	5
<i>Hypoxis vaginata</i> var. <i>brevistigmata</i>	Yellow Star	1	2000	-	-	k	5
<i>Lachnagrostis perennis</i> spp. agg.	Perennial Blown-grass	1	1992	-	-	k	4
<i>Lepidium pseudohyssopifolium</i>	Native Peppercross	1	1990	-	-	k	4

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence
<i>Plantago</i> aff. <i>gaudichaudii</i> (Lowland Swamps)	Swamp Plantain	1	1992	-	-	v	5
<i>Poa amplexicaulis</i>	Red-sheath Tussock-grass	1	2011	-	-	r	5
<i>Westringia glabra</i>	Violet Westringia	4	1996	-	-	r	5

Data source: Victorian Biodiversity Atlas (DEPI 2014); Protected Matters Search Tool (DoE 2015).

Taxonomic order: Alphabetical.

APPENDIX 2 – SIGNIFICANT FAUNA SPECIES

Table A2. Significant fauna within 10 kilometres of the study area.

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

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 (DEPI 2013b); 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

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
Plains-wanderer	<i>Pedionomus torquatus</i>	1911	1	VU	CR	L	EN	4
Growling Grass Frog	<i>Litoria raniformis</i>	1962	5	VU	EN	L	VU	3
# Australasian Bittern	<i>Botaurus poiciloptilus</i>	-	-	EN	EN	L	VU	4
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	4
# Australian Painted Snipe	<i>Rostratula australis</i>	-	-	VU	CR	L	VU	4
# Dwarf Galaxias	<i>Galaxiella pusilla</i>	-	-	VU	VU	L	VU	4
# Golden Sun Moth	<i>Synemon plana</i>	-	-	CR	EN	L	-	4
# Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	-	-	VU	VU	L	VU	4
# Regent Honeyeater	<i>Anthochaera phrygia</i>	-	-	EN	CR	L	EN	4
# Smoky Mouse	<i>Pseudomys fumeus</i>	-	-	EN	CR	L	RA	4
# Striped Legless Lizard	<i>Delma impar</i>	-	-	VU	EN	L	VU	4
# Swift Parrot	<i>Lathamus discolor</i>	-	-	EN	EN	L	EN	4
STATE SIGNIFICANCE								
Brush-tailed Phascogale	<i>Phascogale tapoatafa tapoatafa</i>	1988	1	-	VU	L	NT	4
Black Falcon	<i>Falco subniger</i>	2000	1	-	VU	-	-	2
Common Dunnart	<i>Sminthopsis murina murina</i>	1964	1	-	VU	-	-	4
Greater Glider	<i>Petauroides volans</i>	1969	2	-	VU	-	-	4
Common Bent-wing Bat	<i>Miniopterus schreibersii</i> GROUP	1962	1	-	-	L	CD	3
Musk Duck	<i>Biziura lobata</i>	2000	6	-	VU	-	-	3
Hardhead	<i>Aythya australis</i>	1992	5	-	VU	-	-	3
Blue-billed Duck	<i>Oxyura australis</i>	1986	3	-	EN	L	-	4

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
White-throated Needletail	<i>Hirundapus caudacutus</i>	1976	1	-	VU	-	-	4
Eastern Great Egret	<i>Ardea modesta</i>	1991	2	-	VU	L	-	2
Grey Goshawk	<i>Accipiter novaehollandiae</i>	1992	3	-	VU	L	-	3
Marsh Sandpiper	<i>Tringa stagnatilis</i>	1986	1	-	VU	-	-	4
Powerful Owl	<i>Ninox strenua</i>	1995	1	-	VU	L	-	4
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2000	5	-	NT	-	NT	4
Crested Bellbird	<i>Oreoica gutturalis gutturalis</i>	1800	1	-	NT	L	NT	4
Hooded Robin	<i>Melanodryas cucullata cucullata</i>	1975	1	-	NT	L	NT	3
Tussock Skink	<i>Pseudemoiapagenstecheri</i>	2007	6	-	VU	-	-	2
Brown Toadlet	<i>Pseudophryne bibronii</i>	2003	1	-	EN	L	DD	3
Otway Burrowing Cray	<i>Engaeus fultoni</i>	1963	1	-	VU	-	-	4
Hairy Burrowing Cray	<i>Engaeus sericatus</i>	1982	1	-	VU	-	-	4

Data source: Victorian Biodiversity Atlas (DEPI 2014); Victorian Fauna Database (Viridans 2013b); Protected Matters Search Tool (DoE 2015).

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).

13 GREENDALE

13.1 Introduction

Greendale is a small town approximately nine kilometres north-east of Ballan, containing approximately 33 dwellings (Figure 1a). Blackwood is located along the Greendale-Trentham Road/Greendale/Myrniong Road and is located within the transition between open farmland to the south and the Wombat State Forest to the north.

13.2 Physical Attributes of the Settlement

13.2.1 Landscape

The Greendale study area occurs within the Central Victorian Uplands bioregion and falls within the jurisdiction of the Port Phillip and Westernport CMA (DELWP 2015b) (Figure 1b).

Greendale is located within the foothills to the south of the Wombat State Forest. Dale Creek runs south through the study area. A few small artificial waterbodies (farm dams) are present within agricultural land (DELWP 2015a) (Figure 2).

According to the DELWP Victorian Water Resources map (2015c), there are no salinity prone areas or Erosion Management Overlays within the study area. Based on aerial photography interpretation, Dale Creek appears to be subject to gully erosion; field assessments confirmed occurrences of gully erosion along this creek, in at least one location west of the town centre.

13.2.2 Flora and Fauna

13.2.2.1 *Exiting Conditions*

Ecological Vegetation Classes

According to the DELWP pre-1750 EVC mapping (DELWP 2015b), the study area was likely to support Grassy Woodland (EVC 175), with Herb-rich Foothill Forest (EVC 23) along Dale Creek. The steeper slopes within the north of the study area were likely to support Shrubby Foothill Forest (EVC 45), Heathy Dry Forest (EVC 20) and Grassy Forest (EVC 128). Based on extant vegetation mapping and aerial photography, fragmented areas of Grassy Woodland and Herb-rich Foothill Forest are likely to be persisting, with large contiguous areas of Shrubby Foothill Forest, Heathy Dry Forest and Grassy Forest adjacent to the Wombat State Forest (Figure 3).

Three EVCs were recorded during the site assessment, Grassy Woodland, Herb-rich Foothill Forest and Shrubby Foothill Forest. Grassy Woodland was located on the gentle slopes and ridges to the west of the township. Herb-rich Foothill Forest was found throughout the township particularly to the north of Greendale-Myrniong Road, while Shrubby Foothill Forest was recorded to the north within forest contiguous with the Wombat State Forest. A large number of scattered trees (Manna Gum and Swamp Gum) were recorded within the study area (Figure 5).

Dominant flora species

Grassy Woodland within the study area was dominated by Manna Gum *Eucalyptus viminalis* and Swamp Gum *Eucalyptus ovata* over an understorey of Blackwood *Acacia melanoxylon*, Common Tussock-grass *Poa labillardierei* and Wallaby-grass *Rytidosperma* spp. Herb-rich Foothill Forest was dominated by the same species, with the addition of Candlebark *Eucalyptus rubida* and Drooping Cassinia *Cassinia arcuata*. While Shrubby Foothill Forest was dominated by Messmate *Eucalyptus obliqua* and Swamp Gum with an understorey of Drooping Cassinia, Common Cassinia *Cassinia aculeata*, Sweet Bursaria *Bursaria spinosa* and Black Wattle *Acacia mearnsii*. Scattered trees predominantly comprised Swamp Gums and Manna Gums.

Weeds present predominantly comprised pasture grasses (e.g. Panic Veldt-grass *Ehrharta erecta*, Cocksfoot *Dactylis glomerata*, Toowoomba Canary Grass *Phalaris aquatica*, Wild Oats *Avena fatua*), however Gorse *Ulex ferocissimus* and Blackberry *Rubus fruticosus* was also present nearby streams.

Fauna habitat

The study area supports six broad habitat types, woodland/forest, scattered trees, ephemeral creeklines, artificial waterbodies (farm dams), introduced grasslands and planted vegetation.

Woodland and scattered trees within the study area provides habitat to a range of native fauna, including birds, possums and microbats. Many of the Eucalypts recorded in this area are large, likely to contain hollows, and provide fruitful nectar yields that would attract a large number of native bird species in the immediate area. Scattered remnants of woodland are also likely to facilitate fauna movement between habitats throughout the otherwise cleared landscape.

Ephemeral creeklines are likely to provide occasional habitat for common frog species. However, due to the variability in water levels, few fish or frog species are likely to use this habitat on a permanent basis.

Artificial waterbodies within the study area are likely to support occasional foraging habitat for common wetland species, including frogs, ducks and wading birds.

Introduced grassland and planted vegetation provide foraging resources for species adapted to modified environments such as Magpies, wattlebirds, and honeyeaters. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills, and fantails for nesting and foraging purposes.

13.2.2.2 Significant species and ecological communities

EPBC Act listed Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoE 2015):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain;
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains; and,
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

No nationally listed ecological communities were recorded within the study area and none are considered likely to occur based on landscape context.

FFG Act listed Ecological Communities

No state significant ecological communities were recorded within the study area none are considered likely to occur.

Nationally Significant Flora

The VBA and FIS does not contain records of any nationally listed flora species previously recorded within 10 kilometres of the study area (DEPI 2014; Viridans 2013a; Appendix 1; Figure 3). The PMST nominated eight nationally significant species which have not been recorded in the locality but have the potential to occur (DoE 2015).

Based on habitat within the study area and landscape context nationally significant flora species may occur within the study area (Appendix 1) including Clover Glycine *Glycine latrobeana*.

State Significant Flora

The VBA and FIS contain records of 35 state significant flora species within 10 kilometres of the study area (DEPI 2014; Viridans 2013a) (Appendix 1; Figure 3).

Based on habitat within the study area, landscape context and the proximity of previous records, several state significant flora species may occur within the study area (Appendix 1), including Rough Wattle *Acacia aspera* subsp. *aspera*, Cane Spear-grass *Austrostipa breviglumis*, Slender Tick-trefoil *Desmodium varians*, Hairy Beard Heath *Leucopogon microphyllus* var. *pilibundus*, Brittle Greenhood *Pterostylis truncata* and One-flower Early Nancy *Wurmbea uniflora*.

Fauna habitat

The study area supports six broad habitat types, woodland, scattered trees, ephemeral creeklines, artificial waterbodies (farm dams), introduced grasslands and planted vegetation.

Woodland and scattered trees within the study area provides habitat to a range of native fauna, including birds, possums and microbats. Many of the Eucalypts recorded in this area are large, likely to contain hollows, and provide fruitful nectar yields that would attract a large number of native bird species in the immediate area. Scattered remnants are also likely to facilitate fauna movement between habitats throughout the otherwise cleared landscape.

Ephemeral creeklines are likely to provide occasional habitat for common frog species. However, due to the variability in water levels, few fish or frog species are likely to use this habitat on a permanent basis.

Artificial waterbodies within the study area are likely to support occasional foraging habitat for common wetland species, including frogs, ducks and wading birds.

Introduced grassland and planted vegetation provide foraging resources for species adapted to modified environments such as Magpies, wattlebirds, and honeyeaters. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills, and fantails for nesting and foraging purposes.

Nationally Significant Fauna

The VBA and AVW contain records of three nationally listed fauna species previously recorded within 10 kilometres of the study area; Swift Parrot *Lathamus discolor*, Growling Grass Frog *Litoria raniformis* and Dwarf Galaxias *Galaxiella pusilla* (DEPI 2014; Viridans 2013b; Appendix 2; Figure 3). The PMST nominated an additional nine nationally significant species which have not been recorded in the locality but have the potential to occur due to the presence of suitable habitat (DoE 2015).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, no nationally significant fauna species are likely to occur within the study area as no suitable habitat is present.

State Significant Fauna

The VBA and AVW contain records of 16 State significant fauna species within 10 kilometres of the study area (DEPI 2014; Viridans 2013b) (Appendix 2; Figure 3).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, five State significant fauna species may use habitat within the study area for foraging purposes, including Diamond Firetail *Stagonopleura guttata*, Tussock Skink *Pseudemoia pagenstecheri*, Brown Treecreeper *Climacteris picumnus victoriae*, Common Bent-wing Bat (eastern ssp.) *Miniopterus schreibersii oceanensis* and Greater Glider *Petauroides volans*.

A number of more mobile species (principally bird species) may pass over the study area en-route to more preferred habitats on an occasional basis. There is a low likelihood that other State listed species reside within the study area on a permanent basis as there is no suitable habitat or they are presumed to be extinct in the local area (Appendix 2).

13.2.3 Cultural Heritage

13.2.3.1 Aboriginal Cultural Heritage

There are no registered Aboriginal archaeological places within the study area, and one within the surrounding 2km (Table 15; Figure 4).

Table 15: Aboriginal Cultural Heritage within or surrounding the Greendale Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VAHR 7722-0182	Greendale Axe 1	Isolated Artefact	No, 2km north west

There are two areas of Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, within the study area. Under Regulation 23(1) land within 200 metres of a named waterway is classified as being of Cultural Heritage Sensitivity. The following areas of sensitivity were identified within the study area.

- Blue Gully; and
- Dale Creek.

Aboriginal Heritage Act 2006

It is considered likely that Aboriginal heritage will be found in the study area. This conclusion is derived from the likelihood of areas of unmodified land in close proximity to waterways. A CHMP is used to assess the Aboriginal heritage and manage any heritage in the context of an impact such as a subdivision activity. Under Regulation 23, the study area is within an area of Cultural Heritage Sensitivity as it is located within 200 m of a waterway. Therefore, any future development within the above named areas of Cultural Heritage Sensitivity will require a mandatory CHMP.

13.2.3.2 Historical Cultural Heritage

There are four sites listed on the Moorabool Shire Council Heritage Overlay within the study area, and one site listed on the Victorian Heritage Inventory within the surrounding 2km (Table 16).

Table 16: Historical Cultural Heritage within or surrounding the Greendale Study Area

Register & Site Number	Site Name	Site Type	Within study area?
HO36	Former State School No 918, Napoleon Street	Built: Education	Yes
HO37	"Glen Pedder" Homestead, Myrniong-Greendale Road	Built: Residential	Yes
HO38	Anglican Church, Prince Street	Built: Community	Yes
HO39	Shuters Cottage, LaCote Road	Built: Residential	Yes
VHI H7723-0052	Witnish's Sawmill Greendale	Archaeological: Commercial	No, 900m north east

Heritage Act 1995

There are no sites listed on the Victorian Heritage Register or Victorian Heritage Inventory within the study area.

Planning and Environment Act 1987

There are four heritage sites of local significance listed on the Heritage Overlay under the Moorabool Shire Council Planning Scheme within the study area. A planning permit from the Moorabool Shire Council will be required to remove, impact or destroy these sites.

13.3 Legislative and Policy Implications

13.3.1 Extractive Industry

There are no current mining licenses or extractive industry tenements within the study area (DSDBI 2014) (Figure 6).

13.3.2 Wind Farms

Based on aerial photography interpretation and GeoVic – Explore Victoria Online, there are no operating or proposed wind farms within two kilometres of the study area and none were recorded during the field assessment (DSDBI 2014) (Figure 6).

13.3.3 Intensive Agriculture

Based on aerial photography interpretation and the results of the field assessment, the predominant land use within the settlement is rural living and agriculture (grazing).

13.3.4 Schedule of Licenced Premises

The study area does not include any EPA licences (EPA 2014).

13.4 Bushfire Risk

Based upon aerial photography, extant EVC mapping and results of the field assessment, the bushfire risk for Greendale is high (Tables 2 and 3), given:

- The study area and surrounding landscape predominantly contains a mosaic of moderate and high threat vegetation (woodland and forest), but is adjacent to large contiguous areas of forest. The township is located on slopes of 5-30° (Figures 2 and 3);
- Long bushfire runs (>10 kilometres) are possible, particularly from northerly aspects within a landscape difficult to access for fire fighting purposes;
- The type and extent of vegetation to the north of the township may result in neighbourhood-scale destruction as it interacts with the bushfire hazard within the township; and,
- Access and escape routes are limited to three roads. Routes to the south contain low to moderate tree cover within moderate-risk vegetation (woodland), however, the route to the north contains extensive high-threat vegetation (forest) with trees overhanging or close to the road.

13.5 Summary

Native Vegetation within Greendale is fragmented into moderate to large patches along creeklines and ridges. A large number of scattered trees were also present. It is unlikely any vegetation patches will form a national or state significant ecological community.

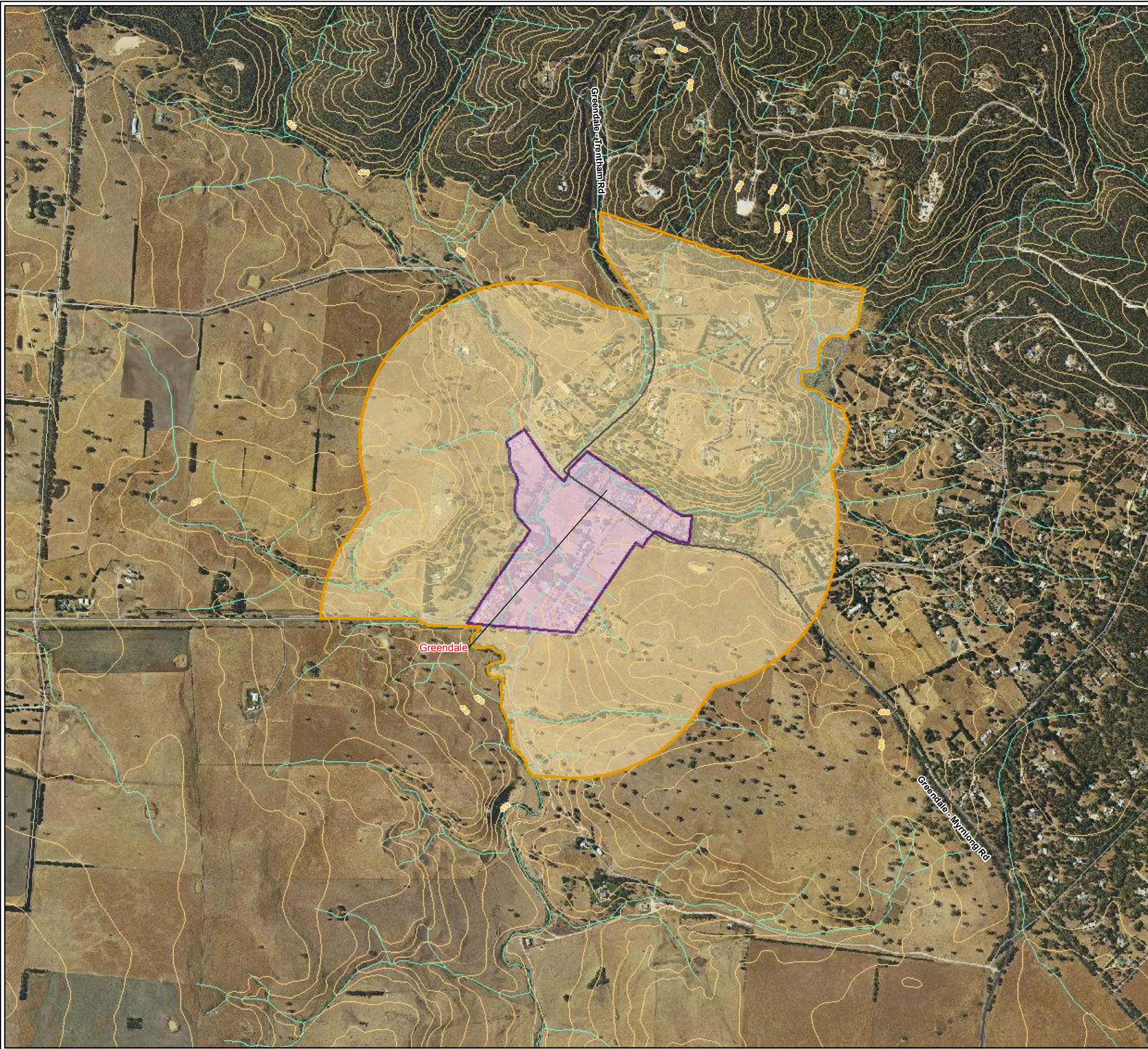
There is a low-moderate likelihood that nationally significant flora species occur within the study area, however, nationally significant fauna are considered unlikely. There is potential habitat within the study area for several state significant flora and fauna species.

Two areas of known Cultural Heritage Sensitivity occur within the study area, Blue Gully and Dale Creek. As such, a mandatory Cultural Heritage Management Plan is likely to be required for development within the study area. Four listed historical heritage sites are located within the study area (Former State School no. 918, “Glen Pedder” Homestead, Anglican Church and Shutters Cottage).

The bushfire risk for Greendale is High.

13.6 Recommendations

In order to mitigate degradation of environmental values, it is recommended that opportunities are investigated to protect larger remnant vegetation patches (particularly those along waterways or forming habitat corridors) and scattered trees through planning controls (e.g. revision of planning zones or application of Environmental Significance Overlays/Vegetation Protection Overlays).



Legend

- Priority B Settlement
- Township Zone
- Contour (10m)

Roads

- Major Road
- Collector Road
- Minor Road

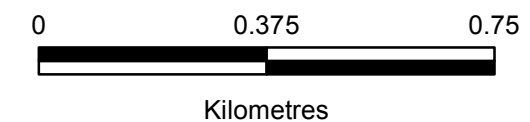
Water

- Minor Watercourse
- Land Subject to Inundation

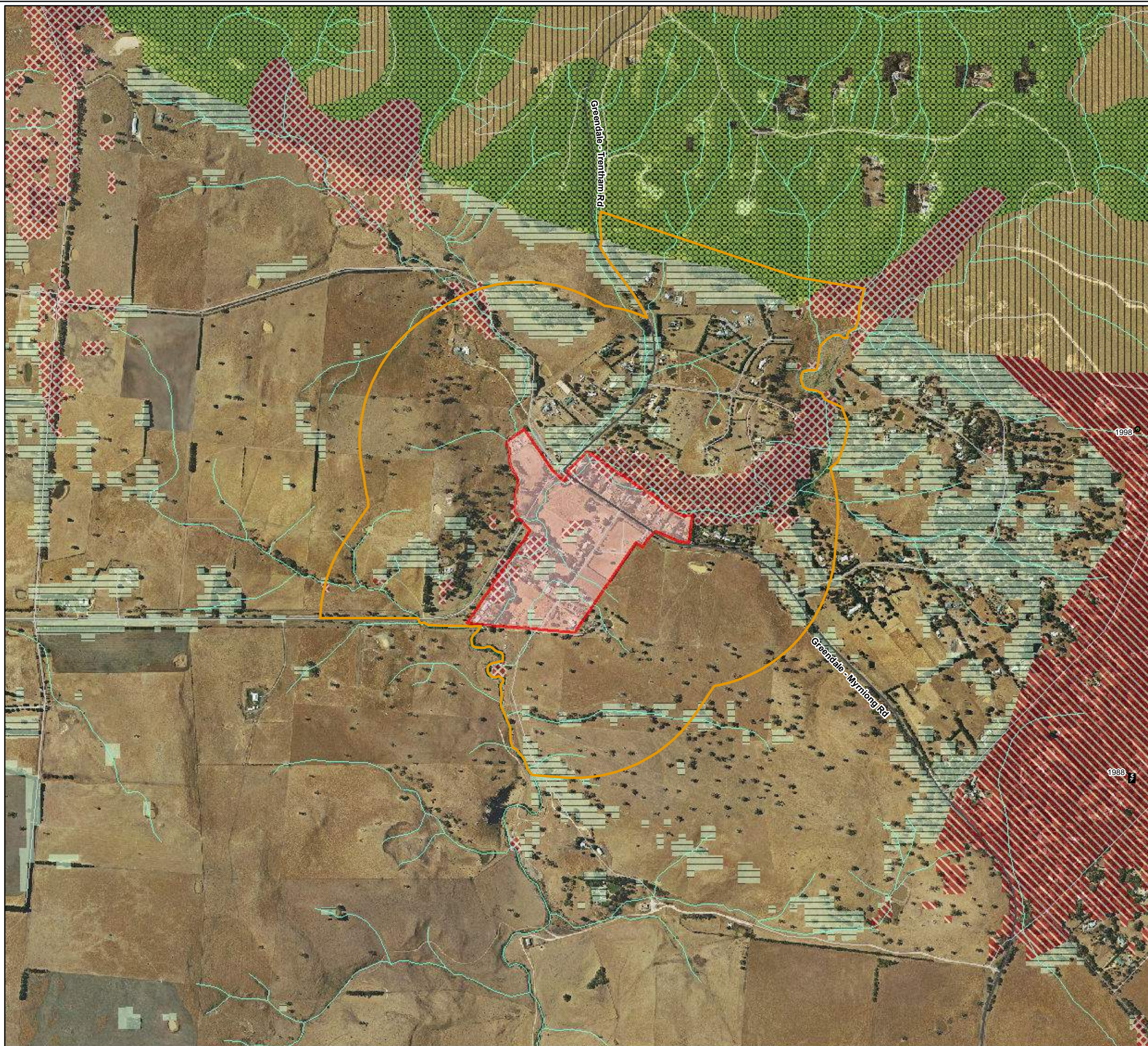
Figure 2 -Greendale

Physical features within and surrounding the settlement

*Environmental Assessment Project
Moorabool Shire Council*



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.
Aerial photo (2013) and contours supplied by Moorabool Shire Council.

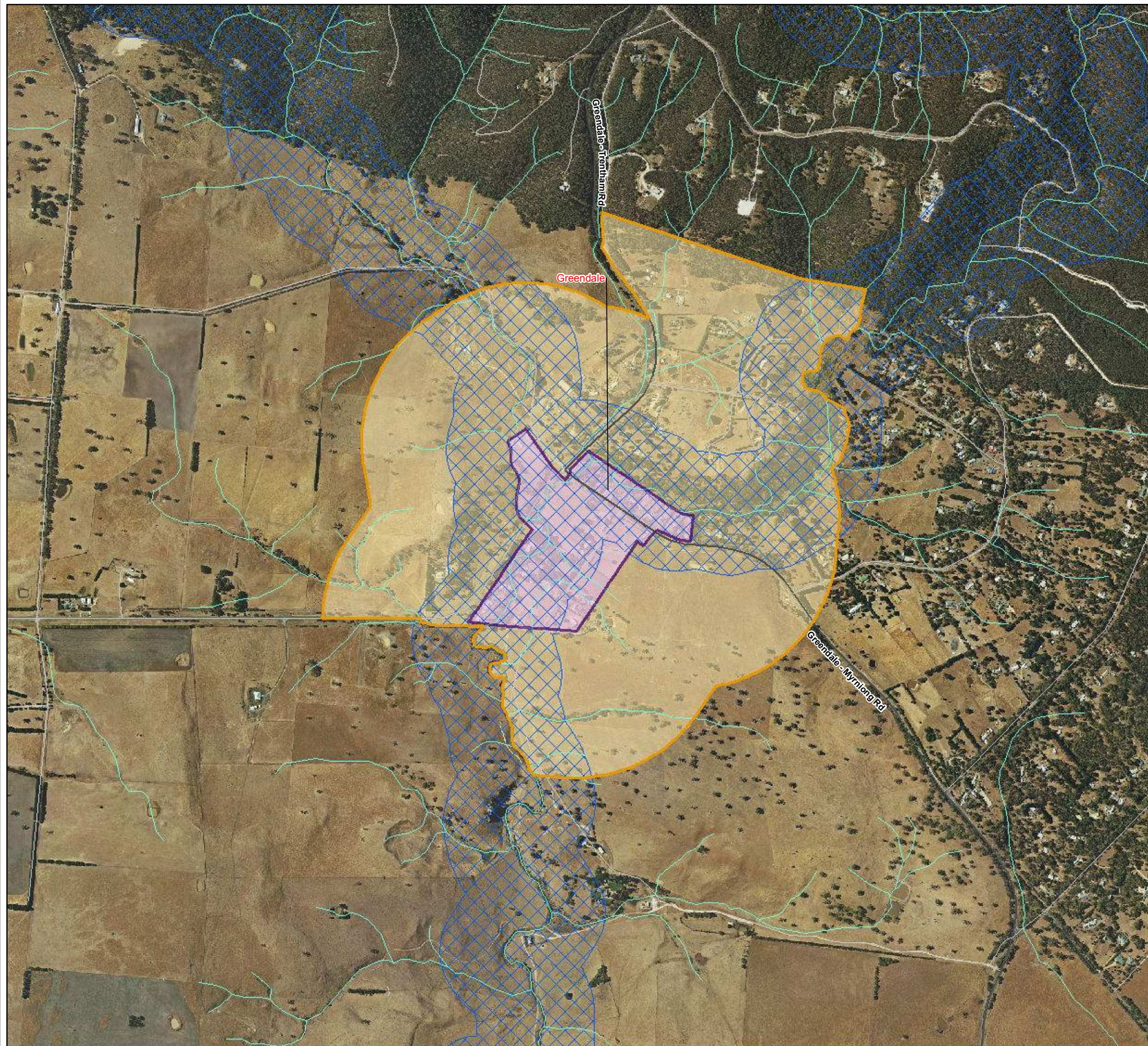


- Legend**
- Priority B Settlement
 - Township Zone
- Ecological Vegetation Class (2005)**
- Grassy Forest
 - Grassy Woodland
 - Heathy Dry Forest
 - Herb-rich Foothill Forest
 - Plains Grassy Woodland
 - Shrubby Foothill Forest
- Significant Flora Records**
- Rough Wattle
- Significant Fauna Records**
- Brush-tailed Phascogale

Figure 3 -Greendale
Constraining ecological features within and surrounding the settlement
Environmental Assessment Project
 Moorabool Shire Council

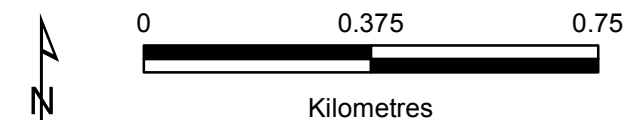


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 Aerial photo (2013) and contours supplied by Moorabool Shire Council.

