

# Cobden Solar Facility

## Native Vegetation Assessment

**Prepared for Bison Energy**

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**Nature  
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## 1. Executive summary

Nature Advisory Pty Ltd undertook a native vegetation assessment of a 25-hectare area of private land and adjacent roadsides at 181 Cobden-Terang Road, Cobden, a property proposed for the installation of a solar facility.

This report presents the information relevant to native vegetation on the property to accompany a planning permit application under Clause 52.17 of the Corangamite Planning Scheme, in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017a), herein referred to as 'the Guidelines'.

The following native vegetation was recorded in the study area:

- Eight patches of native vegetation, totalling 1.985 hectares.

These occurred within the road reserves of both Cobden-Terang Road and Cobden-South Ecklin Road.

No EPBC Act listed values were found in the study area.

One FFG Act listed value (Jersey Cudweed) was found within habitat zone B on public land.

To avoid impacts to native vegetation, it is recommended that the entry/exit point to the solar facility be located outside mapped patches of native vegetation, and that no development occurs within a six-metre buffer of the property boundary where the boundary is adjacent to native roadside vegetation.

A planning permit under Clause 52.17 of the Corangamite Planning Scheme will be required if native vegetation is to be removed. Additionally, a Protected Flora Permit would be required from DELWP to remove the FFG Act listed Jersey Cudweed within areas of native vegetation (habitat zone B).



## 2. Introduction

Bison Energy engaged Nature Advisory Pty Ltd to conduct a native vegetation assessment of a 25-hectare area of private land and adjacent road sides at 181 Cobden-Terang Road, Cobden, a property proposed for the installation of a solar facility.

This investigation was commissioned to provide information on the extent and condition of native vegetation in the study area according to Victoria's *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017a), herein referred to as 'the Guidelines'. Potential impacts on flora and fauna matters listed under the Victorian *Flora and Fauna Guarantee Act 1988* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* have been considered as part of a review of existing information and field investigation; no relevant implications were identified under either Act.

Specifically, the scope of the investigation included:

- A review of existing information on the native vegetation of the study area and surrounds, including:
  - DELWP's *Native Vegetation Information Management system* (NVIM).
- A site survey involving:
  - Characterisation and mapping of native vegetation on the site, as defined in the Guidelines;
  - Assessment of native vegetation in accordance with the Guidelines, including habitat hectare assessment and/or scattered tree assessment; and
  - Compilation of a flora species list for the site.

This report is divided into the following sections:

**Section 3** describes the methods used for the assessment, definitions and the legislative background.

**Section 4** presents the assessment results.

**Section 5** discusses the implications under the Guidelines.

This investigation was undertaken by a team from Nature Advisory comprising Annette Cavanagh (Botanist) and Inga Kulik (Senior Ecologist and Project Manager).

## 3. Definitions, methods and assessment process

### 3.1. Definitions

#### 3.1.1. Study area

The study area for this investigation is defined in Figure 1.

#### 3.1.2. Native vegetation

Native vegetation is currently defined in Clause 73.01 of all Victorian planning schemes as ‘plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses’. The Guidelines (DELWP 2017a) further classify native vegetation as belonging to two categories:

- Patch; or
- Scattered tree.

The definitions of these categories are provided below, along with the prescribed DELWP methods to assess them. Further details on definitions of patches and scattered trees are provided in Appendix 1.

#### Patch

A patch of native vegetation is either:

- An area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native; or
- Any area with three or more native canopy trees<sup>1</sup> where the drip line<sup>2</sup> of each tree touches the drip line of at least one other tree, forming a continuous canopy; or
- Any mapped wetland included in the *Current wetlands map*, available at *MapShareVic* (DELWP 2020b).

Patch condition is assessed using the habitat hectare method (Parkes *et al.* 2003; DSE 2004b) whereby components of the patch (e.g. tree canopy, understorey and ground cover) are assessed against an EVC benchmark. The score effectively measures the percentage resemblance of the vegetation to its original condition.

The *Native Vegetation Information Management* (NVIM) system (DELWP 2020c) provides modelled condition scores for native vegetation to be used in certain circumstances.

#### Scattered tree

A scattered tree is:

- A native canopy tree that does not form part of a patch.

Scattered trees are counted and mapped, the species identified and their circumference at 1.3 m above the ground is recorded.

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<sup>1</sup> A native canopy tree is a mature tree (i.e. it is able to flower) that is greater than 3 metres in height and is normally found in the upper layer of the relevant vegetation type.

<sup>2</sup> The drip line is the outermost boundary of a tree canopy (leaves and/or branches) where the water drips on to the ground.

### 3.2. Field methods

The field assessment was conducted on the 14<sup>th</sup> September 2020. During this assessment, the study area was surveyed on foot.

