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Final Report

Biodiversity Assessment of the Roadside and Intersection Upgrades, Stockyard Hill Wind Farm, Victoria

Prepared for

Stockyard Hill Wind Farm Pty Ltd

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Ecology and Heritage Partners Pty Ltd

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

SUMMARY

Introduction

Ecology and Heritage Partners Pty Ltd was commissioned by Stockyard Hill Wind Farm Pty Ltd (SHWFPL) to conduct a Biodiversity Assessment of the Roadside and Intersection Upgrades associated with the proposed Stockyard Hill Wind Farm, Victoria. This assessment was undertaken to identify and characterise remnant native vegetation on-site, determine the presence (or likelihood thereof) of any significant flora and fauna species and/or ecological communities, and address any implications under Commonwealth and State environmental legislation.

Methods

A field assessment was undertaken between 1 and 2 March 2016 to obtain information on terrestrial flora and fauna values within the study area. A habitat hectare assessment was undertaken in conjunction with the flora survey. Vegetation within the study area was assessed according to the habitat hectare methodology, which is described in the Vegetation Quality Assessment Manual.

This was combined with results from previous ecological assessments that were undertaken within the study area and the immediate surrounds in 2012 and 2014 to determine the overall impact of the proposed road widening and intersection upgrades.

Results

Flora

Previous ecological assessments recorded a total of 233 plant taxa (154 indigenous, 79 introduced) within the broader study area (i.e. including the proposed WEF and associated roads) (Ecology and Heritage Partners 2014a). While the majority of the study area is highly modified and no significant flora were detected during the current assessment, three occurrences of the EPBC Act-listed White Sunray *Leucochrysum albicans* var. *tricolor* and one occurrence of the FFG Act-listed Plump Swamp Wallaby Grass *Amphibromus pithogastrus* have previously been detected within the study area. White Sunray and Matted Flax-lily have also been recording in proximity of the study area.

Fauna

A total of 75 fauna species comprising 64 birds (59 native, five introduced), five mammals (two native, three introduced), one native lizard and five native frogs were recorded during the combined assessments within the broader study area (i.e. including all previously assessed alignments Ecology and Heritage Partners 2014b).

One EPBC Act-listed fauna species (Striped Legless Lizard *Delma impar*) has previously been recorded along the Stockyard Hill Roadside reserve (Ecology and Heritage Partners 2014a) (Figure 2r). No other national or state significant fauna species have previously been recorded within the study area.

The study area currently supports five broad fauna habitat types: Red-gum woodland; planted windrows and woodlots, native grassland, exotic grassland, and patches of native shrubs. Fauna habitat quality ranges from low to high across the entire study area.

Communities

Three patches (0.02 hectares) of Plains Grassland that exist along Dunnets Road meet the condition thresholds for the EPBC Act-listed Natural Temperate Grassland of the Victorian Volcanic Plain

(NTGVVP) ecological community. The state significant (FFG Act-listed community) 'Western (Basalt) Plain Grasslands Community' (WBPGC) is also present within the study area. Seventeen patches of WBPGC occur within the study area and these areas correlate to Plains Grassland.

Legislative and Policy Implications

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act - Federal)

The proposed road widening and intersection works will result in the removal of 0.02 hectares of the NTGVVP ecological community and this does not meet the significant impact thresholds outlined in the significant impact guidelines for this ecological community. In addition, the proposed road widening and intersection works will be located along the eastern boundary of Stockyard Hill Road road reserve, and will avoid the known population of White Sunray within the western roadside reserve of Stockyard Hill Road. As such, this species is not proposed to be impacted and therefore there are no implications under the EPBC Act relating to this species.

However, the proposed widening of Stockyard Hill Road and Dunnets Road is likely to impact suitable habitat (albeit modified grassland) for Striped Legless Lizard, and as such, an EPBC Act referral should be prepared and submitted to DoE for a determination as to whether the proposed action will lead to a significant impact to the species.

Flora and Fauna Guarantee Act 1988 (FFG Act - Victoria)

There are no FFG Act-listed species within the study area.

Environment Effects Act 1978 (Victoria)

The proposed road widening and intersection works are likely to result in the removal of small isolated patches of remnant native vegetation (including up to 0.02 hectares of NTGVVP) and 18 scattered trees. Based on the extent of the proposed impacts it is accurate to conclude that from a biodiversity perspective an EES referral and assessment of the works under the EE Act is not warranted.

Planning and Environment Act 1987

Planning approval is required to remove, destroy or lop any native vegetation. In this instance, the application will be referred to the Department of Environment, Land, Water and Planning (DELWP) as greater than 0.5 hectares of vegetation are proposed for removal.

Permitted Clearing Assessment (the Guidelines)

The study area is within Location C, with 3.852 hectares of native vegetation proposed to be removed. As such, the permit application falls under the High Risk-based pathway.

The offset requirement for native vegetation removal is 0.261 General Biodiversity Equivalence Units (BEU), along with Specific units for Button Wrinklewort (0.202 specific BEUs).

Other Legislation and Policy

Implications relating to other local and State policy (*Wildlife Act 1975*, *Catchment and Land Protection Act 1994*, local government authorities) as well as additional studies or reporting that may be required (targeted surveys, Conservation Management Plan, Weed Management Plan, Construction Environment Managements Plan) are provided in Section 4.

Table S1. Application requirements for a permit to remove native vegetation (*Victoria Planning Provisions* Clause 52.17 -3; DEPI 2013)

No.	Application Requirement	Response
Application requirements for all applications:		
1	The location of the site of native vegetation to be removed.	Stockyard Hill Wind Farm, Victoria. Pyrenees Shire Council, Glenelg Hopkins CMA.
2	A description of the native vegetation to be removed, including the area of the patch of native vegetation and/or the number of any scattered trees to be removed.	Total extent to be removed is 3.852 hectares (2.587 hectares remnant patch, and 18 scattered trees). Details provided in Section 2.3.
3	Maps or plans containing information set out in the Guidelines, (Department of Environment and Primary Industries, September 2013)	Refer to Figures and BIOR report (Appendix 4).
4	Recent dated photographs of the native vegetation to be removed.	Refer to Plates 1-3.
-	Topographic information, highlighting ridges, crests and hilltops, streams and waterways, slopes of more than 20 percent, drainage lines, low lying areas, saline discharge areas, and areas of existing erosion.	Refer to Section 1.2.1
5	The risk-based pathway of the application to remove native vegetation.	High
6	Where the purpose of removal, destruction or lopping of native vegetation is to create defendable space, a statement is required that explains why removal, destruction or lopping of native vegetation is necessary.	Not applicable.
7	A copy of any property vegetation plan that applies to the site.	Not applicable.
8	Details of any other native vegetation that was permitted to be removed on the same property with the same ownership as the native vegetation to be removed, where the removal occurred in the five year period before the application to remove native vegetation is lodged.	Not applicable.
9	The strategic biodiversity score of the native vegetation to be removed.	0.244
10	The offset requirements should a permit be granted to remove native vegetation.	General: 0.261 BEUs Specific: 0.202 for Button Wrinklewort
Additional application requirements for Moderate and High risk-based pathway applications:		
11	A habitat hectare assessment of the native vegetation to be removed.	Refer to Section 2.3 and BIOR report (Appendix 4).
12	A statement outlining what steps have been taken to minimise the impacts of the removal of native vegetation on biodiversity.	A minimisation statement is supplied at Section 6.1.
13	An assessment of whether the proposed removal of native vegetation will have a significant impact on Victoria's biodiversity, with specific regard to the proportional impact on habitat for any rare or threatened species.	The proposed removal of native vegetation is unlikely to have a significant impact on Victoria's biodiversity (Section 0).
14	An offset strategy that details how a compliant offset will be secured to offset the biodiversity impacts of the removal of native vegetation.	It is anticipated that relevant offset obligations can be secured via an OTC facility (Section 6.2).

CONTENTS

1 INTRODUCTION

1.1 Background

Stockyard Hill Wind Farm Pty Ltd (SHWFPL) (a subsidiary of Origin Energy) is developing a wind farm project in south-west Victoria, known as the Stockyard Hill Wind Farm (SHWF). The project has three components - a Wind Energy Facility (WEF), a grid connection (approximately 75 kilometres of overhead powerlines and terminal station) and a quarry.

Planning Permit No. PL-SP/05/0548 (Pyrenees Planning Scheme) (the Permit) was issued by the Minister for Planning on 26 October 2010 to enable the use and development of the SHWF WEF. While the Permit allows for the creation and access to roads (including roads zoned RDZ1), it did not contemplate any removal of native vegetation associated with roadworks, for construction purposes. Condition 35 of the Permit states:

> *"...Note. Once the traffic routes are finalised, it may be necessary to apply for further permission for native vegetation removal to accommodate road works – either by application to amend this permit under section 72 of the Act or by a new permit application".*

As such, planning approval is required for the removal of native vegetation associated with these works. The proposed works will result in the clearing of remnant native vegetation at several locations along the roadsides. Accordingly, the aim of this assessment is to identify the ecological values known to, or likely to occur within the study area, and determine the potential regulatory and legislative implications associated with the proposed action.