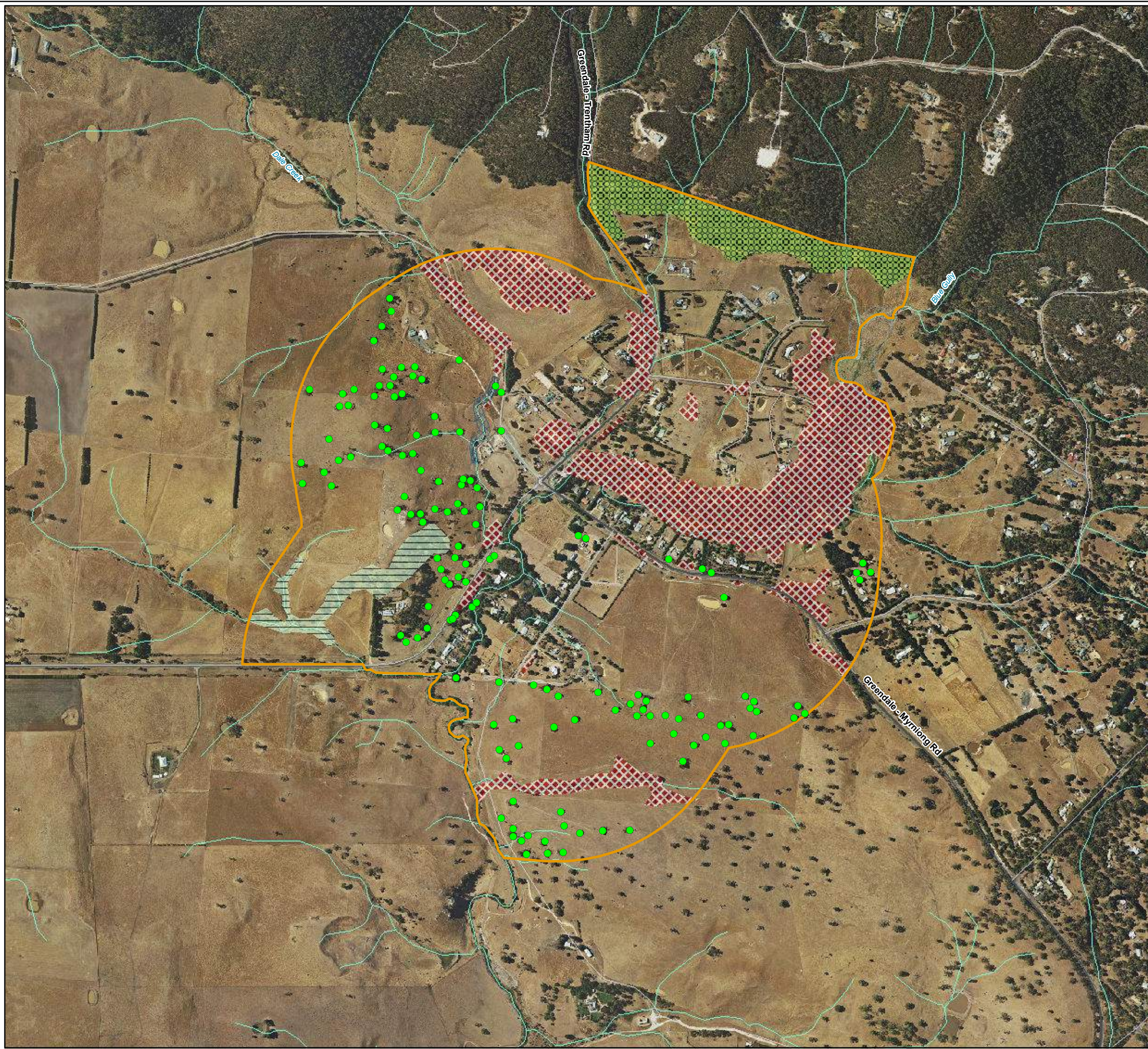


- Legend**
- Priority B Settlement
 - Township Zone
 - Cultural Heritage**
 - Areas of Cultural Heritage Sensitivity

Figure 4 -Greendale
Constraining Aboriginal Heritage features, Extractive Licenses and Wind Farms within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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.
Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority B Settlement

Ecological Vegetation Classes

Grassy Woodland

Herb-rich Foothill Forest

Shubby Foothill Forest

Gully Erosion

Scattered Trees

Watercourse

Minor Watercourse

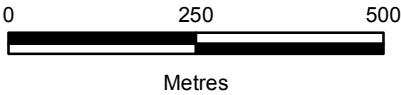
Water Area

Land Subject to Inundation

Figure 5 -Greendale

Ecological features recorded during the field assessment

*Environmental Assessment Project
Moorabool Shire Council*



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.
Aerial photo (2013) and contours supplied by Moorabool Shire Council.

APPENDIX 1 – FLORA DATABASE RESULTS

Table A1 Significant flora recorded within 10 kilometres of the study area

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.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
NATIONAL SIGNIFICANCE							
# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	L	v	5
# <i>Dianella amoena</i>	Matted Flax-lily	-	-	EN	L	e	5
# <i>Glycine latrobeana</i>	Clover Glycine	-	-	VU	L	v	4
# <i>Lepidium hyssopifolium</i>	Basalt Peppercross	-	-	EN	L	e	5
# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	-	-	CR	L	e	5
# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	-	-	EN	L	e	5
# <i>Thelymitra matthewsii</i>	Spiral Sun-orchid	-	-	VU	L	v	5
# <i>Xerochrysum palustre</i>	Swamp Everlasting	-	-	VU	L	v	5
STATE SIGNIFICANCE							
<i>Acacia aspera</i> subsp. <i>parviceps</i>	Rough Wattle	5	1998	-	-	r	3
<i>Acacia williamsonii</i>	Whirrakee Wattle	1	1994	-	-	r	5
<i>Allocasuarina luehmannii</i>	Buloke	1	1980	-	L	-	5
<i>Austrostipa breviglumis</i>	Cane Spear-grass	3	1994	-	-	r	4
* <i>Bossiaea cordigera</i>	Wiry Bossiaea	1	1995	-	-	r	5
<i>Caladenia dilatata</i> s.s.	Green-comb Spider-orchid	1	1994	-	-	k	5
<i>Cardamine papillata</i>	Forest Bitter-cress	1	1898	-	-	r	5
<i>Carex chlorantha</i>	Green-top Sedge	1	1853	-	-	k	5
<i>Dermocybe canaria</i>	Canary Dermocybe	1	2006	-	-	r	5
<i>Dermocybe cramesina</i>	Orange Dermocybe	1	2006	-	-	r	5
<i>Desmodium varians</i>	Slender Tick-trefoil	4	1994	-	-	k	3
<i>Eucalyptus baueriana</i> subsp. <i>thalassina</i>	Werribee Blue-box	1	1980	-	-	e	5

<i>Eucalyptus yarraensis</i>	Yarra Gum	1	1996	-	-	r	5
<i>Euphrasia collina</i> subsp. <i>trichocalycina</i>	Purple Eyebright	1	1963	-	-	r	5
<i>Gahnia microstachya</i>	Slender Saw-sedge	8	2001	-	-	r	5
<i>Grevillea obtecta</i>	Fryerstown Grevillea	1	1994	-	-	r	5
<i>Grevillea repens</i>	Creeping Grevillea	3	1998	-	-	r	5
<i>Leucopogon microphyllus</i> var. <i>pilibundus</i>	Hairy Beard-heath	8	2001	-	-	r	4
<i>Lomandra micrantha</i> subsp. <i>tuberculata</i>	Small-flower Mat-rush	1	1994	-	-	r	5
<i>Nicotiana suaveolens</i>	Austral Tobacco	22	2011	-	-	r	5
<i>Phebalium stenophyllum</i>	Narrow-leaf Phebalium	1	1968	-	-	r	5
<i>Philotheca scabra</i> subsp. <i>scabra</i>	Rough Wax-flower	1	1994	-	-	k	5
<i>*Pimelea hewardiana</i>	Forked Rice-flower	1	1980	-	-	r	5
<i>Platylobium alternifolium</i>	Victorian Flat-pea	1	1994	-	-	r	5
<i>Prostanthera decussata</i>	Dense Mint-bush	4	2001	-	-	r	5
<i>Prostanthera nivea</i> var. <i>nivea</i>	Snowy Mint-bush	1	1980	-	-	r	5
<i>Pseudanthus orbicularis</i>	Tangled Pseudanthus	5	1991	-	-	r	5
<i>*Pterostylis smaragdina</i>	Emerald-lip Greenhood	1	1943	-	-	r	5
<i>Pterostylis truncata</i>	Brittle Greenhood	1	1980	-	L	e	4
<i>Pultenaea reflexifolia</i>	Wombat Bush-pea	14	2007	-	-	r	5
<i>Pultenaea weindorferi</i>	Swamp Bush-pea	4	1995	-	-	r	5
<i>Rhagodia parabolica</i>	Fragrant Saltbush	43	2011	-	-	r	5
<i>Westringia glabra</i>	Violet Westringia	5	1982	-	-	r	5
<i>Westringia glabra</i> var. <i>bacchi</i>	Violet Westringia	1	1994	-	-	r	5
<i>Wurmbea uniflora</i>	One-flower Early Nancy	1	1994	-	-	r	4

Data source: Victorian Biodiversity Atlas (DEPI 2014); Protected Matters Search Tool (DoE 2015). **Taxonomic order:** Alphabetical.

APPENDIX 2 – SIGNIFICANT FAUNA SPECIES

Table A2. Significant fauna within 10 kilometres of the study area.

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

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 (DEPI 2013b); 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

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
Swift Parrot	<i>Lathamus discolor</i>	1957	1	EN	EN	L	EN	3
Growling Grass Frog	<i>Litoria raniformis</i>	1977	1	VU	EN	L	VU	4
Dwarf Galaxias	<i>Galaxiella pusilla</i>	1979	1	VU	EN	L	VU	44
# Australasian Bittern	<i>Botaurus poiciloptilus</i>	-	-	EN	EN	L	VU	4
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	4
# Australian Painted Snipe	<i>Rostratula australis</i>	-	-	VU	CR	L	VU	4
# Golden Sun Moth	<i>Synemon plana</i>	-	-	CR	EN	L	-	4
# Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	-	-	VU	VU	L	VU	3
# Regent Honeyeater	<i>Anthochaera phrygia</i>	-	-	EN	CR	L	EN	4
# Smoky Mouse	<i>Pseudomys fumeus</i>	-	-	EN	CR	L	RA	4
# Spot-tailed Quoll	<i>Dasyurus maculatus</i>	-	-	EN	EN	L	VU	4
# Striped Legless Lizard	<i>Delma impar</i>	-	-	VU	EN	L	VU	4
STATE SIGNIFICANCE								
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	1988	1	-	VU	L	NT	3
Greater Glider	<i>Petauroides volans</i>	2005	14	-	VU	-	-	2
Common Bent-wing Bat	<i>Miniopterus</i> GROUP	1998	5	-	-	L	CD	3
Common Bent-wing Bat (eastern ssp.)	<i>Miniopterus oceanensis</i>	2011	4	-	VU	L	-	2
White-throated Needletail	<i>Hirundapus caudacutus</i>	2001	7	-	VU	-	-	4
Eastern Great Egret	<i>Ardea modesta</i>	1977	1	-	VU	L	-	3

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Square-tailed Kite	<i>Lophoictinia isura</i>	1986	6	-	VU	L	-	3
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	2011	1	-	VU	L	-	3
Grey Goshawk	<i>Accipiter novaehollandiae</i>	1976	1	-	VU	L	-	3
Powerful Owl	<i>Ninox strenua</i>	2000	15	-	VU	L	-	3
Masked Owl	<i>Tyto novaehollandiae</i>	1985	1	-	EN	L	NT	3
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2005	11	-	NT	-	NT	2
Speckled Warbler	<i>Chthonicola sagittatus</i>	1977	1	-	VU	L	NT	4
Diamond Firetail	<i>Stagonopleura guttata</i>	2005	5	-	NT	L	NT	2
Tussock Skink	<i>Pseudemoia pagenstecheri</i>	2008	7	-	VU	-	-	2
Brown Toadlet	<i>Pseudophryne bibronii</i>	1989	1	-	EN	L	DD	4

Data source: Victorian Biodiversity Atlas (DEPI 2014); Victorian Fauna Database (Viridans 2013b); Protected Matters Search Tool (DoE 2015).

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).

14 HOPETOUN PARK

14.1 Introduction

Hopetoun Park is a moderately sized town approximately eight kilometres east of Bacchus Marsh, containing approximately 163 dwellings (Figure 1a). Hopetoun Park is located 800 metres south of the Western Freeway in between Bacchus Marsh and Melton. Hopetoun Park is located immediately adjacent to the western extent of Melbourne's Urban Grown Boundary, which extends east of the Djerriwarrh Creek and south of the Werribee River.

14.2 Physical Attributes of the Settlement

14.2.1 Landscape

The Hopetoun Park study area occurs within the Victorian Volcanic Plain bioregion and falls within the jurisdiction of the Port Phillip and Westernport CMA (DELWP 2015b) (Figure 1b).

Hopetoun Park is located on the flat plains above the Werribee River and Djerriwarrh Creek. The study area includes the northern reaches of the Melton Reservoir, located along the Werribee River. A small number of artificial waterbodies are present within the study area (DELWP 2015a) (Figure 2).

According to the DELWP Victorian Water Resources map (2015c), there are no salinity prone areas or Erosion Management Overlays within the study area. Based on aerial photography interpretation, the Werribee River, Djerriwarrh Creek and their tributaries may be subject to erosion. No erosion within these areas was recorded during the site assessment. However, this landscape presents a high risk of erosion due to the soil type and slope.

14.2.2 Flora and Fauna

14.2.2.1 Existing Conditions

Ecological Vegetation Classes

According to the DELWP pre-1750 EVC mapping (DELWP 2015b), the study area was likely to predominantly support a mosaic of Plains Grassy Woodland (EVC 55) and Plains Grassland (EVC 132). The Werribee River valley was likely to support Escarpment Shrubland (EVC 895) and the eastern slopes beside the Djerriwarrh Creek were likely to support Rocky Chenopod Woodland (EVC 64). Creekline Grassy Woodland (EVC 68) and Stream Bank Shrubland (EVC 851) were likely to dominate the immediate vicinity of the Werribee River and Djerriwarrh Creek, respectively. The floodplain of the Werribee River was likely to support Red-gum Swamp (EVC 292). Based on extant vegetation mapping and aerial photography, scattered occurrences of Plains Grassy Woodland and Plains Grassland are likely to be persisting, with less fragmented corridors of EVCs associated with the Werribee River and Djerriwarrh Creek (Figure 3).

Four EVCs were recorded during the site assessment, Plains Woodland (EVC 803), Grassy Woodland (EVC 175), Lignum Swamp (EVC 104) and Escarpment Shrubland. Plains Woodland Grassy Woodland were

recorded on the plains, whilst Lignum Swamp was recorded within depressions subject to seasonal flooding and Escarpment Shrubland was recorded on along the escarpments of the Werribee River and its tributaries. Scattered trees were also occasionally present within the study area.

Large areas of secondary grassland were also recorded within the study area, and were assessed during previous assessments conducted by Ecology and Heritage Partners (in prep). These areas were dominated by colonising native grasses and herbs following a history of cropping and intensive grazing. While these areas were likely to previously support Plains Grassland prior to agricultural disturbance, they were not classified as remnant vegetation due to the vegetation being regrowth less than 10 years old (Ecology and Heritage Partners in prep). However, this determination may change into the future, subject to the disturbance history at the time of assessment (Figure 5).

A number of scattered trees (approximately 50; Buloke *Allocasuarina littoralis* and Grey Box *Eucalyptus microcarpa*) were recorded within the study area.

Dominant flora species

Grassy Woodland and Plains Woodland within the study area was dominated by Buloke and Grey Box with an understorey of Wallaby-grass *Rytidosperma* spp., Spear-grass *Austrostipa* spp., Blushing Bindweed *Convolvulus angustissimus*, Nodding Saltbush *Einadia nutans* and Berry Saltbush *Atriplex semibaccata*. Areas of Lignum Swamp were dominated by Grey Box with an understorey of Tangled Lignum *Muehlenbeckia florulenta*. Escarpment shrubland was dominated by Lightwood *Acacia implexa*, Kangaroo Grass *Themeda triandra*, Kidney Weed *Dichondra repens*, Spear-grass and Wallaby-grass.

Weeds present predominantly comprised pasture grasses (e.g. Cocksfoot *Dactylis glomerata*, Toowoomba Canary Grass *Phalaris aquatica*, Wild Oats *Avena fatua*), however African Boxthorn *Lycium ferocissimum*, Peppercorn *Schinus molle* and Serrated Tussock *Nassella trichotoma* were also present particularly along escarpments.

Fauna habitat

The study area supports seven broad habitat types, woodland/forest, scattered trees, shrubland, ephemeral creeklines, artificial waterbodies (farm dams), introduced grasslands and planted vegetation.

Modified woodland and remnant trees provide habitat for a range of native mammals (i.e. possums and gliders). Remnant trees containing hollows are also an important habitat feature for many bird species including; cockatoos, parrots, lorikeets and honeyeaters. When in flower, remnant woodland trees provide an important nectar resource for a variety of honeyeaters and lorikeets. Diurnal raptors may also use remnant trees for perching, breeding and foraging activities. Microbats may use hollows and loose bark for breeding habitat or refuge during the day. Larger patches of vegetation are also expected to support a multifaceted ground fauna component, such as reptiles (e.g., lizards, snakes), native frogs and mammals, particularly in areas where there is adequate vegetation cover.

Escarpment shrubland is likely to provide moderate habitat value for native ground dwelling fauna. Due to the highly modified nature of most of these areas few native fauna other than ground dwelling skinks, snakes, lizards and mammals are likely to use this habitat. Common grassland birds and bird species that are typically associated with modified habitats (i.e. farmland) also utilise these areas frequently for foraging.

Ephemeral creeklines are likely to provide occasional habitat for common frog species. Due to the variability in water levels, few fish or frog species are likely to use this habitat on a permanent basis; however, deeper pools may provide habitat locally common fish or frog species.

Artificial waterbodies within the study area are likely to support occasional foraging habitat for common wetland species, including frogs, ducks and wading birds.

Introduced grasslands provide habitat for common open country species (primarily birds). Larger patches are likely to support a suite of indigenous grassland birds such as Magpies, Ravens, Magpie-larks and Willie Wagtails. Raptors would search for prey items over these areas, and introduced grassland species would also be prevalent in this habitat. Although introduced grasses do not provide optimal habitat for fauna, they do provide dispersal opportunities (cover) for reptiles, frogs and other species when adjoining more intact vegetation patches between more optimal habitats throughout the local area.

14.2.2.2 Significant species and ecological communities

EPBC Act listed Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoE 2015):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain;
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains; and,
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Grassy Woodland and Plains Woodland EVC descriptions correlate with the nationally significant *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia*. However, areas of Grassy Woodland and Plains Woodland did not meet the condition thresholds that define these communities at the time of assessment (TSSC 2010a).

Large areas of 'secondary grassland' were assessed previously by Ecology and Heritage Partners (in prep) were considered to form the *Natural Temperate Grassland of the Victorian Volcanic Plain* ecological community (Figure 5).

No additional nationally listed ecological communities are considered likely to occur within the study area.

FFG Act listed Ecological Communities

According to the DELWP Biodiversity Interactive Map (DELWP 2015b), two state significant ecological communities are predicted to occur within the study area, *Rocky Chenopod Open Scrub*, associated with the Rocky Chenopod Woodland EVC, and *Western Basalt Plains (River Red-gum) Grassy Woodland*, which is associated with the Plains Grassy Woodland EVC.

No state significant ecological communities were recorded within the study area during the site assessment. Areas of Grassy Woodland and Plains Woodland were not attributed to the *Rocky Chenopod Open Scrub*

ecological community despite having due to the structure of the community present: a woodland with a lack of stunted Eucalypts forming an 'open scrub' which defines the *Rocky Chenopod Open Scrub* community.

Nationally Significant Flora

The VBA and FIS contain records of six nationally listed flora species previously recorded within 10 kilometres of the study area; Small Golden Moths *Diuris basaltica*, Sunshine Diuris *Diuris fragrantissima*, Clover Glycine *Glycine latrobeana*, Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*, Basalt Peppercress *Lepidium hyssopifolium* and Maroon Leek-orchid *Prasophyllum frenchii*; one of these species, Small Golden Moths has been recorded within the study area (DEPI 2014; Viridans 2013a; Appendix 1; Figure 3). The PMST nominated an additional four nationally significant species which have not been recorded in the locality but have the potential to occur (DoE 2015).

Based on habitat predicted to occur within the study area, landscape context and the proximity of previous records, several nationally significant flora species may occur within the study area (Appendix 1), including Small Golden Moths, Basalt Peppercress and Spiny Rice-flower.

State Significant Flora

The VBA and FIS contain records of 46 state significant flora species within 10 kilometres of the study area; four of these species have been recorded within the study area, Buloke *Allocasuarina luehmannii*, Smooth Nardoo *Marsilea mutica*, Black-tip Greenhood *Pterostylis bicolor* and Fragrant Saltbush *Rhagodia parabolica* (DEPI 2014; Viridans 2013a) (Appendix 1; Figure 3).

Three state listed flora species were recorded during the current site assessment and previous assessments conducted by Ecology and Heritage Partners (in prep), Buloke, Melbourne Yellow-gum *Eucalyptus leucoxylon* subsp. *connata* and Fragrant Saltbush (Figure 5).

Based on habitat predicted to occur within the study area, landscape context and the proximity of previous records, several state significant flora species may occur within the study area (Appendix 1), including Heath Spear-grass *Austrostipa exilis*, Arching Flax-lily *Dianella* sp. aff. *longifolia* (Benambra), Smooth Nardoo *Marsilea mutica*, Austral Tobacco *Nicotiana suaveolens*, Curved Rice-flower *Pimelea curviflora* var. aff. *subglabrata*, Black-tip Greenhood *Pterostylis bicolor*, Black Roly-poly *Sclerolaena muricata* var. *muricata*, Branching Groundsel *Senecio cunninghamii* var. *cunninghamii* and Rye Beetle-grass *Tripogon loliiformis*.

Fauna habitat

The study area supports six broad habitat types, woodland, scattered trees, ephemeral creeklines, artificial waterbodies (farm dams) and introduced grasslands and planted vegetation.

Woodland and scattered trees within the study area provides habitat to a range of native fauna, including birds, possums and microbats. Many of the Eucalypts recorded in this area are large, likely to contain hollows, and provide fruitful nectar yields that would attract a large number of native bird species in the immediate area. Scattered remnants are also likely to facilitate fauna movement between habitats throughout the otherwise cleared landscape.

Ephemeral creeklines are likely to provide occasional habitat for common frog species. However, due to the variability in water levels, few fish or frog species are likely to use this habitat on a permanent basis.

Artificial waterbodies within the study area are likely to support occasional foraging habitat for common wetland species, including frogs, ducks and wading birds.

Introduced grassland and planted vegetation provide foraging resources for species adapted to modified environments such as Magpies, wattlebirds, and honeyeaters. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills, and fantails for nesting and foraging purposes.

Nationally Significant Fauna

The VBA and AVW contain records of eleven nationally listed fauna species previously recorded within 10 kilometres of the study area; Australasian Bittern *Botaurus poiciloptilus*, Eastern Barred Bandicoot *Perameles gunnii*, Grey-headed Flying-fox *Pteropus poliocephalus*, Plains-wanderer *Pedionomus torquatus*, Superb Parrot *Polytelis swainsonii*, Swift Parrot *Lathamus discolor*, Regent Honeyeater *Anthochaera phrygia*, Growling Grass Frog *Litoria raniformis*, Macquarie Perch *Macquaria australasica*, Golden Sun Moth *Synemon plana* and Australian Painted Snipe *Rostratula australis* (DEPI 2014; Viridans 2013b; Appendix 2; Figure 3). The PMST nominated an additional eight nationally significant species which have not been recorded in the locality but have the potential to occur due to the presence of suitable habitat (DoE 2015).

Based on several ecological assessments undertaken by Ecology and Heritage Partners (in prep), previous records, extant EVC mapping and associated habitat predicted to occur within the study area, there is potential for five nationally significant fauna species to occur within the study area including, Striped Legless Lizard, Growling Grass Frog, Swift Parrot and Grey-headed Flying-fox as suitable habitat is present. Golden Sun Moth surveys have been conducted within suitable habitat within the study area and were not recorded (Ecology and Heritage Partners 2014); based on the results of these surveys, there is a low likelihood of Golden Sun Moth occurring within the study area.

State Significant Fauna

The VBA and AVW contain records of 38 State significant fauna species within 10 kilometres of the study area (DEPI 2014; Viridans 2013b) (Appendix 2; Figure 3).

Based on several ecological assessments undertaken by Ecology and Heritage Partners (in prep), previous records, extant EVC mapping and associated habitat predicted to occur within the study area, eight State significant fauna species may use habitat within the study area for foraging purposes. These species include, Bullant sp. 17 *Myrmecia* sp. 17, Hooded Robin *Melanodryas cucullata cucullata*, Diamond Firetail *Stagonopleura guttata*, Brown Treecreeper *Climacteris picumnus victoriae*, Black Falcon *Falco subniger*, Eastern Great Egret *Ardea modesta*, Intermediate Egret *Ardea intermedia* and Hardhead *Aythya australis* (Figure 5).

A number of more mobile species (principally bird species) may pass over the study area en-route to more preferred habitats on an occasional basis. There is a low likelihood that other EPBC Act or State listed species reside within the study area on a permanent basis as there is no suitable habitat or they are presumed to be extinct in the local area (Appendix 2).

14.2.3 Cultural Heritage

14.2.3.1 Aboriginal Cultural Heritage

There are five registered Aboriginal archaeological places within the study area, and 78 within the surrounding 2km (Table 17; Figure 4). For the purposes of this study, only the sites within the study area are shown in Table 17. The sites identified within the study area comprise one scarred tree, and surface scatters of quartz, silcrete and quartzite artefacts.

Table 17: Aboriginal Cultural Heritage within or surrounding the Hopetoun Park Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VAHR 7722-0103	Exford Weir Road	Artefact Scatter	Yes
VAHR 7722-0178	Oasis 7	Scarred Tree	Yes
VAHR 7822-0223	Melton Reservoir	Artefact Scatter	Yes
VAHR 7822-0226	Brooklyn Park	Artefact Scatter	Yes
VAHR 7822-2835	West Djerriwarrh Creek	Isolated Artefact	Yes

There are two areas of Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, within the study area. Under Regulation 23(1) land within 200 metres of a named waterway is classified as being of Cultural Heritage Sensitivity. The following areas of sensitivity were identified within the study area:

- Werribee River; and
- Melton Reservoir.

Aboriginal Heritage Act 2006

It is considered likely that Aboriginal heritage will be found in the study area. This conclusion is derived from the likelihood of areas of unmodified land in close proximity to waterways. A CHMP is used to assess the Aboriginal heritage and manage any heritage in the context of an impact such as a subdivision activity. Under Regulation 23, the study area is within an area of Cultural Heritage Sensitivity as it is located within 200 m of a waterway. Therefore, any future development within the above named areas of Cultural Heritage Sensitivity will require a mandatory CHMP.

14.2.3.2 Historical Cultural Heritage

There are no sites located within the study area. Within the surrounding 2km, there are seven sites listed on the VHI, four sites listed on the Moorabool Shire Council Heritage Overlay, and one listed on the Melton Shire Council Heritage Overlay (Table 18).

Please note that Heritage Inventory sites displaying a 'D' in their Heritage Inventory Number have been de-listed, and are not subject to archaeological controls under the *Victorian Heritage Act 1995*.

Table 18: Historical Cultural Heritage within or surrounding the Hopetoun Park Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VHI H7722-0025 Moorabool HO147	Symington's Brewery	Archaeological: Commercial	No, 900m north west
VHI D7722-0026	Union Flour Mill	Archaeological: Commercial	No, 900m north west
VHI H7722-0027 Moorabool HO10	Former Leahys Residence Leahys Inn	Built: Residential Archaeological: Residential	No, 900m north west
VHI H7822-0190	Kyles Homestead	Archaeological: Residential	No, 1km north west
VHI H7822-0191	Sandstone Quarry	Archaeological: Quarry	No, 600m north east
VHI D7822-0979	Djerriwarrh Station Drain	Archaeological: Infrastructure	No, 800m east

VHI D7822-2201	Board Hole Tree Brookfield	Archaeological: Tree	No, 2km south east
Moorabool HO83	Lerderderg River Engineering Works, Holts Lane to Whelans Road	Built: Commercial	No, 1km west
Moorabool HO148	Anthony's Cutting (surrounds of Djerriwarrh Bridge) Western Highway	Built: Infrastructure	No, 500m east
Melton HO97	Early crossing Place associated with the Djerriwarrh Bridge	Built and Archaeological: Infrastructure	No, 500m east

Heritage Act 1995

There are no sites listed on the Victorian Heritage Register or Victorian Heritage Inventory within the study area.

Planning and Environment Act 1987

There are no heritage sites of local significance listed on the Heritage Overlay under the Moorabool Shire Council Planning Scheme within the study area.

14.3 Legislative and Policy Implications

14.3.1 Extractive Industry

There are no current mining licenses or extractive industry tenements within the study area (DSDBI 2014) (Figure 6).

14.3.2 Wind Farms

Based on aerial photography interpretation and GeoVic – Explore Victoria Online, there are no operating or proposed wind farms within two kilometres of the study area and none were recorded during the site assessment (DSDBI 2014) (Figure 6).

14.3.3 Intensive Agriculture

Based on aerial photography interpretation and the results of the site assessment, the predominant land use within the settlement is grazing and residential living with the main township. The floodplain of the Werribee River within the extreme north-east of the study area contains irrigated crops (vegetables).

14.3.4 Schedule of Licenced Premises

The study area does not include any EPA licences (EPA 2014).

14.4 Bushfire Risk

Based upon aerial photography, extant EVC mapping and results of the field assessment, the bushfire risk for Hopetoun Park is moderate (Tables 2 and 3), given:

- The study area and surrounding landscape predominantly contains fragmented areas of moderate threat vegetation (woodland) (Figure 5). The study area is predominantly flat to 5° slope, however the banks of the rivers and creeks are greater than 10-15° (Figure 2).
- Long bushfire runs (>10 kilometres) are possible; however, given the agricultural environment and low number of surface rocks, the majority of the surrounding landscape easily accessed for fire fighting purposes; long bushfire runs are therefore unlikely;
- Extreme bushfire behaviour is unlikely and the type and extent of vegetation is unlikely to result in neighbourhood scale destruction of property; and,
- There is only one access and escape route via a minor road, Hopetoun Park Road, which contains some sections through woodland; access in other directions is constrained by rivers and streams and steep escarpments.

14.5 Summary

Native vegetation within Hopetoun Park consists of large remnants along the escarpments of the Werribee River (and its tributaries) and a moderate sized patch of woodland to the north. Large areas of secondary grassland (formerly cropped/heavily grazed) were not considered to form an EVC, however, this determination may change following increased time since disturbance. Scattered trees were also present throughout the township.

Large areas of the nationally significant *Natural Temperate Grassland of the Victorian Volcanic Plain* were recorded within the study area (Figure 5).