Sites in the study area found to support native vegetation were mapped through a combination of aerial photograph interpretation and ground-truthing using a hand-held GPS (accurate to approximately five metres).

Whilst this assessment was not designed to provide an exhaustive inventory of flora species in the study area, all efforts were made to schedule the site assessment at a time of year when the majority of native vegetation life forms are likely to be present. The spring timing of the survey and condition of vegetation was considered suitable to ascertain the extent and condition of native vegetation.

### 3.3. Planning permit and application requirements

State planning provisions are established under the *Victorian Planning and Environment Act 1987*. Clause 52.17 of all Victorian Planning Schemes states that:

*A permit is required to remove, destroy or lop native vegetation, including dead native vegetation.*

A permit is not required:

- If an exemption in Table 52.17-7 specifically states that that a permit is not required.
- If a native vegetation precinct plan corresponding to the land is incorporated into the planning scheme and listed in the schedule to Clause 52.16.
- If the native vegetation is specified in a schedule to Clause 52.17.

#### 3.3.1. Exemptions

Exemptions listed in Table 52.17-7 relevant to the study area include:

- *Planted vegetation:* Native vegetation that is to be removed, destroyed or lopped that was either planted or grown as a result of direct seeding. This exemption does not apply to native vegetation planted or managed with public funding for the purpose of land protection or enhancing biodiversity.

#### 3.3.2. Application requirements

Any application to remove, destroy or lop native vegetation must comply with the application requirements specified in the Guidelines (DELWP 2017a).

When assessing an application, Responsible Authorities are also obligated to refer to Clause 12.01-2 (Native vegetation management) in the Planning Scheme which in addition to the Guidelines, refers to the following:

- *Assessor's handbook – applications to remove, destroy or lop native vegetation* (DELWP 2018a).
- Statewide biodiversity information maintained by DELWP.

The application of the Guidelines (DELWP 2017a) are explained further in Appendix 1.

### 3.3.3. Referral to DELWP

Clause 66.02-2 of the Planning Scheme determines the role of DELWP in the assessment of native vegetation removal permit applications. If an application is referred, DELWP may make certain recommendations to the responsible authority in relation to the permit application.

Any application to remove, destroy or lop native vegetation must be referred to DELWP if:

- The impacts to native vegetation are in the *Detailed* assessment pathway;
- A property vegetation plan applies to the site; or
- The native vegetation is on Crown land which is occupied or managed by the responsible authority.

### 3.4. EPBC Act

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) protects a number of threatened species and ecological communities that are considered to be of national conservation significance. Any significant impacts on these species require the approval of the Australian Minister for the Environment.

If there is a possibility of a significant impact on nationally threatened species or communities or listed migratory species, a Referral under the EPBC Act should be considered. The Minister will decide after 20 business days whether the project will be a ‘controlled action’ under the EPBC Act, in which case it cannot be undertaken without the approval of the Minister. This approval depends on a further assessment and approval process (lasting between three and nine months, depending on the level of assessment).

Implications under the EPBC Act for the current proposal are discussed in Section 0.

### 3.5. FFG Act

The Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) lists threatened and protected species and ecological communities (DELWP 2018b, DELWP 2017b). Any removal of protected flora, which includes threatened flora species and the plants that make up threatened communities, listed under the FFG Act from public land requires a Protected Flora Licence or Permit under the Act, obtained from DELWP.

The FFG Act only applies to private land where a license is required to remove grass trees, tree ferns and sphagnum moss for sale, or where an Interim Conservation Order has been made to protect critical habitat for a threatened species or community. As no such habitat has ever been declared, this mechanism under the FFG Act has never been implemented.

Implications under the FFG Act for the current proposal are discussed in Section 5.5.



## 4. Existing information and results

### 4.1. Site description, zoning and overlays

The study area for this investigation (Figure 1) was approximately 25 hectares of private and public land located at 181 Cobden-Terang Road, approximately four kilometres west of the township of Cobden and 120 kilometres west-south-west of the City of Geelong. The study area was bordered by Cobden-Terang Road to the north, Cobden-South Ecklin Road to the south east, and private property to the west.

The study area supported loamy soil on a relatively flat landscape. A dam was present in the north of the study area where there was a slight dip in the landscape. The majority of the study area was used for agriculture with a thick cover of pasture grasses present for stock grazing. The surrounding landscape also supported agricultural properties. Powerlines ran through the road reserve along the Cobden-Terang Road and past clearing had been undertaken underneath the lines with significant regrowth now present.

Vegetation in the study area consisted predominantly of introduced pasture grasses, which included Rye Grass, Annual Meadow-grass and Canary Grass.