1.2 Objectives

The objectives of the assessment were to:

- Review the relevant flora and fauna databases and available literature;
- Conduct a site assessment to identify flora and fauna values within the study area;
- Provide maps showing any areas of remnant native vegetation and locations of any significant flora and fauna species, and/or fauna habitat (if present);
- Classify any flora and fauna species and vegetation communities identified or considered likely to occur within the study area in accordance with Commonwealth and State legislation;
- Document relevant environmental legislation and policy;
- Document any opportunities and constraints associated with the proposed works; and,
- Advise whether any additional flora and/or fauna surveys are required prior to works commencing (e.g. targeted surveys for significant flora and fauna species).

Where areas of remnant vegetation were present, the following tasks were completed to address requirements under the 'Permitted clearing of native vegetation - Biodiversity assessment guidelines' (the Guidelines) (DEPI 2013):

- A habitat hectare assessment of any areas of remnant native vegetation within the study area;

- Recommendations to address requirements under the Guidelines to minimise impacts to remnant vegetation; and,
- Provision of offset targets for any native vegetation, scattered trees and habitat for rare or threatened species proposed to be lost as a result of the proposed works.

1.3 Study Area

The proposed upgrade of intersections and road widening (the 'study area') extends between the intersection of Eurambeen-Streatham Road/Eurambeen-Settlement Road in the north to the intersection of Mount Emu Settlement Road/Skipton Road in the south (Figure 1). The following road sections are within the study area:

- Eurambeen-Settlement Road in Buangor;
- Eurambeen-Streatham Road in Cross Roads and Stockyard Hill;
- Toppers Road in Stockyard Hill and Beaufort;
- Beaufort Carranballac Road in Beaufort;
- Thompson's Road in Beaufort and Lake Goldsmith;
- Stockyard Hill Road in Stockyard Hill;
- Skipton Road in Beaufort, Lake Goldsmith and Skipton;
- Dooleys Road in Lake Goldsmith;
- Dunnets Road in Stockyard Hill; and,
- Mount Emu Settlement Road in Mt Emu and Skipton.

The study area is generally flat. Numerous waterways, primarily minor creeks and drainage lines, intersect with the study area. Major waterbodies in close proximity to the study area include Lake Goldsmith, Black Lake and Slater Lake (Figure 1).

According to the DELWP Native Vegetation Information Management Tool (DELWP 2016a), the study area occurs within the Victorian Volcanic Plain and Central Victorian Uplands bioregions. It is located within the jurisdiction of the Glenelg Hopkins Catchment Management Authority (CMA) and the Pyrenees Shire Council municipality.

2 METHODS

2.1 Desktop Assessment

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

- The Victorian Department of Environment, Land, Water and Planning (DELWP) Native Vegetation Information Management (NVIM) Tool (DELWP 2016a) for:
    - Modelled data for location risk, remnant vegetation patches, scattered trees and habitat for rare or threatened species; and,
    - The extent of historic and current EVCs.
- The VBA (DELWP 2016b), Flora Information System (FIS) (Viridans 2013a) and Atlas of Victorian Wildlife (AVW) (Viridans 2013b) for previously documented flora and fauna records within the project locality;
- The Federal Department of the 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 2016);
- The online resource Planning Maps Online to ascertain current zoning and environmental overlays (DELWP 2016c);
- Aerial photography of the study area;
- Relevant environmental legislation and policies; and,
- Previous ecological assessments within the study area (BLA 2009, Ecology and Heritage Partners 2011a, 2011b, 2012, 2013, 2014a, 2014b, 2014c).

2.2 Site Assessment

A site assessment was undertaken between 1 and 2 March 2016 to obtain information on flora and fauna values within the study area. All observed flora and fauna species within the study area were recorded, any significant records mapped and the overall condition of vegetation and habitats noted. Ecological Vegetation Classes (EVCs) were determined with reference to DELWP pre-1750 and extant EVC mapping and their published descriptions (DELWP 2016d).

Where remnant vegetation was identified a habitat hectare assessment was undertaken following methodology described in the Vegetation Quality Assessment Manual (DSE 2004).

Some areas within the study area had been previously assessed by Ecology and Heritage Partners, including habitat hectare assessments and targeted surveys for significant flora and fauna (Ecology and Heritage Partners 2011a, 2011b, 2012,, 2013, 2014a, 2014b, 2014c). The boundary and habitat hectare score of all remnant vegetation previously mapped were confirmed during the current site assessment and updates made accordingly.

2.2.1 Significant communities

During the site assessment all areas supporting Plains Grassland were assessed to determine whether they met the size and condition thresholds to constitute the EPBC Act-listed Natural Temperate Grassland of the Victoria Volcanic Plain (NTGVVP), and areas supporting Plains Grassy Woodland were assessed to determine whether they met the size and condition thresholds to constitute the EPBC Act-listed community Grassy Eucalypt Woodland of the Victorian Volcanic Plain (GEWVVP).

2.2.2 Significant flora and fauna

Targeted surveys for threatened flora and fauna species have been previously undertaken within all areas of potential habitat located within public and private land in the footprint of the original WEF, including all alignment option, road reserves and intersections (Ecology and Heritage Partners 2014a, 2014b, 2014c). Flora species surveyed include the nationally significant Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*, Ben Major Grevillea *Grevillea floripendula*, Clover Glycine *Glycine latrobeana*, Adamson's Blown Grass *Lachnagrostis adamsonii*, Button Wrinklewort *Rutidosis leptorhynchoides*, Swamp Everlasting *Xerochrysum palustre*, White Sunray *Leucochrysum albicans* var. *tricolor* and Salt-Lake Tussock-Grass *Poa sallacustris*, and State significant Hairy Tails *Ptilotus erubescens*, Small Milkwort *Comesperma polygaloides*, and Australian Anchor Plant *Discaria pubescens* (Ecology and Heritage Partners 2014a). Fauna species surveyed include the nationally significant Striped Legless Lizard *Delma impar* and Golden Sun Moth *Synemon plana* (Ecology and Heritage Partners 2014b, 2014c).

During the most recent site assessment, any additional areas that could provide potential habitat for significant species were noted.

2.3 Permitted Clearing Assessment (the Guidelines)

Under the *Planning and Environment Act 1987,* Clause 52.17 of the Planning Schemes requires a planning permit from the relevant local Council to remove, destroy or lop native vegetation. The assessment process for the clearing of vegetation follows the 'Permitted clearing of native vegetation - Biodiversity assessment guidelines' (the Guidelines) (DEPI 2013).

2.3.1 Risk-based Pathway

The Guidelines manage the impacts on biodiversity from native vegetation removal using a risk-based approach. Two factors – extent risk and location risk – are used to determine the risk associated with an application for a permit to remove native vegetation. The location risk (A, B or C) has been determined for all areas in Victoria and is available on DELWP's Native Vegetation Information Management (NVIM) Tool (DELWP 2016a). Determination of risk-based pathway is summarised in Table 1.

Table 1. Risk-based pathways for applications to remove native vegetation (DEPI 2013)

Extent		Location		
		A	B	C
Native Vegetation	< 0.5 hectares	Low	Low	High
	≥ 0.5 hectares and < 1 hectare	Low	Moderate	High
	≥ 1 hectare	Moderate	High	High
Scattered Trees	< 15 scattered trees	Low	Moderate	High
	≥ 15 scattered trees	Moderate	High	High

Notes: For the purpose of determining the risk-based pathway of an application to remove native vegetation the extent includes any other native vegetation that was permitted to be removed on the same contiguous parcel of land with the same ownership as the native vegetation to be removed, where the removal occurred in the five year period before an application to remove native vegetation is lodged.

2.3.2 Vegetation Assessment

Native vegetation (as defined in Table 2) is assessed using two key parameters: extent (in hectares) and condition. Extent is determined through a site assessment. The condition score for Moderate and High Risk-based pathways must be assessed through a habitat hectare[1] assessment conducted by a qualified ecologist. The condition score for Low Risk-based pathways may be based on either modelled data available on the NVIM Tool (DELWP 2016a), or through a habitat hectare assessment.

Table 2. Determination of remnant native vegetation (DEPI 2013)

Category	Definition	Extent	Condition
Remnant patch of native vegetation	An area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native. OR An area with three or more native canopy trees where the canopy foliage cover is at least 20 per cent of the area.	Measured in hectares. Based on hectare area of the remnant patch.	Vegetation Quality Assessment Manual (DSE 2004).
Scattered tree	A native canopy tree that does not form part of a remnant patch.	Measured in hectares. Each scattered tree is assigned an extent of 0.071 hectares (30m diameter).	Scattered trees are assigned a default condition score of 0.2.

Notes: Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses'.

2.3.3 Impact Minimisation

Applications under the Moderate and High risk-based pathways must include a statement outlining steps taken to minimise the impact of the removal of native vegetation on Victoria's biodiversity, along with an assessment of whether the proposed removal of native vegetation will have a significant impact on Victoria's biodiversity (DEPI 2013). The impact minimisation statement is provided in Section 6.1.

[1] A 'habitat hectare' is a unit of measurement which combines the condition and extent of native vegetation.

2.3.4 Offsets

Offsets are required to compensate for the permitted removal of native vegetation. Offsets are divided into two categories: General and Specific. When the removal of native vegetation has a significant impact on habitat for a specific rare or threatened species, the offset must compensate for the removal of that particular species' habitat. This is referred to as a specific offset. When the removal of native vegetation does not have a significant impact on the habitat of a particular rare or threatened species, a general offset must be obtained (DEPI 2013). Offset obligations and offset site criteria are determined in accordance with the Guidelines (DEPI 2013) and summarised in Appendix 1.5.1 and Appendix 1.5.2.