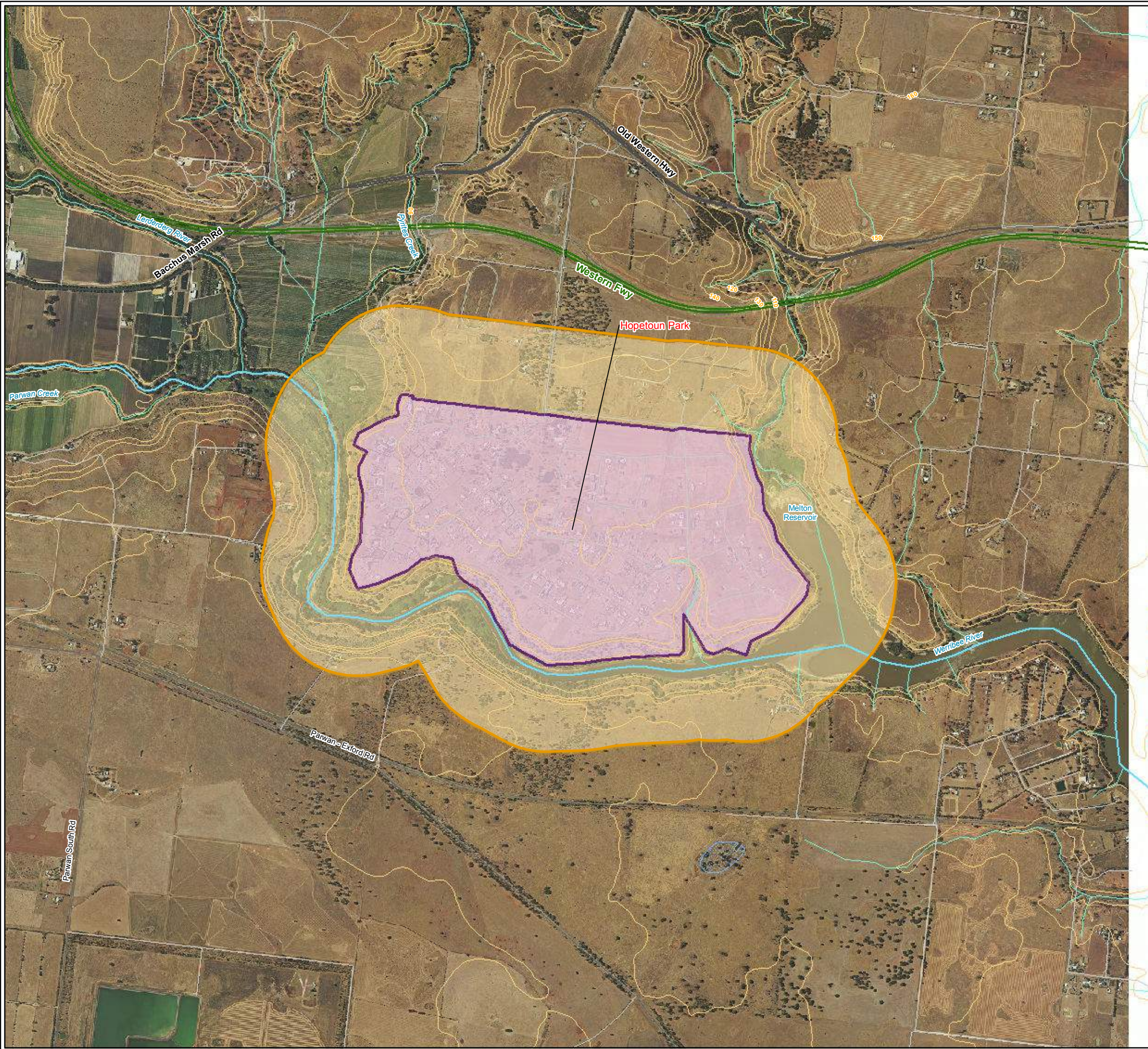
Potential habitat has been identified within the study area for several nationally listed fauna species, including Striped Legless Lizard, Growling Grass Frog, Swift Parrot and Grey-headed Flying-fox. Three state significant flora species (Buloke, Fragrant Saltbush and Melbourne Yellow Gum) and one state significant fauna species (Bullant sp. 17) were recorded within the study area during the site assessment, or during recent surveys (Ecology and Heritage Partners, in prep).

There are five registered Aboriginal archaeological places within the study area, and 78 within the surrounding 2km. There are two areas of known Cultural Heritage Sensitivity within the study area, Werribee River and Melton Reservoir. It is considered likely that Aboriginal heritage will be found in the study area and a Cultural Heritage Management Plan is likely to be required for development within the study area. There are no listed historical heritage sites within the study area.

The bushfire risk for Hopetoun Park is Moderate.

14.6 Recommendations

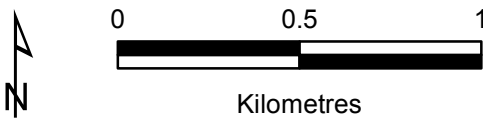
In order to mitigate degradation of environmental values, it is recommended that opportunities are investigated to protect significant flora (e.g. Buloke and Melbourne Yellow-gum) and larger areas of remnant vegetation (Grassy Woodland, Plains Woodland and Escarpment Shrubland) through planning controls (e.g. revision of planning zones or application of Environmental Significance Overlays/Vegetation Protection Overlays).



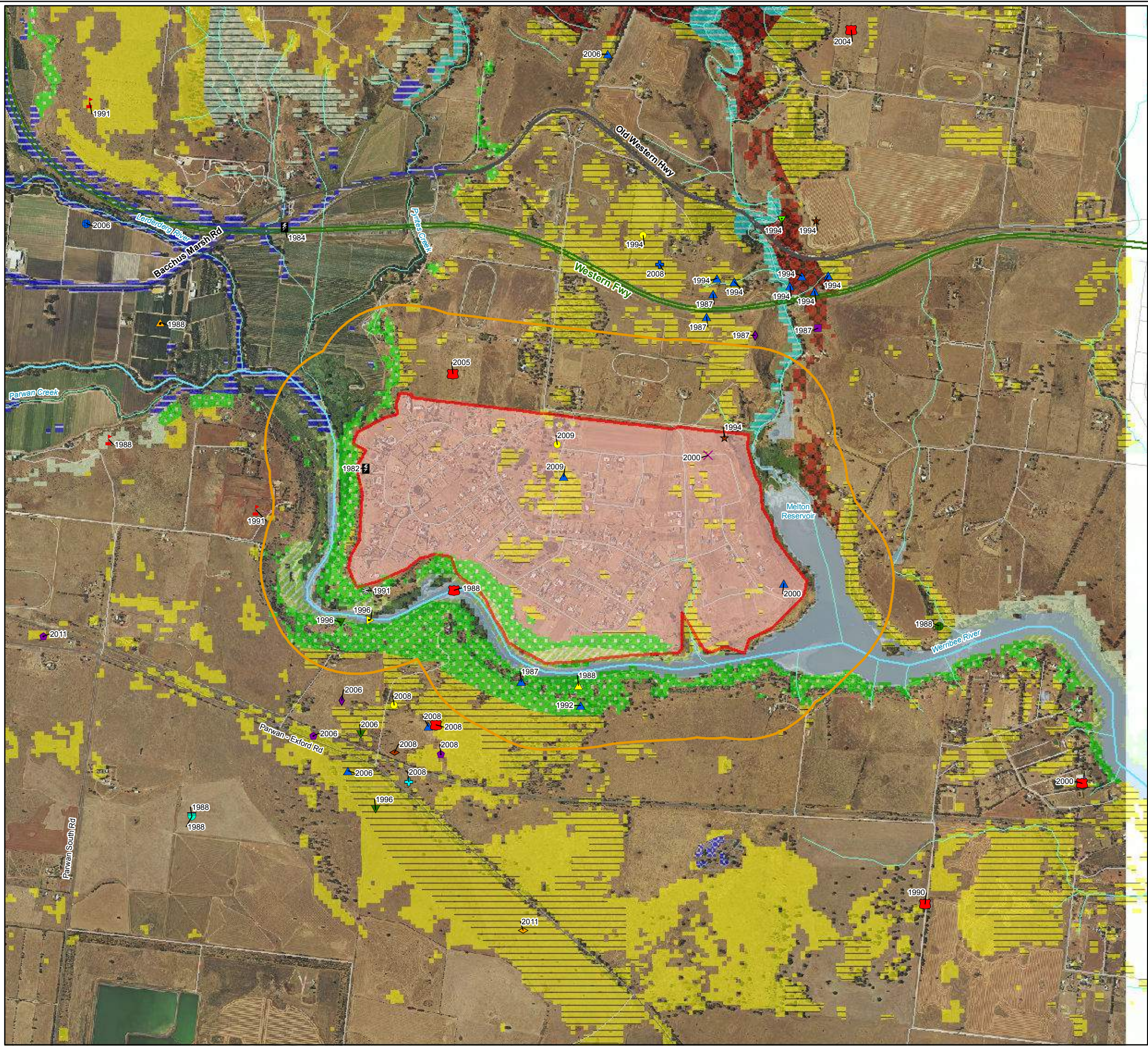
Legend

- Priority B Settlement
 - Township Zone
 - Contour (10m)
- Roads**
- Freeway
 - Major Road
 - Collector Road
 - Minor Road
- Water**
- Minor Watercourse
 - Major Watercourse
 - Land Subject to Inundation

Figure 2 -Hopetoun Park
Physical features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority B Settlement

Township Zone

Ecological Vegetation Class (2005)

Creekline Grassy Woodland

Escarpment Shrubland

Grassy Woodland

Plains Grassland

Plains Grassy Wetland

Plains Grassy Woodland

Plains Woodland/Plains Grassland Mosaic

Red Gum Swamp

Rocky Chenopod Woodland

Stream Bank Shrubland

Water Body - man-made

Significant Fauna Records

Azure Kingfisher

Brush-tailed Phascogale

Diamond Firetail

Eastern Great Egret

Fat-tailed Dunnart

Freckled Duck

Glossy Ibis

Golden Sun Moth

Growling Grass Frog

Little Button-quail

Nankeen Night Heron

Pied Cormorant

Significant Flora Records

Arching Flax-lily

Austral Tobacco

Black Roly-poly

Black-tip Greenhood

Branching Groundsel

Buloke

Curved Rice-flower

Fragrant Saltbush

Heath Spear-grass

Rye Beetle-grass

Small Golden Moths

Smooth Nardoo

Figure 3 -Hopetoun Park
Constraining ecological features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council

N

0

0.5

1

Kilometres

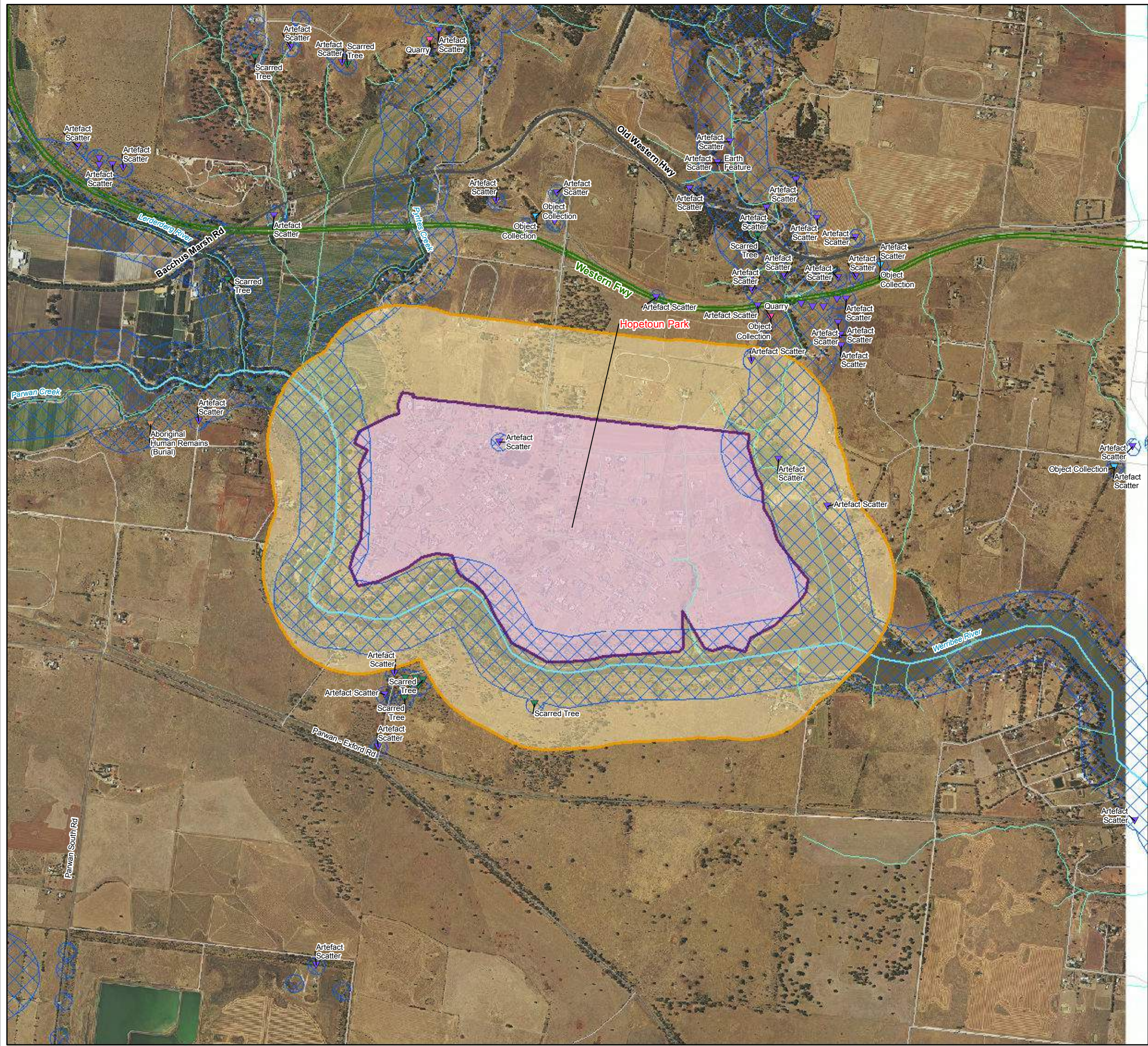
ecology & heritage

partners

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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

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Legend

Priority B Settlement

Township Zone

Cultural Heritage

Areas of Cultural Heritage Sensitivity

Aboriginal Human Remains (Burial)

Artefact Scatter

Earth Feature

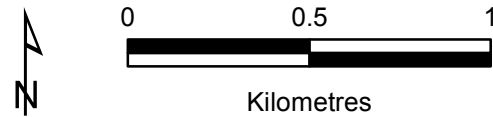
Object Collection

Quarry

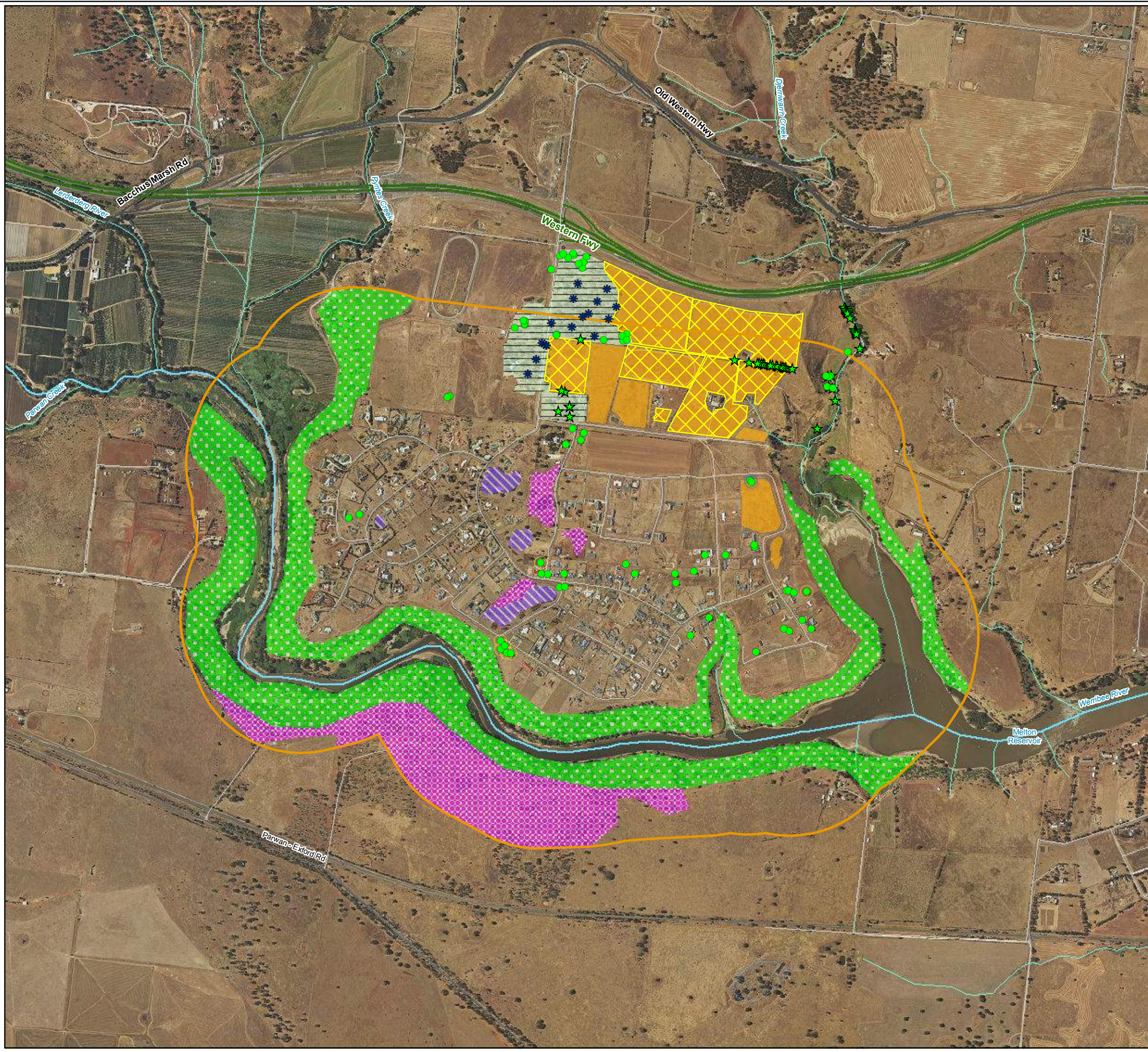
Scarred Tree

Figure 4 -Hopetoun Park

**Constraining Aboriginal Heritage features,
Extractive Licenses and Wind Farms within
and surrounding the settlement**
*Environmental Assessment Project
Moorabool Shire Council*



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

LONGNAME

- * Bullant sp17 (EHP 2014)
- Priority B Settlement

Ecological Vegetation Classes

- Escarpment Shrubland
- Grassy Woodland
- Lignum Swamp
- Plains Woodland
- Secondary Grassland
- Scattered Trees

EPBC Act listed communities

- Natural Temperate Grassland of the Victorian Volcanic Plain

Threatened Flora Species recorded

- Buloke
- Fragrant Saltbush
- Melbourne Yellow Gum

Threatened Fauna Species

- Bullant sp17 (EHP 2014)

Watercourse

- Minor Watercourse
- Major Watercourse

Water Area

- Land Subject to Inundation

Figure 5 -Hopetoun Park
Ecological features recorded during the field assessment
Environmental Assessment Project
Moorabool Shire Council

0 250 500
Metres

N

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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

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APPENDIX 1 – FLORA DATABASE RESULTS

Table A1 Significant flora recorded within 10 kilometres of the study area

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.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
NATIONAL SIGNIFICANCE							
# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	L	v	5
# <i>Dianella amoena</i>	Matted Flax-lily	-	-	EN	L	e	5
# <i>Diuris basaltica</i>	Small Golden Moths	5	2006	EN	L	v	2
<i>Diuris fragrantissima</i>	Sunshine Diuris	1	1770	EN	L	e	5
# <i>Glycine latrobeana</i>	Clover Glycine	3	2006	VU	L	v	5
# <i>Lachnagrostis adamsonii</i>	Adamson's Blown-grass	-	-	EN	L	v	5
<i>Lepidium hyssopifolium</i>	Basalt Peppercress	1	2009	EN	L	e	4
# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	6	2009	CR	L	e	4
# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	1	2009	EN	L	e	5
# <i>Senecio macrocarpus</i>	Large-headed Fireweed	-	-	VU	L	e	5
STATE SIGNIFICANCE							
<i>Acacia aspera</i> subsp. <i>parviceps</i>	Rough Wattle	2	2009	-	-	r	5
* <i>Acacia leprosa</i> var. <i>graveolens</i>	Common Cinnamon-wattle	1	1882	-	-	k	5
<i>Acacia rostriformis</i>	Bacchus Marsh Wattle	8	2010	-	-	v	5
<i>Allocasuarina luehmannii</i>	Buloke	242	2010	-	L	-	1
<i>Alternanthera</i> sp. 1 (Plains)	Plains Joyweed	4	2010	-	-	k	5
<i>Amyema linophylla</i> subsp. <i>orientale</i>	Buloke Mistletoe	15	2010	-	-	v	5
<i>Austrostipa breviglumis</i>	Cane Spear-grass	15	2009	-	-	r	5
<i>Austrostipa exilis</i>	Heath Spear-grass	18	2009	-	-	r	2
<i>Austrostipa hemipogon</i>	Half-bearded Spear-grass	2	2006	-	-	r	5
<i>Calotis lappulacea</i>	Yellow Burr-daisy	3	2009	-	-	r	5

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>*Clematis decipiens</i>	Slender Clematis	1	1904	-	-	k	5
<i>Clematis leptophylla</i>	Skeleton Vine	1	2010	-	-	k	5
<i>Convolvulus angustissimus</i> subsp. <i>omnigracilis</i>	Slender Bindweed	3	2006	-	-	k	5
<i>Cullen parvum</i>	Small Scurf-pea	3	2004	-	L	e	5
<i>Cullen tenax</i>	Tough Scurf-pea	2	2009	-	L	e	5
<i>Desmodium varians</i>	Slender Tick-trefoil	6	2010	-	-	k	5
<i>Dianella</i> sp. aff. <i>longifolia</i> (Benambra)	Arching Flax-lily	14	2011	-	-	v	2
<i>Eleocharis pallens</i>	Pale Spike-sedge	2	2010	-	-	k	5
<i>*Eleocharis plana</i>	Flat Spike-sedge	2	2010	-	-	v	5
<i>Eucalyptus baueriana</i> subsp. <i>thalassina</i>	Werribee Blue-box	11	2010	-	-	e	5
<i>Eucalyptus leucoxydon</i> subsp. <i>connata</i>	Melbourne Yellow-gum	9	2010	-	-	v	1
<i>Goodia medicaginea</i>	Western Golden-tip	2	1993	-	-	r	5
<i>Grevillea steiglitziana</i>	Brisbane Range Grevillea	1	1966	-	-	r	5
<i>Lasiopetalum ferrugineum</i>	Rusty Velvet-bush	1	2010	-	-	v	5
<i>Lepidium pseudohyssopifolium</i>	Native Peppercress	1	1984	-	-	k	5
<i>*Lotus australis</i> var. <i>australis</i>	Austral Trefoil	2	1903	-	-	k	5
<i>Maireana aphylla</i>	Leafless Bluebush	6	2006	-	-	k	5
<i>Marsilea mutica</i>	Smooth Nardoo	1	2000	-	-	k	2
<i>Myoporum montanum</i>	Waterbush	1	1853	-	-	r	5
<i>Nicotiana suaveolens</i>	Austral Tobacco	18	2013	-	-	r	2
<i>Olearia minor</i>	Satin Daisy-bush	2	2009	-	-	r	5
<i>*Parietaria australis</i>	Western Pellitory	1	1886	-	-	r	5

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>Pimelea curviflora</i> var. aff. <i>subglabrata</i>	Curved Rice-flower	3	2001	-	-	k	2
<i>Pimelea hewardiana</i>	Forked Rice-flower	14	2009	-	-	r	5
<i>Prostanthera nivea</i> var. <i>nivea</i>	Snowy Mint-bush	3	2009	-	-	r	5
<i>Pterostylis bicolor</i>	Black-tip Greenhood	1	1996	-	-	k	2
<i>Pterostylis truncata</i>	Brittle Greenhood	50	2009	-	L	e	5
<i>Ptilotus erubescens</i>	Hairy Tails	1	1984	-	L	-	5
<i>Rhagodia parabolica</i>	Fragrant Saltbush	68	2013	-	-	r	1
<i>Sclerolaena muricata</i> var. <i>muricata</i>	Black Roly-poly	10	2010	-	-	k	2
<i>Senecio cunninghamii</i> var. <i>cunninghamii</i>	Branching Groundsel	3	2009	-	-	r	1
<i>Tripogon loliiformis</i>	Rye Beetle-grass	1	2008	-	-	r	2
* <i>Verbena officinalis</i> var. <i>gaudichaudii</i>	Native Verbena	1	1990	-	-	k	5
<i>Westringia glabra</i>	Violet Westringia	1	1904	-	-	r	5

Data source: Victorian Biodiversity Atlas (DEPI 2014); Protected Matters Search Tool (DoE 2015).

Taxonomic order: Alphabetical.

APPENDIX 2 – SIGNIFICANT FAUNA SPECIES

Table A2. Significant fauna within 10 kilometres of the study area.

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

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 (DEPI 2013b); 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

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
Australasian Bittern	<i>Botaurus poiciloptilus</i>	1970	1	EN	EN	L	VU	4
Eastern Barred Bandicoot	<i>Perameles gunnii</i>	1883	15	EN	RX	L	CR	4
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	1968	2	VU	VU	L	VU	2
Plains-wanderer	<i>Pedionomus torquatus</i>	1933	2	VU	CR	L	EN	4
Superb Parrot	<i>Polytelis swainsonii</i>	1881	2	VU	EN	L	VU	4
Swift Parrot	<i>Lathamus discolor</i>	2008	18	EN	EN	L	EN	2
Regent Honeyeater	<i>Anthochaera phrygia</i>	1889	1	EN	CR	L	EN	4
Growling Grass Frog	<i>Litoria raniformis</i>	2011	27	VU	EN	L	VU	2
Macquarie Perch	<i>Macquaria australasica</i>	1930	4	EN	EN	L	DD	4
Golden Sun Moth	<i>Synemon plana</i>	2011	7	CR	CR	L	-	2
Australian Painted Snipe	<i>Rostratula australis</i>	1989	1	VU	CR	L	VU	4
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	4
# Dwarf Galaxias	<i>Galaxiella pusilla</i>	-	-	VU	VU	L	VU	4
# Grassland Earless Dragon	<i>Tympanocryptis pinguicolla</i>	-	-	EN	CR	L	VU	4
# Pink-tailed Worm-Lizard	<i>Aprasia parapulchella</i>	-	-	VU	EN	L	-	4
# Regent Parrot	<i>Polytelis anthopeplus</i>	-	-	VU	VU	L	EN	4
# Striped Legless Lizard	<i>Delma impar</i>	-	-	VU	EN	L	VU	2
# Fairy Tern	<i>Sternula nereis</i>	-	-	VU	EN	L	-	4
STATE SIGNIFICANCE								
Brush-tailed Phascogale	<i>Phascogale tapoatafa tapoatafa</i>	1989	8	-	VU	L	NT	3
Common Dunnart	<i>Sminthopsis murina murina</i>	1990	3	-	VU	-	-	4

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Musk Duck	<i>Biziura lobata</i>	2010	38	-	VU	-	-	3
Freckled Duck	<i>Stictonetta naevosa</i>	2006	8	-	EN	L	-	3
Australasian Shoveler	<i>Anas rhynchotis</i>	2010	35	-	VU	-	-	3
Hardhead	<i>Aythya australis</i>	2006	41	-	VU	-	-	2
Blue-billed Duck	<i>Oxyura australis</i>	2006	15	-	EN	L	-	3
Diamond Dove	<i>Geopelia cuneata</i>	1905	2	-	NT	L	-	4
White-throated Needletail	<i>Hirundapus caudacutus</i>	1994	11	-	VU	-	-	4
Eastern Great Egret	<i>Ardea modesta</i>	2001	21	-	VU	L	-	2
Intermediate Egret	<i>Ardea intermedia</i>	1980	3	-	EN	L	-	2
Little Egret	<i>Egretta garzetta nigripes</i>	1990	1	-	EN	L	-	3
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	2008	8	-	VU	L	-	3
Black Falcon	<i>Falco subniger</i>	2000	8	-	VU	-	-	2
Brolga	<i>Grus rubicunda</i>	1989	1	-	VU	L	-	4
Lewin's Rail	<i>Lewinia pectoralis pectoralis</i>	1889	2	-	VU	L	NT	3
Baillon's Crake	<i>Porzana pusilla palustris</i>	1987	1	-	VU	L	-	3
Major Mitchell's Cockatoo	<i>Lophocroa leadbeateri</i>	2004	1	-	VU	L	-	3
Australian Bustard	<i>Ardeotis australis</i>	1911	1	-	CR	L	NT	4
Bush Stone-curlew	<i>Burhinus grallarius</i>	1889	2	-	EN	L	NT	4
Common Sandpiper	<i>Actitis hypoleucos</i>	1990	1	-	VU	-	-	4
Red-chested Button-quail	<i>Turnix pyrrhotorax</i>	1897	1	-	VU	L	-	4
Gull-billed Tern	<i>Gelochelidon nilotica macrotarsa</i>	1986	1	-	EN	L	-	4
Caspian Tern	<i>Hydroprogne caspia</i>	2000	1	-	NT	L	-	4

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Powerful Owl	<i>Ninox strenua</i>	2011	6	-	VU	L	-	3
Barking Owl	<i>Ninox connivens connivens</i>	2002	27	-	EN	L	NT	3
Masked Owl	<i>Tyto novaehollandiae novaehollandiae</i>	1989	1	-	EN	L	NT	3
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2011	100	-	NT	-	NT	1
Chestnut-rumped Heathwren	<i>Calamanthus pyrrhopygius</i>	2004	4	-	VU	L	-	3
Speckled Warbler	<i>Chthonicola sagittatus</i>	2011	88	-	VU	L	NT	3
Grey-crowned Babbler	<i>Pomatostomus temporalis temporalis</i>	1987	4	-	EN	L	NT	4
Crested Bellbird	<i>Oreoica gutturalis gutturalis</i>	2003	20	-	NT	L	NT	3
Hooded Robin	<i>Melanodryas cucullata cucullata</i>	1999	13	-	NT	L	NT	2
Diamond Firetail	<i>Stagonopleura guttata</i>	2011	90	-	NT	L	NT	2
Bearded Dragon	<i>Pogona barbata</i>	1986	1	-	VU	-	-	3
Lace Goanna	<i>Varanus varius</i>	1968	1	-	EN	-	-	4
Brown Toadlet	<i>Pseudophryne bibronii</i>	2004	5	-	EN	L	DD	3
Bullant	<i>Myrmecia sp. 17</i>	1969	1	-	VU	L	-	1

Data source: Victorian Biodiversity Atlas (DEPI 2014); Victorian Fauna Database (Viridans 2013b); Protected Matters Search Tool (DoE 2015).

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).

15 KORWEINGUBOORA-SPARGO CREEK

15.1 Introduction

Korweinguboorra and Spargo Creek are two small settlements approximately five kilometres apart along the Ballan-Daylesford Road, approximately 17 kilometres north-west of Ballan (Figure 1a). The two settlements contain approximately 68 dwellings in total. The settlements are located within a forest setting surrounded by the Wombat State Forest and private timber plantations.

15.2 Physical Attributes of the Settlement

15.2.1 Landscape

The Korweinguboorra and Spargo Creek study area occurs within the Central Victorian Uplands bioregion (DELWP 2015b) (Figure 1b). The study area predominantly falls within the jurisdiction of the Port Phillip and Westernport CMA, with the western extent of the study area falling within jurisdiction of the Corangamite CMA.

The settlements are located within a relatively flat valley surrounded by the hills and steeper slopes within the Wombat State Forest. The study area contains a number of moderate to large artificial water bodies along streams, and several smaller artificial waterbodies within open paddocks (farm dams) (DELWP 2015a) (Figure 2).

According to the DELWP Victorian Water Resources map (2015c), there are no salinity prone areas or Erosion Management Overlays within the study area. Based on aerial photography interpretation, streams within the study area may be prone to minor to moderate erosion, particularly within cleared areas.

15.2.2 Flora and Fauna

Ecological Vegetation Classes

According to the DELWP pre-1750 EVC mapping (DELWP 2015b), the study area was likely to support predominantly Herb-rich Foothill Forest (EVC 23), with a complexity of Herb-rich Foothill Forest/Shrubby Foothill Forest occurring on the steeper slopes to the east and west of Ballan-Daylesford Road. Creeklines within Spargo Creek are also likely to have supported Sedgy Riparian Woodland (EVC 198). Based on extant vegetation mapping and aerial photography, large contiguous areas of these EVCs are likely to be persisting within the settlement and within adjoining public land (Figure 3).