**Planted vegetation:** Windrows of introduced Cypress were planted along the property boundary in the north west, while two windrows of native vegetation were planted in the study area, one along the southern and western boundary, and one along an internal fenceline. These planted windrows included Bog Gum, Manna Gum, Sugar Gum, Black Wattle and Coast Wattle.

**Native vegetation** was only found in the study area within the road reserves. Blackwood was the dominant native species, with other native species including Cherry Ballart, Hop Goodenia, Prickly Tea-tree, Kangaroo Grass, Spear Grass and Sheep's Burr. The highest quality of native vegetation was present at the corner of Cobden-Terang Road and Cobden-South Ecklin Road where there was a diversity of lifeforms. Within patches of native vegetation, and elsewhere along the road side, weed species were common in the understorey. Weed species included Blackberry, Spear Thistle, Spanish Heath, Cocksfoot and Toowoomba Canary-grass. Along Cobden-Terang Road, there was also a high density of introduced deciduous trees, with the occurrence of native Blackwood amongst them.

The study area lies within the Victorian Volcanic Plain bioregion and falls within the Corangamite and the Glenelg Hopkins catchments and the Corangamite local government area. It is currently zoned Farming Zone and is not covered by any overlays in the Corangamite Planning Scheme.

### 4.2. Native vegetation

#### 4.2.1. Species recorded

During the field assessment, 46 plant species were recorded. Of these, 13 (28%) were indigenous and 33 (72%) were introduced, non-indigenous native in origin or planted (Appendix 3).

#### 4.2.2. Patches of native vegetation

Pre-European EVC mapping (DELWP 2020a) indicated that the study area and surrounds would have supported Herb-rich Foothill Forest (EVC 23) and Plains Grassy Woodland (EVC 55) prior to European settlement based on modelling of factors including rainfall, aspect, soils and remaining vegetation.

Evidence on site, including floristic composition and soil characteristics, suggested that Herb-rich Foothill Forest (EVC 23) was present within the roadsides (Figure 1). A description of this EVC is provided within the EVC benchmarks in Appendix 5.

Eight patches (referred to herein as habitat zones) comprising the abovementioned EVC, were identified in the study area (Table 1). This totalled an area of 1.985 hectares of native vegetation in patches, with no large trees.

**Table 1: Description of habitat zones in the study area**

Habitat Zone	EVC	Description
A	Herb-rich Foothill Forest (EVC 23)	This zone occurred in the road reserve of Cobden-South Ecklin Road. Native vegetation consisted predominantly of Blackwood, giving a total cover of approximately 40%, while there was some native Rush present in the understorey. The remainder of the understorey consisted of introduced species such as Toowoomba Canary-grass, Rye Grass, Cocksfoot, Spear Thistle and Prickly Lettuce. These weeds had a cover of over 50%. No bryophytes or soil crusts were present, and organic litter was mostly non-native in origin.
B	Herb-rich Foothill Forest (EVC 23)	This zone was in the wide road reserve at the corner of Cobden-Terang Road and Cobden-South Ecklin Road. Native vegetation included an open grassy groundcover where the cover of Blackwood was reduced. These areas were dominated by a high cover of Kangaroo Grass with a lower cover of Spear Grass. Other native understorey species included Tasman Flax-lily, Sheep's Burr, Jersey Cudweed, Crane's Bill and Saw Sedge, with a moderate cover of bryophytes. Where Blackwood cover increased, there was also the presence of Prickly Tea-tree as well as the introduced Spanish Heath. Other weed species in the zone included Toowoomba Canary-grass, Onion Grass, Blackberry, Paspalum and Pimpernel, giving a total weed cover of 35%. Some small logs were present and organic litter cover was predominantly native in origin.
C	Herb-rich Foothill Forest (EVC 23)	This zone was present amongst the introduced deciduous trees along Cobden-Terang Road. There was a moderate cover of Blackwood trees and saplings, while the understorey was mostly devoid of vegetation due to the dense shading of the deciduous trees.
D, E, F	Herb-rich Foothill Forest (EVC 23)	These zones occurred along the northern fenceline of the property and represented isolated stands of Blackwood. Blackwood trees were the only native species present, with the understorey being dominated by Toowoomba Canary-grass and Cocksfoot.