The offset requirements for native vegetation removal are calculated by DELWP, based on the vegetation condition scores determined during the biodiversity assessment. The resulting Biodiversity Impact and Offset Requirements report (BIOR) produced by DELWP is presented below (Appendix 4).

2.4 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.

Ecological values identified on site are recorded using a hand-held GPS or tablet with an accuracy of +/- 5 metres. This level of accuracy is considered adequate to provide an accurate assessment of the ecological values present within the study area; however this data should not be used for detailed surveying purposes.

The field assessment was undertaken during a sub-optimal season for the identification of flora and fauna species (late-summer). The 'snap shot' nature of a standard biodiversity assessment, along with sub-optimal timing of the survey, meant that migratory, transitory or uncommon fauna species may have been absent from typically occupied habitats at the time of the site assessment. In addition, annual or cryptic flora species such as those that persist via underground tubers may also be absent. Another limitation was that sections of vegetation along Stockyard Hill Road had been recently slashed.

3 RESULTS

3.1 Vegetation Condition

3.1.1 Remnant Patches

Review of pre-1750 vegetation mapping (DELWP 2016d) indicates that the study area would have originally supported several EVCs. Due to the historical and on-going agricultural land use throughout the study area, extant EVC mapping (DELWP 2016d) shows the study area is largely devoid of remnant native vegetation.

Five EVCs were recorded within the study area: Grassy Woodland (EVC 175), Heavier-Soils Plains Grassland (EVC 132_61), Plains Grassy Woodland (EVC 55_61), Higher Rainfall Plains Grassy Woodland (EVC 55_63) and Heathy Dry Forest (EVC 20) (Figure 2). Only a very small area of Heathy Dry Forest occurs within the study area.

The remainder of the study area comprises introduced and planted vegetation. A brief description of the EVCs, vegetation categories, species composition and vegetation condition is given below.

3.1.2 Grassy Woodland (EVC 175_61)

Grassy Woodland is described as variable open eucalypt woodland to 15 metres tall over a diverse ground layer of grasses and herbs. Typical large trees include Swamp Gum *Eucalyptus ovata*, Manna Gum *Eucalyptus viminalis*, Blackwood *Acacia melanoxylon* and Drooping Sheoak *Allocasuarina verticillata*. The shrub component is usually sparse. It occurs on sites with moderate fertility on plains or undulating hills on a range of geologies (DELWP 2016d).

Grassy Woodland is the dominant EVC within the study area, particularly in the northern section of the study area within the Central Victorian Uplands Bioregion along Toppers Lane, the northern section of Stockyard Hill Road, and Thompsons Road (Figure 2). The quality of remnant Grassy Woodland varies in relation to the presence or absence of Large Old Trees and the composition of the understorey. According to the DELWP pre-1750 vegetation mapping (DELWP 2016d), large areas identified as Grassy Woodland during the site inspections were historically mapped as a mosaic of Heathy Dry Forest/Grassy Woodland. Mosaic and complex mapping units are no longer considered, therefore, even though vegetation is mostly dominated by Red Stringybark *Eucalyptus macrorhyncha*, typical of Heathy Dry Forest, the understorey species composition and structure in terms of height of the tree canopy had closer affinities with that of Grassy Woodland.

Good quality habitat zones (e.g. GW5, GW6) (Appendix 2.3, Figure 2, Plate 1) are dominated by Red Stringybark, Yellow Box *Eucalyptus melliodora* and Scentbark *Eucalyptus aromaphloia* with Black Wattle *Acacia mearnsii* present in the understorey. The shrub layer comprises Golden wattle *Acacia pycnantha*, Hedge Wattle, Wirilda *Acacia provincialis* and Spreading Wattle *Acacia genistifolia* and the understorey is dominated by native wallaby-grasses and herbs.

Other remnants are highly modified Grassy Woodland characterised by either only canopy trees or the ground layer.

3.1.3 Heavier-Soils Plains Grassland (EVC 132_61)

Heavier Soils Plains Grassland (EVC 132_61) is described as treeless vegetation dominated by largely graminoid and herb life forms (DELWP 2016d). This EVC is present in several locations across the study area, with the majority of remnants occurring along Dunnets Road in the south of the study area within the Victorian Volcanic Plains bioregion (Figure 2).

High quality habitat zones (e.g. PG1A) (Appendix 2.3, Plate 2, Figure 2) contain a high cover of indigenous grass species including Kangaroo Grass *Themeda triandra*, spear-grasses *Austrostipa* spp. and wallaby-grasses *Rytidosperma spp*. Other indigenous species present during the time of the assessment include Blue Devil *Eryngium ovinum*, Wattle Mat-rush *Lomandra filiformis* subsp. *coriacea*, and Tufted Bluebell *Wahlenbergia communis* s.l. These higher quality habitat zones generally contain low levels of embedded rock, soil crusts and bryophytes, indicating soil disturbance has been limited since European settlement. However, there are also scattered introduced species present in these areas including Sweet Vernal-grass *Anthoxanthum odoratum*, Lesser Quaking-grass *Briza minor*, Buck's-horn Plantain *Plantago coronopus* subsp. *coronopus* and Squirrel-tall Fescue *Vulpia bromoides*.

More degraded patches contain a lower cover and diversity of native grass species, with few (if any) native forbs present. These lower quality patches also contain a high cover (>70%) of introduced species, particularly exotic pasture species such as Sweet Vernal-grass and Toowoomba Canary-grass *Phalaris aquatica*.

Plains Grassland forms part of the Natural Temperate Grassland of the Victoria Volcanic Plain' (NTGVVP) listed ecological community, which is listed as critically endangered under the EPBC Act. The EPBC Act listing only applies if an area of Plains Grassland meets the required condition thresholds for the ecological community. Plains Grassland also forms part of the state equivalent 'Western (Basalt) Plain Grasslands Community', which is listed under the FFG Act.

Plate 1. Modified Grassy Woodland within the study area (Ecology and Heritage Partners Pty Ltd 01/03/2016)

Plate 2. Modified Plains Grassland within the study area (Ecology and Heritage Partners Pty Ltd: 02/03/2016)

3.1.4 Higher Rainfall Plains Grassy Woodland (EVC 55_63)

Higher Rainfall Plains Grassy Woodland is characterised by an open, eucalypt woodland to 15 metres tall or acacia/sheoak woodland to 10 metres tall (DELWP 2016d).

Several remnant patches of Plains Grassy Woodland occur within the study area, primarily within the southern part of Stockyard Hill Road within the Victorian Volcanic Plains bioregion (Appendix 2.3, Figure 2). Most patches have a highly modified overstorey component, which qualified as remnant patches based on 20% cover of three or more indigenous canopy trees. Indigenous canopy trees within habitat zones are primarily Blackwoods which are classed as canopy trees within the benchmark for this EVC (DELWP 2013d).

Other patches comprise a modified remnant understorey with the overstorey largely cleared (habitat zone PGW_HR1N, Plate 3). The understorey supports a high cover of Kangaroo Grass *Themeda triandra* and wallaby grasses *Rytidosperma* spp. with forb species such as Blushing Bindweed *Convolvulus angustissimus* subsp. *angustissimus* present. It can be unclear whether such areas were historically Plains Grassy Woodland or Plains Grassland, particularly in highly disturbed areas such as along roadsides. Given the existence of surrounding overstorey species such as Blackwood, these patches were classified as woodland.

Plate 3. Modified Grassy Woodland with a high cover of Kangaroo Grass within the study area (Ecology and Heritage Partners Pty Ltd: 02/03/2016)

3.1.5 Plains Grassy Woodland (EVC 55_61)

Plains Grassy Woodland is characterised by open River Red-gum *Eucalyptus camaldulensis* woodland with an understory consisting of a few sparse shrubs, and a grassy and herbaceous ground layer (DELWP 2016d). This EVC is present in several locations within the study area.

The remnant patches are mostly modified, comprising only a sparse layer of native tussocks and River Red-gum recruits in addition to some shrubs, in particular Blackwood *Acacia melanoxylon,* Black Wattle *Acacia mearnsii* and Hedge Wattles *Acacia paradoxa*. Weed cover was generally high in these areas and was primarily dominated by Sweet Vernal-grass.

Plains Grassy Woodland forms part of the Grassy Eucalypt Woodland of the Victoria Volcanic Plain (GEWVVP) ecological community, which is listed as critically endangered under the EPBC Act. The EPBC

Act listing only applies if an area of Plains Grassy Woodland meets the required condition thresholds for the ecological community (Section 3.2.1).

3.1.6 Heathy Dry Forest (EVC 20)

Heathy Dry Forest is described as growing on shallow, rocky skeletal soils on a variety of geologies and on a range of landforms from gently undulating hills to exposed aspects on ridge tops and steep slopes at a range of elevations. The overstorey is a low, open eucalypt forest, poor in form to 20 metres tall with an open crown cover. The understorey is dominated by a low, sparse to dense layer of ericoid-leaved shrubs including heaths and peas. Graminoids are frequently present in the ground layer, but do not provide much cover (DELWP 2016d).

Only one small remnant patch (0.005 hectares) of Heathy Dry Forest was identified within the study area (habitat zone HDF1) (Appendix 2.3, Figure 2).