15.2.2.1 *Significant species and ecological communities*

EPBC Act listed Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoE 2015):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;

- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain;
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains; and,
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

The EVCs predicted to occur do not correspond with EVCs likely to form part of any nationally listed ecological communities (TSSC 2010; TSSC 2006; TSSC 2008a, b).

FFG Act listed Ecological Communities

According to the DELWP Biodiversity Interactive Map (DELWP 2015b), no state significant ecological communities are predicted to occur within the study area and based on the predicted EVCs present, none are likely to occur.

Nationally Significant Flora

The VBA and FIS contain records of three nationally listed flora species previously recorded within 10 kilometres of the study area; Southern Shepherd's Purse *Ballantinia antipoda*, Adamson's Blown-grass *Lachnagrostis adamsonii* and Basalt Peppergrass *Lepidium hyssopifolium* (DEPI 2014; Viridans 2013a; Appendix 1; Figure 3). The PMST nominated an additional six nationally significant species which have not been recorded in the locality but have the potential to occur (DoE 2015).

Based on habitat predicted to occur within the study area, landscape context and the proximity of previous records, no nationally significant flora species are likely to occur within the study area.

State Significant Flora

The VBA and FIS contain records of 42 state significant flora species within 10 kilometres of the study area (DEPI 2014; Viridans 2013a) (Appendix 1; Figure 3).

Based on habitat predicted to occur within the study area, landscape context and the proximity of previous records, several state significant flora species may occur within the study area (Appendix 1), including Dwarf Silver Wattle, Cane Spear-grass, Slender Tick-trefoil *Desmodium varians*, Spotted Hyacinth-orchid, Slender Saw-sedge, Creeping Grevillea and Satinwood.

Nationally Significant Fauna

The VBA and AVW contain records of three nationally listed fauna species previously recorded within 10 kilometres of the study area, Grey-headed Flying-fox *Pteropus poliocephalus*, Superb Parrot *Polytelis* and Macquarie Perch *Macquaria australasica* (DEPI 2014; Viridans 2013b; Appendix 2; Figure 3).

The PMST nominated an additional nine nationally significant species which have not been recorded in the locality but have the potential to occur due to the presence of suitable habitat (DoE 2015).

Based on previous records, extant EVC mapping and associated habitat predicted to occur within the study area, there is potential for one (albeit low likelihood) nationally significant fauna species to occur within the study area, Swift Parrot, as suitable habitat is present.

State Significant Fauna

The VBA and AVW contain records of 22 State significant fauna species within 10 kilometres of the study area (DEPI 2014; Viridans 2013b) (Appendix 2; Figure 3).

Based on previous records, extant EVC mapping and associated habitat predicted to occur within the study area, three State significant fauna species may use habitat within the study area for foraging or potential breeding purposes including, Black Falcon *Falco subniger*, Brush-tailed Phascogale *Phascogale tapoatafa tapoatafa* and Greater Glider *Petauroides volans*.

A number of more mobile species (principally bird species) may pass over the study area en-route to more preferred habitats on an occasional basis. There is a low likelihood that other EPBC Act or State listed species reside within the study area on a permanent basis as there is no suitable habitat or they are presumed to be extinct in the local area (Appendix 2).

15.2.3 Cultural Heritage

15.2.3.1 Aboriginal Cultural Heritage

There are no registered Aboriginal archaeological places within the study area or the surrounding 2km (Figure 4).

There are two areas of Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, within the study area. Under Regulation 23(1) land within 200 metres of a named waterway is classified as being of Cultural Heritage Sensitivity. The following areas of sensitivity were identified within the study area.

- Werribee River; and
- Moorabool River East Branch

Aboriginal Heritage Act 2006

It is considered likely that Aboriginal heritage will be found in the study area. This conclusion is derived from the likelihood of areas of unmodified land in close proximity to waterways. A CHMP is used to assess the Aboriginal heritage and manage any heritage in the context of an impact such as a subdivision activity. Under Regulation 23, the study area is within an area of Cultural Heritage Sensitivity as it is located within 200 m of a waterway. Therefore, any future development within the above named areas of Cultural Heritage Sensitivity will require a mandatory CHMP.

15.2.3.2 Historical Cultural Heritage

There are no sites located within the study area. Within the surrounding 2km, there are two sites listed on the Victorian Heritage Inventory, and four sites on the Hepburn Shire Council Heritage Overlay (Table 19).

Table 19: Historical Cultural Heritage within or surrounding the Korweinguboora-Spargo Creek Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VHI H7723-1149	Daylesford Creswick Railway Reserve	Archaeological: Infrastructure	No, 1km north
VHI H7723-0007	Barkstead Town	Archaeological: Township	No, 2km west

Hepburn HO690	Daylesford Creswick Railway Reserve	Built: Infrastructure	No, 1km north
Hepburn HO728	Leonards Hill	Built	No, 1km north
Hepburn HO729	Leonards Hill	Built	No, 1km north
Hepburn HO730	Leonards Hill	Built	No, 1km north

Heritage Act 1995

There are no sites listed on the Victorian Heritage Register or Victorian Heritage Inventory within the study area.

Planning and Environment Act 1987

There are no heritage sites of local significance listed on the Heritage Overlay under the Moorabool Shire Council Planning Scheme within the study area.

15.3 Legislative and Policy Implications

15.3.1 Extractive Industry

There are two current mining licenses (Tag number MN5460 and MN4305) present on the southern boundary of the study area. There are no extractive industry tenements within the study area (DSDBI 2014) (Figure 6).

15.3.2 Wind Farms

There is one wind farm located within the Korweiguboora and Spargo Creek study area. The operational Leonard's Hill Wind Farm is located on the northern edge of the study area and consists of two turbines (DSDBI 2014) (Figure 6).

15.3.3 Intensive Agriculture

Based on aerial photography interpretation, the predominant land use within the settlement is rural living. The Wombat State Forest is harvested for timber and there are large areas of plantation forests to the west of Ballan-Daylesford Road.

15.3.4 Schedule of Licenced Premises

The study area does not include any EPA licences (EPA 2014).

15.4 Bushfire Risk

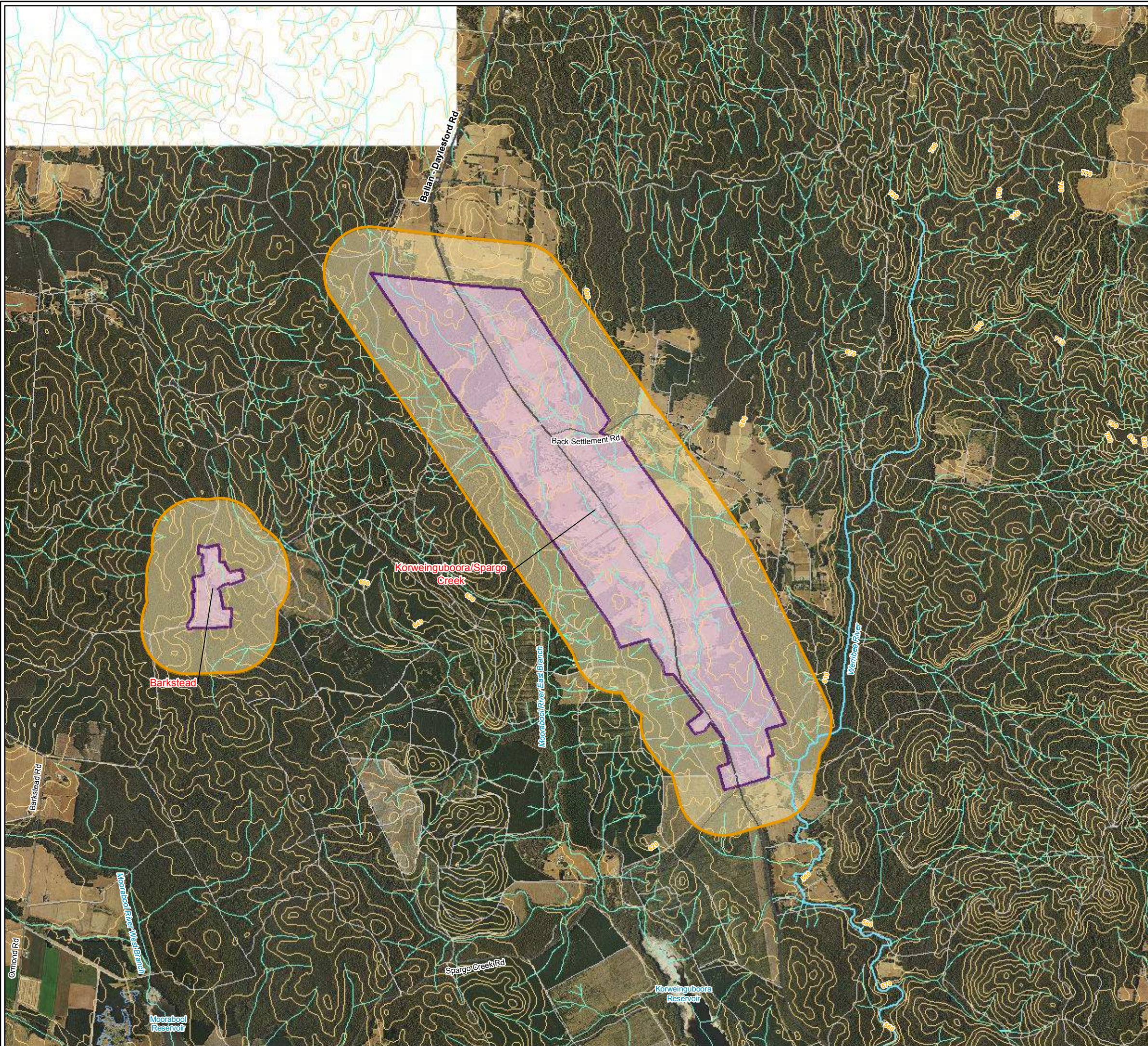
Based upon aerial photography and extant EVC mapping, the study area contains extensive forest vegetation cover surrounding the settlement (Figure 3). The settlements are located within a relatively flat valley, with slopes from 0-5°, with the surrounding landscape having greater undulation with slopes from 5-10° (Figure 2). Access and escape routes are limited to two roads through forest vegetation, Ballan-Daylesford Road (escapes routes via north or south), with remnant forest likely to be close to the road on all routes.

Based on the Bushfire Risk Matrix in Table 2 and 3, the bushfire risk for Korweinguboorra and Spargo Creek is likely to be Extreme.

15.5 Recommendation

Based on the information presented above, there was a low likelihood of occurrence for any threatened species or ecological communities within the Korweinguboorra and Spargo Creek settlement, and therefore a field assessment was not recommended. Further assessment may be undertaken in the future to determine ecological values present within the study area.

Despite the lack of on-ground assessment, the majority of the study area contains native vegetation and in order to mitigate degradation of environmental values, it is recommended that opportunities are investigated to protect remnant vegetation through planning controls (e.g. revision of planning zones or application of Environmental Significance Overlays/Vegetation Protection Overlays).



Legend

- Priority B Settlement
- Township Zone
- Contour (10m)

Roads

- Major Road
- Collector Road
- Minor Road

Water

- Minor Watercourse
- Major Watercourse
- Land Subject to Inundation

Figure 2 -Korweinguboor/Spargo Creek


Physical features within and surrounding the settlement

Environmental Assessment Project

Moorabool Shire Council

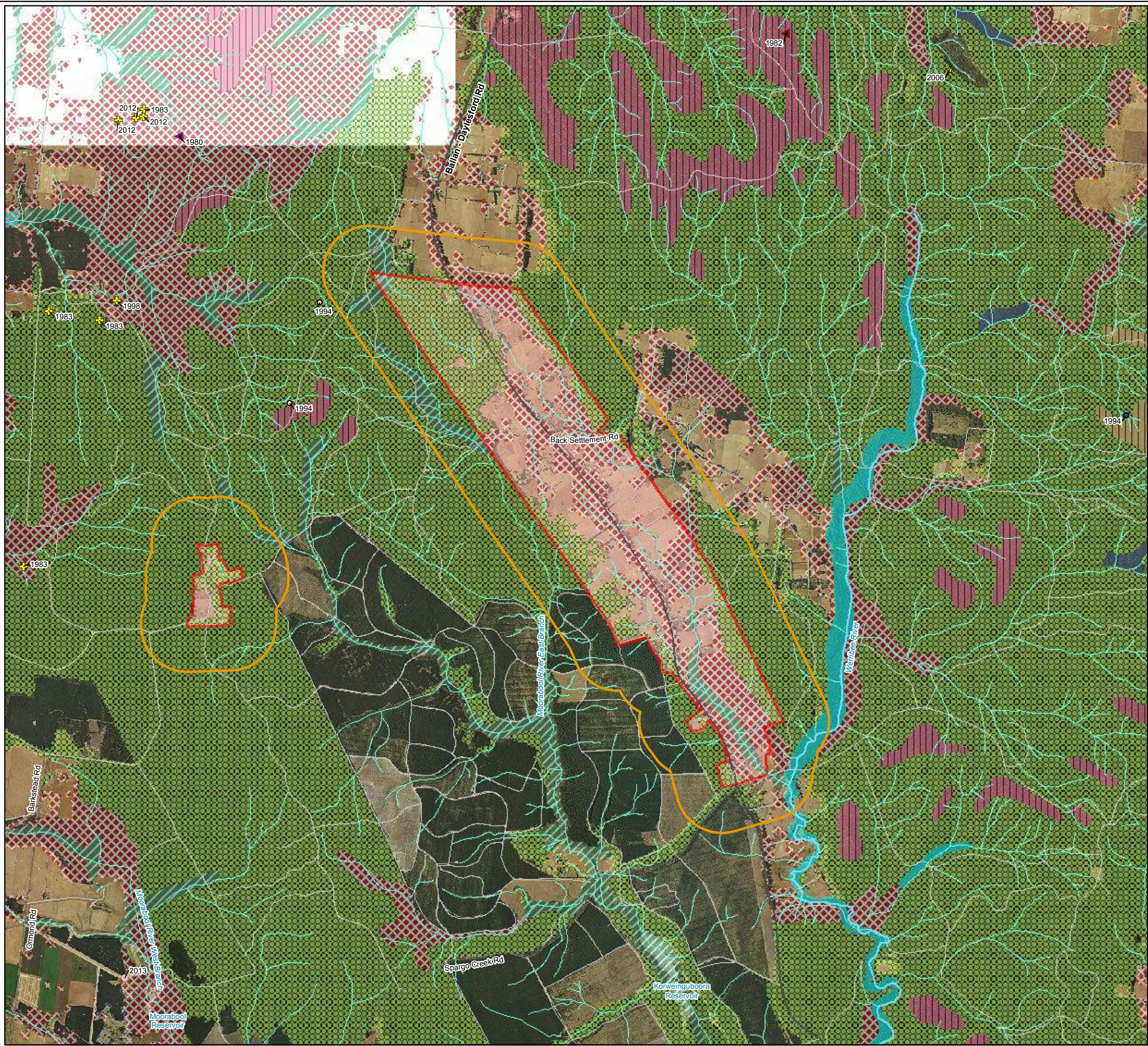
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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

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Legend

- Priority B Settlement
- Township Zone

Ecological Vegetation Class (2005)

- Damp Forest
- Heathy Dry Forest
- Heathy Woodland
- Herb-rich Foothill Forest
- Herb-rich Foothill Forest/Shrubby Foothill Forest Complex
- Riparian Forest
- Sedgy Riparian Woodland
- Shrubby Dry Forest
- Shrubby Foothill Forest
- Swamp Scrub

Significant Flora Records

- Basalt Peppercreese
- Creeping Grevillea
- Netted Daisy-bush
- Satinwood
- Slender Saw-sedge

Significant Fauna Records

- Brown Toadlet
- Masked Owl

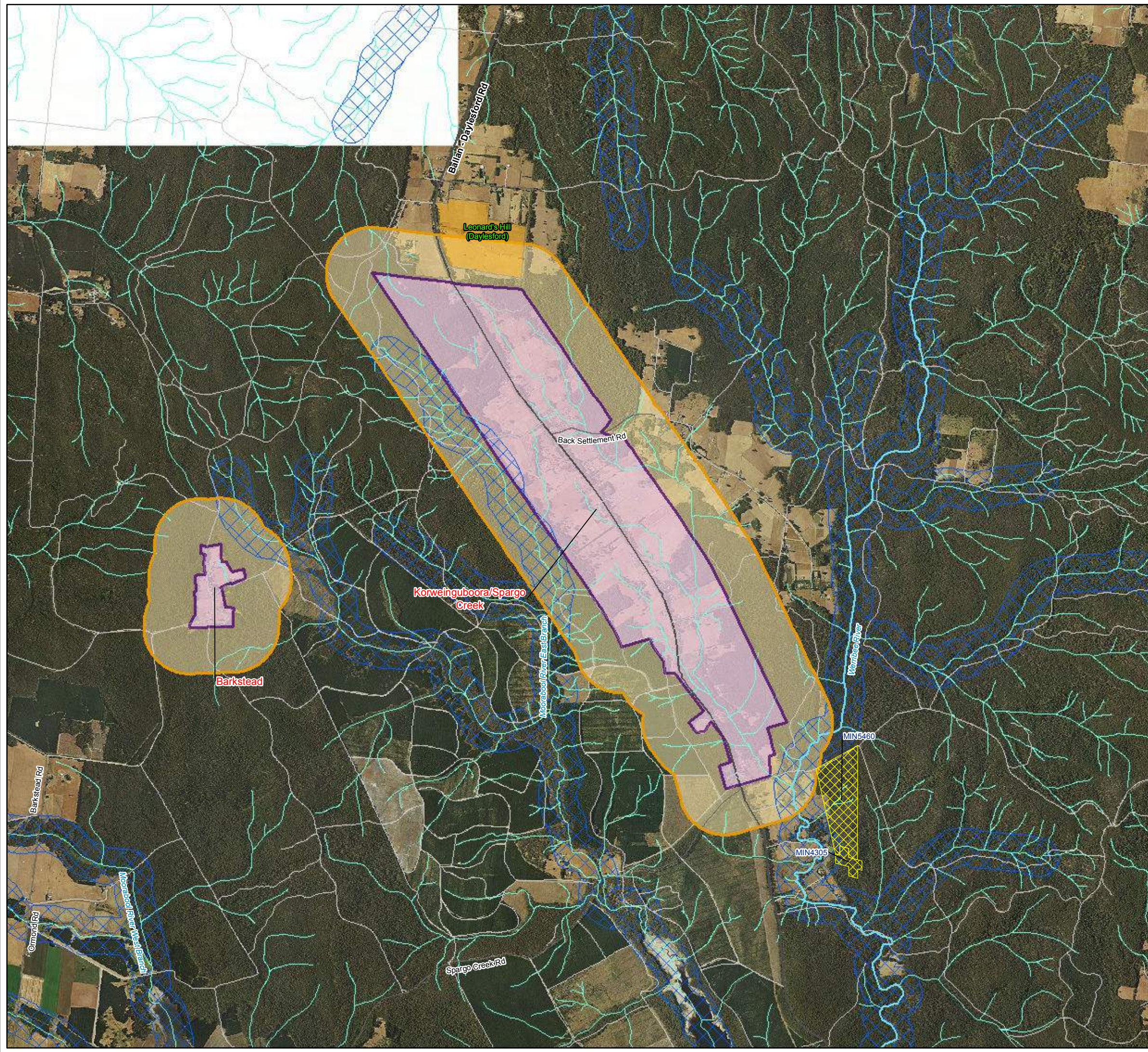
Figure 3 -Korweinguboora/Spargo Creek
Constraining ecological features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council

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ecology & heritage partners

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- Legend**
- Priority B Settlement
 - Township Zone
 - Cultural Heritage**
 - Areas of Cultural Heritage Sensitivity
 - Mining, Extraction**
 - Current Mining Licenses and Leases
 - Wind Farm**
 - In Operation

Figure 4 -Korweinguboora/Spargo Creek
Constraining Aboriginal Heritage features,
Extractive Licenses and Wind Farms within
and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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 Aerial photo (2013) and contours supplied by Moorabool Shire Council.

APPENDIX 1 – FLORA DATABASE RESULTS

Table A1 Significant flora recorded within 10 kilometres of the study area

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.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
NATIONAL SIGNIFICANCE							
<i>Ballantinia antipoda</i>	Southern Shepherd's Purse	1	1880	EN	L	e	4
# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	L	v	4
# <i>Dianella amoena</i>	Matted Flax-lily	-	-	EN	L	e	5
# <i>Glycine latrobeana</i>	Clover Glycine	-	-	VU	L	v	4
<i>Lachnagrostis adamsonii</i>	Adamson's Blown-grass	1	1997	EN	L	v	5
# <i>Lepidium hyssopifolium</i>	Basalt Peppercross	21	2013	EN	L	e	5
# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	-	-	CR	L	e	5
# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	-	-	EN	L	e	5
# <i>Senecio psilocarpus</i>	Swamp Fireweed	-	-	VU	-	v	5
STATE SIGNIFICANCE							
<i>Acacia nano-dealbata</i>	Dwarf Silver Wattle	5	2012	-	-	r	4
<i>Acacia williamsonii</i>	Whirrakee Wattle	1	1994	-	-	r	5
<i>Allocasuarina luehmannii</i>	Buloke	1	1878	-	L	-	5
* <i>Amyema linophylla</i> subsp. <i>orientale</i>	Buloke Mistletoe	1	2007	-	-	v	5
<i>Austrostipa breviglumis</i>	Cane Spear-grass	1	1994	-	-	r	4
* <i>Bossiaea cordigera</i>	Wiry Bossiaea	12	2001	-	-	r	5
<i>Bossiaea vombata</i>	Wombat Bossiaea	2	2010	-	-	e	5
<i>Caladenia dilatata</i> s.s.	Green-comb Spider-orchid	1	1994	-	-	k	5
<i>Cardamine papillata</i>	Forest Bitter-cress	1	1880	-	-	r	5
<i>Cassinia ozothamnoides</i>	Cottony Cassinia	1	1878	-	-	v	5
<i>Chenopodium desertorum</i> subsp. <i>desertorum</i>	Frosted Goosefoot	1	1878	-	-	r	5

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>Chenopodium desertorum</i> subsp. <i>virosum</i>	Frosted Goosefoot	1	1878	-	-	k	5
<i>Desmodium varians</i>	Slender Tick-trefoil	1	1994	-	-	k	4
<i>Dipodium pardalinum</i>	Spotted Hyacinth-orchid	6	2005	-	-	r	4
<i>Eucalyptus aggregata</i>	Black Gum	1	1965	-	L	e	5
<i>Eucalyptus brookeriana</i>	Brooker's Gum	2	2008	-	-	r	5
<i>Eucalyptus yarraensis</i>	Yarra Gum	15	2008	-	-	r	5
<i>Gahnia microstachya</i>	Slender Saw-sedge	2	1994	-	-	r	4
<i>Grevillea obtecta</i>	Fryerstown Grevillea	1	1994	-	-	r	5
<i>Grevillea repens</i>	Creeping Grevillea	20	2012	-	-	r	2
<i>Hypoxis vaginata</i> var. <i>brevistigmata</i>	Yellow Star	2	1882	-	-	k	5
<i>Hypsela tridens</i>	Hypsela	1	1878	-	-	k	5
* <i>Lemna trisulca</i>	Ivy-leaf Duckweed	1	2008	-	-	k	5
<i>Leucopogon microphyllus</i> var. <i>pilibundus</i>	Hairy Beard-heath	1	2000	-	-	r	5
<i>Lomandra micrantha</i> subsp. <i>tuberculata</i>	Small-flower Mat-rush	1	1994	-	-	r	5
<i>Myoporum montanum</i>	Waterbush	1	1878	-	-	r	5
<i>Nematolepis squamea</i>	Satinwood	1	1994	-	-	r	2
<i>Nematolepis squamea</i> subsp. <i>squamea</i>	Satinwood	1	1994	-	-	r	2
<i>Olearia speciosa</i>	Netted Daisy-bush	2	2006	-	-	k	4
<i>Philotheca scabra</i> subsp. <i>scabra</i>	Rough Wax-flower	1	1994	-	-	k	5
<i>Platylobium alternifolium</i>	Victorian Flat-pea	1	1994	-	-	r	5

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>Pleurosorus subglandulosus</i>	Glandular Blanket-fern	1	1877	-	-	k	5
<i>Prostanthera decussata</i>	Dense Mint-bush	1	1994	-	-	r	5
<i>Ptilotus erubescens</i>	Hairy Tails	1	1878	-	L	-	5
<i>*Pultenaea gunnii</i> subsp. <i>tuberculata</i>	Golden Bush-pea	1	2008	-	-	r	5
<i>Pultenaea reflexifolia</i>	Wombat Bush-pea	39	2007	-	-	r	5
<i>Pultenaea weindorferi</i>	Swamp Bush-pea	5	1997	-	-	r	5
<i>Rhagodia parabolica</i>	Fragrant Saltbush	1	1994	-	-	r	5
<i>Westringia glabra</i> var. <i>bacchi</i>	Violet Westringia	1	1994	-	-	r	5
<i>Wurmbea uniflora</i>	One-flower Early Nancy	1	1994	-	-	r	5
<i>Xanthosia leiophylla</i>	Parsley Xanthosia	1	1978	-	-	r	5

Data source: Victorian Biodiversity Atlas (DEPI 2014); Protected Matters Search Tool (DoE 2015).

Taxonomic order: Alphabetical.

APPENDIX 2 – SIGNIFICANT FAUNA SPECIES

Table A2. Significant fauna within 10 kilometres of the study area.

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

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 (DEPI 2013b); 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

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	1883	1	VU	VU	L	VU	4
Swift Parrot	<i>Lathamus discolor</i>	2006	1	EN	EN	L	EN	3
Macquarie Perch	<i>Macquaria australasica</i>	1970	1	EN	EN	L	DD	4
# Australasian Bittern	<i>Botaurus poiciloptilus</i>	-	-	EN	EN	L	VU	4
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	4
# Australian Painted Snipe	<i>Rostratula australis</i>	-	-	VU	CR	L	VU	4
# Dwarf Galaxias	<i>Galaxiella pusilla</i>	-	-	VU	VU	L	VU	4
# Golden Sun Moth	<i>Synemon plana</i>	-	-	CR	EN	L	-	4
# Growling Grass Frog	<i>Litoria raniformis</i>	-	-	VU	EN	L	VU	4
# Murray Cod	<i>Maccullochella peelii peelii</i>	-	-	VU	EN	L	-	4
# Smoky Mouse	<i>Pseudomys fumeus</i>	-	-	EN	CR	L	RA	4
# Spot-tailed Quoll	<i>Dasyurus maculatus</i>	-	-	EN	EN	L	VU	4
STATE SIGNIFICANCE								
Brush-tailed Phascogale	<i>Phascogale tapoatafa tapoatafa</i>	2010	3	-	VU	L	NT	2
Australasian Shoveler	<i>Anas rhynchotis</i>	2006	2	-	VU	-	-	3
Greater Glider	<i>Petauroides volans</i>	2005	52	-	VU	-	-	2
King Quail	<i>Coturnix chinensis victoriae</i>	1995	1	-	EN	L	-	4
Musk Duck	<i>Biziura lobata</i>	2006	13	-	VU	-	-	3
Freckled Duck	<i>Stictonetta naevosa</i>	2006	1	-	EN	L	-	3
Hardhead	<i>Aythya australis</i>	2008	8	-	VU	-	-	3
Blue-billed Duck	<i>Oxyura australis</i>	2006	4	-	EN	L	-	3

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
White-throated Needletail	<i>Hirundapus caudacutus</i>	2003	12	-	VU	-	-	4
Eastern Great Egret	<i>Ardea modesta</i>	1976	2	-	VU	L	-	3
Intermediate Egret	<i>Ardea intermedia</i>	1976	1	-	EN	L	-	3
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	2011	1	-	VU	L	-	3
Grey Goshawk	<i>Accipiter novaehollandiae</i>	1995	2	-	VU	L	-	3
Black Falcon	<i>Falco subniger</i>	1976	1	-	VU	-	-	2
Powerful Owl	<i>Ninox strenua</i>	2001	33	-	VU	L	-	3
Barking Owl	<i>Ninox connivens connivens</i>	1995	3	-	EN	L	NT	3
Sooty Owl	<i>Tyto tenebricosa tenebricosa</i>	1981	1	-	VU	L	-	3
Masked Owl	<i>Tyto novaehollandiae</i>	1995	3	-	EN	L	NT	3
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	1996	4	-	NT	-	NT	3
Painted Honeyeater	<i>Grantiella picta</i>	1991	1	-	VU	L	NT	4
Diamond Firetail	<i>Stagonopleura guttata</i>	1996	3	-	NT	L	NT	3
Brown Toadlet	<i>Pseudophryne bibronii</i>	1982	1	-	EN	L	DD	4

Data source: Victorian Biodiversity Atlas (DEPI 2014); Victorian Fauna Database (Viridans 2013b); Protected Matters Search Tool (DoE 2015).

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).

16 LAL LAL

16.1 Introduction

Lal Lal is a small settlement approximately 20 kilometres south-east of Ballarat, containing approximately five dwellings (Figure 1a). Lal Lal is located at the intersection of Yendon-Lal Lal Road and Clarendon-Lal Lal Road, within a woodland setting.

16.2 Physical Attributes of the Settlement

16.2.1 Landscape

The Lal Lal study area predominantly occurs within the Victorian Volcanic Plain bioregion, however, the south-western extremity of the study area falls within the Central Victorian Uplands bioregion (DELWP 2015b) (Figure 1b). The study falls within the jurisdiction of the Corangamite CMA.

Lal Lal is located on flat plains and on the southern banks of a dry ancient lake bed. A large eutrophic lake is located to the north of the township centre; however, the lake is predominantly permanently dry as a result of natural eutrophication (sedimentation and drying) over the long history of the lake. The lake includes scattered trees and woodland vegetation within dryer areas of the lakebed. The study area also includes numerous small artificial waterbodies (farm dams) (DELWP 2015a) (Figure 2).

According to the DELWP Victorian Water Resources map (2015c), there are no salinity prone areas or Erosion Management Overlays within the study area. No salinity or erosion effected areas were recorded during the field assessment.

16.2.2 Flora and Fauna

16.2.2.1 Existing Conditions

Ecological Vegetation Classes

According to the DELWP pre-1750 EVC mapping (DELWP 2015b), the study area was likely to predominantly support (within the dry lake bed and immediate vicinity) a mosaic of Aquatic Herbland (EVC 653) and Plains Sedgy Wetland (EVC 647). Within the south and west of the study area, Grassy Woodland (EVC 175) and Plains Grassy Woodland (EVC 55) were likely to be the predominant vegetation types. Based on extant vegetation mapping fragmented occurrences of these EVCs are likely to be persisting within the study area (Figure 3).

Two EVCs were recorded within the study area, Aquatic Herbland and Grassy Woodland. Grassy Woodland occurred throughout the town centre and within surrounding areas. Aquatic Herbland was recorded within the eutrophic lake to the north of the study area, east of Yendon-Lal Lal Road. A small number of scattered trees (approximately eight; Manna Gum *Eucalyptus viminalis*) were present to the south of the larger remnant Grassy Woodland within the town centre (Figure 5).

Dominant flora species

Grassy Woodland within the study area was dominated by Manna Gum over a tall shrub layer of Blackwood *Acacia melanoxylon*. The understorey comprised of a dense layer of Austral Bracken *Pteridium esculentum* with Red-anther Wallaby-grass *Rytidosperma pallidus* and other Wallaby-grasses *Rytidosperma* spp, Spear-grass *Austrostipa* sp. and Spiny-headed Matt-rush *Lomandra longifolia*.

