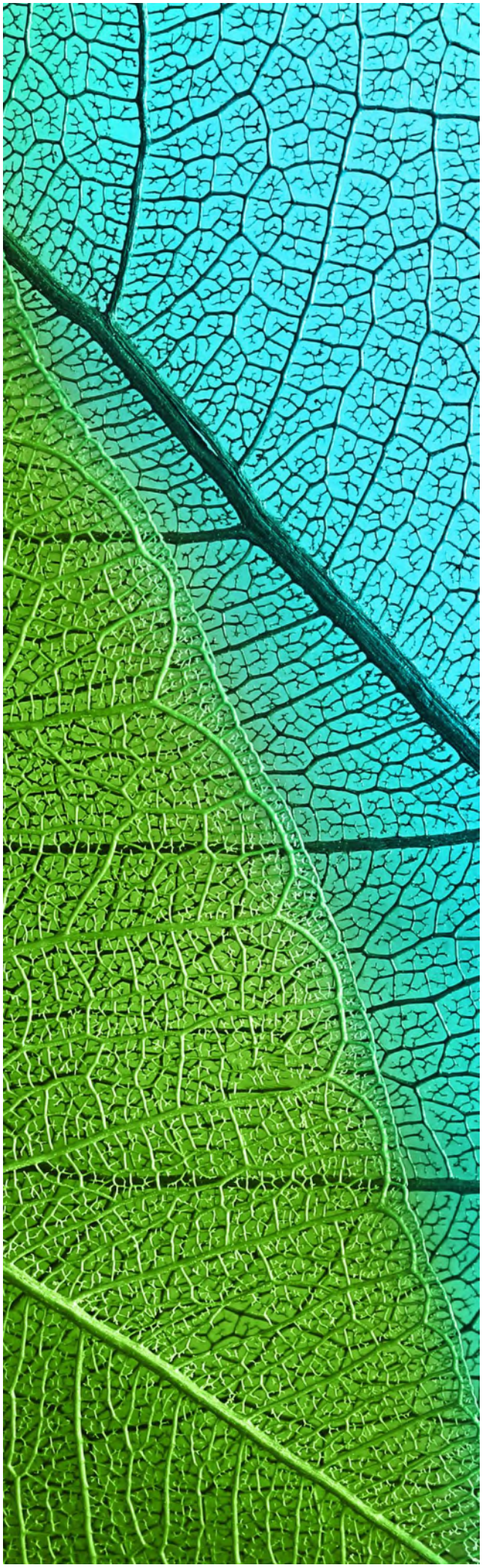

HAWKESDALE AND RYAN CORNER WIND FARMS TRANSMISSION LINE

FLORA AND FAUNA ASSESSMENT

Prepared for Ryan Corner Development Pty Ltd

September 2020
Report No. 14144 (12.5)

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1. EXECUTIVE SUMMARY

BL&A undertook a flora and fauna assessment of approximately 37 kilometres of proposed 132 KVA transmission line route in the localities of Hawkesdale, Willatook, Tarrone, Orford and Port Fairy. The specific area investigated, referred to herein as the 'study area', comprised a 30-metre-wide easement along the proposed transmission line route. Construction of a transmission line is proposed for the study area. The route of the transmission line has been planned over the last 10 years to align to a route that avoids most impacts on native vegetation.

The study area supported soils derived from basalt on a volcanic landscape, which has formed a mosaic of rocky outcrops, broader plains and wet depressions. The southern portion of the study area had evidence of more recent volcanic activity, which has resulted in a more dissected landscape and greater cover of outcropping rock.

The study area predominantly comprised farming land, with farm use mostly determined by the degree of outcropping rock and level of inundation in the landscape. As such, the southern portion of the study area was dominated by grazing (predominantly cattle), while the northern portion supported both grazing and cropping.

Vegetation in the study area consisted mainly of exotic pasture species, with the dominant species being Ryegrass, Soft Brome, Phalaris and Hare-tail Grass. Some rocky outcrops retained native vegetation of varying quality, dominated by native grasses (including Wallaby-grass, Kangaroo Grass and Weeping Grass) with scattered shrubs (mainly Tree-violet). Some lower-lying areas amongst rocky outcrops supported wetlands dominated by Common Tussock-grass and sedges. Other vegetation included roadside vegetation dominated by wattles, and vegetation found along ephemeral watercourses.

Fauna habitat within the study area comprised derived native grasslands, rocky outcrops, ephemeral watercourses and wetlands and treed vegetation along roadsides. The proposed transmission line will involve the removal of small, disparate patches of rocky outcrops, grassland and ephemeral aquatic habitat, and larger patches of treed vegetation. It is considered that the residual impacts of the proposal on fauna habitat would not impact any listed fauna species, provided construction mitigation measures to protect watercourses are in place during construction.

90 patches of native vegetation were identified in the study area. This totalled an area of 22 hectares of native vegetation in patches. The current proposed footprint will result in the loss of a total extent of 3.458 hectares of native vegetation. Offsets required to compensate for the proposed removal of native vegetation from the study area are provided below.

- 1.706 *general habitat units* and must include the following offset attribute requirements:
  - Minimum strategic biodiversity value (SBV) of 0.451
  - Occur within the Glenelg Hopkins CMA boundary or the Moyne municipal district.

Under the Guidelines all offsets must be secured prior to the removal of native vegetation.

The offset target for the current proposal will be achieved via a third-party offset.

An online search of the Native Vegetation Credit Register (NVCR) has shown that the required general offset **is** currently available for purchase from a native vegetation credit owner (DELWP 2020e).

Evidence that the required general offset is available is provided in Appendix 8. The required general offset would be secured following approval of the application to remove native vegetation.

A planning permit under Clause 52.17 of the Moyne Planning Scheme is required for the removal of native vegetation.

This proposal will trigger a referral to DELWP based on the criteria, specifically as a project that requires an detailed assessment pathway.

One EPBC act-listed ecological community, Grassy Eucalypt Woodland of the Victorian Volcanic Plain (GEWVVP) was recorded within the study area, while a second listed ecological community, Seasonal Herbaceous Wetlands of the Temperate Lowland Plains (SHWTLP), is considered likely to occur but would require assessment in spring to confirm.

Impacts could not be assessed based on information obtained during the current assessment for the following EPBC Act-listed values, given that surveys were not undertaken in the appropriate season or at a sufficient level of detail to determine presence or otherwise:

- Ecological communities:
    - Seasonal Herbaceous Wetlands of the Temperate Lowland Plains
- Species:
    - Matted Flax-lily (Endangered)
    - Clover Glycine (Vulnerable)
    - Gorae Leek-orchid (Endangered)
    - Maroon Leek-orchid (Endangered)
    - Swamp Fireweed (Vulnerable)
    - Swamp Everlasting (Vulnerable).

Targeted surveys are therefore required to determine the status of these values in the study area and to assess any potential impacts on these values. Two surveys, one in October in EVC 55_63 and a second in December in EVCs 55_63, 125 and 647 will be undertaken in 2020.

A Referral under the EPBC Act will be required for any of the above-listed flora species/ecological communities, or a combination of such, found to be potentially significantly impacted upon based on the findings of the recommended targeted surveys. However, if found on the planned impact site, then micro siting will be undertaken, or an engineering solution devised, to avoid impacts on EPBC Act-listed species and communities.

The table below summarises the compliance of the information in this report with the application requirements of the *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017a).

Application requirement		Response
1.	Information about the native vegetation to be removed	See Section 5.2, 0 and Appendix 7
2.	Topographic and land information relating to the native vegetation to be removed	See Section 5.1
3.	Recent, dated photographs of the native vegetation to be removed	See Appendix 5
4.	Details of any other native vegetation approved to be removed, or that was removed without the required approvals, on the same property or on contiguous land in the same ownership as the applicant, in the five-year period before the application for a permit is lodged	N/A
5.	An avoid and minimise statement	See Section 7.2.1
6.	A copy of any Property Vegetation Plan contained within an agreement made pursuant to section 69 of the *Conservation, Forests and Lands Act 1987* that applies to the native vegetation to be removed	N/A
7.	Where the removal of native vegetation is to create defendable space, a written statement explaining why the removal of native vegetation is necessary. This statement is not required when the creation of defendable space is in conjunction with an application under the Bushfire Management Overlay.	N/A
8.	If the application is under Clause 52.16, a statement that explains how the proposal responds to the Native Vegetation Precinct Plan considerations (at decision guideline 8).	N/A

Application requirement		Response
9.	An offset statement providing evidence that an offset that meets the offset requirements for the native vegetation to be removed has been identified and can be secured in accordance with the Guidelines.	See Section 7.2.4 and Appendix 8.
Additional requirements for applications in the Detailed Assessment Pathway		
10.	A site assessment report of the native vegetation to be removed, including: ▪ A habitat hectare assessment of any patches of native vegetation, including the condition, extent (in hectares), Ecological Vegetation Class and bioregional conservation status. ▪ The location, number, circumference (in centimetres measured at 1.3 metres above ground level) and species of any large trees within patches ▪ The location, number, circumference (in centimetres measured at 1.3 metres above ground level) and species of any scattered trees, and whether each tree is small or large.	See Sections: ▪ 0 and Appendix 1; ▪ No large trees in patches were recorded; and ▪ No scattered trees were recorded.

Application requirement		Response
11.	Information about impacts on rare or threatened species habitat, including: ▪ The relevant section of the Habitat importance map for each rare or threatened species requiring a species offset. ▪ For each rare or threatened species that the native vegetation to be removed is habitat for, according to the Habitat importance maps: - the species' conservation status - the proportional impact of the removal of native vegetation on the total habitat for that species - whether their habitats are highly localised habitats, dispersed habitats, or important areas of habitat within a dispersed species habitat.	See Appendix 5

2. INTRODUCTION

Ryan Corner Development Pty Ltd engaged Brett Lane & Associates Pty Ltd (BL&A) to conduct a flora and fauna assessment of approximately 37 kilometres of proposed 132 KVA transmission line route in the localities of Hawkesdale, Willatook, Tarrone, Orford and Port Fairy. The specific area investigated, referred to herein as the 'study area', comprised a 30-metre-wide easement along the proposed transmission line route. Construction of a transmission line is proposed for the study area.