3.1.7 Scattered Indigenous Trees

Twenty-seven scattered indigenous trees are likely to be impacted by the current proposed road upgrades and intersections (Appendix 2.4). These include one Very Large Old Tree (VLOT), 10 Large Old Trees (LOT), nine Medium Old Trees (MOT) and seven Small Trees (ST) (Figure 2). The species impacted include Blackwood, Yellow Box and Rough-barked Manna Gum.

3.1.8 Predominantly Introduced Vegetation

Areas that did not constitute the remnant patches described above are comprised of predominantly introduced vegetation. These areas are highly modified and dominated by exotic vegetation, particularly with introduced pasture grasses such as Toowoomba Canary-grass, Brown–top Bent *Agrostis capillaris*, Rye Grass *Lolium* sp., Paspalum *Paspalum dilatatum,* Yorkshire Fog *Holcus lanatus*, as well as common agricultural and environmental weeds (e.g. Panic Veldt-grass *Ehrharta erecta*, White Clover *Trifolium repens,* Flatweed *Hypochoeris radicata*, and Ribwort *Plantago lanceolata*).

Noxious species were also recorded throughout the study area including Hawthorn *Crataegus monogyna* and Spear Thistle *Cirsium vulgare*, as well as the Weed of National Significance (WONS) Gorse *Ulex europaeus* (Plate 4).

Planted trees and shrubs were present in the form of wind rows and wood lots and commonly comprised Sugar Gums, Radiata Pine and Monterey Cypress *Cupressus macrocarpa* (Plate 5). Some roadsides were also heavily slashed.

Plate 4. Introduced vegetation (Gorse) within the study area (Ecology and Heritage Partners Pty Ltd: 01/03/2016)

Plate 5. Planted trees within the study area (Ecology and Heritage Partners Pty Ltd: 02/03/2016)

3.2 Significant Vegetation Communities

3.2.1 EPBC Act-listed Communities

One ecological community listed under the EPBC Act was recorded within the study area; NTGVVP. The criteria to determine if remnant grassland meets the condition thresholds for NTGVVP are provided in the EPBC listing advice (SEWPaC 2011a) (Table 3). Habitat zones representative of Plains Grassland located along Dunnets Road meet the condition thresholds to constitute NTGVVP (Table 3, Figure 2w). All remaining Plains Grassland patches within the study area do not qualify as NTGVVP given the insufficient cover (<50%) of perennial native grasses and a high (>30%) non-grassy weed cover. Three patches of NTGVVP were identified and cover a total of 0.02 hectares.

No additional ecological communities listed under the EPBC Act are present within the study area.

3.2.2 FFG Act Listed Communities

One threatened community, the Western (Basalt) Plain Grassland floristic community, occurs within the study area on public land. All habitat zones of Heavier-soils Plains Grassland recorded within the study area, on public land (including those constituting NTGVVP) form part of the FFG Act listed community (Figure 1). No further ecological communities listed under the FFG Act are present within the study area and will not be impacted by the proposed roadside and intersection works.

Table 3. Condition Thresholds for Natural Temperate Grassland of the Victorian Volcanic Plain.

	Criteria	NTGVVP Patches (PG 1 and 2) (Figure 2)
EVC	The grassland is either Plains Grassland (EVC 132) or Creekline Tussock Grassland (EVC 654)	Criteria Met
Bioregion	Grassland is in the Victorian Volcanic Plain or near to the Victorian Volcanic Plain (Central Victorian Uplands, Dundas Tablelands and Otway Plain bioregions)	Criteria Met
Size of Patch	If grassland remnant is ≤1 hectare, grassland patch needs to be at least 0.05 hectare in size with no more than 5% canopy cover of trees or shrubs.	Criteria Met
	If grassland remnant is >1 hectare, grassland patch needs to be at least 0.5 hectare in size with no more than 2 trees per hectare.	Criteria Met
Condition Thresholds	The native grasses Kangaroo-grass, Wallaby-grass, Spear-grass, or Tussock-grass account for 50% or more of the perennial tussock cover of the grassland patch. OR	Criteria Met.
	Native wildflowers account for 50% or more of the total vegetation from September to February. OR	Criteria not met, low to moderate cover of native wildflowers.
	Non-grassy weeds account for less than 30% of the total vegetation cover at any time of the year.	Criteria Met
Additional Characteristics	The conservation value of a patch of the Natural Temperate Grassland of the Victorian Volcanic Plain ecological community is enhanced if it shows any of the following features: • a high native plant species richness; • large patch size; • minimal weed invasion; • presence of threatened plant and/or animal species; • presence of natural exposed rock platforms and outcrops; or • presence of mosses, lichens or a soil crust on the soil surface.	Sites are of high conservation value due to; Presence of threatened taxa High native plant species richness (PG 2, & 5)

3.3 Significant Flora Species

3.3.1 Flora Species

A total of 233 plant taxa (154 indigenous, 79 introduced) have been recorded within the broader study area (Ecology and Heritage Partners 2014a). Planted trees and shrubs were not recorded unless they were seen to be naturally recruiting on site.

3.3.2 National

Targeted surveys identified two species of national significance within the broader WEF study area: Matted Flax-lily and White Sunray (Ecology and Heritage Partners 2014a) (Figure 3). Matted Flax-lily was recorded at two locations along Cheesemans Road reserve and Carngham – Streatham Road reserve, which is outside of the area to be impacted by the proposed road and intersection upgrades. White Sunray was recorded at several locations, primarily in road reserves within good quality Grassy Woodland (habitat zone GW1 and GW5) and Plains Grassland (habitat zone PG4). Three plants were recorded to the immediate west of the current study area (i.e. of the proposed road widening works) (Figure 2f, 2g and 2k).

White Sunray *Leucochrysum albicans* var. *tricolor*

EPBC Act: Endangered

FFG Act: Not-listed as threatened

DEPI 2014 Conservation Status: Endangered

White Sunray was described by Paul G. Wilson in 1992 (RBG 1999).

Species Description

White Sunray is a perennial, cottony, herb that can grow to 50 centimetres high when flowering. The leaves of the White Sunray are generally narrow (to 2 millimetres wide) and 2 – 10 centimetres long, cottony, green in colour and folded under. White Sunray generally flowers between November and December. It has papery flowers that are mostly white, but with brown to purple colouring on the outside and yellow in the middle. The seeds are wind-born when mature.

Ecology

Plants typically occur in grasslands and occasionally grassy woodlands in Victoria (Sinclair 2010). Grasses typically dominate the understorey layer, including native species such as Kangaroo Grass, Weeping Grass, Common Wheat Grass, Common Tussock-Grass, and Striped Wallaby-grass. Grassy woodlands are usually dominated by River Red-gum. Rocks are often present on sites in the Victorian Volcanic Plain bioregion, and usually offer protection from grazing by stock, pest animals and native fauna.

Current Known Population and Distribution

There are over 80 records for White Sunray in Victoria, although many of these populations are extinct (FIS 2012). The records center on an area from Ballarat to Hamilton. Many of the populations have extremely low individual numbers, are highly fragmented, and are not currently reserved e.g. roadsides, rail lines and are threatened by development.

Occurrence within the study area

Several White Sunray individuals were detected immediately within the study area along the western edge of Stockyard Hill Road south of the intersection with Beaufort-Carranballac Road (Figures 2f and 2k) (Ecology and Heritage Partners 2014a). However, these plants are not proposed to be impacted by the proposed road upgrade in this location. In addition, a population of White Sunray occurs along Eurambeen-Streatham Road, outside of the current road and intersection footprint (Plate 2, Figure 2a).

3.3.3 State

No state significant species were recorded within the footprint of the current proposed road alignment and intersections. There is one record of Plump Wallaby Grass *Amphibromus pithogastrus* within close proximity to the study area boundary along Dunnets Road, however this is not impacted by the current footprint (Figure 3).

3.3.4 Fauna Species

A total of 75 fauna species comprising 64 birds (59 native, five introduced), five mammals (two native, three introduced), one native lizard and five native frogs were recorded during the combined assessments within the broader study area (Appendix 3.1). A list of fauna species previously recorded within 10 kilometres of the study area is provided below (Appendix 3.1).

3.4 Fauna Habitats

The study area currently supports five broad fauna habitat types: remnant woodland, native grassland, exotic grassland, planted windrows and woodlots, and patches of native shrubs. Fauna habitat quality within the study area ranges from low for exotic grassland, to moderate or high for native grassland and modified woodland.

3.5 Significant Fauna

3.5.1 National

Eighteen nationally listed species have either been recorded or are predicted to occur within the local area (Appendix 3.2) (Figure 4). Striped Legless Lizard was detected along the western side of the Stockyard Hill roadside reserve, and there is suitable grassland habitat for this species within this section of the road (albeit isolated and highly modified with less than 25% cover of native grasses) (Figure 2r).

3.5.2 State

No fauna species of national or State significance were recorded within the study area. However, three state significant species (Hardhead *Aythya australis*, Brolga *Grus rubicunda* and Blue-billed Duck *Oxyura australis*) have previously been recorded in the local area as part of the WEF investigations undertaken in 2012. While Brolga may reside within the study area temporarily, there is no important or limiting habitat for any of these species. An additional 25 State significant fauna have previously been recorded from the local area (DELWP 2016b), and the likely use of the study area by these species is provided below (Figure 4, Appendix 3.2).