Aquatic Herbland within the study area was diverse and comprised Scaly Buttons *Leptorhynchos squamatus*, Prickly Tea-tree *Leptospermum continentale*, Bidgee-widgee *Acaena Novae-zelandiae*, Rushes *Juncus* spp., Lobelia *Lobelia* sp., Prickfoot *Eryngium vesiculosum*, Water-milfoil *Myriophyllum* sp. and Swamp Wallaby-grass *Amphibromus* spp. The fringes of the wetland also comprised Swamp Gum *Eucalyptus ovata*.

Weeds present predominantly comprised pasture grasses (e.g. Cocksfoot *Dactylis glomerata*, Toowoomba Canary Grass *Phalaris aquatica* and Wild Oats *Avena fatua*), however Blackberry *Rubus fruticosus* spp. agg. was present within woodland environments and wet areas. Gorse *Ulex europaeus* was also common to the south-east of the town centre.

Fauna habitat

The study area supports seven broad habitat types, woodland/forest, scattered trees, aquatic herbland, ephemeral creeklines, artificial waterbodies (farm dams), introduced grasslands and planted vegetation.

Woodland and scattered trees within the study area provide valuable habitat for a variety of fauna including arboreal mammals, woodland birds, birds of prey, microbats and reptiles. The abundance of large tree hollows, along with connectivity of the tree canopy is important for arboreal mammals such as possums and gliders. These patches provide important foraging and nesting habitat for a variety of woodland birds and birds of prey and the eucalypts provide an important source of nectar for many birds. A suite of microbat species are likely to utilise small hollows and fissures as roosts and to forage within and around the patches. Fallen logs and the grassy understorey present within some of these areas provides suitable foraging and refuge habitat for a variety of reptiles.

The area of aquatic herbland is likely to provide moderate quality habitat when full of water. While locally common frog, reptile and bird species may use this area on an occasional or permanent basis, the dependence on a clean permanent water source is likely to limit the suitability for rare or threatened fauna to use the basin for breeding or foraging purposes. Depending on the water levels present throughout the year, this area may support occasional foraging habitat for common fauna species as well as a range of other wetland adapted species including frogs, ducks and wading birds.

Ephemeral creeklines are likely to provide occasional habitat for common frog species. However, due to the variability in water levels, few fish or frog species are likely to use this habitat on a permanent basis. Similarly, artificial waterbodies within the study area are likely to support occasional foraging habitat for common wetland species, including frogs, ducks and wading birds.

Introduced grassland and planted vegetation provide foraging resources for species adapted to modified environments such as Magpies, wattlebirds, and honeyeaters. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills, and fantails for nesting and foraging purposes.

16.2.2.2 Significant species and ecological communities

EPBC Act listed Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoE 2015):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain;
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains; and,
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

One nationally significant ecological community *Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains* was recorded within the study area during the site assessment (TSSC 2010b). This community was recorded on the eutrophic lakebed to the north of the town centre, predominantly to the east of Yendon-Lal Lal Road.

No additional nationally significant ecological communities were recorded and none are considered likely to occur.

FFG Act listed Ecological Communities

No state significant ecological communities were recorded and none are considered likely to occur.

Nationally Significant Flora

The VBA and FIS contain records of five nationally listed flora species previously recorded within 10 kilometres of the study area; Clover Glycine *Glycine latrobeana*, Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*, Maroon Leek-orchid *Prasophyllum frenchii*, Swamp Fireweed *Senecio psilocarpus* and Swamp Everlasting *Xerochrysum palustre*. Four of these species have been recorded within the study area, Clover Glycine, Maroon Leek-orchid, Swamp Fireweed and Swamp Everlasting (DEPI 2014; Viridans 2013a; Appendix 1; Figure 3). The PMST nominated an additional four nationally significant species which have not been recorded in the locality but have the potential to occur (DoE 2015).

Based on habitat within the study area, landscape context and the proximity of previous records, several nationally significant flora species may occur within the study area (Appendix 1), including Clover Glycine, Spiny Rice-flower, Maroon Leek-orchid, Swamp Fireweed and Swamp Everlasting.

State Significant Flora

The VBA and FIS contain records of 13 state significant flora species within 10 kilometres of the study area (DEPI 2014; Viridans 2013a) (Appendix 1; Figure 3).

Based on within the study area, landscape context and the proximity of previous records, several state significant flora species may occur within the study area (Appendix 1), including Tall Club-sedge *Bolboschoenus fluviatilis*, Pale Swamp Everlasting *Coronidium gunnianum*, Australian Anchor Plant *Discaria*

pubescens, Common Extinguisher-moss *Encalypta vulgaris*, Perennial Blown-grass *Lachnagrostis perennis* spp. agg. and Swamp Plantain *Plantago* aff. *gaudichaudii* (Lowland Swamps).

Nationally Significant Fauna

The VBA and AVW contain records of two nationally listed fauna species previously recorded within 10 kilometres of the study area, Plains-wanderer *Pedionomus torquatus* and Growling Grass Frog *Litoria raniformis* (DEPI 2014; Viridans 2013b; Appendix 2; Figure 3). The PMST nominated an additional nine nationally significant species which have not been recorded in the locality but have the potential to occur due to the presence of suitable habitat (DoE 2015).

Based on previous records, extant EVC mapping and associated habitat within the study area, no nationally significant fauna species are likely to occur within the study area as no suitable habitat is present.

State Significant Fauna

The VBA and AVW contain records of 17 State significant fauna species within 10 kilometres of the study area (DEPI 2014; Viridans 2013b) (Appendix 2; Figure 3).

Based on previous records, extant EVC mapping and associated habitat within the study area, five State significant fauna species may use habitat within the study area for foraging purposes including, Diamond Firetail *Stagonopleura guttata*, Powerful Owl *Ninox strenua*, Barking Owl *Ninox connivens connivens*, Masked Owl *Tyto novaehollandiae novaehollandiae* and Brown Treecreeper *Climacteris picumnus victoriae*.

A number of more mobile species (principally bird species) may pass over the study area en-route to more preferred habitats on an occasional basis. There is a low likelihood that State listed species reside within the study area on a permanent basis as there is no suitable habitat or they are presumed to be extinct in the local area (Appendix 2).

16.2.3 Cultural Heritage

16.2.3.1 Aboriginal Cultural Heritage

There are no registered Aboriginal archaeological places within the study area, and two sites registered within the surrounding 2km (Table 20; Figure 4). These comprise a large (100m x 100m) surface and sub-surface scatter and a smaller scatter of quartz and silcrete artefacts located on the surface.

Table 20: Aboriginal Cultural Heritage within or surrounding the Lal Lal Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VAHR 7722-0645	Lal Lal Creek 2	Artefact Scatter	No, 2km north
VAHR 7722-0671	Lal Lal Creek AS4	Artefact Scatter	No, 2km north

There are no areas of Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, within the study area. A natural lake, an area of Cultural Heritage Sensitivity, is located 500m north east of the study area, and a south draining tributary of Williamson Creek, also an area of Cultural Heritage Sensitivity, is located 700m south east of the study area.

Aboriginal Heritage Act 2006

As the study area is not located within an area of Cultural Heritage Sensitivity, a mandatory Cultural Heritage Management Plan (CHMP) would not be required for future development.

However, it is considered likely that Aboriginal heritage is located in the study area. This conclusion is derived from the presence of the unnamed tributaries located within the study area and the proximity of two areas of Cultural Heritage Sensitivity to the study area. It is recommended preliminary cultural heritage investigation or a voluntary CHMP be undertaken prior to development in the study area.

16.2.3.2 Historical Cultural Heritage

One site is listed on the Victorian Heritage Inventory and one site is listed on the Moorabool Shire Council Heritage Overlay within the study area (Table 21). Within the surrounding 2km, one site is listed on the Victorian Heritage Register and Moorabool Shire Council Heritage Overlay, and one site is listed on the Victorian Heritage Inventory.

Table 21: Historical Cultural Heritage within or surrounding the Lal Lal Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VHI H7722-0012	Knights Brickworks	Archaeological: Industry	Yes
HO41	Lal Lal Railway Station and Water Tank, Eaglesons Road	Built: Infrastructure	Yes
VHR H1697 HO52	Rothbury	Built: Residential	No, 500m north
VHI H7722-0066	Lal Lal Coal Mine	Archaeological: Mining	No, 1km south

Heritage Act 1995

There is one site listed on the Victorian Heritage Inventory within the study area. Under the *Heritage Act 1995*, this site will require a Consent from Heritage Victoria prior to any future development

Planning and Environment Act 1987

There is one heritage site of local significance listed on the Heritage Overlay under the Moorabool Shire Council Planning Scheme within the study area. A planning permit from the Moorabool Shire Council will be required to remove, impact or destroy these sites.

16.3 Legislative and Policy Implications

16.3.1 Extractive Industry

There are no current mining licenses or extractive industry tenements within the study area (DSDBI 2014) (Figure 6).

16.3.2 Wind Farms

There is one approved wind farm, the proposed Lal Lal Wind Farm, less than two kilometres north of the study area (Figure 6). The southern section of the Lal Lal Wind Farm is also located approximately six kilometres south of the study area (DSDBI 2014).

16.3.3 Intensive Agriculture

The predominant land use within the settlement is agricultural (grazing and/or non-irrigated cropping). No intensive agricultural activities were recorded within the study area during the site assessment.

16.3.4 Schedule of Licenced Premises

The study area does not include any EPA licences (EPA 2014).

16.4 Bushfire Risk

Based upon aerial photography, extant EVC mapping and results of the field assessment, the bushfire risk for Lal Lal is moderate (Tables 2 and 3), given:

- The study area and surrounding landscape contains moderate sized fragmented patches of moderate threat vegetation (woodland) with a 0-5° slope. Large area of contiguous vegetation is located within two kilometres of the study area (Figures 2 and 3);
- Long bushfire runs (>10 kilometres) are possible; however, woodland vegetation is partly fragmented, which may assist fire fighting agencies to prevent long bushfire runs into the township.
- The type and extent of vegetation within and surrounding the study area may result in neighbourhood scale destruction; and,
- Access and escape routes are available to the north and east along moderately well maintained roads and to the south and west along minor roads, with some moderate threat vegetation (woodland) close to the road.

16.5 Summary

Moderately large fragmented patches of native vegetation were recorded within the Lal Lal township and surrounding areas. One patch meets the condition thresholds of the nationally significant ecological community, *Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains*.

There is potential habitat within the study area for several nationally significant flora, and state significant flora and fauna.

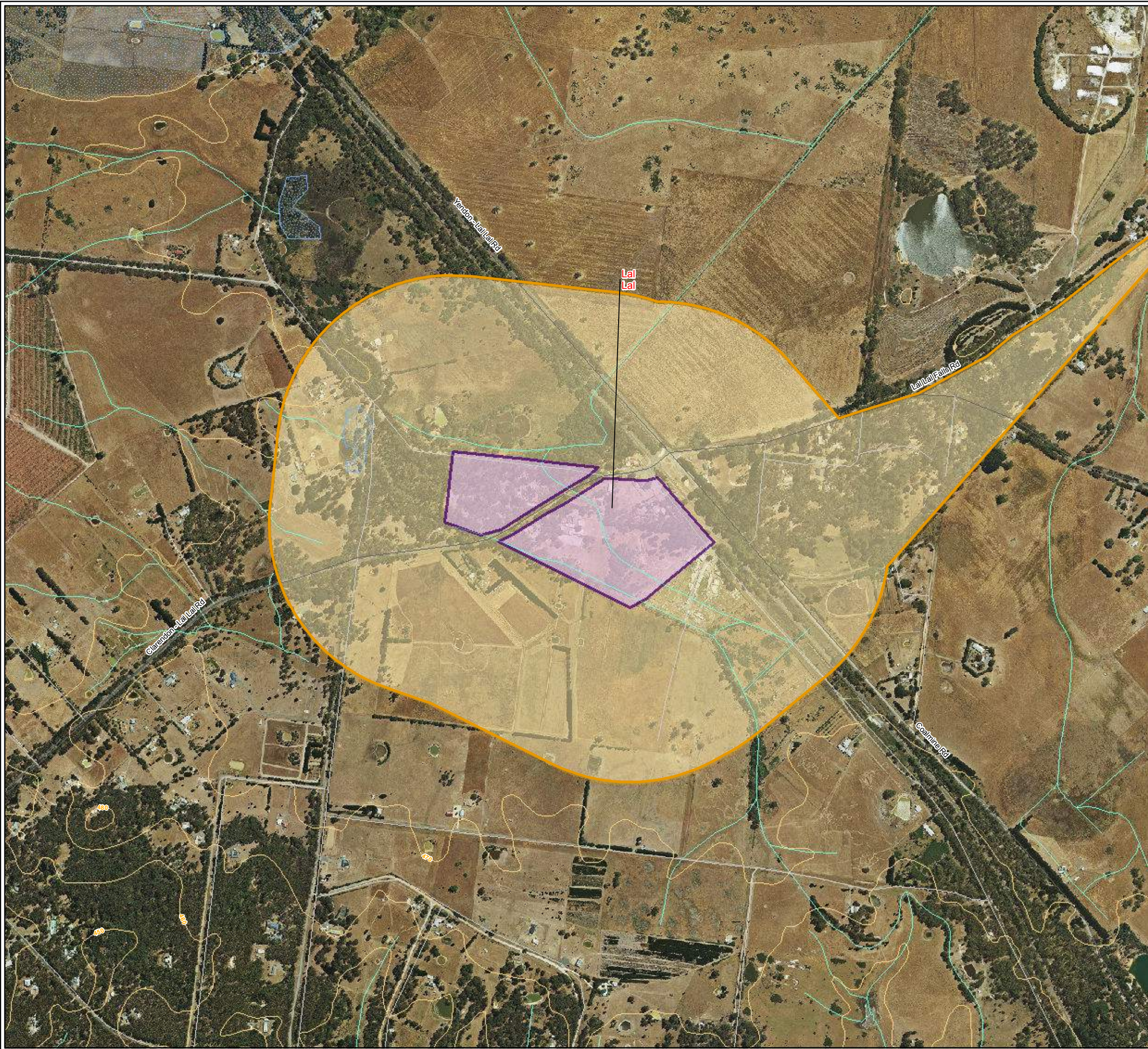
Two areas of Cultural Heritage Sensitivity are located within 2km of the study area: a natural lake located 500m north east of the study area, and a south draining tributary of Williamson Creek located 700m south east of the study area. It is recommended a preliminary cultural heritage investigation or a voluntary CHMP be undertaken prior to development in the study area. Two listed historical heritage sites are located within the study area (Knights Brickworks and Lal Lal Railway Station and Water Tank).

There is one approved wind farm, the proposed Lal Lal Wind Farm, less than two kilometres north of the study area.

The bushfire risk for Lal Lal is Moderate.

16.6 Recommendations

In order to mitigate degradation of environmental values, it is recommended that opportunities are investigated to protect significant ecological communities (*Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains*) and remnant woodland (Grassy Woodland) through planning controls (e.g. revision of planning zones or application of Environmental Significance Overlays/Vegetation Protection Overlays).

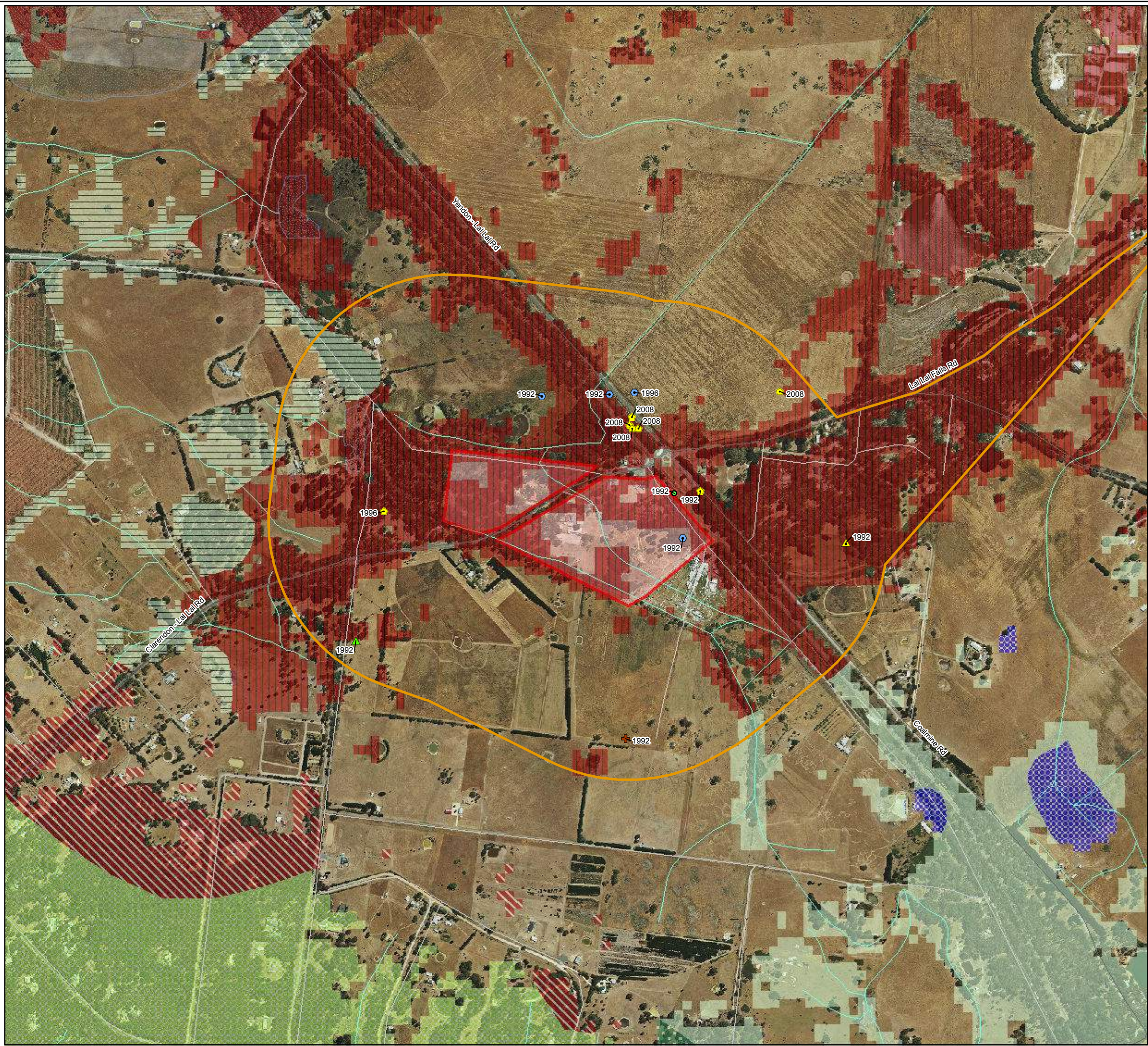


- Legend**
- Priority B Settlement
 - Township Zone
 - Contour (10m)
- Roads**
- Collector Road
 - Minor Road
- Water**
- Minor Watercourse
 - Land Subject to Inundation

Figure 2 -Lal Lal
Physical features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority B Settlement

Township Zone

Ecological Vegetation Class (2005)

Aquatic Herbland/Plains Sedgy Wetland Mosaic

Grassy Dry Forest

Grassy Forest

Grassy Woodland

Plains Grassy Wetland

Plains Grassy Woodland

Plains Sedgy Wetland

Valley Grassy Forest

Significant Flora Records

Maroon Leek-orchid

Pale Swamp Everlasting

Perennial Blown-grass

Swamp Everlasting

Swamp Fireweed

Swamp Plantain

Figure 3 -Lal Lal
Constraining ecological features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council

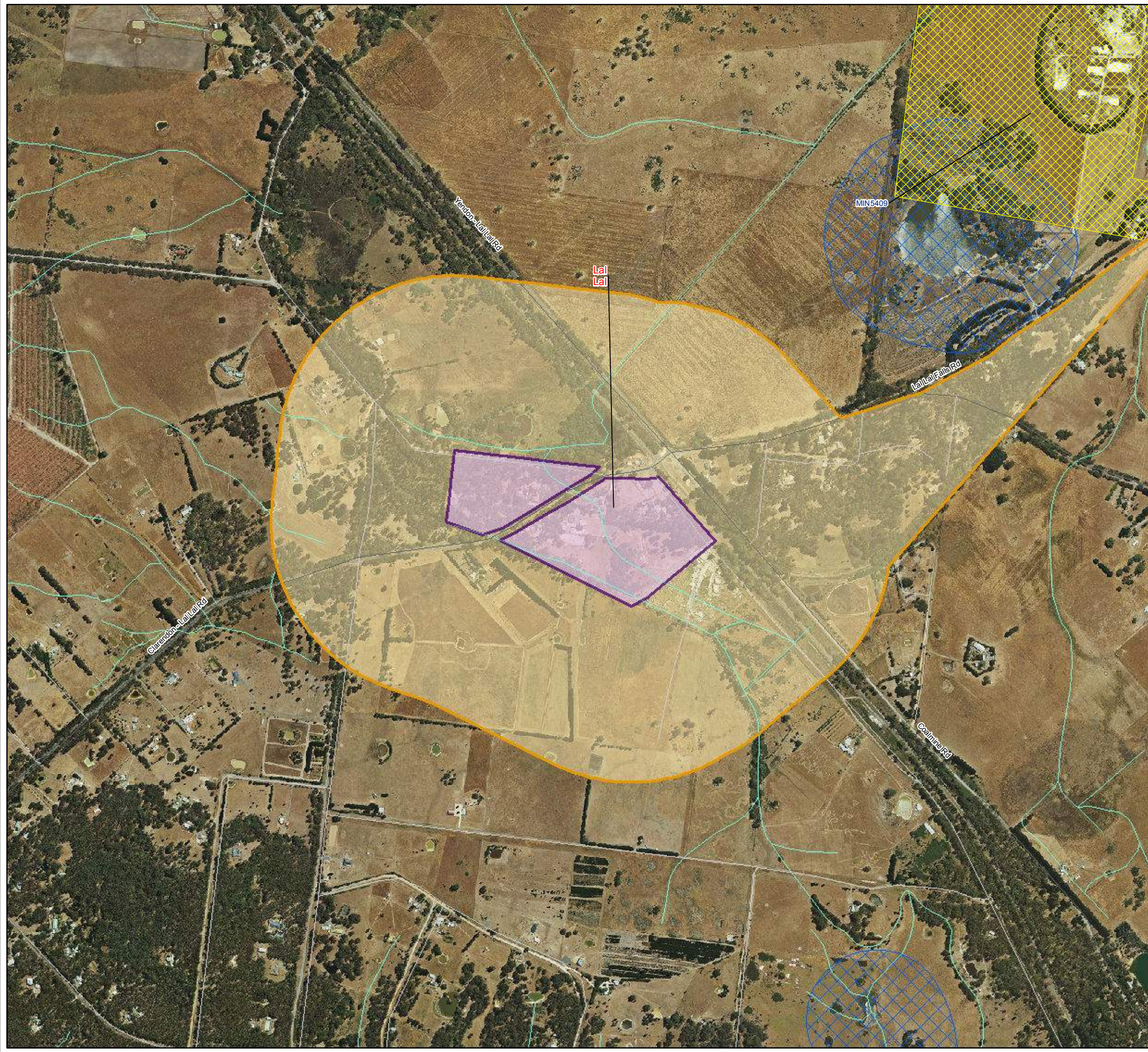
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Kilometres

ecology & heritage

partners

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Legend

- Priority B Settlement
- Township Zone

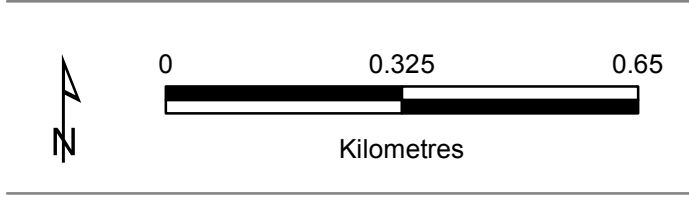
Cultural Heritage

- Areas of Cultural Heritage Sensitivity

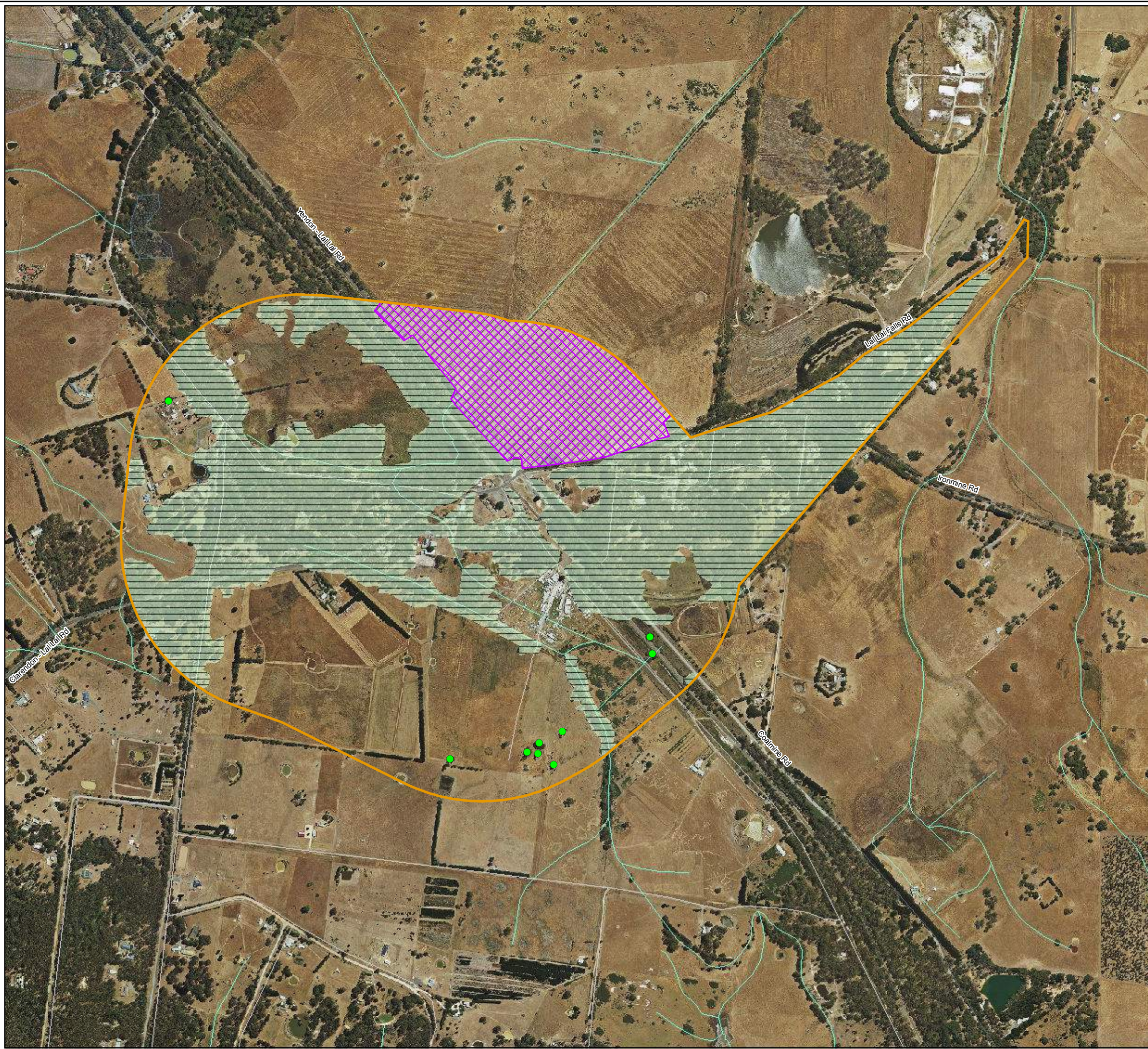
Mining and Extraction

- Current Mining Licenses and Leases

Figure 4 -Lal Lal
Constraining Aboriginal Heritage features, Extractive Licenses and Wind Farms within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority B Settlement

Ecological Vegetation Classes

Aquatic Herbland

Grassy Woodland

Scattered Trees

EPBC Act listed communities

Seasonal Herbaceous Wetlands (Freshwater) of the
Temperate Lowland Plains

Watercourse

Minor Watercourse

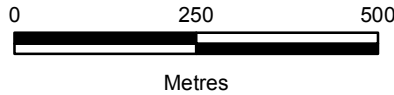
Water Area

Land Subject to Inundation

Figure 5 -Lal Lal

**Ecological features recorded during the field
assessment**

*Environmental Assessment Project
Moorabool Shire Council*



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

APPENDIX 1 – FLORA DATABASE RESULTS

Table A1 Significant flora recorded within 10 kilometres of the study area

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.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence
NATIONAL SIGNIFICANCE							
# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	L	v	5
# <i>Dianella amoena</i>	Matted Flax-lily	-	-	EN	L	e	5
# * <i>Glycine latrobeana</i>	Clover Glycine	1	2011	VU	L	v	4
# <i>Lepidium hyssopifolium</i>	Basalt Peppercress	-	-	EN	L	e	5
# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	5	2010	CR	L	e	4
# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	1	1992	EN	L	e	1
# <i>Senecio psilocarpus</i>	Swamp Fireweed	7	1996	VU	-	v	1
# <i>Thelymitra matthewsii</i>	Spiral Sun-orchid	-	-	VU	L	v	5
# <i>Xerochrysum palustre</i>	Swamp Everlasting	9	2008	VU	L	v	1
STATE SIGNIFICANCE							
<i>Bolboschoenus fluviatilis</i>	Tall Club-sedge	1	1982	-	-	k	3
* <i>Cardamine paucijuga</i> s.s.	Annual Bitter-cress	1	1982	-	-	v	5
<i>Cardamine tenuifolia</i>	Slender Bitter-cress	1	1895	-	-	k	5
<i>Coronidium gunnianum</i>	Pale Swamp Everlasting	2	1996	-	-	v	2
<i>Discaria pubescens</i>	Australian Anchor Plant	14	2003	-	L	r	3
<i>Encalypta vulgaris</i>	Common Extinguisher-moss	1	1996	-	-	r	3
<i>Eucalyptus yarraensis</i>	Yarra Gum	34	2011	-	-	r	5
<i>Grevillea steiglitziana</i>	Brisbane Range Grevillea	1	1977	-	-	r	5
<i>Lachnagrostis perennis</i> spp. agg.	Perennial Blown-grass	1	1992	-	-	k	3
<i>Lepidium pseudohyssopifolium</i>	Native Peppercress	1	1990	-	-	k	5
<i>Plantago</i> aff. <i>gaudichaudii</i> (Lowland Swamps)	Swamp Plantain	1	1992	-	-	v	1

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence
<i>Poa amplexicaulis</i>	Red-sheath Tussock-grass	1	2011	-	-	r	5
<i>Westringia glabra</i>	Violet Westringia	4	1996	-	-	r	5

Data source: Victorian Biodiversity Atlas (DEPI 2014); Protected Matters Search Tool (DoE 2015).

Taxonomic order: Alphabetical.

APPENDIX 2 – SIGNIFICANT FAUNA SPECIES

Table A2. Significant fauna within 10 kilometres of the study area.