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', as well as any potential impacts on flora and fauna matters listed under the state *Flora and Fauna Guarantee Act 1988* (FFG Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This report outlines any implications under relevant national, state and local legislation and policy frameworks.

This report is divided into the following sections:

Section 3 provides the legislative background including details of all relevant Commonwealth, State and local legislation and policies.

Section 4 describes the sources of information, including the methods used for the field survey.

Section 5 presents the assessment results, including details of the native vegetation, flora and fauna of the study area.

Section 6 discusses the proposed impacts of the project.

Section 7 details the implications of the findings under the relevant legislation and policy.

This investigation was undertaken by a team from BL&A, comprising Elinor Ebsworth (Senior Ecologist), Justin Sullivan (Senior Ecologist), Brett Macdonald (Senior Ecologist) and Bernard O'Callaghan (Senior Ecologist & Project Manager).

3. PLANNING AND LEGISLATIVE CONSIDERATIONS

This investigation and report addresses the application on the site of relevant legislation and planning policies that protect biodiversity. Local, state and Commonwealth controls are summarised below.

3.1. Local planning provisions

The study area is located within the Moyne local government area. It is primarily zoned Farm Zone (FZ), with three small areas of Road Zone – Category 1 (RDZ1) along the Penshurst-Warrnambool Road, Spencer Road and the Hamilton-Port Fairy Road in the Moyne Planning Scheme.

Local planning provisions apply under the Victorian *Planning and Environment Act 1987*.

3.1.1. Overlays

No overlays relevant to this investigation cover the study area.

3.2. State planning provisions

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:

- 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.

3.2.1. Exemptions

No exemptions to Clause 52.17 are relevant to this project.

3.2.2. 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 2017b); and
- Statewide biodiversity information maintained by DELWP.

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

3.2.3. 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 is 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.

3.3. 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.

Implications under the EPBC Act for the current proposal are discussed in Section 7.3.

3.4. FFG Act

The Victorian FFG Act lists threatened and protected species and ecological communities (DELWP 2017c, DELWP 2017d). 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 7.4.

3.5. EE Act

One or a combination of a number of criteria may trigger a requirement for a Referral to the Victorian Minister for Planning who will determine if an Environmental Effects Statement (EES) is required according to the "Ministerial Guidelines for Assessment of Environmental Effects under the *Environment Effects Act 1978"* (DSE 2006).

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

3.6. CaLP Act

The *Catchment and Land Protection Act 1994* (CaLP Act) requires that land owners (or a third party to whom responsibilities have been legally transferred) must prevent the growth and spread of regionally controlled weeds.

Weed species listed on the CaLP Act that have been recorded in the study area are discussed in Section 7.6.

4. EXISTING INFORMATION & METHODS

4.1. Existing information

Existing information used for this investigation is described below.

4.1.1. Existing reporting and documentation

The existing documentation below, relating to the study area was reviewed.

- Moyne Planning Scheme

4.1.2. Native vegetation

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 (EVCs) was obtained from published EVC benchmarks. These sources included:

- Relevant EVC benchmarks for the Victorian Volcanic Plains bioregion[1] (DSE 2004a); and
- NatureKit (DELWP 2018a).

4.1.3. Listed matters

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 study area boundary.

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 online EPBC Act Protected Matters Search Tool (DoEE 2015) was consulted to determine whether nationally listed species or communities potentially occurred in the search region based on habitat modelling.

4.2. Field methods

The field assessment was conducted on the 19th – 22nd March and the 3rd – 6th April 2018. During this assessment, the study area was surveyed on foot.

Sites in the study area found to support native vegetation or with potential to support listed matters were mapped through a combination of aerial photograph interpretation and ground-truthing using a hand held GPS (accurate to approximately five metres). Species and ecological communities listed as threatened under the EPBC Act were also mapped using the same method.

[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).

4.2.1. Native vegetation

Native vegetation is currently defined in the Victoria Planning Provisions 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[2] where the drip line[3] 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 in DELWP systems and tools.

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 2018b) provides modelled condition scores for native vegetation to be used in certain circumstances.

Scattered tree

A scattered tree is:

- A native canopy tree[2] 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.

4.2.2. Flora species and habitats

Records of flora species were made in conjunction with sampling methods used to undertake habitat hectare assessments of native vegetation described above. Specimens requiring identification using laboratory techniques were collected.

Species protected under the FFG Act were determined by crosschecking against the FFG Act Protected Flora List (DELWP 2017c).

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

The potential for habitats to support listed flora species was assessed based on the criteria outlined below:

- The presence of suitable habitat for flora species such as soil type, floristic associations and landscape context; and
- The level of disturbance of suitable habitats by anthropogenic disturbances and invasions by pest plants and animals.

Wherever appropriate, a precautionary approach was adopted in determining the likelihood of occurrence or flora listed under the EPBC Act and/or FFG Act. That is, where insufficient evidence was available on the potential occurrence of a listed species, it is assumed that it could be in an area of suitable habitat.

4.2.3. Fauna species and habitats

Fauna habitats are described using habitat components that include leaf litter, watercourses and waterbodies, soil cracks and surface rocks.

The study area's habitat connectivity (i.e. degree of isolation/fragmentation), including linkages to other habitats in the region, was determined using field observations, recent aerial photography and DELWP's NatureKit (DELWP 2018a).

Wherever appropriate, a precautionary approach was adopted in determining the likelihood of occurrence or fauna listed under the EPBC Act and FFG Act. That is, where insufficient evidence was available on the potential occurrence of a listed species, it is assumed that it could be in an area of suitable habitat.

4.2.4. Threatened ecological communities

The study area was assessed against published descriptions of relevant listed ecological communities modelled to potentially occur in the study area.

Reviewed ecological community descriptions comprised identification criteria and condition thresholds from listing advice for EPBC Act communities as well as FFG Act listed community descriptions (SAC 2015).

4.3. Limitations of field assessment

The site assessments were carried out in autumn. The short duration and seasonal timing of field assessments can result in some species not being detected when they may occur at other times. Additionally, some flora species and life-forms may be undetectable at the time of the survey or unidentifiable due to a lack of flowers or fruit.

Identification of the presence of the EPBC Act listed community, *Seasonal Herbaceous Wetlands of the Temperate Lowland Plains* (SHWTLP) was limited by the season and lack of inundation in vegetation that may qualify as this community (i.e. areas of Plains Grassy Wetland (EVC 125), Plains Sedgy Wetland (EVC 647) and Aquatic Herbland (EVC 653)). Where this was the case, this limitation was noted. A survey could be undertaken in spring for those of these EVCs proposed to be impacted to determine the presence (or otherwise) of this community, as per the listing advice (TSSC 2012); however given the very small impact to the potential community (0.003 hectares), this is not considered necessary.

The timing of the survey and condition of vegetation was otherwise considered suitable to ascertain the extent and condition of native vegetation and fauna habitats.

These limitations were not considered to compromise the validity of the current investigation, which was designed to address the relevant policies and decision guidelines.

Identification of EVCs considers vegetation types which would have naturally occupied the landscape prior to European impacts. Significant past vegetation clearance has resulted, in some cases, in the emergence of vegetation that is likely to be notably different to what would have naturally occupied the study area. Identification of EVCs in altered areas was therefore based upon consideration of:

- Modelled EVC mapping (DELWP 2018a);
- Observations of nearby natural vegetation;
- Any observed indigenous flora species that are useful for determining EVCs; and
- Relevant published EVC benchmark descriptions.

5. ASSESSMENT RESULTS

5.1. Site description

The study area for this investigation (Figure 1) was approximately 100 hectares of private agricultural land and roadsides in the localities of Hawkesdale, Willatook, Tarrone, Orford and Port Fairy, 250 kilometres south-west of Melbourne.

The study area supported soils derived from basalt on a volcanic landscape, which has formed a mosaic of rocky outcrops, broader plains and wet depressions. The southern portion of the study area had evidence of more recent volcanic activity, which has resulted in a more dissected landscape and greater cover of outcropping rock.

The study area predominantly comprised farming land, with farm use mostly determined by the degree of outcropping rock and level of inundation in the landscape. As such, the southern portion of the study area was dominated by grazing (predominantly cattle), while the northern portion supported both grazing and cropping.

The proposed transmission line will cross the following roads:

- Warrnambool-Penshurst Road;
- Woolsthorpe-Heywood Road;
- McGillvrays Road;
- Malseeds Road;
- Willatook-Warrong Road;
- Poyntons Road;
- Coomete Road;
- Tarrone North Road;
- Tarrone Lane;
- Gapes Road;
- Spencer Road; and
- Hamilton-Port Fairy Road.

The study area crossed a number of watercourses. Named watercourses within the study area included:

- Austins Creek;
- Nardoo Creek;
- Moyne River; and
- Back Creek.

A number of unnamed, ephemeral watercourses also occurred within the study area. Only Austins Creek, Back Creek and the Moyne River held water at the time of survey.

Vegetation in the study area consisted mainly of exotic pasture species, with the dominant species being Ryegrass, Soft Brome, Phalaris and Hare-tail Grass. Some rocky outcrops retained native vegetation of varying quality, dominated by native grasses (including Wallaby-grass, Kangaroo Grass and Weeping Grass) with scattered shrubs (mainly Tree-violet). Some lower-lying areas amongst rocky outcrops supported wetlands dominated by Common Tussock-grass and sedges.