Based on habitat type and conditions present within the study area, it is unlikely that any State significant fauna species will be significantly impacted by the proposed works.

3.5.3 Regional and local

No regionally significant species were recorded during the assessment. Twelve regionally significant fauna have previously been recorded from the local area (VFD and VBA) (Appendix 3.2).

Based on habitat type and conditions present within the study area it is unlikely that most of these species would occur within the study area on a regular basis (Appendix 3.2). However, Fat-tailed Dunnart is likely to use habitats within the study area.

3.6 Permitted Clearing Assessment (the Guidelines)

3.6.1 Vegetation proposed to be removed

A total of 157 patches of remnant native vegetation are mapped within the study area, ranging in quality from a site assessed condition score of 0.15 to 0.49. Areas proposed to be impacted include:

- Grassy Woodland (1.899 hectares);
- Plains Grassland (0.085 hectares);
- Higher Rainfall Plains Grassy Woodland (0.456 hectares);
- Plains Grassy Woodland (0.143 hectares); and,
- Heathy Dry Forest (0.005 hectares).

The study area is within Location C, with 3.852 hectares of native vegetation proposed to be removed. As such, the permit application falls under the High Risk-based pathway.

As the application falls under the High Risk-based pathway, a habitat hectare assessment was completed to determine condition scores of vegetation proposed to be removed, with condition scores provided in Appendix 2.3.

Table 4. Permitted Clearing Assessment (the Guidelines)

Risk-based pathway	High
Total Extent	3.852
Remnant Patch (ha)	2.587
Scattered Trees (no.)	18
Location Risk	C
Strategic Biodiversity Score	0.244

3.6.2 Offset Targets

The offset requirement for native vegetation removal is 0.261 General Biodiversity Equivalence Units (BEU), along with Specific units for Button Wrinklewort (0.202 specific BEUs).

A summary of proposed vegetation losses and associated offset requirements is presented in Table 5 and the Biodiversity Impact and Offset Requirements (BIOR) Report is presented in Appendix 4.

Table 5. Offset targets

General Offsets Required	0.261 General BEUs
Specific Offsets Required	Button Wrinklewort (0.202 specific BEUs)
Vicinity (catchment / LGA)	Glenelg Hopkins CMA / Pyrenees Shire Council
Minimum Strategic Biodiversity Score*	0.191

Note: BEU = Biodiversity Equivalence Units

4 LEGISLATIVE AND POLICY IMPLICATIONS

4.1 Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

The EPBC Act establishes a Commonwealth process for the assessment of proposed actions likely to have a significant impact on any matters of National Environment Significance (NES), described in Table 6.

Table 6. Potential impacts to matters of National Environmental Significance (NES)

Matter of NES	Potential Impacts
World Heritage properties	The proposed action will not impact any properties listed for World Heritage.
National heritage places	The proposed action will not impact any places listed for national heritage.
Ramsar wetlands of international significance	The study area occurs within a 10 kilometre radius of one wetland of international significance (Western Lakes District) (DoE 2016). The proposed action is unlikely to impact the ecological character of any Ramsar wetland.
Threatened species and ecological communities	Several White Sunray plants have previously been recorded within the roadside reserve along the western side of Stockyard Hill Road (Figure 2f, 2g and 2k) directly outside of the area of the proposed road upgrade. Matted Flax-lily has also been recorded along roads during targeted surveys, although no plants of this species is proposed to be impacted by the proposed road and intersection upgrades. There is suitable habitat (albeit isolated and modified grassland patches) for one fauna species listed under the EPBC Act (Striped Legless Lizard) along Stockyard Hill Road (Figure 2r). One ecological community listed under the EPBC Act (NTGVVP) is present within the study area (i.e. 0.02 hectares). The proposed development is not likely to have a significant impact on any threatened species or ecological communities (see Section 4.1.1).
Migratory and marine species	Several Migratory and Marine species have been recorded within 10 kilometres of the study area (DELWP 2016b; Appendix 3.2). However, the study area does not provide 'important habitat' as defined under the EPBC Act Policy Statement 1.1 Principal Significant Impact Guidelines (DoE 2013), and therefore the proposed road widening and intersection updates are not likely to lead to a significant impacts to migratory or marine species.
Commonwealth marine area	The proposed action will not impact any Commonwealth marine areas.
Nuclear actions (including uranium mining)	The proposed action is not a nuclear action.
Great Barrier Reef Marine Park	The proposed action will not impact the Great Barrier Reef Marine Park.
Water resources impacted by coal seam gas or mining development	The proposed action is not a coal seam gas or mining development.

4.1.1 Implications

The proposed development will result in the removal of 0.02 hectares of the NTGVVP ecological community and this does not meet the significant impact thresholds outlined in the significant impact guidelines for this ecological community. An assessment against the Significant Impact Guidelines 1.1 (DoE 2013) for the NTGVVP ecological community is provided below (Table 7).

In addition, based on recent 'non-controlled action' decisions under the EPBC Act, where projects were proposed to lead to the removal of up to 0.775 hectares of NTGVVP (DoE 2015), it is highly unlikely that the proposed removal of 0.02 hectares of NTGVVP associated with the proposed road widening and intersection upgrades would constitute a 'significant impact' under the Act.

Table 7. Assessment against the Significant Impact Guidelines for Endangered or Critically Endangered Ecological Communities: NTGVVP ecological community (DoE 2013).

Significant Impact Guidelines 1.1 – Significant Impact Criteria for Endangered or Critically Endangered Ecological Communities (NTGVVP)	
Significant impact Criteria	**Comment**
1. Reduce the extent of an ecological community.	The proposed development will result in the loss of very small area of modified NTGVVP (i.e. 0.02 hectares).
2. Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines.	The proposed removal of small patches of NTGVVP along roadsides will not lead to the fragmentation of a much larger patch of NTGVVP (i.e. patches of NTGVVP are already fragmented and isolated for any larger patches).
3. Adversely affect habitat critical to the survival of an ecological community.	The proposed removal of NTGVVP will not adversely affect the long-term survival of the ecological community.
4. Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns.	Given the localised nature of the proposed action, groundwater levels, water drainage patterns and nutrient loads will not be affected by the proposed development.
5. Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting.	Due to the small, localised nature of the NTGVVP and the extent of the proposed removal, the overall functionality of the community within a landscape context will not be affected by the proposed development.
6. Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: a. assisting invasive species, that are harmful to the listed ecological community, to become established or; b. causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community.	The proposed development will result in the loss of 0.02 hectares of NTGVVP, however this loss is considered marginal due to the small area and isolated nature of the vegetation.
7. Interfere with the recovery of an ecological community.	The proposed development will not allow for the recovery of this community, however due to the minimal area of NTGVVP the loss is considered to be minimal.

The proposed widening of Stockyard Hill Road is likely to impact suitable habitat (albeit highly modified grassland) for Striped Legless Lizard, and therefore an EPBC Act referral should be prepared and submitted to DoE for assessment and determination under the Act. An assessment against the Significant Impact Guidelines 1.1 for Striped Legless Lizard (DoE 2013) is provided below (Table 8).

Table 8. Assessment against the Significant Impact Guidelines for Vulnerable species: Striped Legless Lizard (SEWPaC 2011b; DoE 2013).

Significant Impact Guidelines 1.1 – Significant Impact Criteria for a Vulnerable Species (Striped Legless Lizard)	
Significant Impact Criteria	**Comment**
1. Disrupt the breeding cycle of an 'important population', defined as: i) key source populations either for breeding or dispersal ii) populations that are necessary for maintaining genetic diversity iii) populations that are near the limit of the species range. iv) Sites less than 0.5 hectares v) Small isolated areas of habitat which are currently under pressure, or are likely to experience long-term pressures (for example sites located within urban settings, such as adjacent to factories or in residential subdivisions) vi) Small sites which support marginal or low quality habitat (for example dominated by high threat weeds).	Given that several individual Striped Legless Lizards of were detected during targeted surveys over several months along Stockyard Hill Road roadside reserve (Figure 2r) (Ecology and Heritage Partners 2014c) and a single Striped Legless Lizard specimen was captured along Dunnets Road on 12 November 2013 (Ecology and Heritage Partners 2014c), it is apparent that these two section of the roadside reserves supports an extant population of the species, where ongoing breeding and dispersal occurs. However, given the location of the site, this population is not considered to be near the limit of the species range, nor is it likely to be an important population for maintaining genetic diversity across the species geographical range. As outlined above, the proposed action will result in a minor reduction in the extent of potential Striped Legless Lizard habitat, with the proposed removal of linear strips of highly modified grassland along either side of Stockyard Hill Road and Dunnets Road. The total area of potentially suitable habitat that is proposed to be disturbed along either side of the roadside is approximately 2.5 hectares. It is important to note that the small linear strips proposed to be disturbed either side of Stockyard Hill Road and Dunnets Road constitute a small proportion of grassland habitat present, and areas along the roadside will be avoided during the road works (i.e. retained areas will be clearly demarcated or fenced as no-go areas). The vegetation along both Stockyard Hill Road and Dunnets Road roadside reserves is connected to extensive areas (i.e. it forms part of an area greater than 0.5 hectares) within the agricultural landscape, and these areas (i.e. several hectares) of available habitat are likely to support the species' breeding and dispersal requirements in the future. Therefore, the breeding and dispersal capabilities of this population are unlikely to be significantly impacted given the highly localised nature of the proposed road works.
2. Lead to a long-term decrease in the size of an important population of a species	Given the breeding and dispersal capabilities of the population are unlikely to be significantly affected by the proposed road widening, there is not likely to be a long-term decrease in the size of this population in direct response to the proposed works.
3. Reduce the area of occupancy of an important population	Approximately 2.5 hectares of modified grassland habitat where the species has previously been detected along Stockyard Hill Road and Dunnets Road is proposed to be removed. However, given the availability of suitable dispersal habitat within the road reserve and across adjacent paddocks, the removal of a linear strip of modified grassland either side of the existing roads is not likely to fragment the existing population into two or more populations. Indeed, individuals are likely to continue to disperse across the landscape (i.e. along and outside
4. Fragment an existing important population into two or more populations	