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

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 (DEPI 2013b); 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

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
Plains-wanderer	<i>Pedionomus torquatus</i>	1911	1	VU	CR	L	EN	4
Growling Grass Frog	<i>Litoria raniformis</i>	1962	3	VU	EN	L	VU	4
# Australasian Bittern	<i>Botaurus poiciloptilus</i>	-	-	EN	EN	L	VU	4
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	4
# Australian Painted Snipe	<i>Rostratula australis</i>	-	-	VU	CR	L	VU	4
# Dwarf Galaxias	<i>Galaxiella pusilla</i>	-	-	VU	VU	L	VU	4
# Golden Sun Moth	<i>Synemon plana</i>	-	-	CR	EN	L	-	4
# Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	-	-	VU	VU	L	VU	3
# Regent Honeyeater	<i>Anthochaera phrygia</i>	-	-	EN	CR	L	EN	4
# Striped Legless Lizard	<i>Delma impar</i>	-	-	VU	EN	L	VU	4
# Swift Parrot	<i>Lathamus discolor</i>	-	-	EN	EN	L	EN	4
STATE SIGNIFICANCE								
Otway Burrowing Cray	<i>Engaeus fultoni</i>	1963	1	-	VU	-	-	4
Brush-tailed Phascogale	<i>Phascogale tapoatafa tapoatafa</i>	1988	1	-	VU	L	NT	3
Australasian Shoveler	<i>Anas rhynchos</i>	1999	1	-	VU	-	-	3
Common Dunnart	<i>Sminthopsis murina murina</i>	1964	1	-	VU	-	-	4
Greater Glider	<i>Petauroides volans</i>	1969	2	-	VU	-	-	4
Common Bent-wing Bat	<i>Miniopterus schreibersii</i> GROUP	1962	1	-	-	L	CD	4
Musk Duck	<i>Biziura lobata</i>	2000	9	-	VU	-	-	4
Hardhead	<i>Aythya australis</i>	1992	6	-	VU	-	-	3
Blue-billed Duck	<i>Oxyura australis</i>	1952	2	-	EN	L	-	4

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
White-throated Needletail	<i>Hirundapus caudacutus</i>	1986	4	-	VU	-	-	4
Eastern Great Egret	<i>Ardea modesta</i>	1991	2	-	VU	L	-	2
Black Falcon	<i>Falco subniger</i>	2000	1	-	VU	-	-	2
Lewin's Rail	<i>Lewinia pectoralis pectoralis</i>	1896	1	-	VU	L	NT	4
Marsh Sandpiper	<i>Tringa stagnatilis</i>	1986	1	-	VU	-	-	4
Powerful Owl	<i>Ninox strenua</i>	2004	3	-	VU	L	-	3
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2000	5	-	NT	-	NT	2
Crested Bellbird	<i>Oreoica gutturalis gutturalis</i>	1800	1	-	NT	L	NT	4
Hooded Robin	<i>Melanodryas cucullata cucullata</i>	1975	1	-	NT	L	NT	2
Tussock Skink	<i>Pseudemoia pagenstecheri</i>	2007	6	-	VU	-	-	3

Data source: Victorian Biodiversity Atlas (DEPI 2014); Victorian Fauna Database (Viridans 2013b); Protected Matters Search Tool (DoE 2015).

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).

17 MOUNT EGERTON

17.1 Introduction

Mount Egerton is a small town approximately 10 kilometres south-west of Ballan, containing approximately 130 dwellings (Figure 1a). Mount Egerton is located along Gordon-Egerton/Yendon-Egerton Roads and is within a forest setting.

17.2 Physical Attributes of the Settlement

17.2.1 Landscape

The Mount Egerton study area occurs within the Central Victorian Uplands bioregion and falls within the jurisdiction of the Corangamite CMA (DELWP 2015b) (Figure 1b).

Mount Egerton is located within the valleys and slopes to the north of Mount Egerton. A number of medium to large artificial waterbodies are located along streams within the study area, and there are a small number of small farm dams (DELWP 2015a) (Figure 2).

According to the DELWP Victorian Water Resources map (2015c), there are no salinity prone areas or Erosion Management Overlays within the study area. No salinity or erosion effected areas were recorded during the field assessment.

17.2.2 Flora and Fauna

17.2.2.1 Existing Conditions

Ecological Vegetation Classes

According to the DELWP pre-1750 EVC mapping (DELWP 2015b), the study area was likely to support Grassy Dry Forest (EVC 22) and Herb-rich Foothill Forest (EVC 23). Based on extant vegetation mapping, large contiguous areas of these EVCs are likely to be persisting within the study area (Figure 3).

Two EVCs were recorded within the study area. Large, relatively contiguous areas of Grassy Dry Forest and Herb-rich Foothill Forest were recorded surrounding the township. A moderate number (approximately 30) scattered trees (Messmate *Eucalyptus obliqua*, Narrow-leaf Peppermint *Eucalyptus radiata* and Eurabbie *Eucalyptus globulus* subsp. *bicostata*) were also present within the study area (Figure 5).

Dominant flora species

Grassy Dry Forest and Herb-rich Foothill Forest within the study area was dominated by Messmate, Narrow-leaf Peppermint and Eurabbie over a tall shrub layer of Black Wattle *Acacia mearnsii* and Blackwood *Acacia melanoxylon*. The understorey was dominated by Austral Bracken *Pteridium esculentum*, Red-anther Wallaby-grass *Rytidosperma pallidum* and Honeypots *Acrotriche serrulata*.

Weeds present predominantly comprised pasture grasses (e.g. Cocksfoot *Dactylis glomerata*, Toowoomba Canary Grass *Phalaris aquatica*, Wild Oats *Avena fatua*), however Gorse *Ulex ferocissimum* was also present within woodland environments.

Fauna habitat

The study area supports six broad habitat types, woodland/forest, scattered trees, ephemeral creeklines, artificial waterbodies (farm dams), introduced grasslands and planted vegetation.

Woodland/forest and scattered trees within the study area provide valuable habitat for a variety of fauna including arboreal mammals, woodland birds, birds of prey, microbats and reptiles. The abundance of large tree hollows, along with connectivity of the tree canopy is important for arboreal mammals such as possums and gliders. These patches provide important foraging and nesting habitat for a variety of woodland birds and birds of prey and the eucalypts provide an important source of nectar for many birds. A suite of microbat species are likely to utilise small hollows and fissures as roosts and to forage within and around the patches. Fallen logs and the dense grassy understorey present within some of these areas provides suitable foraging and refuge habitat for a variety of reptiles.

Ephemeral creeklines are likely to provide occasional habitat for common frog species. However, due to the variability in water levels, few fish or frog species are likely to use this habitat on a permanent basis.

Artificial waterbodies within the study area are likely to support occasional foraging habitat for common wetland species, including frogs, ducks and wading birds.

Introduced grassland and planted vegetation provide foraging resources for species adapted to modified environments such as Magpies, wattlebirds, and honeyeaters. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills, and fantails for nesting and foraging purposes.

17.2.2.2 Significant species and ecological communities

EPBC Act listed Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoE 2015):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain;
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains; and,
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

No nationally significant ecological communities were recorded during the site assessment and based on the landscape context; nationally significant ecological communities are unlikely to occur within the study area.

FFG Act listed Ecological Communities

No nationally significant ecological communities were recorded during the site assessment and based on the landscape context; state significant ecological communities are unlikely to occur within the study area.

Nationally Significant Flora

The VBA and FIS contain records of five nationally listed flora species previously recorded within 10 kilometres of the study area; Adamson's Blown Grass *Lachnagrostis adamsonii*, Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*, Maroon Leek-orchid *Prasophyllum frenchii*, Swamp Fireweed *Senecio psilocarpus* and Swamp Everlasting *Xerochrysum palustre* (DEPI 2014; Viridans 2013a; Appendix 1; Figure 3). The PMST nominated an additional five nationally significant species which have not been recorded in the locality but have the potential to occur (DoE 2015).

Based on habitat within the study area, landscape context and the proximity of previous records, several nationally significant flora species may occur within the study area (Appendix 1), including Clover Glycine *Glycine latrobeana* and Maroon Leek-orchid.

State Significant Flora

The VBA and FIS contain records of 15 state significant flora species within 10 kilometres of the study area (DEPI 2014; Viridans 2013a) (Appendix 1; Figure 3).

Based on habitat within the study area, landscape context and the proximity of previous records, several state significant flora species may occur within the study area (Appendix 1), including Slender Tick-trefoil *Desmodium varians*, Yellow Star *Hypoxis vaginata* var. *brevistigmata*, Red-sheath Tussock-grass *Poa amplexicaulis* and Screw Moss *Westringia glabra*.

17.2.2.3 Fauna

Nationally Significant Fauna

The VBA and AVW contain records of three nationally listed fauna species previously recorded within 10 kilometres of the study area; Swift Parrot *Lathamus discolor*, Plains-wanderer *Pedionomus torquatus* and Growling Grass Frog *Litoria raniformis* (DEPI 2014; Viridans 2013b; Appendix 2; Figure 3). The PMST nominated an additional eight nationally significant species which have not been recorded in the locality but have the potential to occur due to the presence of suitable habitat (DoE 2015).

Based on previous records, extant EVC mapping and associated habitat within the study area, no nationally significant fauna species are likely to occur within the study area as no suitable habitat is present.

State Significant Fauna

The VBA and AVW contain records of 17 state significant fauna species within 10 kilometres of the study area (DEPI 2014; Viridans 2013b) (Appendix 2; Figure 3).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, five state significant fauna species may use habitat within the study area for foraging, purposes including Diamond Firetail *Stagonopleura guttata*, Powerful Owl *Ninox strenua*, Barking Owl *Ninox connivens connivens*, Masked Owl *Tyto novaehollandiae novaehollandiae* and Brown Treecreeper *Climacteris picumnus victoriae*.

A number of more mobile species (principally bird species) may pass over the study area en-route to more preferred habitats on an occasional basis. There is a low likelihood that other State listed species reside within the study area on a permanent basis as there is no suitable habitat or they are presumed to be extinct in the local area (Appendix 2).

17.2.3 Cultural Heritage

17.2.3.1 Aboriginal Cultural Heritage

There are no registered Aboriginal archaeological places within the study area, and two sites registered within the surrounding 2km (Table 22; Figure 4). These comprise an artefact scatter associated with a burial, and a scarred tree.

Table 22: Aboriginal Cultural Heritage within or surrounding the Mount Egerton Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VAHR 7722-0028	Egerton 1	Burial and Artefact Scatter	No, 1.5km west
VAHR 7722-0257	Gordon Street	Artefact Scatter	No, 2km north

There are no areas of Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, within the study area. Woollen Creek, an area of Cultural Heritage Sensitivity, passes 600m west of the study area, and Green Hill Gully, also an area of Cultural Heritage Sensitivity, is located 800m east of the study area.

Aboriginal Heritage Act 2006

As the study area is not located within an area of Cultural Heritage Sensitivity, a mandatory Cultural Heritage Management Plan (CHMP) would not be required for future development.

However, it is considered likely that Aboriginal heritage is located in the study area. This conclusion is derived from the proximity of two areas of Cultural Heritage Sensitivity to the study area. It is recommended preliminary cultural heritage investigation or a voluntary CHMP be undertaken prior to development in the study area.

17.2.3.2 Historical Cultural Heritage

Three sites are listed on the Victorian Heritage Inventory within the study area (Table 23).

Table 23: Historical Cultural Heritage within or surrounding the Mount Egerton Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VHI H7722-0043	Victorian Tile Company	Archaeological: Industry	Yes
VHI H7722-0044	New Black Horse Mine	Archaeological: Mining	Yes
VHI H7722-0045	Mount Egerton Government Battery	Archaeological: Mining	Yes

Heritage Act 1995

There are three sites listed on the Victorian Heritage Inventory within the study area. Under the *Heritage Act 1995*, these sites will require a Consent from Heritage Victoria prior to any future development

Planning and Environment Act 1987

There are no heritage sites of local significance listed on the Heritage Overlay under the Moorabool Shire Council Planning Scheme within the study area.

17.3 Legislative and Policy Implications

17.3.1 Extractive Industry

There is one current mining licenses (Tag number MP-MIN4422) present on the southern boundary of the study area. There are no extractive industry tenements within the study area (DSDBI 2014) (Figure 6).

17.3.2 Wind Farms

Based on aerial photography interpretation and GeoVic – Explore Victoria Online, there are no operating or proposed wind farms within two kilometres of the study area and none were recorded during the site assessment (DSDBI 2014) (Figure 6).

17.3.3 Intensive Agriculture

The predominant land use within the settlement is rural living and agricultural (grazing). Evidence of intensive agricultural was not recorded within the study area.

17.3.4 Schedule of Licenced Premises

The study area does not include any EPA licences (EPA 2014).

17.4 Bushfire Risk

Based upon aerial photography, extant EVC mapping and results of the field assessment, the bushfire risk for Mount Egerton is high (Tables 2 and 3), given:

- The study area contains moderate to large areas of high threat vegetation (forest) surrounding the settlement on slopes of 5-10° (Figure 2).
- Long bushfire runs (>10 kilometres) are possible; however, woodland vegetation is partly fragmented, which may assist fire fighting agencies to prevent long bushfire runs into the township.
- The type and extent of vegetation within and surrounding the study area may result in neighbourhood scale destruction; and,
- Access and escape routes are available to the north, south and east along moderately maintained roads; however, routes to the south and east contain high threat vegetation (forest) close to the road.

17.5 Summary

Large, relatively contiguous areas of native vegetation were recorded surrounding the township. No national or state significant ecological communities are likely to occur within the study area.

There is potential habitat within the study area for several nationally significant flora, and state significant flora and fauna.

A mandatory Cultural Heritage Management Plan would not be required for future development; however, it is considered likely that Aboriginal heritage is located in the study area. Three listed historical cultural heritage sites are located within the study area (Victorian Tile Company, New Black Horse Mine and Mount Egerton Government Battery).

The bushfire risk for Mount Egerton is High.

17.6 Recommendations

In order to mitigate degradation of environmental values, it is recommended that opportunities are investigated to protect remnant vegetation (Grassy Dry Forest and Herb-rich Foothill Forest) through planning controls (e.g. revision of planning zones or application of Environmental Significance Overlays/Vegetation Protection Overlays).

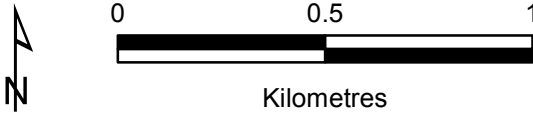


Legend

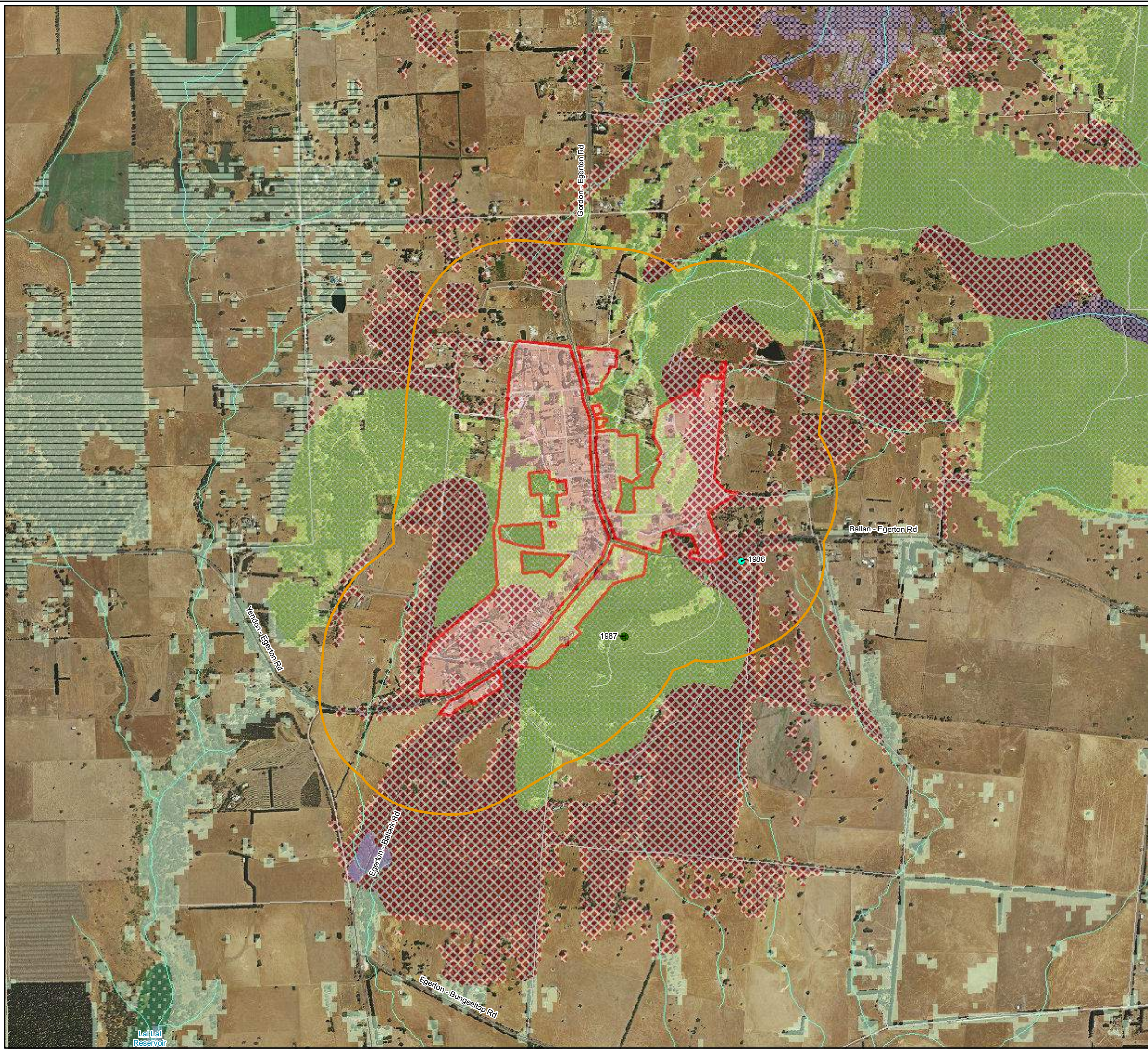
- Priority B Settlement
 - Township Zone
 - Contour (10m)
- Roads**
- Collector Road
 - Minor Road
- Water**
- Minor Watercourse
 - Land Subject to Inundation

Figure 2 -Mount Egerton

Physical features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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.
Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority B Settlement

Township Zone

Ecological Vegetation Class (2005)

Creekline Herb-rich Woodland

Damp Sands Herb-rich Woodland

Grassy Dry Forest

Grassy Woodland

Herb-rich Foothill Forest

Plains Grassy Woodland

Valley Grassy Forest

Water Body - man-made

Significant Fauna Records

Latham's Snipe

Nankeen Night Heron

Figure 3 -Mount Egerton
Constraining ecological features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council

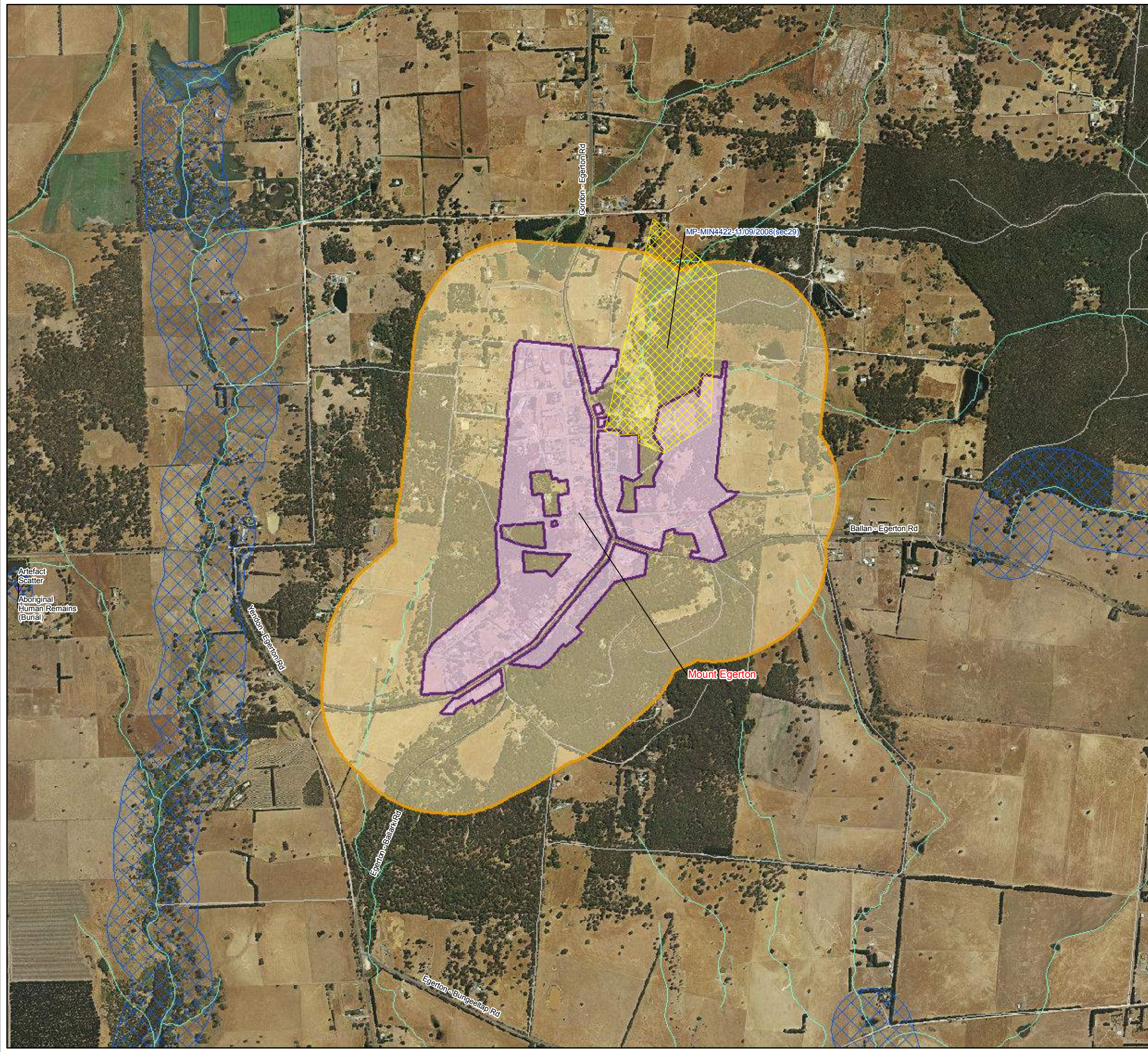
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ecology & heritage

partners

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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

- Priority B Settlement
- Township Zone

Cultural Heritage

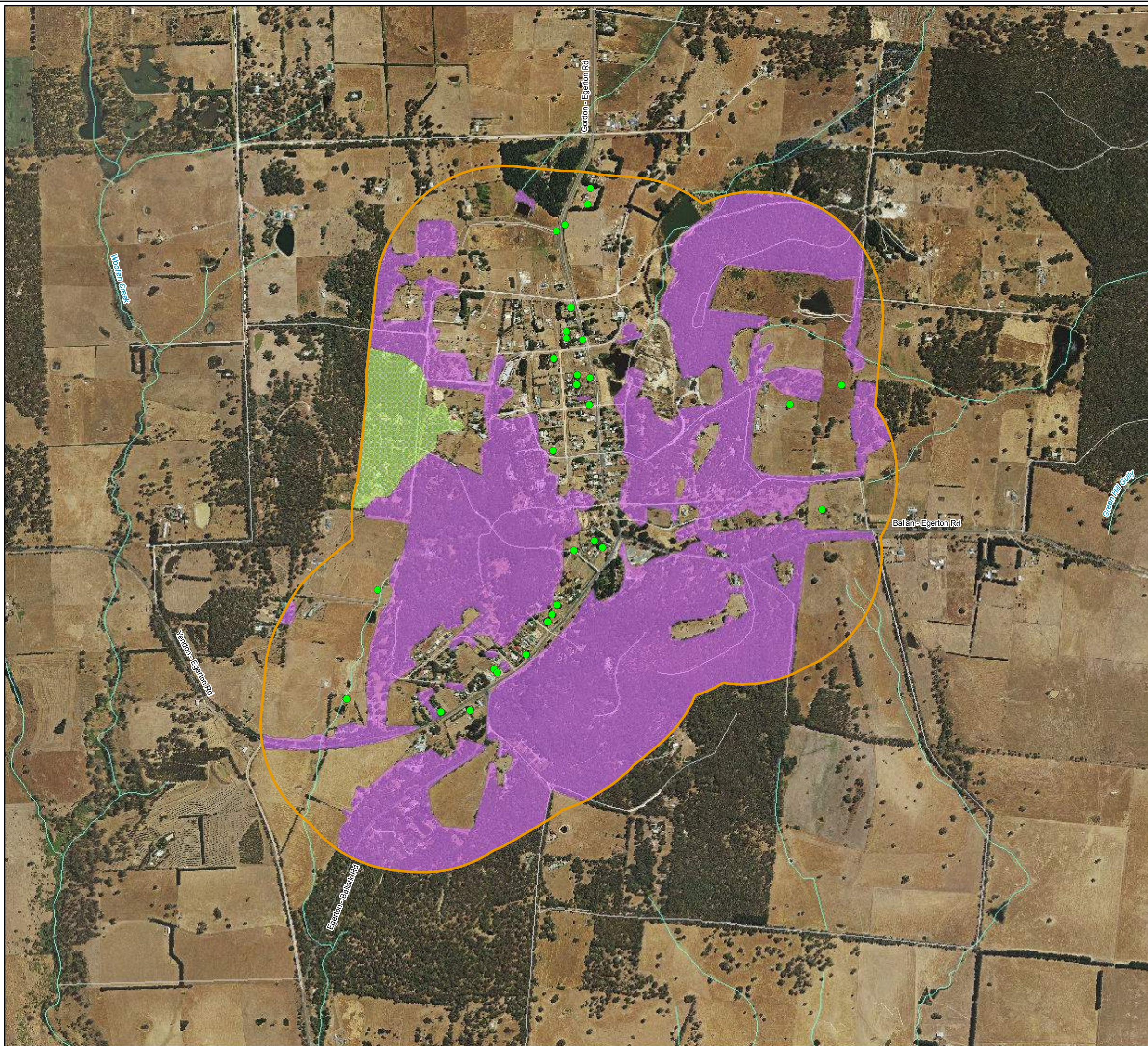
- Areas of Cultural Heritage Sensitivity
- Aboriginal Human Remains (Burial)
- Artefact Scatter

Mining and Extraction


- Current Mining Licenses and Leases

Figure 4 -Mount Egerton
Constraining Aboriginal Heritage features, Extractive Licenses and Wind Farms within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council

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Aerial photo (2013) and contours supplied by Moorabool Shire Council.




Legend

 Priority B Settlement

Ecological Vegetation Classes

 Grassy Dry Forest

 Grassy Dry Forest/Herb-rich Foothill Forest mosaic

 Scattered Trees

Watercourse

 Minor Watercourse

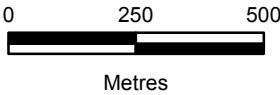
Water Area

 Land Subject to Inundation

Figure 5 -Mt Egerton

Ecological features recorded during the field assessment

*Environmental Assessment Project
Moorabool Shire Council*



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

APPENDIX 1 – FLORA DATABASE RESULTS

Table A1 Significant flora recorded within 10 kilometres of the study area

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.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
NATIONAL SIGNIFICANCE							
# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	L	v	5
# <i>Dianella amoena</i>	Matted Flax-lily	-	-	EN	L	e	5
# <i>Glycine latrobeana</i>	Clover Glycine	-	-	VU	L	v	4
<i>Lachnagrostis adamsonii</i>	Adamson's Blown-grass	1	1997	EN	L	v	5
# <i>Lepidium hyssopifolium</i>	Basalt Peppercress	-	-	EN	L	e	5
# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	3	2010	CR	L	e	5
# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	1	1992	EN	L	e	4
# <i>Senecio psilocarpus</i>	Swamp Fireweed	8	1996	VU	-	v	5
# <i>Thelymitra matthewsii</i>	Spiral Sun-orchid	-	-	VU	L	v	5
# <i>Xerochrysum palustre</i>	Swamp Everlasting	9	2008	VU	L	v	5
STATE SIGNIFICANCE							
<i>Bolboschoenus fluviatilis</i>	Tall Club-sedge	1	1982	-	-	k	5
<i>Cardamine tenuifolia</i>	Slender Bitter-cress	2	1964	-	-	k	5
<i>Carex chlorantha</i>	Green-top Sedge	1	1853	-	-	k	5
<i>Coronidium gunnianum</i>	Pale Swamp Everlasting	2	1996	-	-	v	5
<i>Desmodium varians</i>	Slender Tick-trefoil	1	1964	-	-	k	4
<i>Discaria pubescens</i>	Australian Anchor Plant	14	2003	-	L	r	4
<i>Encalypta vulgaris</i>	Common Extinguisher-moss	1	1996	-	-	r	5
<i>Eucalyptus yarraensis</i>	Yarra Gum	18	2011	-	-	r	5
<i>Hypoxis vaginata</i> var. <i>brevistigmata</i>	Yellow Star	1	1978	-	-	k	4
<i>Lachnagrostis perennis</i> spp. agg.	Perennial Blown-grass	1	1992	-	-	k	5

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	DSE	Likelihood of occurrence in study area
<i>Lepidium pseudohyssopifolium</i>	Native Peppercress	1	1990	-	-	k	5
<i>Plantago</i> aff. <i>gaudichaudii</i> (Lowland Swamps)	Swamp Plantain	1	1992	-	-	v	5
<i>Poa amplexicaulis</i>	Red-sheath Tussock-grass	1	2011	-	-	r	4
<i>Tortula rubella</i>	Screw Moss	1	1998	-	-	k	4
<i>Westringia glabra</i>	Violet Westringia	3	1996	-	-	r	5

Data source: Victorian Biodiversity Atlas (DEPI 2014); Protected Matters Search Tool (DoE 2015).

Taxonomic order: Alphabetical.

APPENDIX 2 – SIGNIFICANT FAUNA SPECIES

Table A2. Significant fauna within 10 kilometres of the study area.