Habitat Zone	EVC	Description
G	Herb-rich Foothill Forest (EVC 23)	This zone was also amongst introduced deciduous trees along Cobden-Terang Road. Again, Blackwood was the dominant native species (30% cover), however, there were additional native species present in both the mid-storey and understorey, including Cherry Ballart, Hop Goodenia and Crane's Bill. Weed species in the zone had a cover of 40%. Typical weed species were Pimpernel, Cleavers, Toowoomba Canary-grass and Blackberry. Organic litter cover was 10% and was mostly non-native in origin. Bare ground cover was also approximately 10%.
H	Herb-rich Foothill Forest (EVC 23)	This zone was in the north west of the study area along Cobden-Terang Road. Blackwood was the dominant native species (30% cover), with Prickly Tea-tree also present in the clearer areas beneath the powerlines. Saw Sedge, Rush and Spear Grass were present in the understorey in these clearer areas. Beneath the Blackwood trees, there was a dense cover of introduced Blackberry. Other weed species present included Cocksfoot, Toowoomba Canary-grass and Spanish Heath.

The habitat hectare assessment results for these habitat zones are provided in Table 2. More detailed habitat scoring results are presented in Appendix 2.

**Table 2: Summary of habitat hectare assessment results**

Habitat Zone	EVC	Area (ha)	Condition score (out of 100)	No. of Large Trees in HZ
A	Herb-rich Foothill Forest (EVC 23)	0.225	14	0
B	Herb-rich Foothill Forest (EVC 23)	0.858	28	0
C	Herb-rich Foothill Forest (EVC 23)	0.127	14	0
D	Herb-rich Foothill Forest (EVC 23)	0.006	14	0
E	Herb-rich Foothill Forest (EVC 23)	0.006	14	0
F	Herb-rich Foothill Forest (EVC 23)	0.019	14	0
G	Herb-rich Foothill Forest (EVC 23)	0.074	16	0
H	Herb-rich Foothill Forest (EVC 23)	0.670	16	0
<b>Total</b>		<b>1.985</b>		<b>0</b>

#### 4.2.1. Scattered trees

No scattered trees were recorded in the study area.






**Figure 1:** Study area and native vegetation

**Project:** Cobden Solar Facility

**Client:** Bison Energy

**Date:** 16/09/2020

 Study area

 Herb-rich Foothill Forest (EVC 23)



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## 5. Proposed development and implications

### 5.1. Proposed development

The current proposal will involve the installation of a solar facility. An entry/exit point and access track to the facility will also be required.

There are currently no development plans for the facility.

### 5.2. Design recommendations

The following design recommendations are provided to avoid/minimise impacts on native vegetation:

- The entry/exit point to the facility be located outside native vegetation.
- No development occurs within a six-metre buffer of the property boundary where the boundary is adjacent to native roadside vegetation.

Further mitigation recommendations to mitigate impacts to native vegetation during construction are provided in Section 5.6.

### 5.3. Summary of planning implications

A planning permit under Clause 52.17 of the Corangamite Planning Scheme will be required if native vegetation is to be removed.

Planted native vegetation, i.e. the two windrows of native vegetation along the southern and western boundary and along an internal fenceline are exempt from requiring a permit under Clause 52.17 for removal.

### 5.4. EPBC Act

The EPBC Act protects a number of threatened species and ecological communities that are considered to be of national conservation significance. Any significant impacts on these species require the approval of the Australian Minister for the Environment.

Based on the relevant guidelines, the proposed development is unlikely to result in a significant impact on any EPBC Act-listed values.

Therefore, there are no implications under the EPBC Act.

### 5.5. FFG Act

The Victorian FFG Act lists threatened and protected species and ecological communities (DELWP 2018b, DELWP 2017b). Any removal of threatened flora species or communities (or protected flora) listed under the FFG Act from public land requires a Protected Flora Permit under the Act, obtained from DELWP.

The FFG Act only applies to private land in relation to the commercial collection of grasstrees, tree-ferns and sphagnum moss.

The following FFG Act values listed as threatened or protected are susceptible to impacts from the proposed development on public land:

- Jersey Cudweed (protected) within habitat zone B

A Protected Flora Permit would be required from DELWP to remove the plant taxa comprising the abovementioned listed threatened community, listed threatened flora species or otherwise



protected values from public land. Application forms for Protected Flora Permits can be obtained from DELWP offices or from their customer service centre.

#### 5.6. Construction mitigation recommendations

Recommendations to avoid and minimise impacts to native vegetation are provided in this report in Section 5.2.

Additional recommendations to mitigate impacts to vegetation during construction are provided below:

- Establish appropriate vegetation protection zones around areas of native vegetation to be retained prior to works.
- Ensure all construction personnel are appropriately briefed prior to works, and that no construction personnel, machinery or equipment are placed inside vegetation/tree protection zones.
- A suitably qualified zoologist should undertake a pre-clearance survey of planted trees to be removed (if this is the case) in the week prior to removal to identify the presence of any nests or hollows.
- If considered necessary based on the results of the pre-clearance survey, a suitably qualified zoologist should be on site during any tree removal works to capture and relocate any misplaced fauna that may be present.

