# Attachment C: Salt Creek Wind Farm transmission line options – overview of biodiversity impacts

Attachment C presents a biodiversity assessment overview report prepared by Brett Lane & Associates Pty Ltd (BL&A). Two powerline options were initially surveyed to understand their respective biodiversity impacts, the results of which are detailed within this report.

# SALT CREEK WIND FARM
# POWER LINE OPTIONS

# OVERVIEW OF BIODIVERSITY IMPACTS

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## CONTENTS

1. INTRODUCTION ..... 1
2. SOURCES OF INFORMATION AND FIELD METHODS ..... 2
2.1. Existing information ..... 2
2.2. Field assessments ..... 2
2.2.1. Study areas and scope ..... 2
2.2.2. Native vegetation assessment ..... 3
2.3. Limitations of field assessments ..... 4
3. RESULTS OF THE BIODIVERSITY ASSESSMENT ..... 5
3.1. Overview of landscape ecological characteristics ..... 5
3.2. Native vegetation ..... 6
3.3. Listed communities ..... 9
3.4. Threatened species ..... 10
4. CONCLUSIONS ..... 12
5. REFERENCES ..... 13

## TABLES

Table 1: Area of Ecological Vegetation Classes within the study areas for each transmission line option ..... 6
Table 2: Potential area of EPBC Act listed communities within the study areas for each transmission line option. ..... 9
Table 3: Potential area of FFG Act listed communities within the study areas for each transmission line option. ..... 9
Table 4: Area of potential habitat for threatened species within the study areas for each transmission line option. ..... 11

## FIGURES

Figure 1: Salt Creek Wind Farm Transmission Line - extent and location of native vegetation and EPBC Act listed communities on the eastern and western option ..... 8

# 1. INTRODUCTION

Trustpower Pty Ltd engaged Brett Lane & Associates Pty. Ltd. (BL&A) to conduct a preliminary assessment of the biodiversity values within two proposed power line alignments (the Eastern and Western options) linking the approved Salt Creek Wind Farm with the Terang terminal station. These alignments totalled approximately 100 kilometres in length (about 50 kilometres each) and extended between Woorndoo and Terang via Mortlake in Victoria's west. The specific area investigated, referred to herein as the 'study area', comprised both private land (50-metre wide corridors) and public road reserves (full width of road reserves). The alignments and study area are shown in Figure 1.

Both options were subject to a comprehensive overview assessment, investigating the potential occurrence of all EPBC Act and *Flora and Fauna Guarantee Act 1988* (FFG Act) listed species and communities, and determining at a moderate scale the extent of native vegetation in accordance with the indigenous cover criteria of Victoria's *Biodiversity assessment guidelines* (DEPI 2013a).

The purpose of this report is to summarise the findings of the assessments of both options and to compare and contrast potential biodiversity impacts. This report does this in the sections described below.

Section 3 describes the sources of information and field methods used in the assessment.

Section 4 presents the results of the assessment and compares both options.

Section 5 compares the impacts of both options on EPBC Act listed matters, on FFG Act listed species and communities, and on native vegetation and provides an evaluation of the preferred, western option.

This investigation was undertaken by a team from BL&A, comprising Davide Coppolino (Senior Ecologist), Elinor Ebsworth (Senior Ecologist), Jackson Clerke (Zoologist), (Senior Ecologist & Project Manager) and Brett Lane (Principal Consultant).

# 2. SOURCES OF INFORMATION AND FIELD METHODS

## 2.1. Existing information

Existing flora and fauna species records and information about the potential occurrence of listed matters was obtained from an area termed the 'search region', defined here as an area with a radius of ten kilometres from the approximate centreline of the study area, extending between the following coordinates:

- Latitude 37˚ 57' 26" S and longitude 142˚ 45' 28" E;
- Latitude 38˚ 04' 50" S and longitude 142˚ 48' 21" E; and
- Latitude 38˚ 14' 24" S and longitude 142˚ 55' 02" E.

A list of the flora and fauna species recorded in the search region was obtained from the Victorian Biodiversity Atlas (VBA), a database administered by DELWP.

The 'Vegetation/ Modelled FFG Communities' layer in DELWP's Biodiversity Interactive Map (DELWP 2016a) was consulted to determine which ecological communities listed as threatened under the FFG Act were modelled to potentially occur in or near the study area.