Other vegetation included roadside vegetation dominated by wattles, and vegetation found along ephemeral watercourses.

Fauna habitat within the study area comprised derived native grasslands, rocky outcrops, ephemeral watercourses and wetlands and treed vegetation along roadsides.

The following key fauna habitat areas occurred within the region:

- Tower Hill Wildlife Reserve approximately 15 kilometres south-east of the study area. Native vegetation in the study area was isolated from this habitat by roads and large tracts of agricultural land.
- Belfast Coastal Reserve approximately 20 kilometres south-east of the study area. Native vegetation in the study area was isolated from this habitat by roads and large tracts of agricultural land.
- Budj Bim National Park approximately 25 kilometres north-west of the study area. Native vegetation in the study area was isolated from this habitat by roads and large tracts of agricultural land.

The study area lies within the Victorian Volcanic Plains bioregion and falls within the Glenelg Hopkins catchment management area.

5.2. Native vegetation

5.2.1. Patches of native vegetation

Pre–European EVC mapping (DELWP 2018a) indicated that the study area and surrounds would have supported the following EVCs prior to European settlement based on modelling of factors including rainfall, aspect, soils and remaining vegetation:

- Aquatic Herbland;
- Basalt Creekline Shrubby Woodland;
- Basalt Shrubby Woodland;
- Plains Grassland;
- Plains Grassy Wetland;
- Plains Grassy Woodland;
- Plains Sedgy Wetland;
- Plains Swampy Woodland;
- Stony Knoll Shrubland;
- Swamp Scrub; and
- Swampy Riparian Woodland.

Evidence on site, including floristic composition and soil characteristics, suggested that the following EVCs were present within the study area (Figure 1):

- Stony Knoll Shrubland (EVC 649);
- Basalt Shrubby Woodland (EVC 642);
- Plains Grassy Wetland (EVC 125);
- Plains Sedgy Wetland (EVC 647);
- Higher Rainfall Plains Grassy Woodland (EVC 55_63);
- Plains Swampy Woodland (EVC 651);

- Aquatic Herbland (EVC 653); and
- Swamp Scrub (EVC 53).

Descriptions of these EVCs are provided within the EVC benchmarks in Appendix 6.

90 patches (referred to herein as habitat zones) comprising the abovementioned EVCs, were identified in the study area. This totalled an area of 22 hectares of native vegetation in patches and included no large trees. Descriptions of a representative selection of those habitat zones proposed to be impacted are included in Table 1.

Table 1: Description of habitat zones in the study area

Habitat Zone	EVC	Description
BJ	Plains Grassy Wetland (EVC 125)	Ephemeral wetland with high cover of grass weeds including Phalaris and Spiny Rush. Dominant native species include Common Tussock-grass, Kangaroo Grass, wallaby-grasses, Australian Sweet-grass and Knobby Club-sedge. Native herbs include Common Woodruff, Cudweed, Lesser Loosestrife and Narrow Plantain. Moderate cover of bryophytes and high cover of organic litter dominated by exotic species.
AZ, BI, BK, CD, CI	Stony Knoll Shrubland (EVC 649)	Highly modified patch of Stony Knoll Shrubland lacking woody vegetation and dominated by Bracken, with scattered indigenous grasses including wallaby-grasses, Kangaroo Grass and Weeping Grass with indigenous herbs including Bidgee-widgee and Ivy-leaved Violet. Moderate cover of weeds dominated by high-threat grass weeds including Phalaris and Soft Brome. Good cover of bryophytes and soil crust. Moderate cover of organic litter dominated by exotic species.
BB, CF	Plains Sedgy Wetland (EVC 647)	Ephemeral wetland dominated by native sedges. Scattered native Grassland Wood-sorrel. Moderate cover of weeds dominated by Phalaris. No bryophytes recorded. High cover of organic litter dominated by native species.
BR, BS, BT, BU, BV, BW	Stony Knoll Shrubland (EVC 649)	Small patches of Stony Knoll Shrubland within roadside dominated by recruiting Blackwood trees and shrubs. Understorey dominated by pasture grasses and Mirror Bush shrubs with scattered native Windmill Grass. No bryophytes recorded. Moderate cover of organic litter dominated by native species.
BY, BZ, CJ, CK	Stony Knoll Shrubland (EVC 649)	Small patches of Stony Knoll Shrubland within roadsides dominated by Black Wattle trees and shrubs. No recruitment recorded. Understorey dominated by pasture grasses, Mirror Bush shrubs and Spear-thistles with moderate cover of native Bracken. No bryophytes recorded. High cover of organic litter dominated by exotic species.

Habitat Zone	EVC	Description
CE	Higher Rainfall Plains Grassy Woodland (EVC 55_63)	Patch of derived grassland that would have once supported Higher Rainfall Plains Grassy Woodland. No woody vegetation persists. Dominated by exotic pasture grasses including Phalaris and Soft Brome. Dominant native species include Common Tussock-grass, Kangaroo Grass, wallaby-grasses and Common Wheat-grass. Scattered bracken. No native herbs recorded. Moderate cover of bryophytes and high cover of organic litter dominated by exotic species.
DA	Plains Swampy Woodland (EVC 651)	Small patch of Plains Swampy Woodland along ephemeral watercourse including planted Swamp Gum and Blackwoods. Ground cover dominated by Mat Grass, spear-grasses, wallaby-grasses, Common Tussock-grass and Tall Sedge with scattered native herbs including Cotton Fire-weed and Lesser Loosestrife. Moderate cover of weeds dominated by Phalaris and Yorkshire Fog. No bryophytes recorded. High cover of organic litter dominated by native species.
DB	Plains Swampy Woodland (EVC 651)	Small patch of Plains Swampy Woodland along ephemeral watercourse including planted Swamp Gum and Broad-leafed Peppermint with Blackwoods and Black Wattle. Ground cover dominated by exotic pasture grasses including Phalaris and Yorkshire Fog with scattered native Common Tussock-grass and Black-anther Flax-lily. No bryophytes recorded. High cover of organic litter dominated by exotic species.
DE	Swamp Scrub (EVC 53)	Patch of Swamp Scrub along ephemeral watercourse including planted Swamp Gum with Prickly Tea-tree, Wooly Tea-tree, Blackwoods and Scented Paperbark. Ground cover dominated by native aquatic species including Common Reed, Cumbungi, Tall Sedge and Water Ribbons. High cover of weeds including the high-threat woody weeds Sweet Briar and Gorse. No bryophytes recorded. High cover of organic litter dominated by native species.

The habitat hectare assessment results for those habitat zones proposed to be impacted 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 no.	Area (ha)	Condition score (out of 100)	Condition score (out of 1)
J	642	0.065	18	0.18
K	642	0.051	15	0.15
L	642	0.056	15	0.15
M	642	0.074	15	0.15
R	125	0.097	40	0.40
AA	649	0.122	48	0.48
AB	649	0.043	48	0.48
AC	649	0.048	48	0.48
AE	649	0.367	48	0.48
AF	649	0.143	48	0.48
AG	649	0.381	48	0.48
AH	649	0.107	48	0.48
AI	649	0.541	48	0.48
AJ	649	0.617	48	0.48
AL	649	0.263	48	0.48
AO	125	0.700	56	0.56
AP	649	0.076	48	0.48
AR	649	0.290	48	0.48
AS	125	0.360	56	0.56
AU	649	0.312	48	0.48
AV	125	0.350	56	0.56
AX	125	1.056	56	0.56
AY	649	0.262	48	0.48
AZ	649	0.299	48	0.48
BA	125	0.305	56	0.56
BB	647	0.332	46	0.46
BC	55_63	0.505	23	0.23
BD	647	0.256	46	0.46
BE	55_63	0.283	23	0.23
BF	649	0.145	48	0.48
BG	649	0.292	48	0.48
BH	125	0.076	56	0.56
BI	649	1.130	48	0.48
BJ	125	0.682	56	0.56
BK	649	0.835	48	0.48
BL	647	0.017	46	0.46
BM	55_63	0.465	26	0.26

Habitat Zone	EVC no.	Area (ha)	Condition score (out of 100)	Condition score (out of 1)
BN	55_63	0.072	28	0.28
BO	55_63	0.503	23	0.23
BP	125	0.314	56	0.56
BQ	55_63	0.358	28	0.28
BR	649	0.005	33	0.33
BS	649	0.018	33	0.33
BT	649	0.033	32	0.32
BU	649	0.024	31	0.31
BV	649	0.030	31	0.31
BW	649	0.078	33	0.33
BY	649	0.030	17	0.17
BZ	649	0.007	17	0.17
CA	649	0.082	48	0.48
CB	649	0.047	48	0.48
CC	125	0.253	56	0.56
CD	649	0.196	48	0.48
CE	55_63	0.809	23	0.23
CF	647	0.182	46	0.46
CG	649	0.193	48	0.48
CH	125	0.257	55	0.55
CI	649	0.889	48	0.48
CJ	649	0.042	18	0.18
CK	649	0.012	18	0.18
CL	649	0.544	48	0.48
CM	649	0.405	48	0.48
CN	649	0.047	48	0.48
CO	649	0.168	48	0.48
CP	125	0.105	42	0.42
CQ	125	0.087	42	0.42
CR	55_63	0.188	23	0.23
CS	649	0.082	48	0.48
CT	649	0.080	48	0.48
CU	649	0.140	48	0.48
CV	125	0.450	56	0.56
CY	649	0.140	48	0.48
CZ	649	0.562	48	0.48
DA	651	0.037	24	0.24
DB	651	0.047	20	0.20
DC	653	0.275	39	0.39
DD	647	0.653	28	0.28