Significant Impact Guidelines 1.1 – Significant Impact Criteria for a Vulnerable Species (Striped Legless Lizard)	
	of the roadside reserve) within and between areas of suitable habitat.
5. Adversely affect habitat critical to the survival of a species	The proposed road widening and intersection upgrades will result in the removal of modified vegetation / habitat that does not constitute habitat that is critical to the survival of the species.
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Approximately 2.5 hectares of modified grassland habitat where the species has previously been detected along Stockyard Hill Road is proposed to be removed. Given the availability of the same habitat along the roadside reserves and similar habitats across the adjoining paddocks, the proposed removal of habitat will not lead to the long-term decline of the species in the immediate area. The proposed action is also not likely to impact the population on a regional, state or national level.
7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed action is not likely to result in invasive species that are harmful to the Striped Legless Lizard habitat, introduce disease that may cause the species to decline, and interfere substantially with the recovery of the species.
8. Introduce disease that may cause the species to decline, or	
9. Interfere substantially with the recovery of the species.	

In the northern section of Stockyard Hill Road the proposed road widening and intersection works will be located along the eastern boundary of Stockyard Hill Road road reserve, and will avoid the known population of White Sunray within the western roadside reserve of Stockyard Hill Road (Figure 2f, 2g and 2k). As such, this species is not proposed to be impacted and therefore there are no implications under the EPBC Act relating to this species.

4.2 Flora and Fauna Guarantee Act 1988 (Victoria)

The FFG Act is the primary legislation dealing with biodiversity conservation and sustainable use of native flora and fauna in Victoria. Proponents are required to apply for an FFG Act Permit to 'take' listed and/or protected 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.

Flora – There was one species (Plump Swamp Wallaby Grass) listed under the FFG Act identified within the current proposed road alignment and intersections.

Fauna – No species listed under the FFG Act were detected during the ecological assessments within the study area. Thirty species listed under the FFG Act have previously been recorded in the local area (DSE 2013; Viridans 2013b). While a small number of state significant species are likely to occasionally use habitat resources within the study area the proposed development is not likely to significantly impact any of these species.

Communities – One state significant community, *Western (Basalt) Plains Grassland community*, occurs as patches of Plains Grassland within the study area.

Threatening processes – Threatening process listed under Schedule 3 of the FFG Act that require consideration include:

- Alteration to the natural flow regimes of rivers and streams
- Degradation of native riparian vegetation along Victorian rivers and streams
- Increase of sediment input into Victorian rivers and streams due to human activities
- Input of toxic substances into Victorian rivers and streams
- Invasion of native vegetation by Gorse *Ulex europaeus*
- Invasion of native vegetation by 'environmental weeds'
- Loss of hollow-bearing trees from Victorian native forests
- Prevention of passage of aquatic biota as a result of the presence of instream structures

4.2.1 Implications

One FFG Act-listed species (Plump Swamp Wallaby Grass) was detected within the study area. A permit under the FFG Act will be required if this species cannot be avoided during detailed design as the study area is located on public land. Up to six weeks should be allowed for to obtain a FFG Act permit through DELWP.

4.3 Environment Effects Act 1978 (Victoria)

The *Environment Effects Act 1978* provides for assessment of proposed actions that are capable of having a significant effect on the environment via the preparation of an Environment Effects Statement (EES). A project with potential adverse environmental effects that, individually or in combination, could be significant in a regional or State context should be referred. An action may be referred for an EES decision where:

- one of the following occurs:
    - Potential clearing of 10 hectares or more of native vegetation from an area that:
        - is of an EVC identified as endangered by DELWP;
        - is, of Very High conservation significance; or,
        - is not authorised under an approved Forest Management Plan or Fire Protection Plan.
    - Potential long-term loss of a significant proportion (1-5% depending on conservation status of species) of known remaining habitat or population of a threatened species within Victoria.
- or where two or more of the following occur:
    - Potential clearing of 10 hectares or more of native vegetation, unless authorised under an approved Forest Management Act or Fire Protection Plan;
    - Matters listed under the FFG Act:
        - Potential loss of a significant area of a listed ecological community;
        - Potential loss of a genetically important population of an endangered or threatened species;
        - Potential loss of critical habitat; or,

- Potential significant effects on habitat values of a wetland supporting migratory birds.

4.3.1 Implications

The proposed road widening and intersection works are likely to result in the removal of small isolated patches of remnant native vegetation (including up to 0.02 hectares of NTGVVP) and 18 scattered trees (Appendix 4). Based on the extent of the proposed impacts it is accurate to conclude that from a biodiversity perspective a referral under the EE Act is not warranted. An explanation relating to the specific criteria relevant to ecology is provided:

- The criteria refers to Very High conservation significance which relates to the former Native Vegetation Management Framework (NRE 2002) and does not apply to the Guidelines (i.e. no such classification). The majority of the remnant native vegetation along roadsides and area of proposed disturbance is of very low quality.
- The project will not lead to the potential long-term loss of a significant proportion (1-5% depending on conservation status of species) of known remaining habitat or population of a threatened species within Victoria.
- The project will not lead to the loss of the following:
    - Matters listed under the FFG Act:
    - Potential loss of a significant area of a listed ecological community;
    - Potential loss of a genetically important population of an endangered or threatened species;
    - Potential loss of critical habitat; or,
    - Potential significant effects on habitat values of a wetland supporting migratory birds.

4.4 Planning and Environment Act 1987 (Victoria)

The *Planning and Environment Act 1987* outlines the legislative framework for planning in Victoria and for the development and administration of planning schemes.

4.4.1 Victorian Planning Schemes

All planning schemes contain native vegetation provisions at Clause 52.17 Native Vegetation which require a planning permit from the relevant local 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 (Appendix 1.5.3) or a subdivision is proposed with lots less than 0.4 hectares[2]. Local planning schemes may contain other provisions in relation to the removal of native vegetation.

[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.

Table 9. Permit to remove native vegetation – application referral triggers (Clause 66, Referral and Notice Provisions)

Native Vegetation	• Remove, destroy or lop native vegetation where the area to be cleared is 0.5 hectares or more
	• Remove, destroy or lop native vegetation which is to be considered under the High Risk-based pathway
Other Circumstances	• Remove, destroy or lop native vegetation if a property vegetation plan applies to the site
	• Remove, destroy or lop native vegetation on Crown land which is occupied or managed by the responsible authority

The relevant overlay that applies to the study area (DELWP 2016c) is the Environmental Significance Overlay – Schedule 1 (ESO1).

The ESO1 covers Designated Water Supply Areas and applies to the southern part of Stockyard Hill Road and Dunnets Road. There are several objectives of the ESO1, including to ensure the protection and maintenance of water quality and water yield within the designated water supply catchments. A permit is not required to remove, destroy or lop any vegetation except where:

- Vegetation is within 30 metre of a waterway, waterbody or water supply channel.
- The application proposes the mass clearance of more than one hectare of land.

4.4.2 Implications

The study area is within Location C, with 3.852 hectares of native vegetation proposed to be removed. As such, the permit application falls under the High Risk-based pathway.

The offset requirement for native vegetation removal is 0.261 General Biodiversity Equivalence Units (BEU), along with Specific units for Button Wrinklewort (0.202 specific BEUs).

A Planning Permit from Pyrenees Shire Council is required to remove, destroy or lop any native vegetation. In this instance, the application will be referred to DELWP as greater than 0.5 hectares of vegetation are proposed for removal.

There are currently 0.728 hectares of remnant native vegetation and 18 scattered remnant trees that are covered by the ESO1, and that are proposed to be impacted as a result of the proposed road widening and intersection upgrades.

4.5 Wildlife Act 1975 and Wildlife Regulations 2013 (Victoria)

The *Wildlife Act 1975* (and associated Wildlife Regulations 2013) is the primary legislation in Victoria providing for protection and management of wildlife. Authorisation for habitat removal may be obtained under the *Wildlife Act 1975* through a licence granted under the *Forests Act 1958*, or under any other Act such as the *Planning and Environment Act 1987*. Any persons engaged to remove, salvage, hold or relocate native fauna during construction must hold a current Management Authorisation under the *Wildlife Act 1975*, issued by DELWP.

4.5.1 Implications

For the roads and intersection upgrades it is unlikely that salvage of fauna will be undertaken as there is unlikely to be hollow-bearing trees or arboreal animals affected, and therefore Management Authorisation under the *Wildlife Act 1975* is not required.