The online EPBC Act Protected Matters Search Tool (Department of the Environment 2016) was consulted to determine whether nationally listed species or communities potentially occurred in the search region based on habitat modelling.

## 2.2. Field assessments

### *2.2.1. Study areas and scope*

Where the power line was located in road reserves, the study area included the whole road reserve, including both sides of any road formation, where present. On private land, it included a corridor 50 metres either side of the proposed alignment (100 metres total width).

The study area (including previously proposed alignment options and iterations) was surveyed on 16th September and 16th to 20th November 2015 as well as 15th April and 27th to 28th June 2016. It was inspected initially by vehicle and areas requiring closer inspection (i.e. areas where native vegetation might have been significantly obscured by overlying weeds and areas which could not be viewed directly or closely enough from a vehicle) were sampled on foot.

Each part of the study area found to support a distinct type or grouping of native vegetation (patches or scattered trees as defined in Section **Error! Reference source not found.**) was mapped at a moderately-fine scale. Mapping was undertaken by ground-truthing aerial photography. The following information was collected for each of these distinct units, referred to hereon as Vegetation Sites:

- Brief descriptions of the vegetation;
- Brief vegetation condition information, including:
    - Native flora diversity;
    - Weediness; and
    - Structural intactness.

- General vegetation quality (categorised as very low, low, moderate, high or very high quality) based on the above vegetation condition information;
- Presence or likelihood of occurrence of threatened terrestrial flora, fauna and ecological communities listed on the Commonwealth EPBC Act and the state FFG Act would be present.
- Each Vegetation Site covered one or more areas, contained one or more patches and/or scattered trees and could contain one or more EVCs.

### *2.2.2. Native vegetation assessment*

Pre-1750 (pre-European settlement) vegetation mapping administered by DELWP was reviewed to determine the type of native vegetation likely to occur in the study area and surrounds. Information on Ecological Vegetation Classes was obtained from published EVC benchmarks. These sources included:

- Relevant EVC benchmarks for the Victorian Volcanic Plain and Dundas Tablelands bioregions[1] (DELWP 2016b); and
- Biodiversity Interactive Maps (DELWP 2016a).

Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses'. The *Biodiversity assessment guidelines* define native vegetation as belonging to two categories (DEPI 2013):

- Remnant patch; or
- Scattered trees.

The definitions of these categories are provided below.

#### Remnant patches

A remnant patch of native vegetation is either:

- An area of native vegetation where at least 25 per cent of the total perennial understorey plant cover is native; and/or
- Any area with three or more native canopy trees[2] where the canopy foliage cover[3] is at least 20 per cent of the area.

#### Scattered trees

The *Biodiversity assessment guidelines* define scattered trees as a native canopy tree[2] that does not form part of a remnant patch of native vegetation.

[1] A bioregion is defined as "a geographic region that captures the patterns of ecological characteristics in the landscape, providing a natural framework for recognising and responding to biodiversity values". In general bioregions reflect underlying environmental features of the landscape (DNRE 1997).

[2] A canopy tree is a reproductively mature tree that is greater than 3 metres in height and is normally found in the upper layer of the relevant vegetation type.

[3] Foliage cover is the proportion of the ground that is shaded by vegetation foliage when lit from directly above.

## 2.3. Limitations of field assessments

This assessment was undertaken as an overview assessment. While areas of native vegetation were mapped at a scale sufficient for informing preliminary power line design, the detailed extent and quality of this vegetation (habitat hectare score) was not recorded, and would require further assessment for fine-scale micro-siting of power poles and to provide information required for a Clause 52.17 Planning permit for the removal of any native vegetation. This is not the scope of the current report.

Some areas of roadside vegetation had been slashed recently and some areas of private land were heavily grazed and very dry. In these areas, it was difficult to make accurate conclusions on the presence of native vegetation and likely occurrence of listed species and communities. A precautionary approach was therefore adopted in these situations.

# 3. RESULTS OF THE BIODIVERSITY ASSESSMENT

This section of the report describes the general ecological characteristics of the landscape in which the two transmission line options lie. This is followed by a description of their native vegetation then their other biodiversity values, including their potential to support species and communities listed on the EPBC Act and FFG Act.