Habitat Zone	EVC no.	Area (ha)	Condition score (out of 100)	Condition score (out of 1)
DE	53	0.260	12	0.12
DI	649	0.012	48	0.48
DK	649	0.239	48	0.48
DL	649	0.099	48	0.48
DM	649	0.363	48	0.48
DN	649	0.069	49	0.49
DP	649	0.155	48	0.48
DQ	649	0.194	48	0.48
DR	649	0.019	48	0.48
DT	649	0.033	48	0.48
DU	53	0.013	23	0.23
DW	53	0.050	23	0.23
DX	53	0.047	23	0.23
Total		22.000		

Figure 1: Study area and native vegetation

Project: RCWF and HWF external txl
Client: Ryan Corner Wind Farm Pty Ltd
Date: 18/11/2020

Study area
Tranmission line easement
Native vegetation to be
Pole locations

Native vegetation

Swamp Scrub (EVC 53)

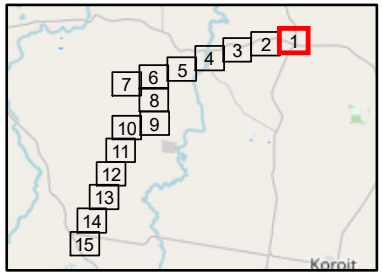

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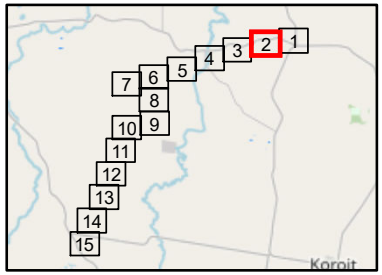
Figure 2: Study area and native vegetation

Project: RCWF and HWF external txl
Client: Ryan Corner Wind Farm Pty Ltd
Date: 18/11/2020

Study area
Tranmission line easement
Native vegetation to be removed
Pole locations

Native vegetation

Stony Knoll Shrubland (EVC 649)
Swamp Scrub (EVC 53)



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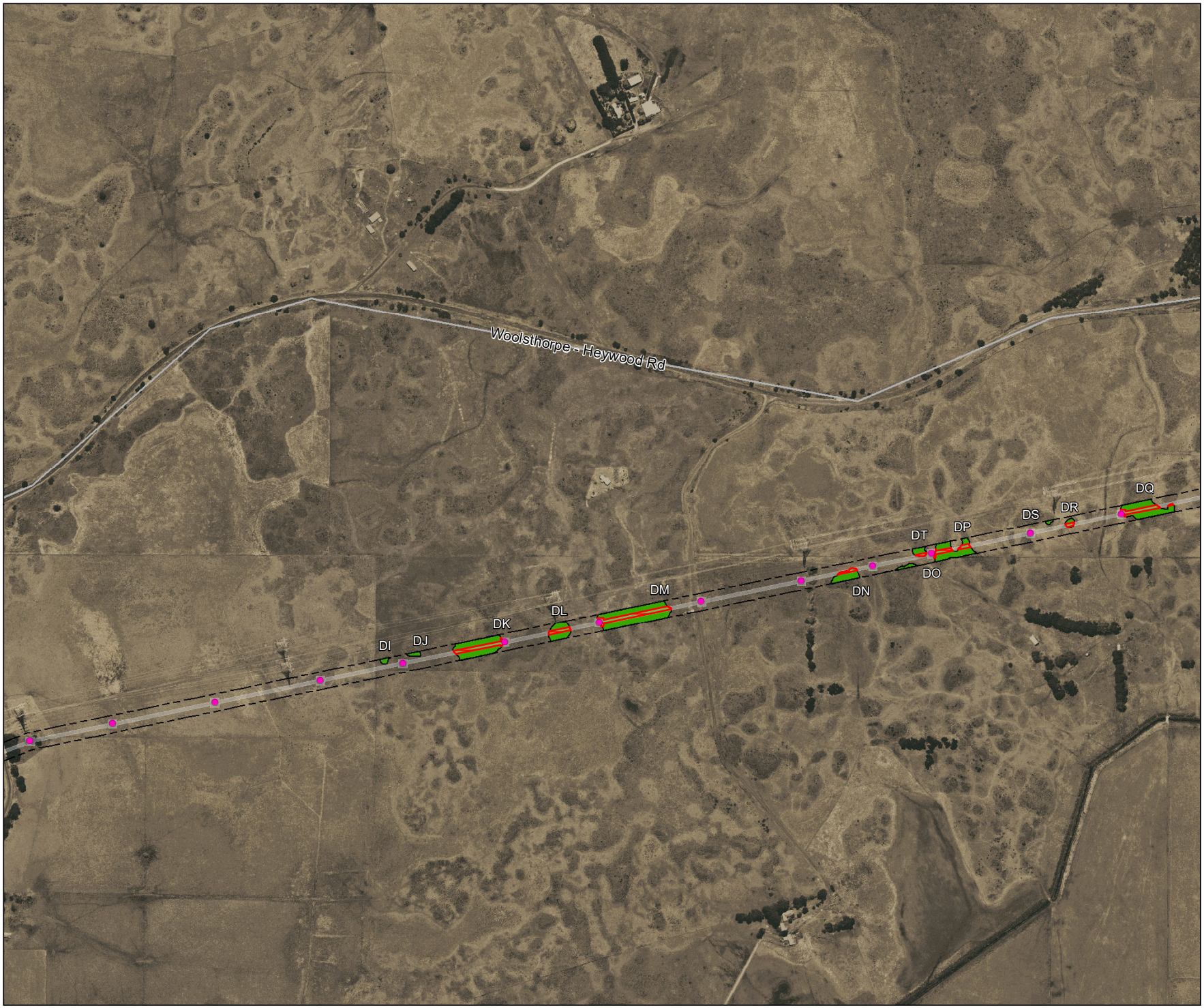

Figure 3: Study area and native vegetation

Project: RCWF and HWF external txl
Client: Ryan Corner Wind Farm Pty Ltd
Date: 18/11/2020

- Study area
- Tranmission line easement
- Native vegetation to be removed
- Pole locations

Native vegetation

- Stony Knoll Shrubland (EVC 649)

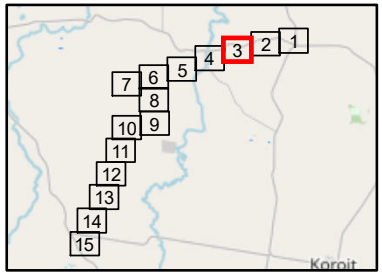

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Figure 4: Study area and native vegetation

Project: RCWF and HWF external txl
Client: Ryan Corner Wind Farm Pty Ltd
Date: 18/11/2020

- Study area
- Tranmission line easement
- Native vegetation to be removed
- Pole locations

Native vegetation

- Aquatic Herbland (EVC 653)
- Plains Sedgy Wetland (EVC 647)
- Swamp Scrub (EVC 53)

No-go zones

- Potential

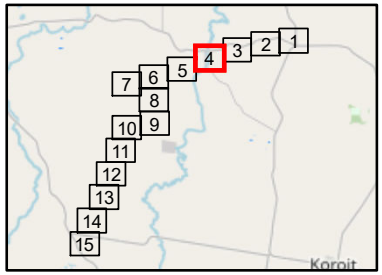

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Figure 5: Study area and native vegetation

Project: RCWF and HWF external txl
Client: Ryan Corner Wind Farm Pty Ltd
Date: 18/11/2020

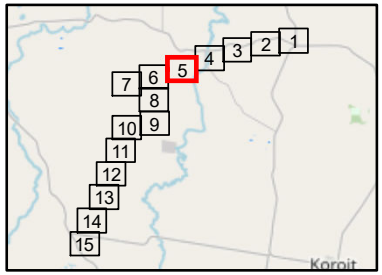
Study area
Tranmission line easement
Native vegetation to be removed
Pole locations

Native vegetation

Aquatic Herbland (EVC 653)
Plains Sedgy Wetland (EVC 647)
Plains Swampy Woodland (EVC 651)