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

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 (DEPI 2013b); 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

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
Plains-wanderer	<i>Pedionomus torquatus</i>	1911	1	VU	CR	L	EN	4
Swift Parrot	<i>Lathamus discolor</i>	1957	1	EN	EN	L	EN	3
Growling Grass Frog	<i>Litoria raniformis</i>	1962	3	VU	EN	L	VU	4
# Australasian Bittern	<i>Botaurus poiciloptilus</i>	-	-	EN	EN	L	VU	4
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	4
# Australian Painted Snipe	<i>Rostratula australis</i>	-	-	VU	CR	L	VU	4
# Dwarf Galaxias	<i>Galaxiella pusilla</i>	-	-	VU	VU	L	VU	4
# Golden Sun Moth	<i>Synemon plana</i>	-	-	CR	EN	L	-	4
# Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	-	-	VU	VU	L	VU	3
# Regent Honeyeater	<i>Anthochaera phrygia</i>	-	-	EN	CR	L	EN	4
# Smoky Mouse	<i>Pseudomys fumeus</i>	-	-	EN	CR	L	RA	4
STATE SIGNIFICANCE								
Brush-tailed Phascogale	<i>Phascogale tapoatafa tapoatafa</i>	1988	2	-	VU	L	NT	3
Australasian Shoveler	<i>Anas rhynchos</i>	1999	1	-	VU	-	-	4
Greater Glider	<i>Petauroides volans</i>	1969	2	-	VU	-	-	4
King Quail	<i>Coturnix chinensis victoriae</i>	1995	1	-	EN	L	-	3
Musk Duck	<i>Biziura lobata</i>	2000	13	-	VU	-	-	4
Hardhead	<i>Aythya australis</i>	1976	2	-	VU	-	-	3
White-throated Needletail	<i>Hirundapus caudacutus</i>	1986	4	-	VU	-	-	4
Eastern Great Egret	<i>Ardea modesta</i>	1991	2	-	VU	L	-	3
Grey Goshawk	<i>Accipiter novaehollandiae</i>	1976	1	-	VU	L	-	3

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
Lewin's Rail	<i>Lewinia pectoralis pectoralis</i>	1896	1	-	VU	L	NT	3
Powerful Owl	<i>Ninox strenua</i>	2004	5	-	VU	L	-	2
Barking Owl	<i>Ninox connivens connivens</i>	1995	2	-	EN	L	NT	2
Masked Owl	<i>Tyto novaehollandiae novaehollandiae</i>	1995	1	-	EN	L	NT	2
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2000	2	-	NT	-	NT	2
Crested Bellbird	<i>Oreoica gutturalis gutturalis</i>	1800	1	-	NT	L	NT	4
Diamond Firetail	<i>Stagonopleura guttata</i>	1996	3	-	NT	L	NT	2
Tussock Skink	<i>Pseudemoia pagenstecheri</i>	2008	24	-	VU	-	-	3

Data source: Victorian Biodiversity Atlas (DEPI 2014); Victorian Fauna Database (Viridans 2013b); Protected Matters Search Tool (DoE 2015).

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).

18 YENDON

18.1 Introduction

Yendon is a small town approximately 15 kilometres north-west of Ballan, containing approximately 12 dwellings, and is located along Yendon Number Two Road (Figure 1a).

18.2 Physical Attributes of the Settlement

18.2.1 Landscape

The Yendon study area predominantly occurs within the Victorian Volcanic Plain bioregion, with the western extent falling within the Central Victorian Uplands bioregion (DELWP 2015b) (Figure 1b). The study area falls within the jurisdiction of the Corangamite CMA.

Yendon is located on flat plains and includes a number of small streams. A number of small artificial waterbodies (farm dams) occur within the study area along streams and adjacent areas (DELWP 2015a) (Figure 2).

According to the DELWP Victorian Water Resources map (2015c), there are no salinity prone areas or Erosion Management Overlays within the study area. No salinity or erosion effected areas were recorded during the field assessment.

18.2.2 Flora and Fauna

18.2.2.1 Existing Conditions

Ecological Vegetation Classes

According to the DELWP pre-1750 EVC mapping (DELWP 2015b), the study area was likely to support Plains Grassy Woodland (EVC 55) and Grassy Woodland (EVC 175), with Swampy Riparian Woodland (EVC 83) along seasonally flooded creeklines. Grassy Dry Forest was also likely to occur within the west of the study area. Based on extant vegetation mapping, fragmented occurrences of these EVCs are likely to be persisting within the study area, particularly along creeklines and roadsides (Figure 3).

Two EVCs were recorded within the study area, Grassy Woodland and Plains Grassy Wetland. Narrow, fragmented linear strips of Grassy Woodland were recorded, predominantly along roadsides; the largest patch being along Navigators Road. One small patch of Plains Grassy Wetland was also recorded along Navigators Road. Approximately 20 scattered trees (Narrow-leaf Peppermint *Eucalyptus radiata*, Manna Gum *Eucalyptus viminalis*, Messmate *Eucalyptus obliqua* and Swamp Gum *Eucalyptus ovata*) were also recorded throughout the study area (Figure 5).

Dominant flora species

Grassy Woodland within the study area was dominated by Narrow-leaf Peppermint, Manna Gum, Messmate and Swamp Gum. The understorey was dominated by Blackwood *Acacia melanoxylon*, Spear-grasses *Austrostipa* spp, Wallaby-grasses *Rytidosperma* spp and Kangaroo Grass *Themeda triandra*.

Plains Grassy Wetland within the study area was dominated by Swamp Wallaby-grass *Amphibromus* sp. and Rushes *Juncus* sp.

Weeds present predominantly comprised pasture grasses (e.g. Cocksfoot *Dactylis glomerata*, Toowoomba Canary Grass *Phalaris aquatica*, Wild Oats *Avena fatua*), however Gorse *Ulex europaeus* was also present in scattered occurrences throughout the study area.

Fauna habitat

The study area supports six broad habitat types, woodland, scattered trees, ephemeral creeklines, artificial waterbodies (farm dams), introduced grasslands and planted vegetation.

Woodland and scattered trees within the study area provides habitat to a range of native fauna, including birds, possums and microbats. Many of the Eucalypts recorded in this area are large, likely to contain hollows, and provide fruitful nectar yields that would attract a large number of native bird species in the immediate area. Scattered remnants of woodland are also likely to facilitate fauna movement between habitats throughout the otherwise cleared landscape.

Ephemeral creeklines are likely to provide occasional habitat for common frog species. However, due to the variability in water levels, few fish or frog species are likely to use this habitat on a permanent basis.

Artificial waterbodies within the study area are likely to support occasional foraging habitat for common wetland species, including frogs, ducks and wading birds.

Introduced grassland and planted vegetation provide foraging resources for species adapted to modified environments such as Magpies, wattlebirds, and honeyeaters. Additionally, low growing shrubs would be used by smaller passerine species such as wrens, thornbills, and fantails for nesting and foraging purposes.

18.2.2.2 Significant species and ecological communities

EPBC Act listed Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DoE 2015):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain;
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Temperate Grassland of the Victorian Volcanic Plain;
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains; and,
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

No nationally significant ecological communities were recorded during the site assessment and none are considered likely to occur. Areas of Plains Grassy Wetland recorded during the site assessment did not meet the minimum size thresholds to meet the nationally listed *Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains*.

FFG Act listed Ecological Communities

According to the DELWP Biodiversity Interactive Map (DELWP 2015b), one state significant ecological community is predicted to occur within the study area, *Western Basalt Plains (River Red-gum) Grassy Woodland*, which is associated with the Plains Grassy Woodland EVC..

Nationally Significant Flora

The VBA and FIS contain records of five nationally listed flora species previously recorded within 10 kilometres of the study area, Clover Glycine *Glycine latrobeana*, Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*, Maroon Leek-orchid *Prasophyllum frenchii*, Swamp Fireweed *Senecio psilocarpus* and Swamp Everlasting *Xerochrysum palustre* (DEPI 2014; Viridans 2013a; Appendix 1; Figure 3). The PMST nominated an additional four nationally significant species which have not been recorded in the locality but have the potential to occur (DoE 2015).

Based on habitat within the study area, landscape context and the proximity of previous records, several nationally significant flora species may occur within the study area (Appendix 1), including Clover Glycine, Spiny Rice-flower, Swamp Fireweed and Swamp Everlasting.

State Significant Flora

The VBA and FIS contain records of 18 state significant flora species within 10 kilometres of the study area (DEPI 2014; Viridans 2013a) (Appendix 1; Figure 3).

Based on habitat within the study area, landscape context and the proximity of previous records, several state significant flora species may occur within the study area (Appendix 1), including Wavy Swamp Wallaby-grass *Amphibromus sinuatus*, Tall Club-sedge *Bolboschoenus fluviatilis*, Pale Swamp Everlasting *Coronidium gunnianum*, Slender Tick-trefoil *Desmodium varians*, Common Extinguisher-moss *Encalypta vulgaris*, Perennial Blown-grass *Lachnagrostis perennis* spp. agg. and Swamp Plantain *Plantago* aff. *gaudichaudii* (Lowland Swamps).

18.2.2.3 Fauna

Nationally Significant Fauna

The VBA and AVW contain records of three nationally listed fauna species previously recorded within 10 kilometres of the study area, Plains-wanderer *Pedionomus torquatus*, Swift Parrot *Lathamus discolor* and Growling Grass Frog *Litoria raniformis* (DEPI 2014; Viridans 2013b; Appendix 2; Figure 3).

The PMST nominated an additional nine nationally significant species which have not been recorded in the locality but have the potential to occur due to the presence of suitable habitat (DoE 2015).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, two nationally significant fauna species, Grey-headed Flying Fox *Pteropus*

poliocephalus and Growling Grass Frog, have the potential to occur within the study area as suitable habitat is present.

State Significant Fauna

The VBA and AVW contain records of 21 state significant fauna species within 10 kilometres of the study area (DEPI 2014; Viridans 2013b) (Appendix 2; Figure 3).

Based on the number of previous records, extant EVC mapping, landscape context and associated habitat within the study area, 11 state significant fauna species may use habitat within the study area for foraging purposes including, Powerful Owl *Ninox strenua*, Barking Owl *Ninox connivens connivens*, Brown Treecreeper *Climacteris picumnus victoriae*, Hooded Robin *Melanodryas cucullata cucullata*, Tussock Skink *Pseudemoia pagenstecheri*, Grey Goshawk *Accipiter novaehollandiae novaehollandiae*, Black Falcon *Falco subniger*, Eastern Great Egret *Ardea modesta*, Hardhead *Aythya australis*, Common Bent-wing Bat *Miniopterus schreibersii* GROUP and Brush-tailed Phascogale *Phascogale tapoatafa tapoatafa*.

A number of more mobile species (principally bird species) may pass over the study area en-route to more preferred habitats on an occasional basis. There is a low likelihood that other nominated EPBC Act and State listed species reside within the study area on a permanent basis as there is no suitable habitat or they are presumed to be extinct in the local area (Appendix 2).

18.2.3 Cultural Heritage

18.2.3.1 Aboriginal Cultural Heritage

There are no registered Aboriginal archaeological places within the study area, and one within the surrounding 2km (Table 24; Figure 4).

Table 24: Aboriginal Cultural Heritage within or surrounding the Yendon Study Area

Register & Site Number	Site Name	Site Type	Within study area?
VAHR 7622-0001	Yendon	Rock engraving	No, 800m south

There is one area of Cultural Heritage Sensitivity, as defined by the *Aboriginal Heritage Regulations 2007*, within the study area (Figure 4). Under Regulation 23(1) land within 200 metres of a named waterway is classified as being of Cultural Heritage Sensitivity. One area of sensitivity was identified within the study area, a south flowing tributary to Lal Lal Creek.

Aboriginal Heritage Act 2006

It is considered likely that Aboriginal heritage will be found in the study area. This conclusion is derived from the likelihood of areas of unmodified land in close proximity to waterways. A CHMP is used to assess the Aboriginal heritage and manage any heritage in the context of an impact such as a subdivision activity. Under Regulation 23, the study area is within an area of Cultural Heritage Sensitivity as it is located within 200 m of a waterway. Therefore, any future development within the above named areas of Cultural Heritage Sensitivity will require a mandatory CHMP.

18.2.3.2 Historical Cultural Heritage

There are no cultural heritage sites listed within the study area, or the surrounding 2km.

Heritage Act 1995

There are no sites listed on the Victorian Heritage Register or Victorian Heritage Inventory within the study area.

Planning and Environment Act 1987

There are no heritage sites of local significance listed on the Heritage Overlay under the Moorabool Shire Council Planning Scheme within the study area.

18.3 Legislative and Policy Implications

18.3.1 Extractive Industry

There are no current mining licenses or extractive industry tenements within the study area (DSDBI 2014) (Figure 6). There are two extractive industry tenements approximately 400m north of the study area (Tag number WA82 and WA482).

18.3.2 Wind Farms

There is one approved wind farm, the proposed Lal Lal Wind Farm, less than two kilometres west of the study area (Figure 6) (DSDBI 2014).

18.3.3 Intensive Agriculture

The predominant land use within the settlement is rural living and agriculture (grazing). Evidence of intensive agricultural activities was not recorded within the study area.

18.3.4 Schedule of Licenced Premises

The study area does not include any EPA licences (EPA 2014).

18.4 Bushfire Risk

Based upon aerial photography, extant EVC mapping and results of the field assessment, the bushfire risk for Yendon is low (Tables 2 and 3), given:

- The study area and surrounding landscape predominantly contains low threat vegetation (crops and managed pasture) with a 0-5° slope. However, moderate sized fragmented patches of moderate threat vegetation (woodland) occurs to the east and south of the study area (Figures 2 and 3);
- Long bushfire runs (>10 kilometres) are possible; however, given the agricultural environment and low number of surface rocks, the surrounding landscape easily accessed for fire fighting purposes; long bushfire runs are therefore unlikely;

- Extreme bushfire behaviour is not possible and the type and extent of vegetation is unlikely to result in neighbourhood scale destruction of property; and,
- Access and escape routes are available to the north, south, east and west, with low to moderate cover of moderate threat vegetation (woodland) vegetation close to the road.

18.5 Summary

Narrow, fragmented strips of native vegetation are present within Yendon. No national or state significant ecological communities are likely to occur.

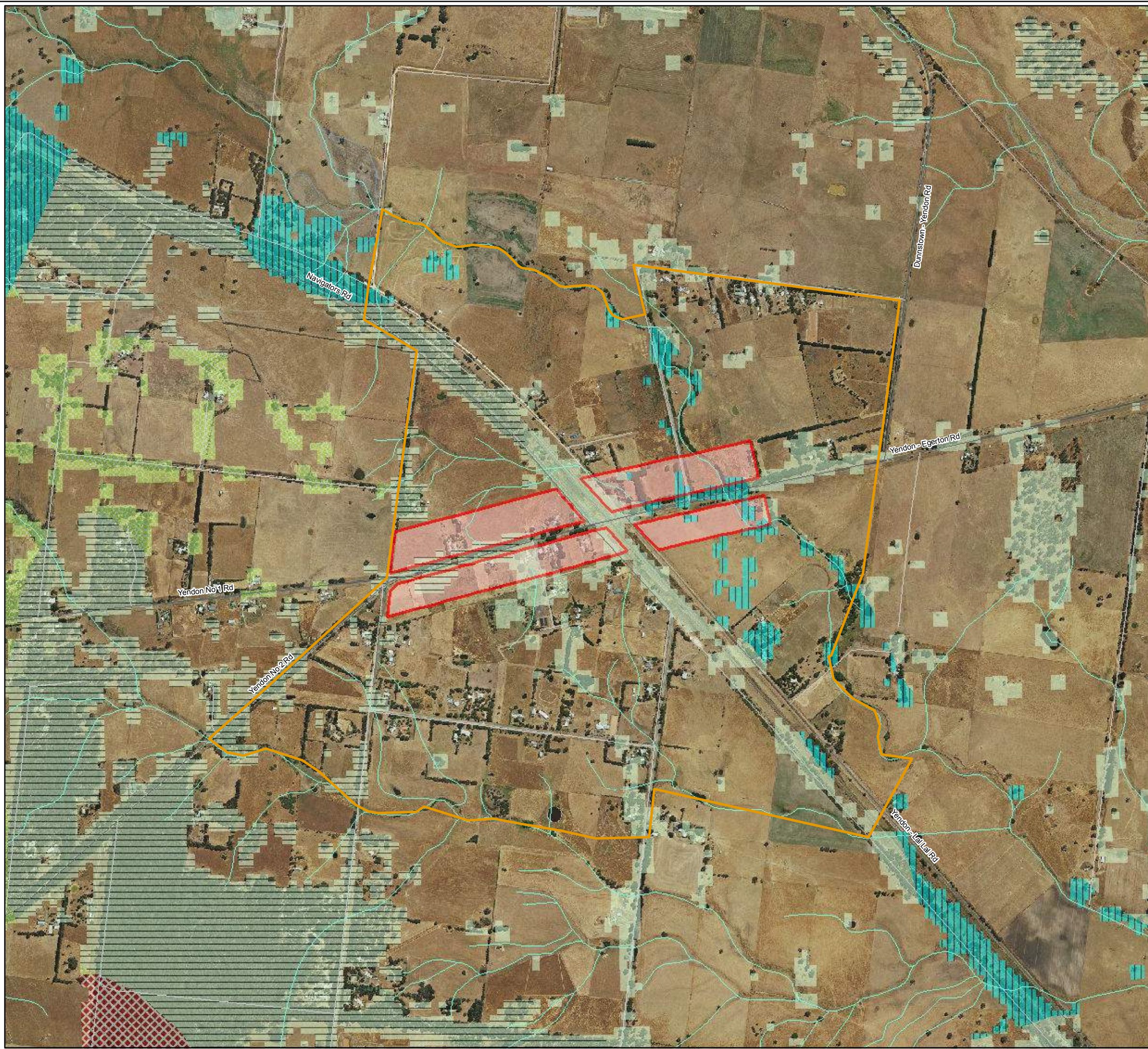
There is potential habitat within the study area for several national and state significant flora and fauna.

A mandatory Cultural Heritage Management Plan would not be required for future development; however, it is considered likely that Aboriginal heritage is located in the study area. No listed historical cultural heritage sites are located within the study area.

The bushfire risk for Yendon is low.

18.6 Recommendations

In order to mitigate degradation of environmental values, it is recommended that opportunities are investigated to protect remnant vegetation forming habitat corridors through planning controls (e.g. revision of planning zones or application of Environmental Significance Overlays/Vegetation Protection Overlays).



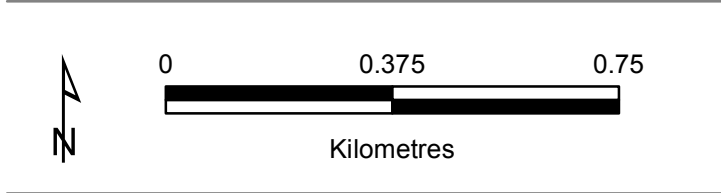
Legend

- Priority B Settlement
- Township Zone

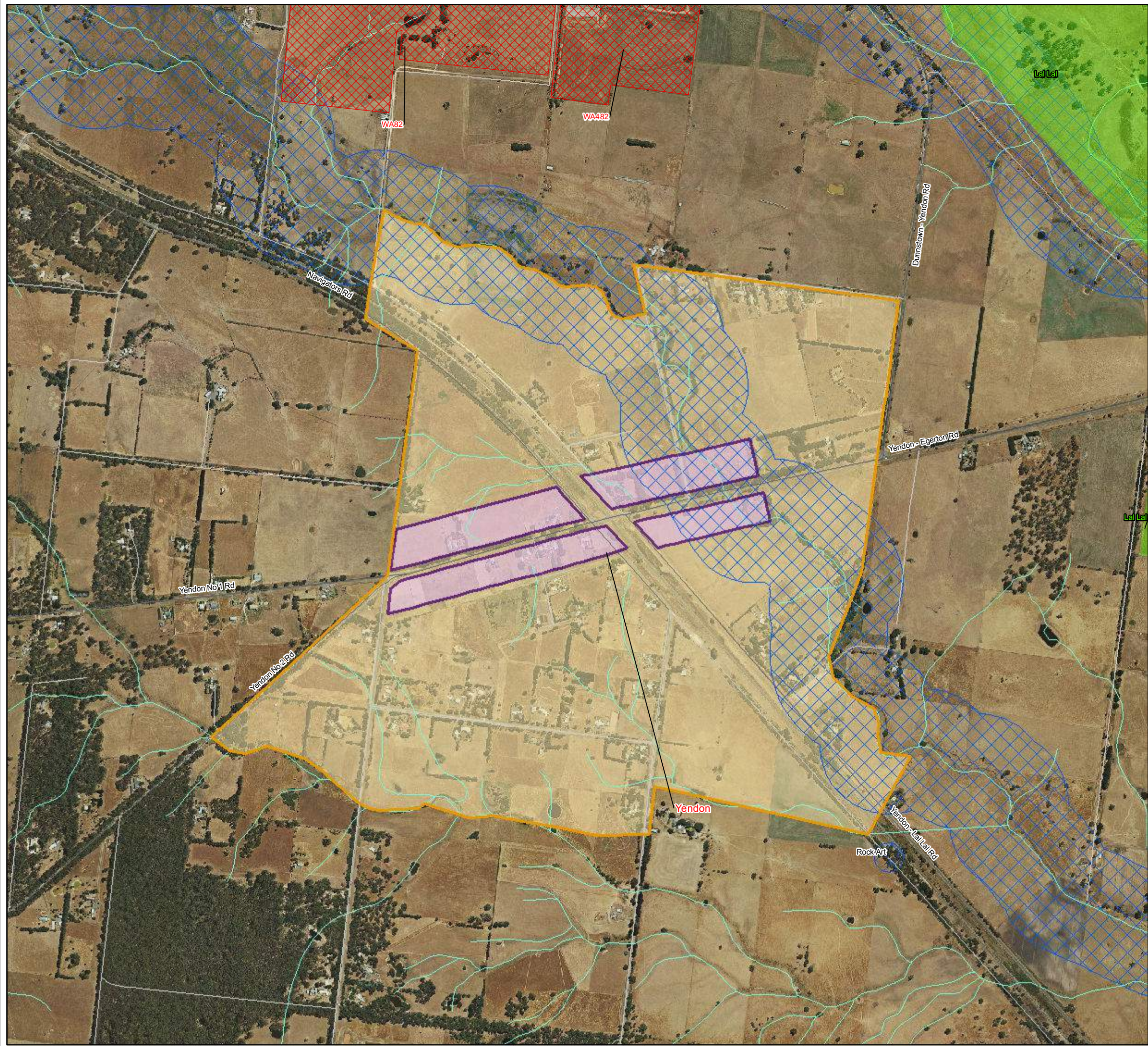
Ecological Vegetation Class (2005)

- Grassy Dry Forest
- Grassy Woodland
- Herb-rich Foothill Forest
- Plains Grassy Woodland
- Swampy Riparian Woodland

Figure 3 -Yendon
Constraining ecological features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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.
 Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority B Settlement

Township Zone

Cultural Heritage

Areas of Cultural Heritage Sensitivity

Mining and Extraction

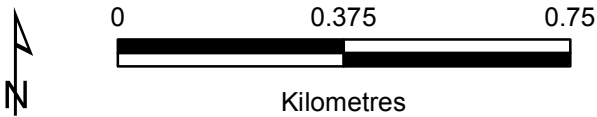
Current Extractive Industry Tenements

Wind Farm

Approved

Figure 4 -Yendon

**Constraining Aboriginal Heritage features,
Extractive Licenses and Wind Farms within
and surrounding the settlement**
*Environmental Assessment Project
Moorabool Shire Council*



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.



Legend

Priority B Settlement

Ecological Vegetation Classes

Grassy Woodland

Plains Grassy Wetland

Scattered Trees

Watercourse

Minor Watercourse

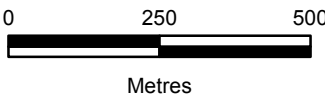
Water Area

Land Subject to Inundation

Figure 5 -Yendon

Ecological features recorded during the field assessment

*Environmental Assessment Project
Moorabool Shire Council*



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

APPENDIX 1 – FLORA DATABASE RESULTS

Table A1 Significant flora recorded within 10 kilometres of the study area

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.

Scientific name	Common name	EPBC	FFG	DSE	Total # of documented records	Last documented record	Likelihood of occurrence in study area
NATIONAL SIGNIFICANCE							
# <i>Carex tasmanica</i>	Curly Sedge	-	-	VU	L	v	5
# <i>Dianella amoena</i>	Matted Flax-lily	-	-	EN	L	e	5
# <i>Glycine latrobeana</i>	Clover Glycine	1	2011	VU	L	v	4
# <i>Lepidium hyssopifolium</i>	Basalt Peppercress	-	-	EN	L	e	5
# <i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	3	2010	CR	L	e	4
# <i>Prasophyllum frenchii</i>	Maroon Leek-orchid	1	1992	EN	L	e	5
# <i>Senecio psilocarpus</i>	Swamp Fireweed	7	1996	VU	-	v	3
# <i>Thelymitra matthewsii</i>	Spiral Sun-orchid	-	-	VU	L	v	5
# <i>Xerochrysum palustre</i>	Swamp Everlasting	9	2008	VU	L	v	3
STATE SIGNIFICANCE							
<i>Amphibromus sinuatus</i>	Wavy Swamp Wallaby-grass	1	2008	-	-	v	3
<i>Bolboschoenus fluviatilis</i>	Tall Club-sedge	1	1982	-	-	k	4
<i>Cardamine tenuifolia</i>	Slender Bitter-cress	1	1895	-	-	k	5
<i>Coronidium gunnianum</i>	Pale Swamp Everlasting	2	1996	-	-	v	3
<i>Desmodium varians</i>	Slender Tick-trefoil	1	1992	-	-	k	4
<i>Discaria pubescens</i>	Australian Anchor Plant	15	2003	-	L	r	5
<i>Distichium capillaceum</i>	Fine Fringe-moss	3	1898	-	-	v	5
<i>Encalypta vulgaris</i>	Common Extinguisher-moss	1	1996	-	-	r	4
<i>Eucalyptus brookeriana</i>	Brooker's Gum	3	2002	-	-	r	5
<i>Eucalyptus yarraensis</i>	Yarra Gum	52	2004	-	-	r	5
<i>Lachnagrostis perennis</i> spp. agg.	Perennial Blown-grass	1	1992	-	-	k	4

Scientific name	Common name	EPBC	FFG	DSE	Total # of documented records	Last documented record	Likelihood of occurrence in study area
<i>Lepidium pseudohyssopifolium</i>	Native Peppercress	1	1990	-	-	k	5
<i>Melaleuca armillaris</i> subsp. <i>armillaris</i>	Giant Honey-myrtle	1	2006	-	-	r	5
<i>Plantago</i> aff. <i>gaudichaudii</i> (Lowland Swamps)	Swamp Plantain	1	1992	-	-	v	3
<i>Poa amplexicaulis</i>	Red-sheath Tussock-grass	1	2011	-	-	r	5
<i>Ptychomitrium muelleri</i>	Pincushion	3	1898	-	-	k	5
<i>*Scleranthus brockei</i>	Brock Knawel	1	1876	-	-	r	5
<i>Westringia glabra</i>	Violet Westringia	3	1996	-	-	r	5

Data source: Victorian Biodiversity Atlas (DEPI 2014); Protected Matters Search Tool (DoE 2015).

Taxonomic order: Alphabetical.

APPENDIX 2 – SIGNIFICANT FAUNA SPECIES

Table A2. Significant fauna within 10 kilometres of the study area.

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

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 (DEPI 2013b); 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

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
NATIONAL SIGNIFICANCE								
Plains-wanderer	<i>Pedionomus torquatus</i>	1911	2	VU	CR	L	EN	4
Swift Parrot	<i>Lathamus discolor</i>	1977	2	EN	EN	L	EN	4
Growling Grass Frog	<i>Litoria raniformis</i>	1962	3	VU	EN	L	VU	3
# Australasian Bittern	<i>Botaurus poiciloptilus</i>	-	-	EN	EN	L	VU	4
# Australian Grayling	<i>Prototroctes maraena</i>	-	-	VU	VU	L	VU	4
# Australian Painted Snipe	<i>Rostratula australis</i>	-	-	VU	CR	L	VU	4
# Dwarf Galaxias	<i>Galaxiella pusilla</i>	-	-	VU	VU	L	VU	4
# Golden Sun Moth	<i>Synemon plana</i>	-	-	CR	EN	L	-	4
# Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	-	-	VU	VU	L	VU	2
# Regent Honeyeater	<i>Anthochaera phrygia</i>	-	-	EN	CR	L	EN	4
# Smoky Mouse	<i>Pseudomys fumeus</i>	-	-	EN	CR	L	RA	4
# Striped Legless Lizard	<i>Delma impar</i>	-	-	VU	EN	L	VU	4
STATE SIGNIFICANCE								
Brush-tailed Phascogale	<i>Phascogale tapoatafa tapoatafa</i>	1991	2	-	VU	L	NT	2
Australasian Shoveler	<i>Anas rhynchotis</i>	2001	5	-	VU	-	-	3
Common Dunnart	<i>Sminthopsis murina murina</i>	1964	1	-	VU	-	-	4
Greater Glider	<i>Petauroides volans</i>	1969	1	-	VU	-	-	3
Common Bent-wing Bat	<i>Miniopterus schreibersii</i> GROUP	1962	1	-	-	L	CD	2
Musk Duck	<i>Biziura lobata</i>	2000	22	-	VU	-	-	3
Hardhead	<i>Aythya australis</i>	2000	9	-	VU	-	-	2
Blue-billed Duck	<i>Oxyura australis</i>	1992	5	-	EN	L	-	3

Common name	Scientific name	Last documented record	Total # of documented records	EPBC	DSE	FFG	NAP	Likely use of study area
White-throated Needletail	<i>Hirundapus caudacutus</i>	1977	2	-	VU	-	-	4
Eastern Great Egret	<i>Ardea modesta</i>	2001	4	-	VU	L	-	2
Grey Goshawk	<i>Accipiter novaehollandiae</i>	1992	3	-	VU	L	-	2
Black Falcon	<i>Falco subniger</i>	2000	1	-	VU	-	-	2
Lewin's Rail	<i>Lewinia pectoralis pectoralis</i>	1896	1	-	VU	L	NT	3
Marsh Sandpiper	<i>Tringa stagnatilis</i>	1986	1	-	VU	-	-	4
Elegant Parrot	<i>Neophema elegans</i>	1886	1	-	VU	-	-	4
Powerful Owl	<i>Ninox strenua</i>	1995	1	-	VU	L	-	2
Barking Owl	<i>Ninox connivens connivens</i>	1989	1	-	EN	L	NT	2
Brown Treecreeper (south-eastern ssp.)	<i>Climacteris picumnus victoriae</i>	2000	3	-	NT	-	NT	2
Hooded Robin	<i>Melanodryas cucullata cucullata</i>	1975	1	-	NT	L	NT	2
Tussock Skink	<i>Pseudemoia pagenstecheri</i>	2007	6	-	VU	-	-	2
Brown Toadlet	<i>Pseudophryne bibronii</i>	2003	1	-	EN	L	DD	3

Data source: Victorian Biodiversity Atlas (DEPI 2014); Victorian Fauna Database (Viridans 2013b); Protected Matters Search Tool (DoE 2015).

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).