4.6 Catchment and Land Protection Act 1994 (Victoria)

The *Catchment and Land Protection Act 1994* (CaLP Act) contains provisions relating to catchment planning, land management, noxious weeds and pest animals. Landowners are responsible for the control of any infestation of noxious weeds and pest fauna species to minimise their spread and impact on ecological values.

4.6.1 Implications

A number of weeds listed as noxious under the CaLP Act were recorded during the assessment (Blackberry, Spear Thistle). The proposed development should include controls to prevent the introduction of noxious weed species or transfer within the corridor. Any infestation of noxious weeds that may become established during and/or after the completion of works should be appropriately controlled in areas of native vegetation to minimise their spread and overall impact on ecological values. It is understood that these requirements could be adequately addressed by the development of on-going management arrangements.

5 POTENTIAL IMPACTS

Currently the proposed road alignment and intersections is likely to have a direct impact to areas of remnant native vegetation along with significant species and ecological communities (Figure 5). Impacts are likely to include:

- Removal of approximately 0.023 hectares of NTGVVP and 2.5 hectares of modified habitat for Striped Legless Lizard, both of which are matters of NES listed under the EPBC Act;
- Further depletion of a state significant community, Western (Basalt) Plains Grassland community;
- Loss and/or disturbance to scattered remnant (indigenous) trees, associated with Plains Grassy Woodland and Creekline Grassy Woodland;
- Soil disturbance and compaction which could increase the spread of weeds in the study area and beyond;
- Potential impact to the State significant Brolga as a result of powerline collision;
- Disturbance to aquatic environments (e.g. waterways and farm dams) and,
- Loss of foraging, nesting, roosting and sheltering habitat for local native fauna if hollow-bearing trees, dams and planted trees are removed.

6 MITIGATION MEASURES

6.1 Minimise Impacts

For the removal of vegetation that falls under the High Risk-based pathways, the Guidelines (DEPI 2013) require the responsible authority to consider whether reasonable steps have been taken to ensure that impacts of the proposed removal of native vegetation on biodiversity have been minimised. Minimisation effort should be commensurate with the contribution that the native vegetation makes to Victoria's biodiversity (DELWP 2015e).

SHWFPL have avoided and minimised the proposed removal of remnant native vegetation, and also areas supporting EPBC Act-listed listed species and communities, and sensitive sites by locating the proposed works in areas of exotic vegetation / areas devoid of ecological values (Plate 1, and 2). Further avoidance of NTGVVP by micro siting infrastructure and the construction footprint should be considered.

Plate 1. EPBC Act-listed White Sunray proposed to be avoided along Stockyard Hill Road.

Plate 2. EPBC Act-listed White Sunray and Golden Cowslip proposed to be avoided along Eurambeen-Streatham Road.

6.1.1 Contribution to Victoria's Biodiversity

The Handbook (DELWP 2015e) describes the relevant information to consider when determining the contribution native vegetation makes to Victoria's biodiversity (Table 10). Based on available information it is determined that the native vegetation proposed to be removed as part of the current application has a Low contribution to Victoria's biodiversity.

Table 10. Assessment of the contribution the native vegetation makes to Victoria's biodiversity (as per Table 3 of the Handbook [DELWP 2015e])

Criteria	Assessment	Contribution
What is the extent and condition of native vegetation?		
Habitat hectare assessment • The higher the value, the greater the contribution to Victoria's biodiversity. • Scores above 0.8 indicate very good condition.	Total extent: 3.852 hectares (2.587 hectares of remnant patch and 18 scattered trees). Habitat score: 0.15 to 0.49	Low to Moderate
What is the landscape biodiversity value of the native vegetation?		
Strategic Biodiversity Score • The higher the value, the greater the contribution to Victoria's biodiversity. • Scores above 0.8 are very important sites.	0.244	Low
Is the native vegetation important habitat for rare or threatened species?		
Number of Rare or Threatened species habitats	29 species	Based on overall impacts to

Criteria	Assessment	Contribution
impacted • The more species listed, the greater the contribution the native vegetation makes to Victoria's biodiversity. • Site observations may also be considered.		habitat for rare or threatened species the overall impact is considered to be Low to Moderate.
Number of Rare or Threatened species habitats impacted above the specific offset threshold • The more species requiring a specific offset, the greater the contribution the native vegetation makes to Victoria's biodiversity.	One species: Button Wrinklewort (0.202 specific BEUs)	
The proportional impact for species requiring a specific offset • The higher the proportional impacts, the more important that site is for that particular species.	0.014%	
Habitat importance score for impacted species • The higher the habitat importance score, the more important that site is for that particular species.	Low	
Impact on highly localised habitat • Native vegetation that provides habitat for species with highly localised habitat is very important vegetation as it is limited and any loss needs to be carefully considered.	No species affected	

6.1.2 Minimisation Statement[3]

SHWFPL have avoided and minimised the proposed removal of remnant native vegetation, and also areas supporting EPBC Act-listed listed species and communities, and sensitive sites such as roadsides and waterways and alternation by locating the current powerline footprint in areas of exotic vegetation / areas devoid of ecological values. Areas of ecological values will be further minimised through the implementation of an Environment Management Plan (EMP). The following measures will be undertaken as part of the development of the project and will be in accordance with an EMP:

- Further micro-siting techniques, including fencing retained areas of native vegetation and suitable fauna habitat (e.g. for Striped Legless Lizard). If indeed necessary, trees will be lopped or trimmed rather than removed. Similarly, soil disturbance and sedimentation into drainage lines / dams will be avoided or kept to a minimum, to avoid, or minimise impacts to fauna habitats.
- All contractors will be aware of ecologically sensitive areas to minimise the likelihood of inadvertent disturbance to areas marked for retention. Habitat zones (areas of sensitivity) will be included as a mapping overlay on construction plans;
- Tree Retention Zones (TRZs) will be implemented to prevent indirect losses of native vegetation during construction activities). A TRZ applies to a tree and is a specific area above and below the ground, with a radius 12 x the DBH. At a minimum standard a TRZ will consider the following:
    a. A TRZ of trees will be a radius no less than two metres or greater than 15 metres;
    b. Construction, related activities and encroachment (i.e. earthworks such as trenching that disturb the root zone) will be excluded from the TRZ;

[3] Section 5.2 (page 20) of the Handbook (DELWP 2015e) states:

> *"Minimisation should target native vegetation that makes the greatest contribution to Victoria's biodiversity - that is, areas of better condition, higher strategic biodiversity score, and/or higher habitat importance scores.*
>
> *The minimisation statement could state that minimisation was achieved by a past strategic planning exercise or by site interventions, or that it is not achievable or desirable on site for specific reasons."*

Section 6.3.2 (page 26) of the Handbook (DELWP 2015e) states:

> *"Minimisation should be commensurate with the contribution that the native vegetation makes to Victoria's biodiversity. Minimum effort can be considered reasonable when the native vegetation contributes lower value to Victoria's biodiversity – for example, only general offsets are required, strategic biodiversity score is low, the native vegetation is limited in extent and isolated from other patches of remnant vegetation."*

Section 6.5, Table 4 (page 29) of the Handbook (DELWP 2015e) states:

> *"Statement can describe that minimisation is unreasonable at the site level because the native vegetation makes a very low contribution to biodiversity (such as no species offset requires, low strategic biodiversity score) or because retained native vegetation would have limited long term prospect of retaining biodiversity value."*

c. Where encroachment exceeds 10% of the total area of the TRZ, the tree will be considered as lost and offset accordingly;

d. Directional drilling may be used for works within the TRZ without being considered encroachment. The directional bore will be at least 600 millimetres deep;

e. The above guidelines may be varied if a qualified arborist confirms the works will not significantly damage the tree (including stags / dead trees). In this case the tree would be retained and no offset would be required;

f. Where the minimum standard for a TRZ has not been met an offset may be required; and,

- The development of a Pest Plant Management Plan. This plan will follow the guidelines set out in the CaLP Act, and clearly outline any obligations of the project team in relation to minimising the spread of weeds as a result of this project. This may include a pre-clearance weed survey undertaken prior to any construction activities to record and map the locations of all noxious and environmental weeds; and,
- Construction stockpiles, machinery, roads, and other infrastructure will be placed away from areas supporting native vegetation and/or other ecological sensitive areas.

6.2 Offset Impacts

The Guidelines (DEPI 2013) require offsetting as the final step in considering the impacts of development on native vegetation. Under the High Risk-based pathway, emphasis is placed on minimising impacts, and only after these steps have been taken should offsets be considered. Offset targets must be met, as specified in Section 3.6. Potential offsets may be sourced using the following mechanisms:

- BushBroker: BushBroker maintains a register of landowners who are willing to sell offset credits. Offsets secured by Bushbroker are done so via a Section 69 Agreement under the *Conservation, Forest and Lands Act 1987*.
- Trust for Nature: Trust for Nature holds a list of landowners who are willing to sell vegetation offsets. Offsets secured by Trust for Nature are done so under the Victorian *Conservation Trust Act 1972*.
- Local Councils: The proponent may contact local councils to seek availability of offsets.
- Over-the-Counter Offsets Scheme: The Guidelines include the expansion of the "Over-the-Counter" (OTC) Offsets Scheme, allowing non-government agencies to establish themselves as OTC Facilities. OTC Facilities will broker native vegetation offsets (credits) between landholders (with offset sites) and permit holders (with offset requirements).