No-go zones

Potential



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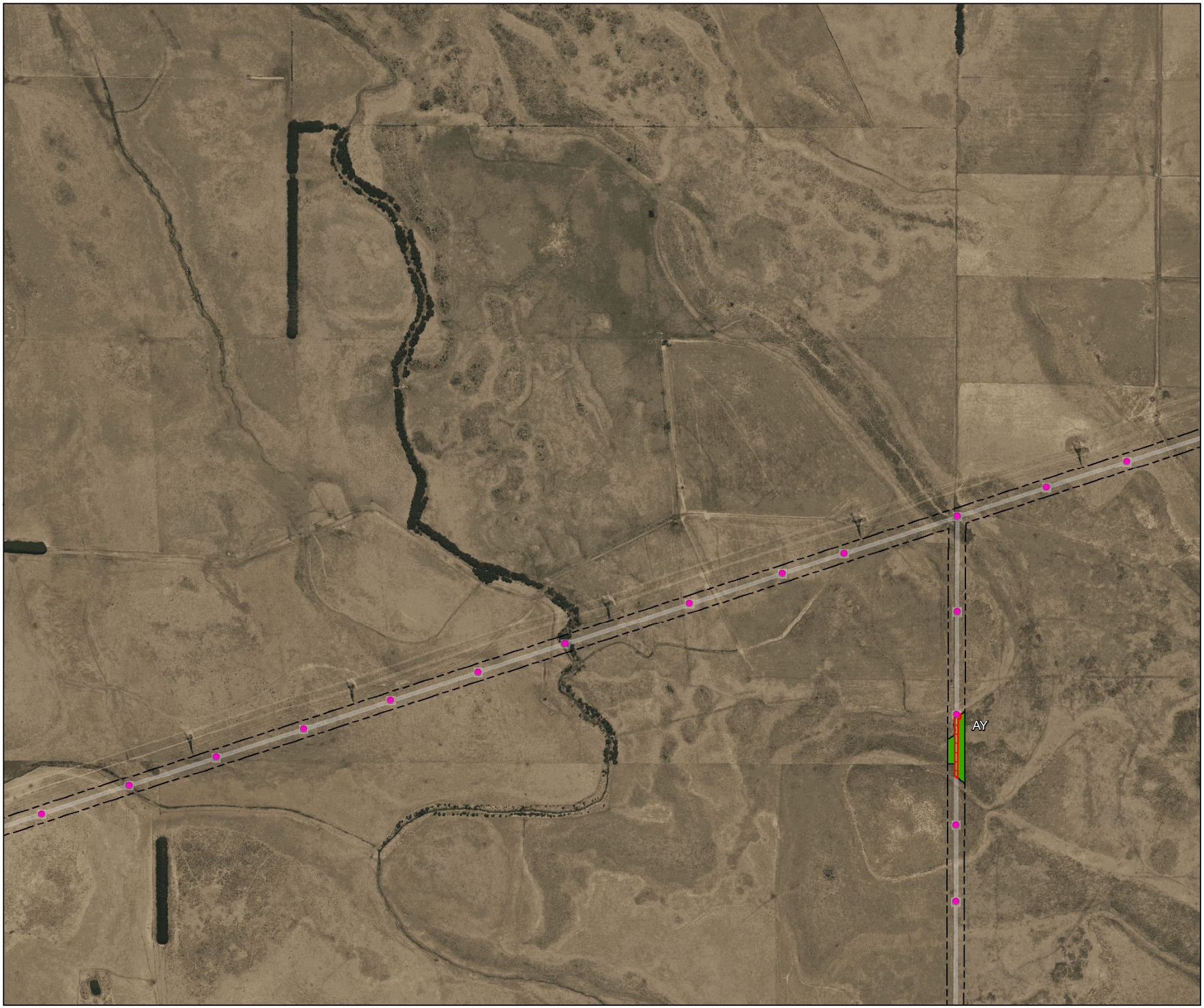

Figure 6: Study area and native vegetation

Project: RCWF and HWF external txl
Client: Ryan Corner Wind Farm Pty Ltd
Date: 18/11/2020

Study area
Tranmission line easement
Native vegetation to be
Pole locations

Native vegetation

Stony Knoll Shrubland (EVC

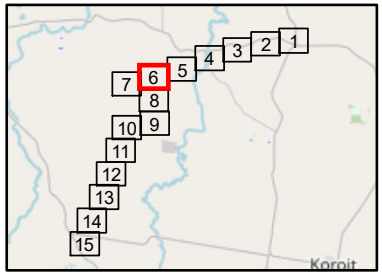

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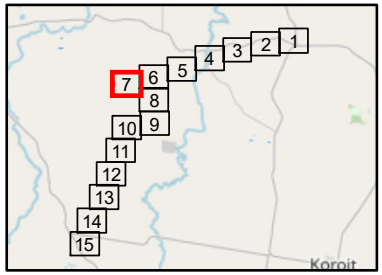
Figure 7: Study area and native vegetation

Project: RCWF and HWF external txl
Client: Ryan Corner Wind Farm Pty Ltd
Date: 18/11/2020

Study area
Tranmission line easement
Native vegetation to be
Pole locations

Native vegetation

Plains Grassy Wetland (EVC 125)
Stony Knoll Shrubland (EVC



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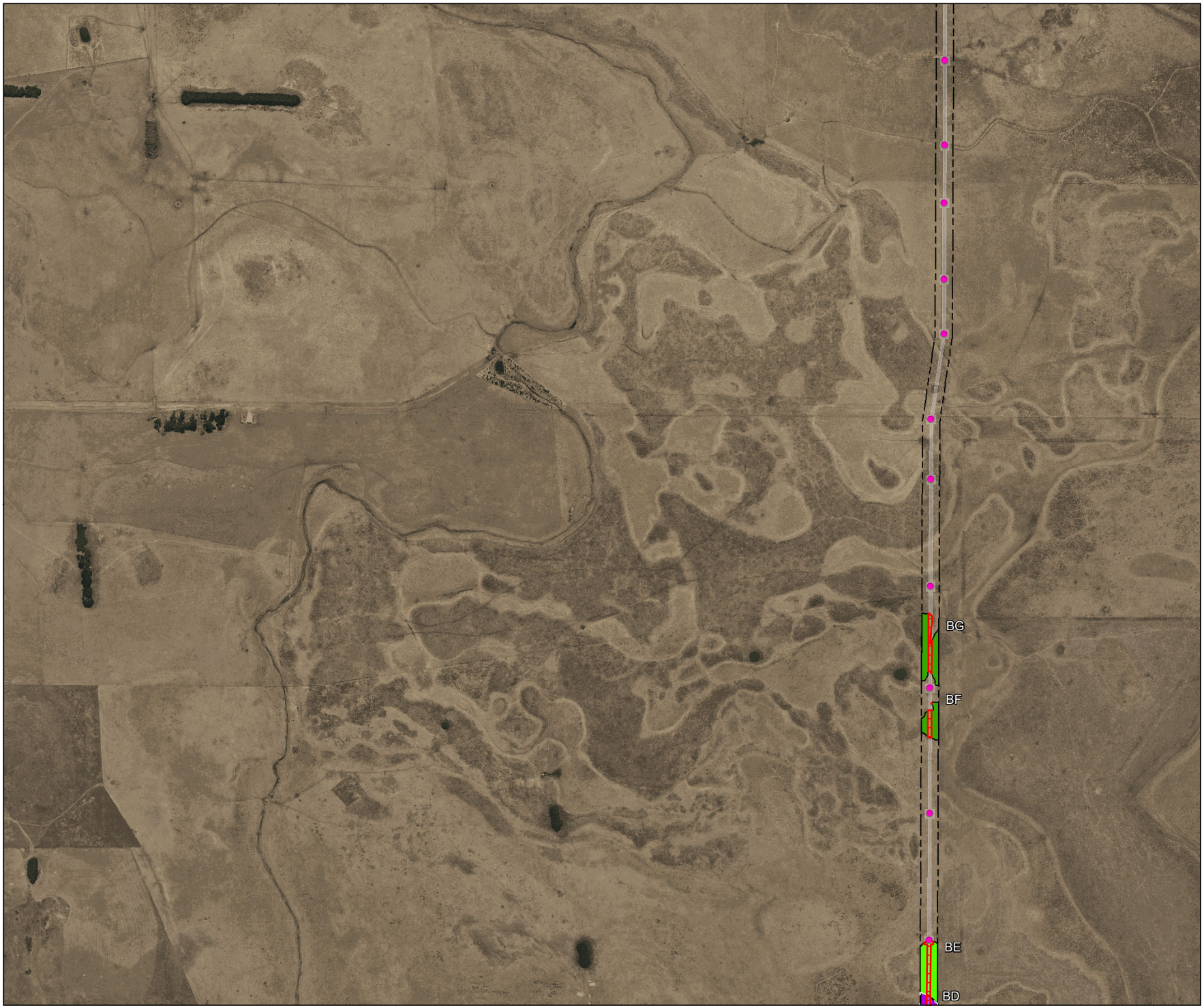


Figure 8: Study area and native vegetation

Project: RCWF and HWF external txl
Client: Ryan Corner Wind Farm Pty Ltd
Date: 18/11/2020

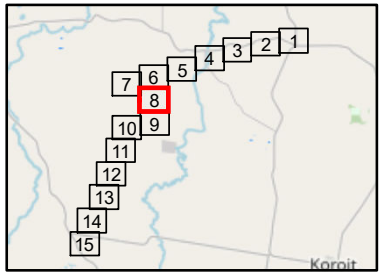
Study area
Tranmission line easement
Native vegetation to be
Pole locations

Native vegetation

Higher Rainfall Plains Grassy Woodland (EVC 55_63)
Plains Sedgy Wetland (EVC
Stony Knoll Shrubland (EVC