## 6. References

- DELWP 2017a, *Guidelines for the removal, destruction or lopping of native vegetation*, Department of Environment, Land, Water and Planning, East Melbourne.
- DELWP 2017b, *Flora and Fauna Guarantee Act 1988 - Protected Flora List, June 2017*, Department of Environment, Land, Water and Planning, East Melbourne.
- DELWP 2018a, *Assessor's Handbook – Applications to remove, destroy or lop native vegetation* (Version 1.1, dated October 2018), Department of Environment, Land, Water and Planning, East Melbourne.
- DELWP 2018b, *Flora and Fauna Guarantee Act 1988 – Threatened List, April 2018*, Department of Environment, Land, Water and Planning, East Melbourne.
- DELWP 2020a, *NatureKit*, Department of Environment, Land, Water and Planning, East Melbourne, Victoria, viewed 14 September 2020, <https://www.environment.vic.gov.au/biodiversity/naturekit>.
- DELWP 2020b, *MapShareVic*, Department of Environment, Land, Water and Planning, East Melbourne, Victoria, viewed 14 September 2020, <https://www2.delwp.vic.gov.au/maps/maps-and-services/interactive-maps>.
- DELWP 2020c, *Native Vegetation Information Management system*, Department of Environment, Land, Water and Planning, East Melbourne, Victoria, viewed 14 September 2020, <https://nvim.delwp.vic.gov.au/>.
- Department of Sustainability and Environment (DSE) 2004b, *Native Vegetation: sustaining a living landscape, Vegetation Quality Assessment Manual – guidelines for applying the Habitat Hectare scoring method (Version 1.3)*, Department of Environment, Land, Water and Planning, East Melbourne.
- Parkes D, Newell G, & Cheal D 2003, 'Assessing the Quality of Native Vegetation: The 'habitat hectares' approach', *Ecological Management and Restoration* 4:29–38.

## Appendix 1: Details of the assessment process in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017a)

### *Purpose and objective*

Policies and strategies relating to the protection and management of native vegetation in Victoria are defined in the State Planning Policy Framework (SPPF). The objective identified in Clause 12.01 of all Victorian Planning Schemes is 'To ensure that there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation'.

This is to be achieved through the following three-step approach, as detailed in the Guidelines:

1. Avoid the removal, destruction or lopping of native vegetation.
2. Minimise impacts from the removal, destruction or lopping of native vegetation that cannot be avoided.
3. Provide an offset to compensate for the biodiversity impact from the removal, destruction or lopping of native vegetation.

**Note:** While a planning permit may still be required, if native vegetation does not meet the definition of either a patch or a scattered tree, an offset under the Guidelines is not required.

### *Assessment pathways*

The first step in determining the type of assessment required for any site in Victoria is to determine the assessment pathway for the proposed native vegetation removal. The three possible assessment pathways for applications to remove native vegetation in Victoria are:

- Basic;
- Intermediate; or
- Detailed.

This assessment pathway is determined by two factors:

- **Location Category**, as determined using the states' Location Map. The location category indicates the potential risk to biodiversity from removing a small amount of native vegetation. The three location categories are defined as:
  - **Location 1** – shown in light blue-green on the Location Map; occurring over most of Victoria.
  - **Location 2** – shown in dark blue-green on the Location Map; includes areas mapped as endangered EVCs and/or sensitive wetlands and coastal areas.
  - **Location 3** – shown in brown on the Location Map; includes areas where the removal of less than 0.5 hectares of native vegetation could have a significant impact on habitat for rare and threatened species.
- **Extent of native vegetation** – The extent of any patches and scattered trees proposed to be removed (as well as the extent of any past native vegetation removal), with consideration as to whether the proposed removal includes any large trees. Extent of native vegetation is determined as follows:
  - **Patch** – the area of the patch in hectares.
  - **Scattered Tree** – the extent of a scattered tree is dependent on whether the scattered tree is small or large. A tree is considered to be a large tree if it is greater or equal to the large tree benchmark diameter at breast height (DBH) for the relevant bioregional EVC. Any scattered

tree that is not a large tree is a small scattered tree. The extent of large and small scattered trees is determined as follows:

- **Large scattered tree** – the area of a circle with a 15-metre radius, with the trunk of the tree at the centre.
- **Small scattered tree** – the area of a circle with a ten-metre radius, with the trunk of the tree at the centre.

The assessment pathway for assessing an application to remove native vegetation is then determined as detailed in the following matrix table:

Extent of native vegetation	Location Category		
	Location 1	Location 2	Location 3
< 0.5 hectares and not including any large trees	Basic	Intermediate	Detailed
< 0.5 hectares and including one or more large trees	Intermediate	Intermediate	Detailed
≥ 0.5 hectares	Detailed	Detailed	Detailed

**Note:** If the native vegetation to be removed includes more than one location category, the higher location category is used to determine the assessment pathway.