## 3.1. Overview of landscape ecological characteristics

The two alignment options (see Figure 1) are located approximately 190 to 200 kilometres west-south-west of Melbourne, roughly centred on the Mortlake Township. This study area falls within the Glenelg-Hopkins catchment and extends across two bioregions: the Dundas Tablelands (in the north-western part of the study area, west of Salt Creek); and, the Victorian Volcanic Plain (covering the remainder of the study area). Four prominent landscape features occur in or near the study area:

- Salk Creek (dissecting the north-western part of the study area);
- Mount Noorat (in Noorat);
- Lake Keilambete (in Terang); and
- Mount Shadwell (in Mortlake).

Salt Creek is a large creek extending along the far edge of the Dundas Tablelands bioregion, abutting newer quaternary basalt flows. The creek has carved a broad, deep valley with rocky escarpments at its edges, colluvial soils at the bases of the escarpments and alluvial floodplains on the valley floor, flanking the meandering creekline. At least parts of the creekline hold water permanently or semi-permanently. Roadsides on plains above the river valley (to the west of Salt Creek) supported high-quality indigenous grassland and woodland vegetation. The rocky escarpments supported some scattered indigenous shrubs over otherwise mostly weedy vegetation. The riparian zones supported some moderate quality semi-aquatic herbaceous vegetation while the defined creek channel was filled with Water Ribbons and lined with River Red-gums.

Mount Noorat and Mount Shadwell comprise scoria cone volcano complexes. Mount Noorat is a relatively young volcano. As a result, its skirting lava fields comprise rocky, undulating land with high soil fertility criss-crossed by dry-stone walls. Austral Bracken, Manna Gum and Sweet Bursaria are examples of the indigenous vegetation elements, which occur as very small, isolated remnants. Mount Shadwell is skirted by less rocky land and deeper soils.

Remaining land comprised fairly flat to very gently undulating land typical of older (i.e. more eroded) and/or less viscous lava flows. Many of the public roadsides within these parts of the study area supported moderate to very high-quality native grasslands and grassy wetlands. The formed roads in these road reserves were generally raised with a weedy embankment on each side. Some of the adjacent table-drains supported native grassland or wetland vegetation and cleared bare-earth fire breaks had been established along many road reserve edges which abutted adjacent private properties.

Predominant land uses on private land across this study area comprised stock grazing and cropping. Roadsides had been managed through fire-reduction burning, slashing and/or periodic stock grazing.

## 3.2. Native vegetation

The native vegetation found on the two transmission line options is described briefly below. Native vegetation, or potential native vegetation, was observed along a significant proportion of the eastern alignment option (totalling 105.55 hectares). A lower proportion of the western transmission line option supported native vegetation (totalling 37.85 hectares).

The mapped native vegetation belonged to the following 12 Ecological Vegetation Classes (EVCs) or mosaics of these:

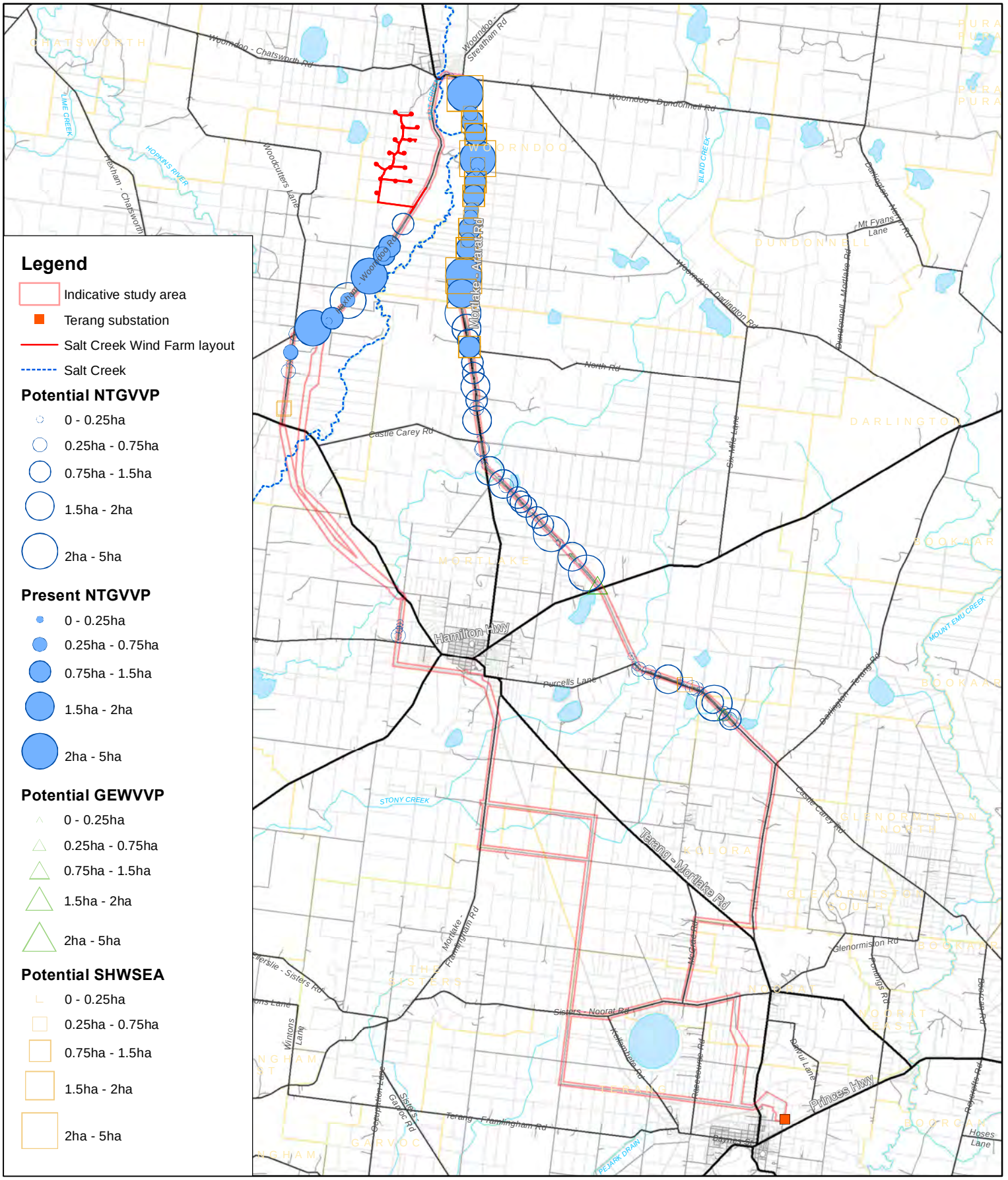
- Plains Grassy Woodland (EVC 55)
- Plains Grassy Woodland (EVC 55_61)
- Floodplain Riparian Woodland (56)
- Creekline Grassy Woodland (EVC 68)
- Plains Grassy Wetland (EVC 125)
- Plains Grassland (EVC 132)
- Heavier-soils Plains Grassland (132_61)
- Riparian Woodland (641)
- Aquatic Herbland (EVC 653)
- Brackish Wetland (EVC 656)
- Scoria Cone Woodland (894)
- Escarpment Shrubland (895)

Table 1 details the area of native vegetation in the EVCs along the two transmission line options. Figure 1 shows the location and extent of native vegetation along each option.

**Table 1: Area of Ecological Vegetation Classes within the study areas for each transmission line option**

| Ecological Vegetation Class | Eastern Option (ha) | Western Option (ha) |
|---|---|---|
| Aquatic Herbland (653) | 0.17 | 0.32 |
| Brackish Wetland (656) | 0.10 | 0.00 |
| Creekline Grassy Woodland (68) | 0.74 | 1.60 |
| Floodplain Riparian Woodland (56) | 0.00 | 2.04 |
| Heavier-soils Plains Grassland (132_61) | 82.90 | 26.05 |
| Heavier-soils Plains Grassland/ Plains Grassy Wetland (132_61/125) | 1.51 | 0.00 |
| Plains Grassland/ Plains Grassy Woodland (132/55) | 14.38 | 0.00 |
| Plains Grassy Wetland (125) | 0.59 | 1.28 |
| Plains Grassy Woodland (55) | 2.45 | 0.814 |
| Plains Grassy Woodland Mosaics | 2.72 | 4.95 |
| **TOTAL** | **105.55** | **37.85** |

This table shows that the study area for the eastern option supports about three times the area of remnant native vegetation as the western option.