No-go zones

Potential



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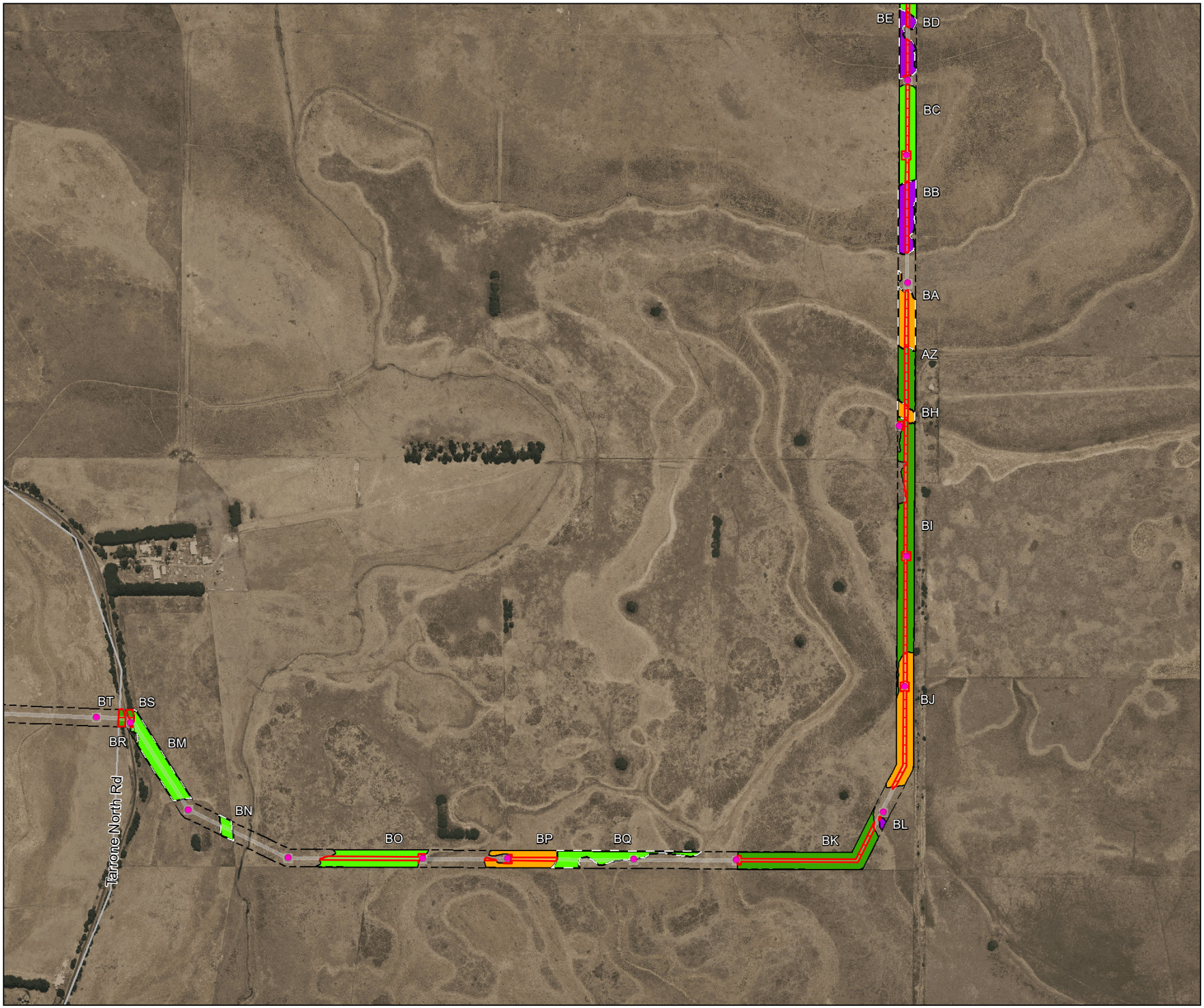

Figure 9: Study area and native vegetation

Project: RCWF and HWF external txl
Client: Ryan Corner Wind Farm Pty Ltd
Date: 18/11/2020

- Study area
- Tranmission line easement
- Native vegetation to be removed
- Pole locations

Native vegetation

- Higher Rainfall Plains Grassy Woodland (EVC 55_63)
- Plains Grassy Wetland (EVC 125)
- Plains Sedgy Wetland (EVC 647)
- Stony Knoll Shrubland (EVC 649)

No-go zones

- Potential

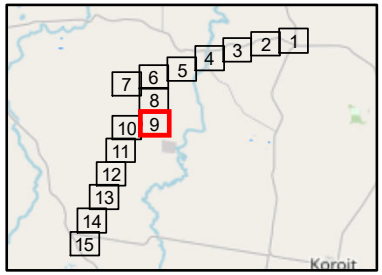

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Figure 10: Study area and native vegetation

Project: RCWF and HWF external txl
Client: Ryan Corner Wind Farm Pty Ltd
Date: 18/11/2020

Study area
Tranmission line easement
Native vegetation to be removed
Pole locations

Native vegetation

Stony Knoll Shrubland (EVC 649)

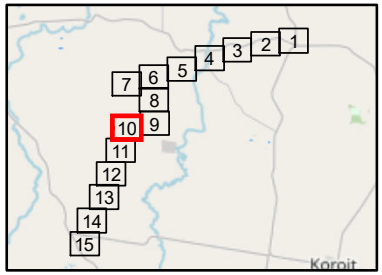

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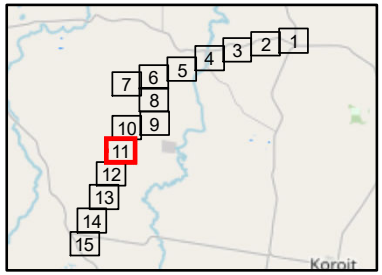
Figure 11: Study area and native vegetation

Project: RCWF and HWF external txl
Client: Ryan Corner Wind Farm Pty Ltd
Date: 18/11/2020

Study area
Tranmission line easement
Native vegetation to be removed
Pole locations

Native vegetation

Stony Knoll Shrubland (EVC 649)



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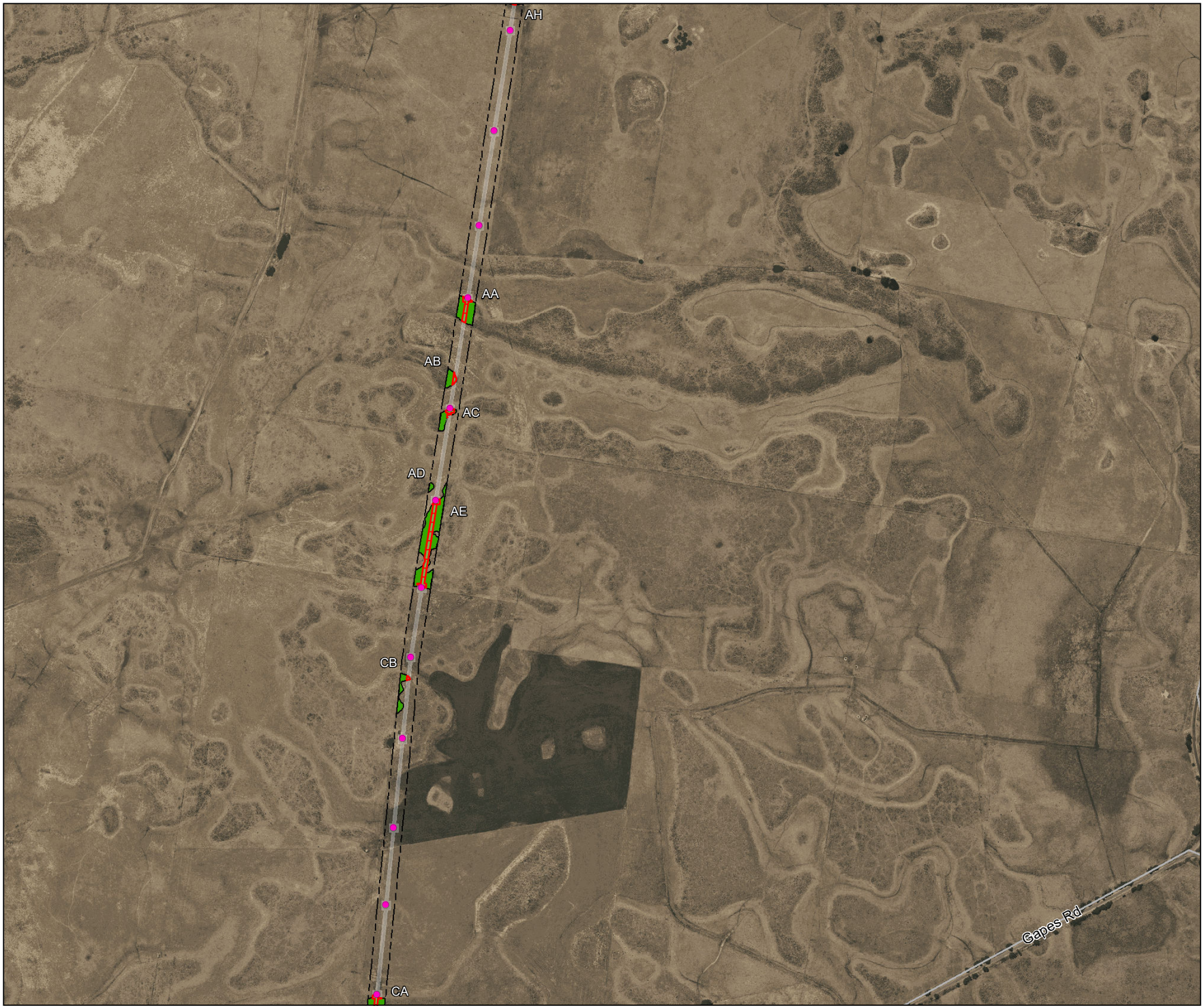


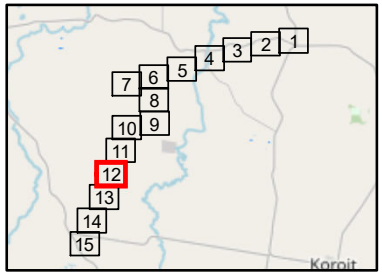
Figure 12: Study area and native vegetation

Project: RCWF and HWF external txl
Client: Ryan Corner Wind Farm Pty Ltd
Date: 18/11/2020

Study area
Tranmission line easement
Native vegetation to be removed
Pole locations

Native vegetation

Stony Knoll Shrubland (EVC 649)