#### *Landscape scale information – strategic biodiversity value*

The strategic biodiversity value (SBV) is a measure of a location's importance to Victoria's biodiversity, relative to other locations across the state. It is represented as a score between 0 and 1 and determined from the Strategic biodiversity value map, available from NVIM (DELWP 2020c).

#### *Landscape scale information – habitat for rare or threatened species*

Habitat importance for rare or threatened species is a measure of the importance of a location in the landscape as habitat for a particular rare or threatened species, in relation to other habitat available for that species. It is represented as a score between 0 and 1 and is determined from the Habitat importance maps, administered by DELWP.

This includes two groups of habitat:

- **Highly localised habitats** – Limited in area and considered to be equally important, therefore having the same habitat importance score.
- **Dispersed habitats** – Less limited in area and based on habitat distribution models.

Habitat for rare or threatened species is used to determine the type of offset required in the detailed assessment pathway.

#### *Biodiversity value*

A combination of site-based and landscape scale information is used to calculate the biodiversity value of native vegetation to be removed. Biodiversity value is represented by a general or species habitat score, detailed as follows.

Firstly, the extent and condition of native vegetation to be removed are combined to determine the habitat hectares as follows:

$$\text{Habitat hectares} = \text{extent of native vegetation} \times \text{condition score}$$

Secondly, the habitat hectare score is combined with a landscape factor to obtain an overall measure of biodiversity value. Two landscape factors exist as follows:

- **General landscape factor** – determined using an adjusted strategic biodiversity score, and relevant when no habitat importance scores are applicable;
- **Species landscape factor** – determined using an adjusted habitat importance score for each rare or threatened species habitat mapped at a site in the Habitat importance map.

These factors are then used as follows to determine the biodiversity value of a site:

$$\text{General habitat score} = \text{habitat hectares} \times \text{general landscape factor}$$

$$\text{Species habitat score} = \text{habitat hectares} \times \text{species landscape factor}$$

#### Offset requirements

A native vegetation offset is required for the approved removal of native vegetation. Offsets conform to one of two types and each type incorporates a multiplier to address the risk of offset:

- A **general offset** is required when the removal of native vegetation does not have a significant impact on any habitat for rare or threatened species (i.e. the proportional impact is below the species offset threshold). In this case a multiplier of 1.5 applies to determine the general offset amount.

$$\text{General offset (amount of general habitat units)} = \text{general habitat score} \times 1.5$$

- A **species offset** is required when the removal of native vegetation has a significant impact on habitat for a rare or threatened species (i.e. the proportional impact is above the species offset threshold). In this case a multiplier of 2 applies to determine the species offset amount.

$$\text{Species offset (amount of species habitat units)} = \text{Species habitat score} \times 2$$

**Note:** if native vegetation does not meet the definition of either a patch or scattered tree an offset is not required.

#### Offset attributes

Offsets must meet the following attribute requirements, as relevant:

- General offsets
  - **Offset amount** – general offset = general habitat score x 1.5
  - **Strategic biodiversity value (SBV)** – the offset has at least 80% of the SBV of the native vegetation removed



- **Vicinity** – the offset is in the same CMA boundary or municipal district as the native vegetation removed
- Habitat for rare and threatened species – N/A
- **Large trees** – the offset include the protection of at least one large tree for every large tree to be removed
- Species offsets
  - **Offset amount** – species offset = species habitat score x 2
  - Strategic biodiversity value (SBV): N/A
  - Vicinity: N/A
  - **Habitat for rare and threatened species** – the offset comprises mapped habitat according to the Habitat importance map for the relevant species
  - **Large trees** – the offset include the protection of at least one large tree for every large tree to be removed

## Appendix 2: Detailed habitat hectare assessment results

Habitat Zone			A	B	C	D	E	F	G	H
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number			23	23	23	23	23	23	23	23
Total area of Habitat Zone (ha)			0.225	0.858	0.127	0.006	0.006	0.019	0.074	0.670
Site Condition	Large Old Trees	/10	0	0	0	0	0	0	0	0
	Tree Canopy Cover	/5	0	0	0	0	0	0	0	0
	Lack of Weeds	/15	0	4	0	0	0	0	4	0
	Understorey	/25	5	10	5	5	5	5	5	5
	Recruitment	/10	5	5	5	5	5	5	3	5
	Organic Matter	/5	2	5	2	2	2	2	2	4
	Logs	/5	0	2	0	0	0	0	0	0
	Site condition standardising multiplier*		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Site Condition subtotal		12	26	12	12	12	12	14	14
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1
	Neighbourhood	/10	0	0	0	0	0	0	0	0
	Distance to Core	/5	1	1	1	1	1	1	1	1
Total Condition Score			14	28	14	14	14	14	16	16

\* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004).