Legend
Indicative study area
Terang substation
Salt Creek Wind Farm layout
Salt Creek
Potential NTGVVP
0 - 0.25ha
0.25ha - 0.75ha
0.75ha - 1.5ha
1.5ha - 2ha
2ha - 5ha
Present NTGVVP
0 - 0.25ha
0.25ha - 0.75ha
0.75ha - 1.5ha
1.5ha - 2ha
2ha - 5ha
Potential GEWVVP
0 - 0.25ha
0.25ha - 0.75ha
0.75ha - 1.5ha
1.5ha - 2ha
2ha - 5ha
Potential SHWSEA
0 - 0.25ha
0.25ha - 0.75ha
0.75ha - 1.5ha
1.5ha - 2ha
2ha - 5ha
Woomdoo - Chatsworth Rd
Woomdoo - Streatham Rd
Woomdoo - Dundonnell Rd
Woodcutters Lane
Woodgate - Woodglen Rd
Mortlake - Ararat Rd
Woomdoo - Darlington Rd
Dundonnell - Mortlake Rd
Mt Fyans Lane
North Rd
Castle Carey Rd
Six Mile Lane
Hamilton Hwy
Purcells Lane
Darlington - Terang Rd
Terang - Mortlake Rd
Mortlake - Framlingham Rd
Sisters - Noorat Rd
Glenormiston Rd
Princes Hwy
Terang - Framlingham Rd
Hoses Lane
Ballarat
Melbourne
Geelong
Kilometers
0
2.5
5
10
Attachment X1: Illustrative spatial distribution of EPBC communities
Project: Salt Creek TxL Assessment
Client: Trust Power
Project No.: 15101
Date: 21/06/2016
Created By: N. May / D. Coppolino
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## 3.3. Listed communities

Of the foregoing native vegetation, some was confirmed as and some was considered potentially a listed threatened community.

Eight ecological communities were modelled to potentially occur in the study area. Of these, the following ecological communities were identified or considered to potentially occur in the study area due to the presence of corresponding site characteristics and general species composition:

- Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) – listed as critically endangered under the EPBC Act.
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains (SHWTLP) – listed as critically endangered under the EPBC Act.
- Grassy Eucalypt Woodland of the Victorian Volcanic Plain (GEWVVP) – listed as critically endangered under the EPBC Act.
- Western (Basalt) Plains Grassland (WBPG) – listed as threatened under the FFG Act.
- Western Basalt Plains (River Red Gum) Grassy Woodland (WBPGW) – listed as threatened under the FFG Act.

The potential occurrence of the EPBC Act listed communities is shown in Figure 1 and summarised in Table 2.

**Table 2: Potential area of EPBC Act listed communities within the study areas for each transmission line option.**

| EPBC Act listed community | Eastern Option (ha) | Western Option (ha) |
|---|---|---|
| NTGVVP* | 68.68 | 27.36 |
| SHWTLP* | 0.80 | 14.02 |
| GWVVP | 1.65 | 0.00 |

* Note that potential habitat for NTGVVP and SHWTLP can potentially co-occur in the same areas

This shows that the study area of the eastern transmission line options supports or potentially supports a significantly greater area (i.e. over twice the area) of EPBC Act listed threatened communities than the study area of the western alignment.

The potential occurrence of FFG Act listed communities is summarised in Table 3.

**Table 3: Potential area of FFG Act listed communities within the study areas for each transmission line option.**

| Community | Eastern Option (ha) | Western Option (ha) |
|---|---|---|
| WBPG | 82.00 | 22.68 |
| WBPGW | 32.79 | 0.79 |

This shows that most of the native vegetation along the eastern transmission line option qualifies potentially as FFG Act listed threatened community. Similarly, a very substantial proportion of the native vegetation on the western transmission line option could belong

to the FFG Act listed communities. In both cases, most belongs to the Western Basalt Plains Grassland community (WBPG), with a lesser area being Western Basalt Plains Grassy Woodland community (WBPGW).

## 3.4. Threatened species

Although targeted surveys were not undertaken for threatened flora or fauna species, an assessment was made of their likelihood of occurrence along both transmission line options. The threatened species considered to have the potential to occur in the study areas of both transmission line options are listed below. Nomenclature follows the Victorian Biodiversity Atlas.

- Adamson's Blown-grass
- Basalt Leek-orchid
- Clover Glycine
- Fragrant Leek-orchid
- Hairy Tails
- Maroon Leek-orchid
- Matted Flax-lily
- Purple Blown-grass
- Small Milkwort
- Spiny Peppercress
- Spiny Rice-flower
- Trailing Hop-bush
- White Sunray
- Striped Legless Lizard
- Growling Grass Frog
- Golden Sun Moth

Table 4 shows the area of potential habitat for listed threatened flora species comparing both options. Note that not all species are equally likely to occur in all areas with such potential so this table is a broad overview of the potential occurrence of these species that enables a comparison of the potential for impacts on threatened species of both options.