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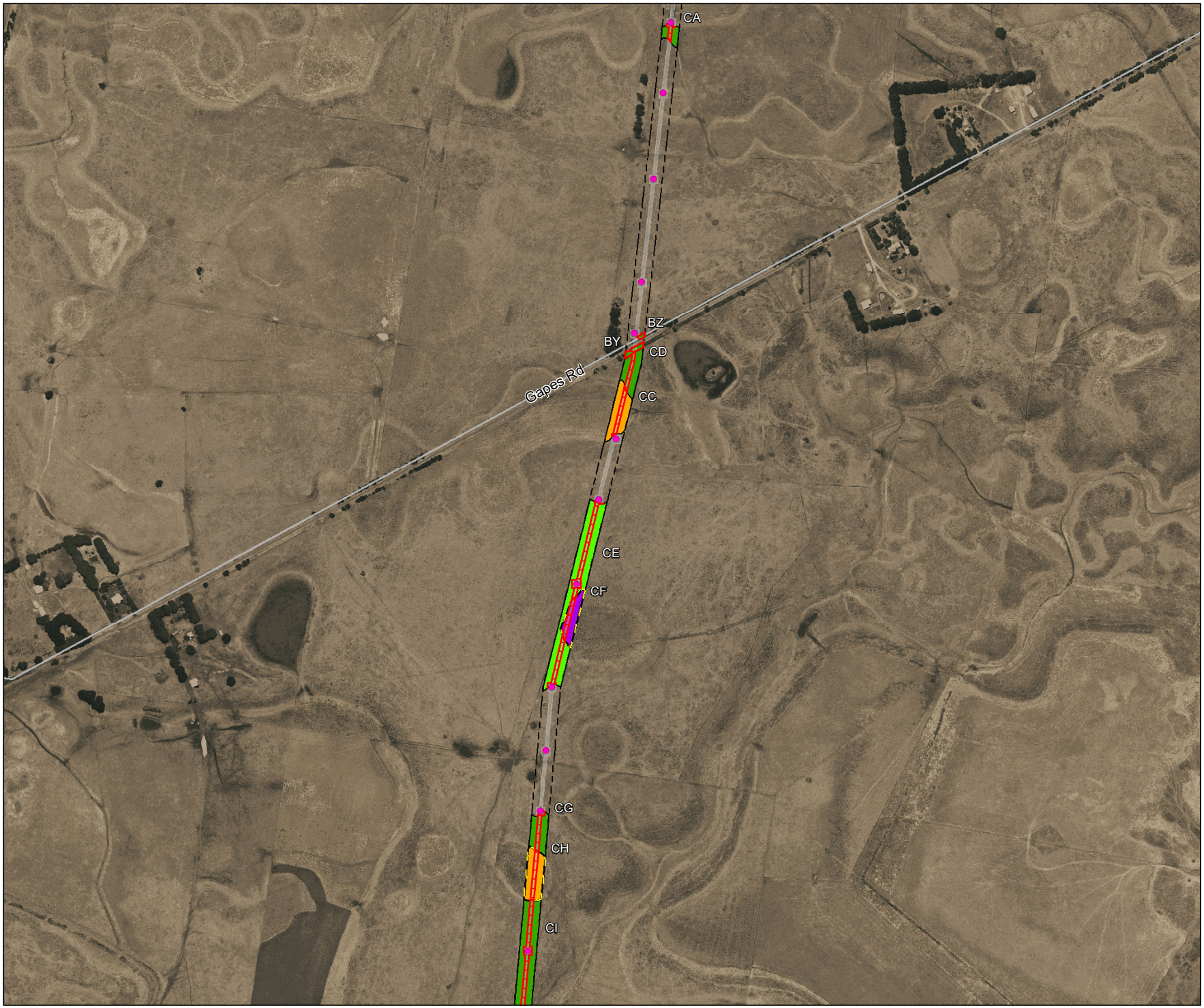


Figure 13: Study area and native vegetation

Project: RCWF and HWF external txl
Client: Ryan Corner Wind Farm Pty Ltd
Date: 18/11/2020

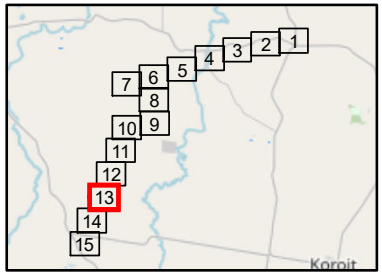
- Study area
- Tranmission line easement
- Native vegetation to be removed
- Pole locations

Native vegetation

- Higher Rainfall Plains Grassy Woodland (EVC 55_63)
- Plains Grassy Wetland (EVC 125)
- Plains Sedgy Wetland (EVC 647)
- Stony Knoll Shrubland (EVC 649)

No-go zones

- Confirmed



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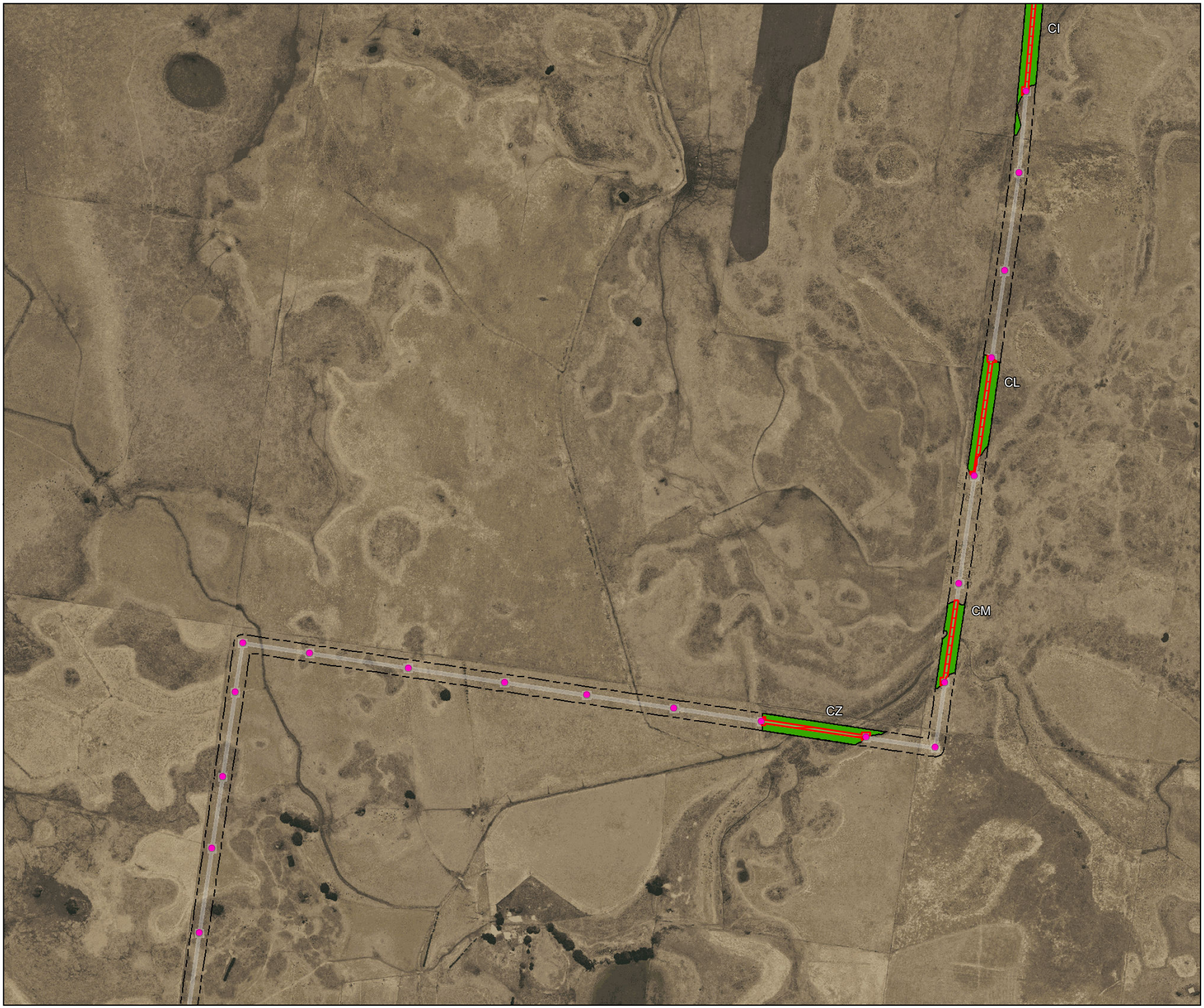

Figure 14: Study area and native vegetation

Project: RCWF and HWF external txl
Client: Ryan Corner Wind Farm Pty Ltd
Date: 18/11/2020

Study area
Tranmission line easement
Native vegetation to be removed
Pole locations

Native vegetation

Stony Knoll Shrubland (EVC 649)

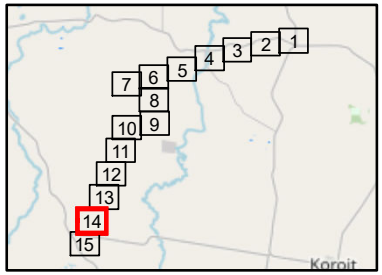

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Figure 15: Study area and native vegetation

Project: RCWF and HWF external txl
Client: Ryan Corner Wind Farm Pty Ltd
Date: 18/11/2020

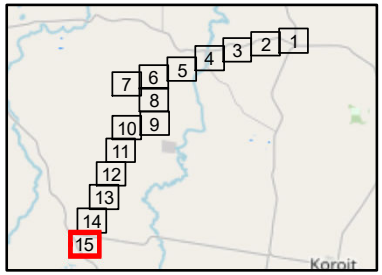
Study area
Tranmission line easement
Native vegetation to be removed
Pole locations

Native vegetation

Higher Rainfall Plains Grassy Woodland (EVC 55_63)
Plains Grassy Wetland (EVC 125)
Stony Knoll Shrubland (EVC 649)

No-go zones

Confirmed



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5.2.2. Scattered trees

No scattered trees were recorded in the study area.

5.3. Flora species

5.3.1. Species recorded

During the field assessments 95 plant species were recorded. Of these, 59 (62%) were indigenous and 36 (38%) were introduced or non-indigenous native in origin (Appendix 3).

5.3.2. Listed species

VBA records (DELWP 2018c) and the EPBC Protected Matters Search Tool (DoEE 2015) indicated that within the search region there were records of, or there occurred potential suitable habitat for, 19 species listed under the Commonwealth EPBC Act and 22 listed under the state FFG Act, including 15 listed under both Acts. No flora species listed under the EPBC Act were recorded during the field survey.