## Appendix 3: Flora species recorded in the study area

Origin	Common name	Scientific name	EPBC	FFG-T	FFG-P	CaLP Act
p	Coast Wattle	<i>Acacia longifolia</i> subsp. <i>sophorae</i>			p	
p	Black Wattle	<i>Acacia mearnsii</i>			p	
	Blackwood	<i>Acacia melanoxylon</i>				
	Sheep's Burr	<i>Acaena echinata</i>				
*	Cape weed	<i>Arctotheca calendula</i>				
	Spear Grass	<i>Austrostipa</i> sp.				
*	Common Mouse-ear Chickweed	<i>Cerastium glomeratum</i> s.l.				
*	Spear Thistle	<i>Cirsium vulgare</i>				R
p	Cypress	<i>Cupressus</i> sp.				
*	Cocksfoot	<i>Dactylis glomerata</i>				
	Tasman Flax-lily	<i>Dianella tasmanica</i>				
*	Spanish Heath	<i>Erica lusitanica</i>				
p	Sugar Gum	<i>Eucalyptus cladocalyx</i>				
p	Bog Gum	<i>Eucalyptus kitsoniana</i>				
p	Manna Gum	<i>Eucalyptus viminalis</i>				
	Cherry Ballart	<i>Exocarpos cupressiformis</i>				
*	Fennel	<i>Foeniculum vulgare</i>				C
	Saw Sedge	<i>Gahnia</i> sp.				
*	Cleavers	<i>Galium aparine</i>				
	Crane's Bill	<i>Geranium</i> sp.				
	Hop Goodenia	<i>Goodenia ovata</i>				
*	Barley-grass	<i>Hordeum leporinum</i>				
*	Flatweed	<i>Hypochaeris radicata</i>				
	Rush	<i>Juncus</i> sp.				

Origin	Common name	Scientific name	EPBC	FFG-T	FFG-P	CaLP Act
*	Prickly Lettuce	<i>Lactuca serriola</i>				
	Jersey Cudweed	<i>Laphangium luteoalbum</i>			p	
	Prickly Tea-tree	<i>Leptospermum continentale</i>				
*	Rye Grass	<i>Lolium</i> sp.				
*	Pimpernel	<i>Lysimachia arvensis</i>				
*	Mallow	<i>Malva</i> sp.				
*	Hillock Bush	<i>Melaleuca hypericifolia</i>				
*	Soursob	<i>Oxalis pes-caprae</i>				R
	Wood Sorrel	<i>Oxalis</i> sp.				
*	Paspalum	<i>Paspalum dilatatum</i>				
*	Toowoomba Canary-grass	<i>Phalaris aquatica</i>				
*	Canary Grass	<i>Phalaris</i> sp.				
*	Sweet Pittosporum	<i>Pittosporum undulatum</i>				
*	Ribwort	<i>Plantago lanceolata</i>				
*	Annual Meadow-grass	<i>Poa annua</i> s.l.				
*	Prunus	<i>Prunus</i> sp.				
*	Wild Radish	<i>Raphanus raphanistrum</i>				
*	Onion Grass	<i>Romulea rosea</i>				
*	Sweet Briar	<i>Rosa rubiginosa</i>				C
*	Blackberry	<i>Rubus fruticosus</i> spp. agg.				C
*	Clustered Dock	<i>Rumex conglomeratus</i>				
	Kangaroo Grass	<i>Themeda triandra</i>				

**Notes: Origin:** \* = introduced to Victoria; p = planted; **EPBC** = threatened species status under the EPBC Act (EX = presumed extinct in the wild; CR = critically endangered; EN = endangered; VU = vulnerable); **FFG-T** = listed as threatened (L) under the FFG Act; **FFG-P**: listed as protected (P) under the FFG Act; **CaLP Act**: declared noxious weeds under the CaLP Act (C = Regionally Controlled Weeds [Land owners have the responsibility to take all reasonable steps to prevent the growth and spread of Regionally controlled weeds on their land]; R = Restricted Weeds [Trade in these weeds and their propagules, either as plants, seeds or contaminants in other materials is prohibited]).