6.2.1.1 Offset Strategy

Based on the current offset requirement for the proposed roadside and intersection upgrade the General and Specific offset obligations generated by development can be satisfied through existing credits registered through the OTC scheme. As such, it is anticipated that the relevant offset obligations generated by the WEF can be secured through an OTC scheme without any difficulty.

7 FURTHER REQUIREMENTS

Further requirements associated with development of the study area, as well as additional studies or reporting that may be required, are provided below (Table 11).

Table 11. Further requirements associated with development of the study area

Relevant Legislation	Implications	Further Action
Environment Protection and Biodiversity Conservation Act 1999	The proposed road widening and intersection works will result in the removal of 0.02 hectares of the NTGVVP ecological community and this does not meet the significant impact thresholds outlined in the significant impact guidelines for this ecological community. In addition, the proposed road widening and intersection works will be located along the eastern boundary of Stockyard Hill Road road reserve, and will avoid the known population of White Sunray within the western roadside reserve of Stockyard Hill Road. As such, this species is not proposed to be impacted and therefore there are no implications under the EPBC Act relating to this species. The proposed widening of Stockyard Hill Road and Dunnets Road is likely to impact approximately 2.5 hectares of suitable habitat (albeit modified grassland) for Striped Legless Lizard.	Prepare and submit an EPBC Act referral to DoE for assessment under the Act.
Flora and Fauna Guarantee Act 1988	One flora species (Plump Swamp Wallaby Grass) listed under the FFG Act has been identified within the proposed road alignment and intersections. No fauna species listed under the FFG Act were detected during the ecological assessments across the study area. Thirty species listed under the FFG Act have previously been recorded in the local area (DSE 2013; Viridans 2013b). While a small number of state significant species are likely to occasionally use habitat resources within the study area the proposed development is not likely to significantly impact any of these species. One state significant community, Western (Basalt) Plains Grassland community, occurs as patches of Plains Grassland vegetation and as scattered remnants within the study area.	Prepare and submit a FFG Act permit application to DELWP, prior to construction.
Environment Effects Act 1978	The proposed road widening and intersection works are likely to result in the removal of small isolated patches of remnant native vegetation (including up to 0.02 hectares of NTGVVP) and 18 scattered trees (Appendix 4).	Based on the extent of the proposed impacts it is accurate to conclude that from a biodiversity perspective an EE referral and assessment of the works under the EE Act is not warranted. As such, no further action required.
Planning and Environment Act 1987	The study area is within Location C, with 3.852 hectares of native vegetation proposed to be removed. As such, the permit application falls under the High Risk-based pathway.	Prepare and submit a Planning Permit application. Planning Permit conditions are likely to include a requirement for: • Demonstration of impact

Relevant Legislation	Implications	Further Action
	The offset requirement for native vegetation removal is 0.261 General Biodiversity Equivalence Units (BEU), along with Specific units for Button Wrinklewort (0.202 specific BEUs). A Planning Permit from Pyrenees Shire Council is required to remove, destroy or lop any native vegetation. In this instance, the application will be referred to DELWP as greater than 0.5 hectares of vegetation are proposed for removal.	minimisation. • Identification of a suitable offset to satisfy the requirements under the Guidelines. • A Construction Environment Management Plan (CEMP).
Catchment and Land Protection Act 1994	Several weed species listed under the CaLP Act were recorded within the study area. To meet requirements under the CaLP Act, listed noxious weeds should be appropriately controlled throughout the study area.	Planning Permit conditions are likely to include a requirement for a Weed Management Plan.
Wildlife Act 1975	Any persons engaged to conduct salvage and translocation or general handling of terrestrial fauna species must hold a current Management Authorisation.	Ensure wildlife specialists hold a current Management Authorisation.

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FIGURES

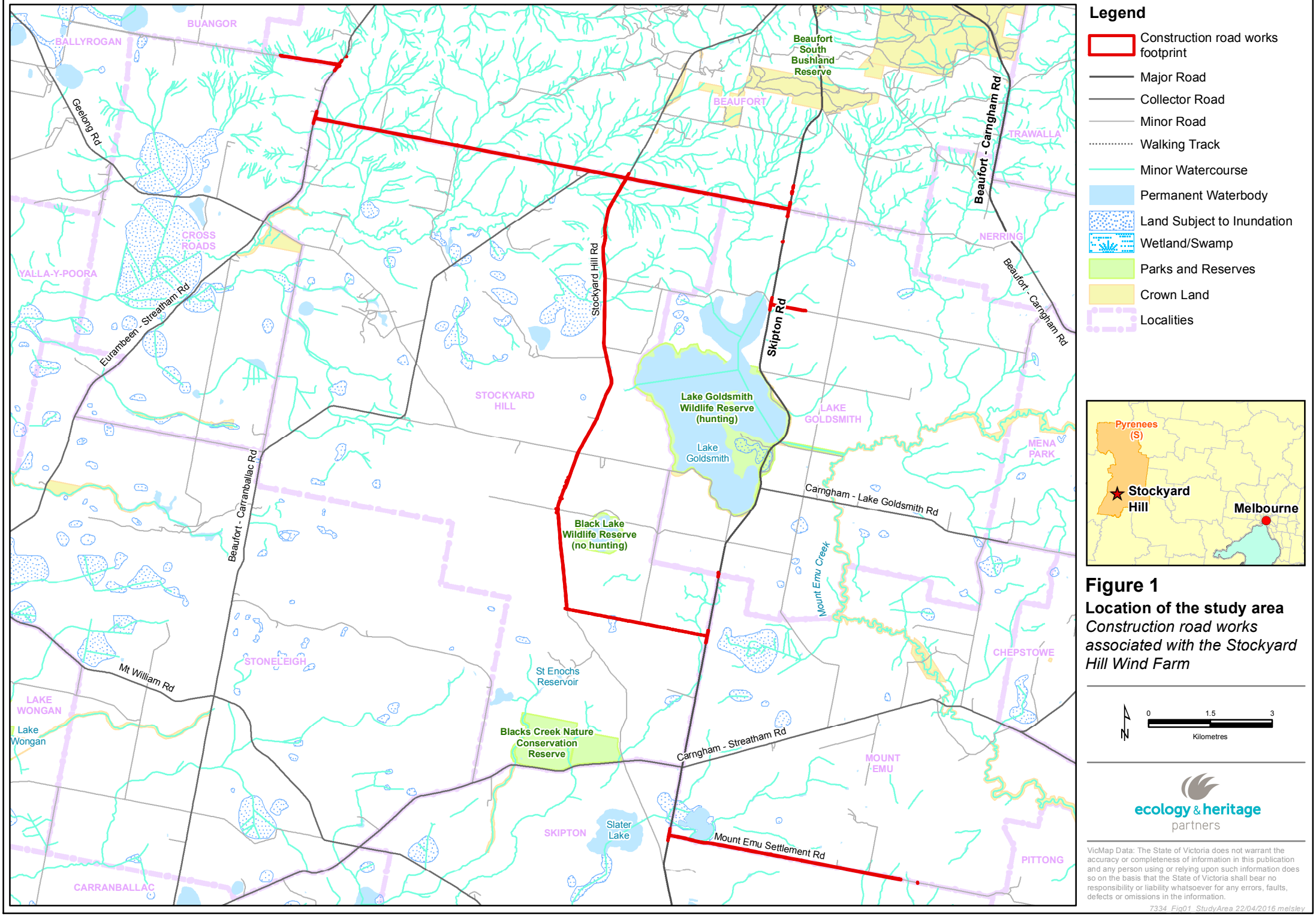

Figure 1

Location of the study area

Construction road works associated with the Stockyard Hill Wind Farm

ecology & heritage partners

Legend

Construction road works footprint

EPBC Act listed

White Sunray

State significant flora

Golden Cowslip

Ecological Vegetation Classes

Grassy Woodland (EVC 75)

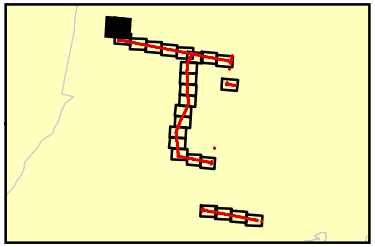

Figure 2a

Ecological features

Construction road works associated with the Stockyard Hill Wind Farm

N

0 100 200

Metres

ecology & heritage partners

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Legend

Construction road works footprint

EPBC Act listed

White Sunray

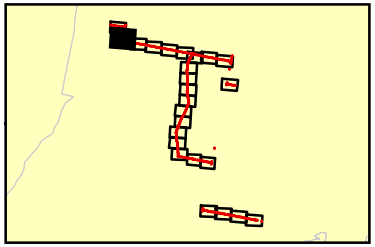

Figure 2b

Ecological features

Construction road works associated with the Stockyard Hill Wind Farm

N

0 100 200

Metres

ecology & heritage partners

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Legend

Construction road works footprint

Ecological Vegetation Classes

Grassy Woodland (EVC 75)

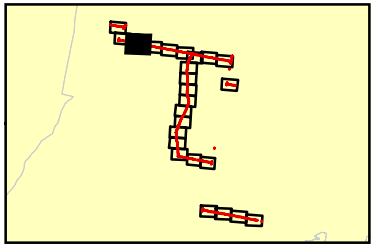

Figure 2c

Ecological features

Construction road works associated with the Stockyard Hill Wind Farm

N

0 100 200

Metres

ecology & heritage partners

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