Table 4: Area of potential habitat for threatened species within the study areas for each transmission line option.

| Total maximum areas (ha) | Western Option (ha) | Eastern Option (ha) |
|---|---|---|
| Flora | | |
| Adamson's Blown-grass | 17.34 | 0.85 |
| Basalt Leek Orchid | 14.02 | 20.70 |
| Clover Glycine | 16.99 | 46.03 |
| Fragrant Leek-orchid | 14.02 | 20.70 |
| Hairy Tails | 12.63 | 12.23 |
| Maroon Leek-orchid | 14.02 | 20.70 |
| Matted Flax-lily | 14.02 | 51.75 |
| Purple Blown-grass | 17.34 | 22.54 |
| Small Milkwort | 14.02 | 20.70 |
| Spiny Peppercress | 15.64 | 2.36 |
| Spiny Rice-flower | 24.20 | 81.99 |
| Trailing Hop-bush | 0.93 | 51.52 |
| White Sunray | 14.02 | 47.55 |
| Fauna | | |
| Striped Legless Lizard | 26.05 | 85.27 |
| Growling Grass Frog | 6.94 | 22.87 |
| Golden Sun Moth | 26.05 | 98.33 |

Comparison of the western and eastern transmission line options shows that the study area of the eastern option supports much more habitat with the potential to support threatened flora and fauna species than the study area of the western option. Not only does it have more extensive habitat but such habitat exists over a higher proportion of the remnant native vegetation along this option for many more threatened species. This reflects the generally lower quality and more disturbed state of remnant native ground cover along the western alignment.

# 4. CONCLUSIONS

The conclusions from this overview comparison of the two transmission line options are summarised below.

- The western transmission line option supports less native vegetation than the eastern option (37.85 hectares versus 105.55 hectares).
- The western transmission line option supports a lesser area of potential habitat for the EPBC Act listed community Natural Temperate Grassland of the Victorian Volcanic Plains (NTGVVP) - 27.36 hectares (west) versus 68.68 hectares (east).
- The western transmission line option supports a larger area of potential habitat for the EOBC Act listed community Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains (SHWTLP) - 14.02 hectares (west) versus 0.80 hectares (east).
- The western transmission line option does not support any areas of potential habitat for the EPBC act listed community Grassy Eucalypt Woodland of the Victorian Volcanic Plain (GEWVVP), whereas the eastern option supports potentially 1.65 hectares.
- The western transmission line option supports a lesser area of potential habitat for the FFG Act listed community Western (Basalt) Plains Grassland (WBPG) - 22.68 hectares (west) versus 82 hectares (east).
- The western transmission line option supports a lesser area of potential habitat for the FFG Act listed community Western Basalt Plains (River Red Gum) Grassy Woodland (WBPGW) – 0.79 hectares (west) versus 32.79 hectares (east).
- The western transmission line option supports much less habitat with the potential to support listed threatened species and for less of these species (see Table 4).

In view of this, adoption of the western option would satisfy Commonwealth EPBC Act policies and state native vegetation planning provisions requiring the minimisation of project impacts on Matters of National Environmental Significance and on native vegetation.

# 5. REFERENCES

Department of Environment, Land, Water and Planning (DELWP) 2016a, *Biodiversity Interactive Map 2.0*. Department of Environment and Primary Industries (then DSE), East Melbourne, Victoria, viewed January 2016, http://www.depi.vic.gov.au

Department of Environment, Land, Water and Planning (DELWP) 2016b, *Ecological Vegetation Class (EVC) Benchmarks by Bioregion*, Department of Environment and Primary Industries (then DSE), East Melbourne, Victoria, viewed January 2016, http://www.depi.vic.gov.au

Department of Environment and Primary Industries (DEPI) 2013, *Permitted clearing of native vegetation: Biodiversity assessment guidelines* (dated September 2013), Department of Environment and Primary Industries, East Melbourne, Victoria.

Department of the Environment 2016, *EPBC Act Protected Matters Search Tool*. Department of the Environment, Canberra, viewed January 2016, http://www.environment.gov.au/topics/about-us/legislation/environment-protection-and-biodiversity-conservation-act-1999/protected