#### Appendix 4: Photographs of vegetation in the study area



The study area was predominantly agricultural land with introduced pasture grasses



Windrows of planted trees were present along the south west boundary and along an internal fence





A windrow of planted Cypress occurred along the north western boundary of the property



Habitat Zone A: Native Blackwood trees along Cobden-South Ecklin Road





Habitat Zone B: Native Blackwood and Prickly Tea-tree with an understorey of native grasses in the road reserve at the corner of Cobden-Terang Road and Cobden-South Ecklin Road



Habitat Zone H: Native Blackwood trees with a dense understorey of introduced Blackberry adjacent to Cobden-Terang Road at the west of the study area

## Appendix 5: EVC benchmarks

Herb-rich Foothill Forest (EVC 23) – Victorian Volcanic Plain

# EVC/Bioregion Benchmark for Vegetation Quality Assessment

## Victorian Volcanic Plain bioregion

### EVC 23: Herb-rich Foothill Forest

#### Description:

Occurs on relatively fertile, moderately well-drained soils on an extremely wide range of geological types and in areas of moderate to high rainfall. Occupies easterly and southerly aspects mainly on lower slopes and in gullies. A medium to tall open forest or woodland to 25 m tall with a small tree layer over a sparse to dense shrub layer. A high cover and diversity of herbs and grasses in the ground layer characterise this EVC.

#### Large trees:

Species	DBH(cm)	#/ha
<i>Eucalyptus</i> spp.	70 cm	20 / ha

#### Tree Canopy Cover:

%cover	Character Species	Common Name
40%	<i>Eucalyptus ovata</i>	Swamp Gum
	<i>Eucalyptus obliqua</i>	Messmate Stringybark
	<i>Eucalyptus viminalis</i> ssp. <i>viminalis</i>	Manna Gum

#### Understorey:

Life form	#Spp	%Cover	LF code
Immature Canopy Tree		5%	IT
Understorey Tree or Large Shrub	2	10%	T
Medium Shrub	3	20%	MS
Small Shrub	1	1%	SS
Large Herb	2	5%	LH
Medium Herb	6	15%	MH
Small or Prostrate Herb	3	5%	SH
Large Tufted Graminoid	3	20%	LTG
Large Non-tufted Graminoid	1	5%	LNG
Medium to Small Tufted Graminoid	5	10%	MTG
Medium to Tiny Non-tufted Graminoid	2	10%	MNG
Ground Fern	1	5%	GF
Scrambler/Climber	2	5%	SC
Bryophytes/Lichens	na	20%	BL



## EVC 23: Herb-rich Foothill Forest - Victorian Volcanic Plain bioregion

LF Code	Species typical of at least part of EVC range	Common Name
T	<i>Acacia melanoxylon</i>	Blackwood
MS	<i>Leptospermum continentale</i>	Prickly Tea-tree
MS	<i>Acacia verticillata</i>	Prickly Moses
MS	<i>Ozothamnus ferrugineus</i>	Tree Everlasting
MS	<i>Bursaria spinosa</i>	Sweet Bursaria
SS	<i>Pimelea humilis</i>	Common Rice-flower
SS	<i>Hibbertia riparia</i>	Erect Guinea-flower
PS	<i>Bossiaea prostrata</i>	Creeping Bossiaea
PS	<i>Acrotriche serrulata</i>	Honey-pots
LH	<i>Senecio tenuiflorus</i>	Slender Fireweed
LH	<i>Pterostylis longifolia</i> s.l.	Tall Greenhood
MH	<i>Euchiton collinus</i> s.s.	Creeping Cudweed
MH	<i>Hypericum gramineum</i>	Small St John's Wort
MH	<i>Gonocarpus tetragynus</i>	Common Raspwort
MH	<i>Viola hederacea</i> sensu Willis (1972)	Ivy-leaf Violet
SH	<i>Hydrocotyle laxiflora</i>	Stinking Pennywort
LTG	<i>Juncus procerus</i>	Tall Rush
LTG	<i>Lepidosperma laterale</i> var. <i>majus</i>	Variable Sword-sedge
LTG	<i>Deyeuxia quadriseta</i>	Reed Bent-grass
LNG	<i>Lepidosperma longitudinale</i>	Pithy Sword-sedge
MTG	<i>Lomandra filiformis</i>	Wattle Mat-rush
MTG	<i>Lomandra sororia</i>	Small Mat-rush
MTG	<i>Lepidosperma laterale</i> var. <i>laterale</i>	Variable Sword-sedge
MNG	<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass
MNG	<i>Poa tenera</i>	Slender Tussock-grass
GF	<i>Pteridium esculentum</i>	Austral Bracken
SC	<i>Clematis aristata</i>	Mountain Clematis
SC	<i>Billardiera scandens</i>	Common Apple-berry

### Recruitment:

Continuous

### Organic Litter:

40 % cover

### Logs:

20 m/0.1 ha.

### Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
MH	<i>Hypochoeris radicata</i>	Cat's Ear	high	low
MH	<i>Centaureum erythraea</i>	Common Centaury	high	low
MNG	<i>Holcus lanatus</i>	Yorkshire Fog	high	high
MTG	<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	high	high

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