PRIORITY C SETTLEMENTS

Gordon

Ballan

19 GORDON

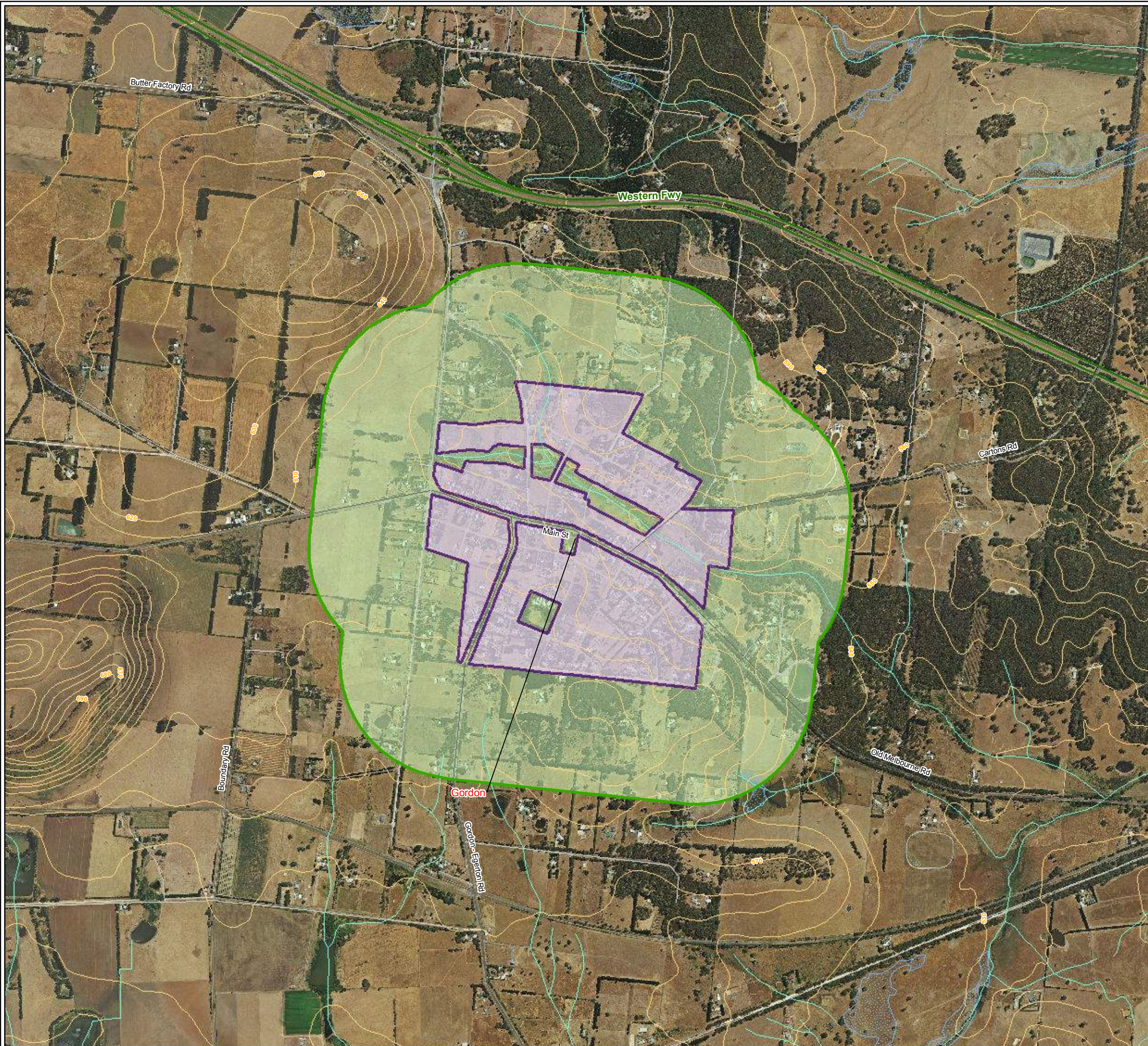
19.1 Introduction

Gordon is a small town approximately 20 kilometres east of Ballarat, containing approximately 169 dwellings, and is located along the Old Melbourne Road, adjacent to the Western Freeway (Figure 1a).

19.2 Bushfire Risk

Based upon aerial photography and extant EVC mapping, the study area contains moderate sized fragmented forest vegetation patches, particularly to the east of the township. Gordon is located on hills and slope of 5-10° (Figure 2). Access and escape routes are available to the north, south east and west. There is moderate cover of forest vegetation close to the road to the north and east and low cover to the south and west. Gordon is within close proximity to a major freeway, Western Freeway.

Based on the Bushfire Risk Matrix in Table 2 and 3, the bushfire risk for Gordon is likely to be moderate.

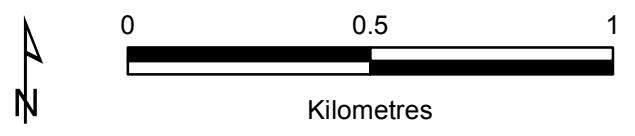


Legend

- Priority C Settlement
 - Township Zone
 - Contour (10m)
- Roads**
- Freeway
 - Collector Road
 - Minor Road
- Water**
- Minor Watercourse
 - Land Subject to Inundation

Figure 2 -Gordon

Physical features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

20 BALLAN

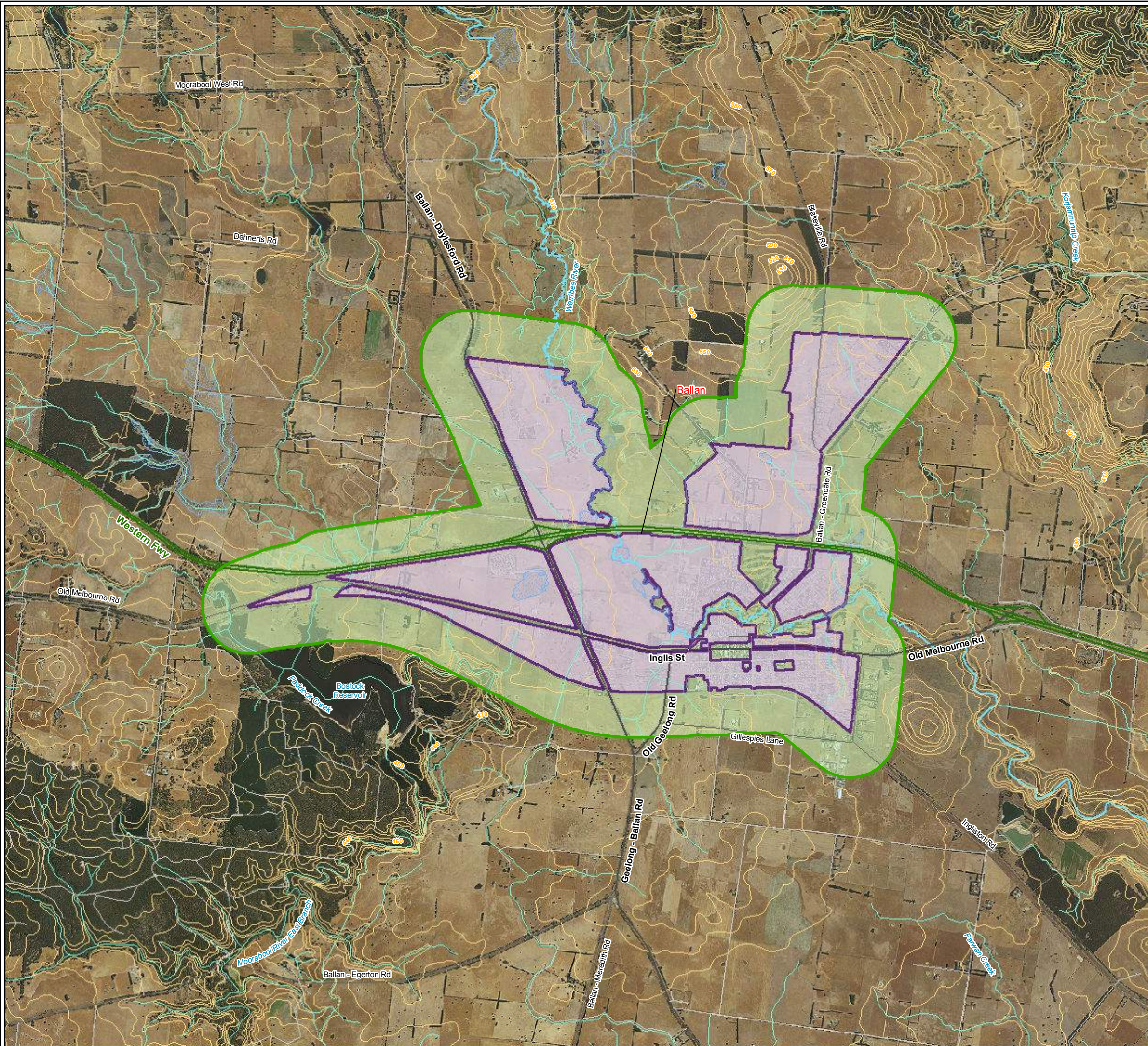
20.1 Introduction

Ballan is a small town approximately 34 kilometres east of Ballarat, containing approximately 897 dwellings, and is located along Old Melbourne Road, adjacent to the Western Freeway (Figure 1a).

20.2 Bushfire Risk

Based upon aerial photography and extant EVC mapping, the study area contains small fragmented patches of woodland vegetation (Figure 2). Ballan is located on hills and slope of 0-5°. Access and escape routes are available to the north, south east and west, along well maintained roads with limited woodland vegetation close to the road. Ballan is within close proximity to a major freeway, Western Freeway.

Based on the Bushfire Risk Matrix in Table 2 and 3, the bushfire risk for Ballan is likely to be moderate.



Legend

- Priority C Settlement
 - Township Zone
 - Contour (10m)
- Roads**
- Freeway
 - Major Road
 - Collector Road
 - Minor Road
- Water**
- Minor Watercourse
 - Major Watercourse
 - Land Subject to Inundation

Figure 2 -Ballan
Physical features within and surrounding the settlement
Environmental Assessment Project
Moorabool Shire Council



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Aerial photo (2013) and contours supplied by Moorabool Shire Council.

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APPENDIX 1 - FFG ACT PROTECTED SPECIES

Protected flora and fauna under the Flora and Fauna Guarantee Act 1988 (FFG Act) are defined as those that have legal protection under the Act. Protected taxa includes plants and animals from three sources:

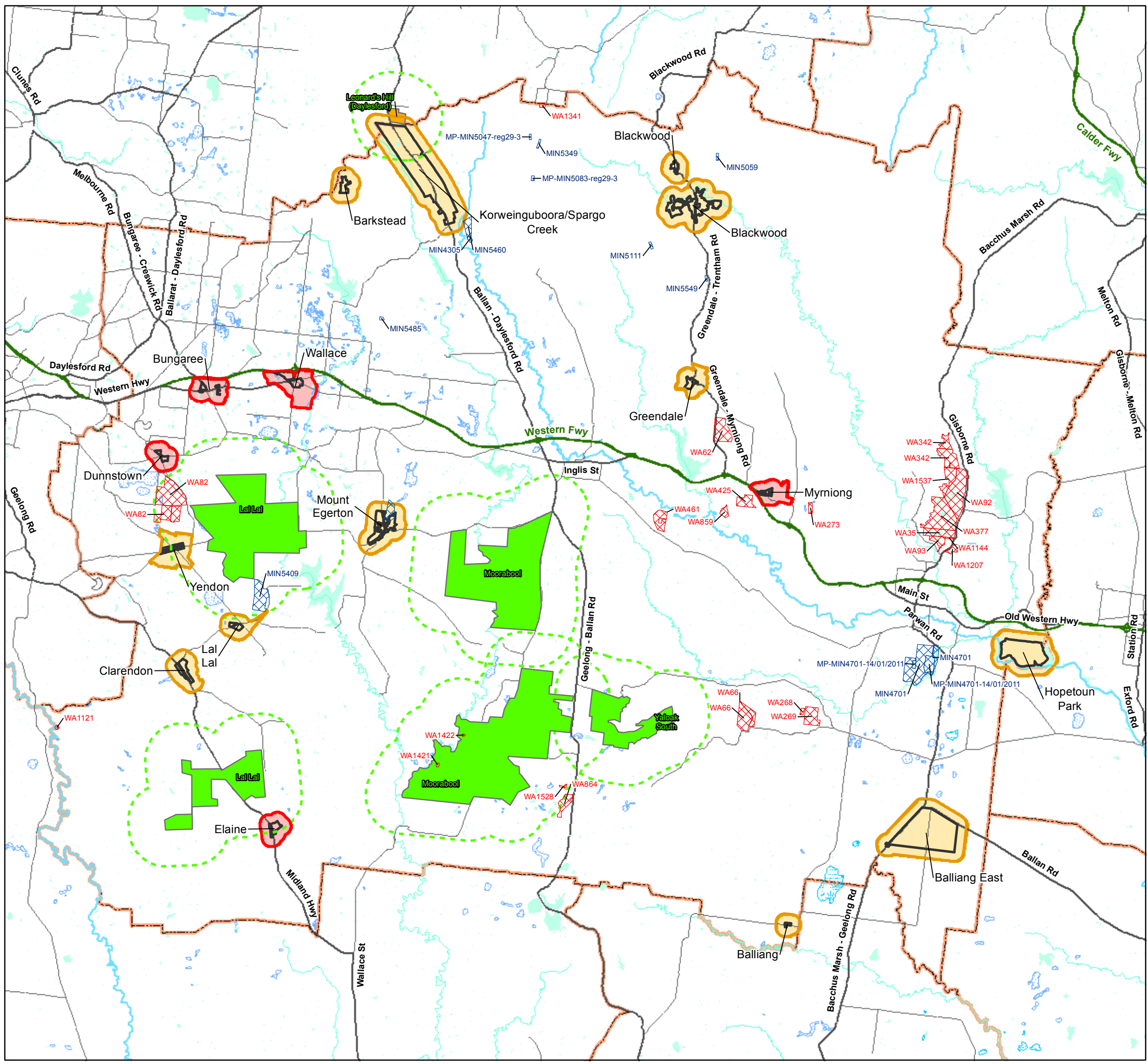
- plant or animal taxa (species, subspecies or varieties) listed as threatened under the FFG Act;
- plant taxa belonging to communities listed as threatened under the FFG Act; and,
- plant taxa which are not threatened but require protection for other reasons.

Table A1 provides a list of plant groups (Families, Genera and Kingdom Divisions) which are not threatened but are protected under the FFG Act.

Table A1. Plant groups (Families, Genera and Kingdom Divisions) protected under the FFG Act.

Taxa	Common Name	Exclusions
Pteridophyta	Clubmosses, ferns and fern allies	<i>Pteridium esculentum</i> Austral Bracken
Asteraceae	Daisies	nil
Ericaceae (formerly Epacridaceae)	Heaths	nil
Orchidaceae	Orchids	nil
<i>Acacia</i>	Wattles	<i>Acacia dealbata</i> , <i>Acacia decurrens</i> , <i>Acacia implexa</i> , <i>Acacia melanoxylon</i> and <i>Acacia paradoxa</i>
<i>Baeckea</i>	Baeckneas	nil
<i>Boronia</i>	Boronias	nil
<i>Calytrix</i>	Fringe-myrtles	nil
<i>Correa</i> -	Correas	nil
<i>Darwinia</i>	Darwinias	nil
<i>Eremophila</i>	Emu-bushes	nil
<i>Eriostemon</i>	Wax-flowers	nil
<i>Gompholobium</i>	Wedge-peas	nil
<i>Grevillea</i>	Grevilleas	nil
<i>Prostanthera</i>	Mint-bushes	nil
<i>Sphagnum</i>	Sphagnum mosses	nil
<i>Stylidium</i>	Trigger-plants	nil
<i>Thryptomene</i>	Thryptomenes	nil
<i>Thysanotus</i>	Fringe-lilies	nil
<i>Xanthorrhoea</i>	Grass-trees	nil

ADDITIONAL FIGURES



Legend

 Current Mining Licenses and Leases

 Current Extractive Industry Tenements

Wind Farm

 Approved

 Operating

 Wind Farm buffer (2km)

Settlements

 Priority A

 Priority B

Figure 6
Mining and Energy Licenses and Approvals
Environmental Assessment Project
Moorabool Shire Council

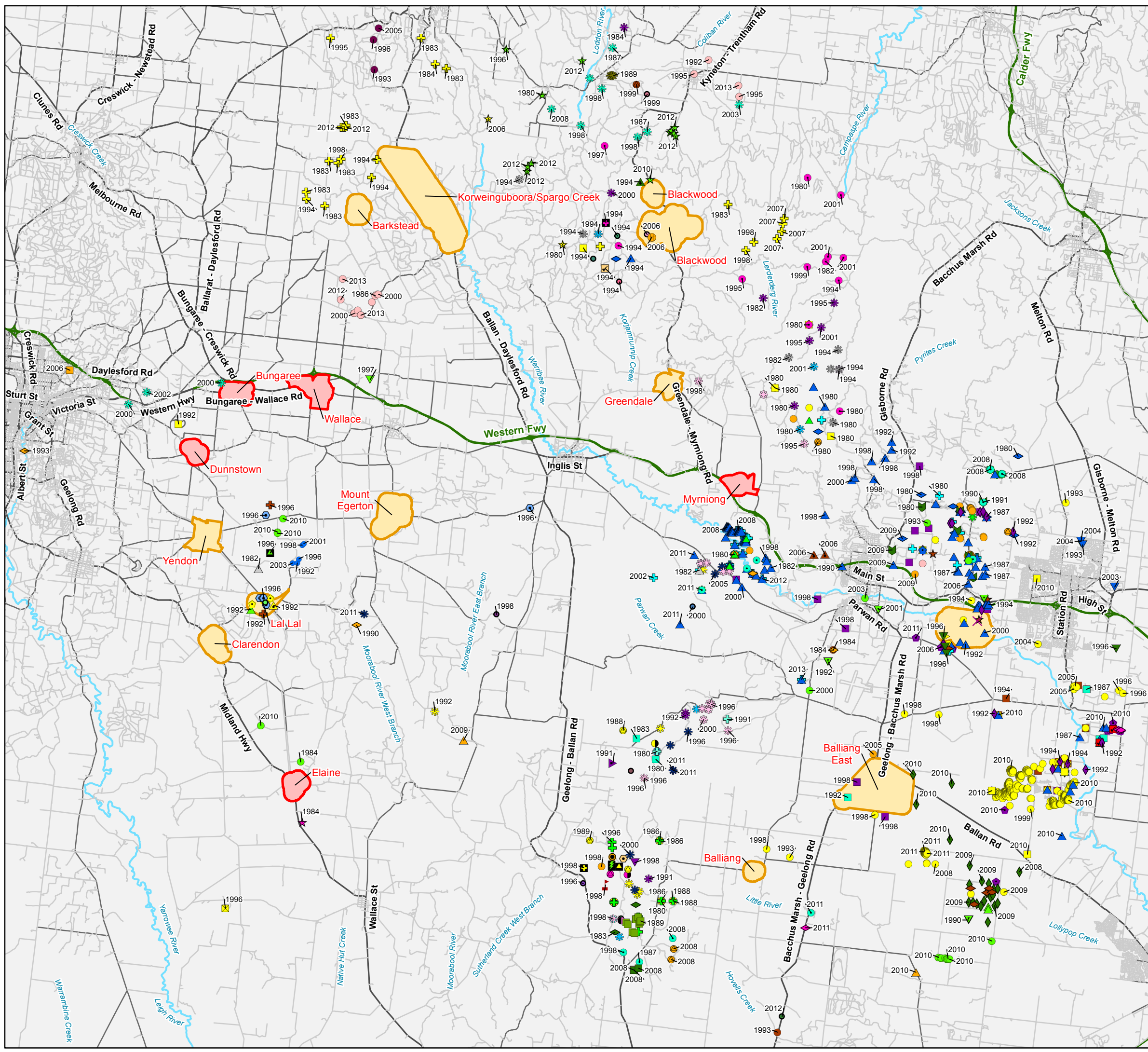


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Kilometres



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Legend

Adamson's Blown-grass

Arching Flax-lily

Austral Tobacco

Australian Anchor Plant

Bacchus Marsh Wattle

Basalt Peppercross

Basalt Tussock-grass

Beech Nyctalis

Black Roly-poly

Black-tip Greenhood

Branching Groundsel

Brisbane Range Grevillea

Brisbane Range Scentbark

Brittle Greenhood

Brooker's Gum

Buloke

Buloke Mistletoe

Button Wrinklewort

Canary Dermocybe

Cane Spear-grass

Clover Glycine

Clustered Poranthera

Common Extinguisher-moss

Creeping Grevillea

Crimson Sun-orchid

Curved Rice-flower

Dark Wire-grass

Dense Mint-bush

Dwarf Silver Wattle

Emerald-lip Greenhood

Fertile Finger-orchid

Forest Bitter-cress

Forked Rice-flower

Fragrant Saltbush

Fringed Midge-orchid

Fryerstown Grevillea

Glistening Sun-orchid

Golden Bush-pea

Golden Grevillea

Green-comb Spider-orchid

Hairy Beard-heath

Hairy Tails

Half-bearded Spear-grass

Heath Spear-grass

Hoary Bush-pea

Leafless Bluebush

Maroon Leek-orchid

Matted Flax-lily

Mauve-tuft Sun-orchid

Melbourne Yellow-gum

Mentone Greenhood

Naked Beard-orchid

Naked Sun-orchid

Narrow Goodenia

Native Peppercross

Netted Daisy-bush

One-flower Early Nancy

Orange Dermocybe

Ornate Pink-fingers

Oval Woodrush

Pale Spike-sedge

Pale Swamp Everlasting

Pale-flower Crane's-bill

Perennial Blown-grass

Plains Joyweed

Red-sheath Tussock-grass

River Swamp Wallaby-grass

Rough Wattle

Rough Wax-flower

Rusty Velvet-bush

Rye Beetle-grass

Salt Blown-grass

Satin Daisy-bush

Satinwood

Scented Bush-pea

Screw Moss

Sharp Greenhood

Shiny Leionema

Skeleton Vine

Slender Bindweed

Slender Pink-fingers

Slender Ruddyhood

Slender Saw-sedge

Slender Tick-trefoil

Small Golden Moths

Small Scurf-pea

Small Sickie Greenhood

Small-flower Mat-rush

Smooth Nardoo

Snowy Mint-bush

Southern Blue-gum

Southern Plume-orchid

Spiny Rice-flower

Spotted Hyacinth-orchid

Swamp Bush-pea

Swamp Everlasting

Swamp Fireweed

Swamp Plantain

Tall Club-sedge

Tangled Pseudanthus

Tough Scurf-pea

Trailing Hop-bush

Upright Panic

Velvet Daisy-bush

Priority A

Priority B

Figure 7
Previously documented significant flora within 10km of each settlement
Environmental Assessment Project
Moorabool Shire Council

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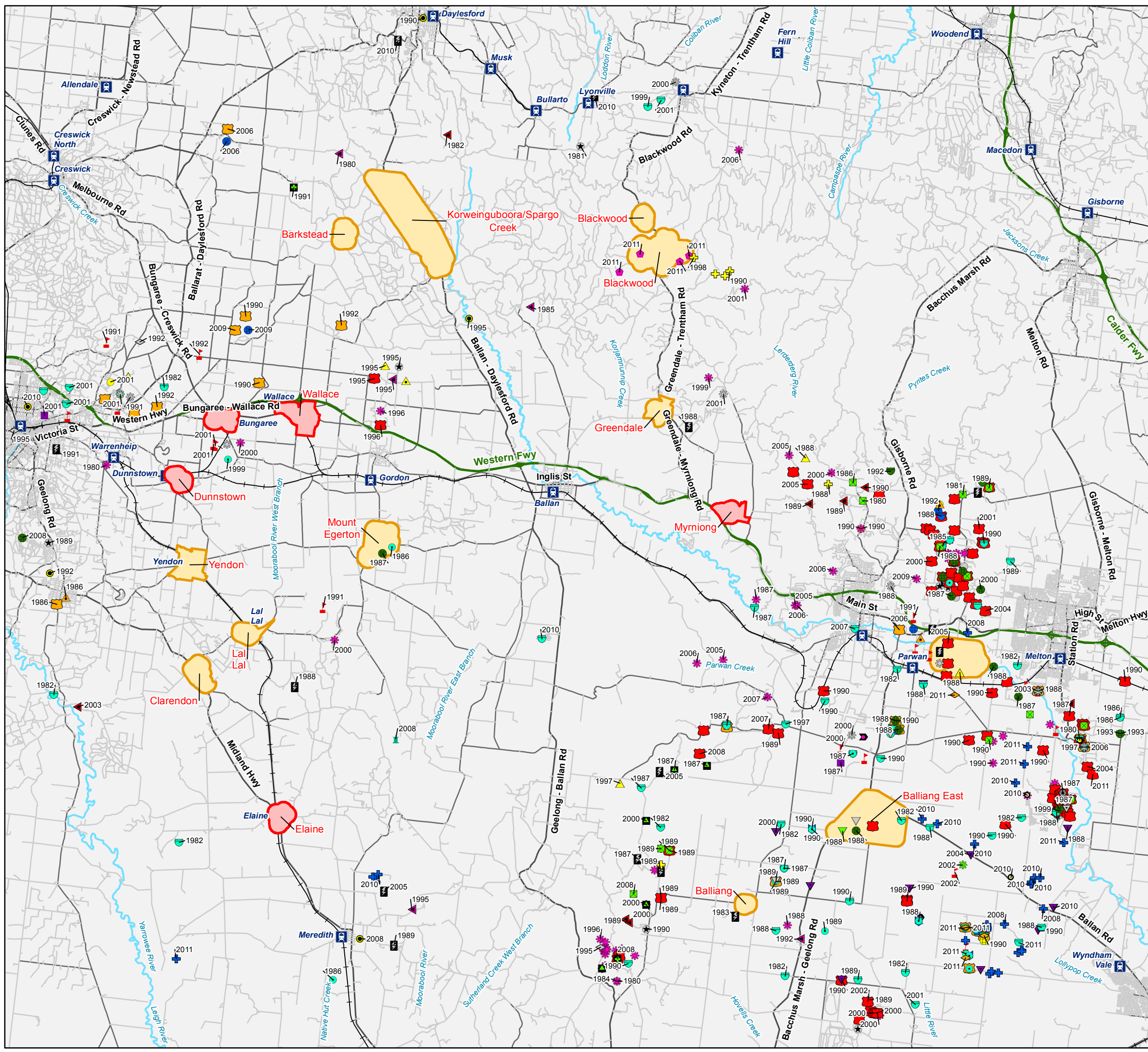
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Kilometres

VBA 2014. Victorian Biodiversity Atlas. Sourced from: 'VBA_FLORA25' and 'VBA_FLORA100', March 2014 © The State of Victoria, Department of Environment and Primary Industries. Records prior to 1949 not shown.
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5941_Fig7_Sig_flora 16/02/2015 rgles



Legend

Australasian Bittern

Australian Painted Snipe

Azure Kingfisher

Baillon's Crake

Barking Owl

Black-eared Cuckoo

Blue-billed Duck

Brolga

Brown Toadlet

Brown Treecreeper (south-eastern ssp.)

Brush-tailed Phascogale

Caspian Tern

Chestnut-rumped Heathwren

Common Bent-wing Bat

Common Bent-wing Bat (eastern ssp.)

Crested Bellbird

Diamond Firetail

Eastern Great Egret

Eastern Pygmy-possum

Emu

Fat-tailed Dunnart

Freckled Duck

Glossy Ibis

Golden Sun Moth

Grey Goshawk

Grey-crowned Babbler

Grey-headed Flying-fox

Growing Grass Frog

Gull-billed Tern

Hooded Robin

Intermediate Egret

King Quail

Latham's Snipe

Lewin's Rail

Little Bittern

Little Button-quail

Little Egret

Magpie Goose

Major Mitchell's Cockatoo

Masked Owl

Nankeen Night Heron

Painted Honeyeater

Pied Cormorant

Priority

Priority B

Common Bent-wing Bat

Common Bent-wing Bat (eastern ssp.)

Crested Bellbird

Diamond Firetail

Eastern Great Egret

Eastern Pygmy-possum

Emu

Fat-tailed Dunnart

Freckled Duck

Glossy Ibis

Golden Sun Moth

Grey Goshawk

Grey-crowned Babbler

Grey-headed Flying-fox

Growing Grass Frog

Gull-billed Tern

Hooded Robin

Intermediate Egret

King Quail

Latham's Snipe

Lewin's Rail

Little Bittern

Little Button-quail

Little Egret

Magpie Goose

Major Mitchell's Cockatoo

Masked Owl

Nankeen Night Heron

Painted Honeyeater

Pied Cormorant

Priority

Priority B

Figure 8
Previously documented significant fauna within 10km of each settlement
Environmental Assessment Project
Moorabool Shire Council

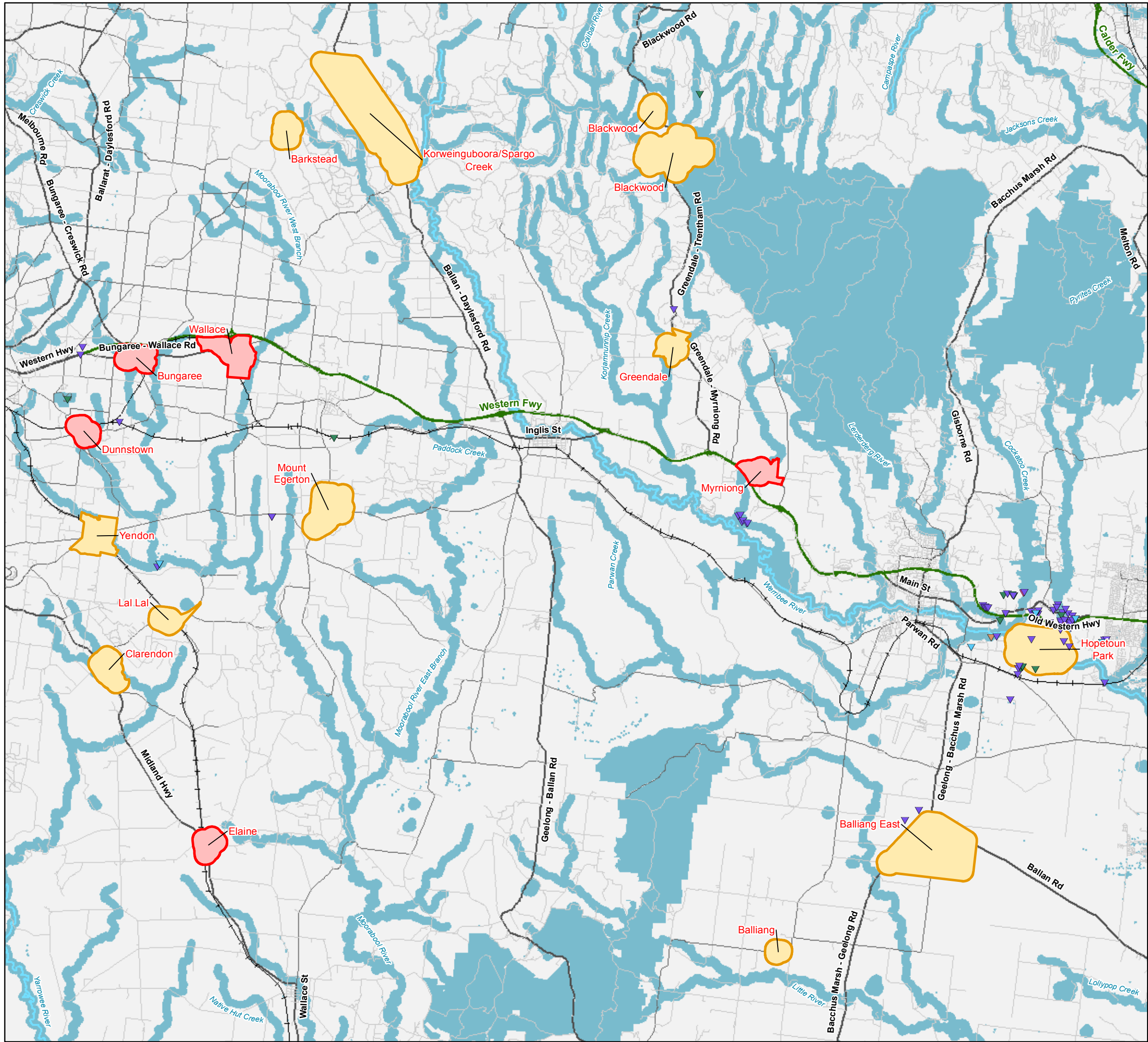
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Kilometres

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Legend

Cultural Heritage records

- Aboriginal Human Remains (Burial)
- Artefact Scatter
- Earth Feature
- Object Collection
- Quarry
- Scarred Tree

Areas of Cultural Heritage Sensitivity

- Priority A
- Priority B

Figure 9
Cultural heritage records within 2km of each settlement
Environmental Assessment Project
Moorabool Shire Council



VBA 2014. Victorian Biodiversity Atlas.
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