The likelihood of occurrence in the study area of species listed under the EPBC Act and FFG Act is addressed in Table 3. Species considered 'likely to occur' are those that have a very high chance of being in the study area based on numerous records in the search region and suitable habitat in the study area. Species considered to have the 'potential to occur' are those where suitable habitat exists, but recent records are scarce.

This analysis indicates that eight listed flora species are known to occur, likely to occur or have the potential to occur. These species are listed below.

- Curly Sedge (FFG: Listed)
- Matted Flax-lily (EPBC: Endangered; FFG: Listed)
- Clover Glycine (EPBC: Vulnerable; FFG: Listed)
- Gorae Leek-orchid (EPBC: Endangered; FFG: Listed)
- Maroon Leek-orchid (EPBC: Endangered; FFG: Listed)
- Basalt Leek-orchid (FFG: Listed)
- Swamp Fireweed (EPBC: Vulnerable)
- Swamp Everlasting (EPBC: Vulnerable; FFG: Listed)

Table 3: FFG Act and EPBC Act listed flora species and likelihood of occurrence

Common Name	Scientific name	EPBC	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
River Swamp Wallaby-grass	*Amphibromus fluitans*	VU		River Swamp Wallaby-grass grows mostly in permanent swamps and also lagoons, billabongs, dams and roadside ditches. The species requires moderately fertile soils with some bare ground; conditions that are caused by seasonally-fluctuating water levels (DoEE 2018).	0	N/A	Marginal suitable habitat. No records within 10km. **Unlikely to occur.**
Western Water-starwort	*Callitriche cyclocarpa*	VU	L	NSW and Victoria in thick patches in floodwaters. Also Victoria in River Red Gum open woodland with an open grassy understorey dominated by Paspalidium jubiflorum along river banks, and with wallaby grasses on ground less-frequently inundated (DEC 2007).	1	25/11/2009	No suitable habitat. **Unlikely to occur.**
Tuberous Bitter-cress	*Cardamine gunnii s.s.*		L	Appears to have been a plant of lowland swamps. The species is probably extinct due to extensive habitat clearing for agriculture. One recent (1968) collection was from Mount Gambier in South Australia (Thompson 1996).	2	1/11/1903	Marginal suitable habitat. Thought to be extinct. No recent records within 10km. **Unlikely to occur.**
Curly Sedge	*Carex tasmanica*		L	Occurs in seasonally wet, fertile, heavy basalt clay soils, usually around the margins of slightly saline drainage lines or freshwater swamps. The dominant vegetation type varies but is often grassy/sedgy and generally lacks trees (Carter 2010). Known occurrences are localised around Heywood, Portland, Port Fairy, Karish (Lake Weeranganuk), Craigieburn, Kalkallo and Wollert (VBA 2015).	1	23/12/2008	Suitable habitat within EVCs 53, 125, 647, 651, 653. **Recorded within study area** (beyond impact area). **No suitable habitat on public land.**
Matted Flax-lily	*Dianella amoena*	EN	L	Lowland grassland and grassy woodlands on well-drained to seasonally waterlogged fertile sandy loams to heavy cracking soils derived from sedimentary or volcanic Geology. It is widely distributed from eastern to south-western Victoria (DoEE 2018).	2	2/10/2016	Suitable (but species depauperate) habitat within EVC 55_63. **Potential to occur.**
Bell-flower Hyacinth-orchid	*Dipodium campanulatum*	EN	L	Reported from only a few scattered localities west of Melbourne to Portland (Entwisle 1994). The bell-flower hyacinth orchid is typically found on deep grey sands or limestone in stringybark or Yellow Gum woodland with an understorey of bracken and Acacia (Bates, 2011).	0	N/A	No suitable habitat. **Unlikely to occur.**
Swamp Diuris	*Diuris palustris*		L	Scattered distribution throughout western Victoria. Usually in swampy depressions in grassland or open woodland (Entwisle 1994).	1	21/09/1903	Marginal suitable habitat. No recent records within 10km. **Unlikely to occur.**
Clover Glycine	*Glycine latrobeana*	VU	L	Found across south-eastern Australia in native grasslands, dry sclerophyll forests, woodlands and low open woodlands with a grassy ground layer. In Victoria, populations occur in lowland grasslands, grassy woodlands and sometimes in grassy heath (DoEE 2018).	9	9/11/2016	Suitable (but species depauperate) habitat within EVC 55_63. **Potential to occur.**
Coast Ixodia	*Ixodia achillaeoides subsp. arenicola*	VU		Confined to coastal vegetation in the Cape Bridgewater-Portland area (Short 1999).	0	N/A	No suitable habitat. **Unlikely to occur.**
Adamson's Blown-grass	*Lachnagrostis adamsonii*	EN	L	Confined to slow moving creeks, swamps, flats, depressions or drainage lines that are seasonally inundated or waterlogged and usually moderately to highly saline. Appear to favour sites that have some shelter from the wind (DoEE 2018).	0	N/A	Marginal suitable habitat. No records within 10km. **Unlikely to occur.**
Purple Blown-grass	*Lachnagrostis punicea subsp. filifolia*		L	Seasonally wet, heavy clay soils (Walsh 1994).	6	22/11/2011	No suitable habitat within public land. **Unlikely to occur** within public land.
Basalt Peppercress	*Lepidium hyssopifolium*	EN	L	Known to establish on open, bare ground with limited competition from other plants. Previously recorded from Eucalypt woodland with a grassy ground cover, low open Casuarina woodland with a grassy ground cover and tussock grassland. Now generally found amongst exotic pasture grasses and beneath exotic trees (DoEE 2018).	1	25/11/2009	No suitable habitat. **Unlikely to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Pretty Leek-orchid	*Prasophyllum anticum*		L	Grassland on moist to wet black basaltic loam (Jeanes 2015).	2	22/10/2015	No suitable habitat. **Unlikely to occur.**
Gorae Leek-orchid	*Prasophyllum diversiflorum*	EN	L	Wet grasslands or inundated swamps among tussocks (Jones 2006).	4	19/11/1998	Suitable (but species depauperate) habitat within EVCs 53, 125, 647. **Potential to occur.**
Maroon Leek-orchid	*Prasophyllum frenchii*	EN	L	Grows mainly in open sedge swampland or in wet grassland and wet heathland generally bordering swampy regions. Sites are generally low altitude, flat and moist. Soils are generally moderately rich damp sandy or black clay loams. Climate is mild, with an annual rainfall of 600–1100 mm, occurring predominantly in winter and spring (DoEE 2018).	2	13/11/2005	Suitable (but species depauperate) habitat within EVCs 125 and 647. **Potential to occur.**
Dense Leek-orchid	*Prasophyllum spicatum*	VU		Occurs in coastal and near-coastal heathland and heathy woodland. Soils are generally sandy, with some sites seasonally waterlogged (Duncan 2010).	2	1/11/2000	No suitable habitat. **Unlikely to occur.**
Basalt Leek-orchid	*Prasophyllum viretrum*		L	Moist to wet grassland on dark basaltic loam (Jones & Rouse 2006).	16	24/11/2011	Suitable (but species depauperate) habitat within EVCs 125 and 647. **Potential to occur, but no suitable habitat on public land.**
Green-striped Greenhood	*Pterostylis chlorogramma*	VU	L	Occurs in mixed Box-Stringybark forest with a shrubby understorey, often with Pteridium esculentum as a major component on sandy or clay loam soils (Duncan et al 2009).	0	N/A	No suitable habitat. **Unlikely to occur.**
Leafy Greenhood	*Pterostylis cucullata*	VU	L	Tea-tree scrubs on tall sandy and calcareous dunes, in moist, open or even deep shaded locations (Jones 1994).	0	N/A	Marginal suitable habitat within EVC 53. No records within 10km. **Unlikely to occur.**
Small Sickle Greenhood	*Pterostylis lustra*		L	Apparently restricted to waterlogged black, peaty alkaline soils in closed, Woolly Tea-tree scrub within swamps and along watercourses. Vegetation considered to be suitable habitat provides a continuous canopy over a relatively open understorey with a herbaceous ground layer. Gahnia, Viola, Lobelia, Selliera and Geranium are notable associated species (Duncan et al. 2009).	1	18/12/1900	Marginal suitable habitat within EVC 53. No recent records within 10km. **Unlikely to occur.**
Button Wrinklewort	*Rutidosis leptorhynchoides*	EN	L	Restricted to open stands of plains grassland and grassy woodlands, on fertile clays to clay loams, usually in areas where the grass cover is more open, either as a result of recurrent fires or grazing by native macropods or stock. It also occurs on low rises with shallow, stony soils at less than 100 m above sea level.	0	N/A	Marginal suitable habitat within EVC 55_63. No records within 10km. **Unlikely to occur.**
Swamp Fireweed	*Senecio psilocarpus*	VU		Herb-rich winter-wet swamps on volcanic clays or peaty soils (Walsh 1999). Known from approximately 10 sites between Wallan, about 45 km north of Melbourne, and Honans Scrub in south-eastern South Australia (TSSC 2008).	6	20/11/2009	Suitable (but species depauperate) habitat within EVCs 53, 125, 647, 651 and 653. **Potential to occur.**
Coast Dandelion	*Taraxacum cygnorum*	VU	L	Woodland and scrub on limestone (Scarlett 1999).	0	N/A	No suitable habitat. **Unlikely to occur.**
Metallic Sun-orchid	*Thelymitra epipactoides*	EN	L	Grows primarily in mesic coastal heathlands, grasslands and woodlands, but is also found in drier inland heathlands, open forests and woodlands. Substrates may be moist or dry sandy loams or loamy sands. Critical habitat has not been determined but the species is likely to require open conditions, which may be created by soil disturbance or fire, for recruitment (DoEE 2018).	0	N/A	No suitable habitat. **Unlikely to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Spiral Sun-orchid	*Thelymitra matthewsii*	VU	L	Slightly elevated sites to 300m in well-drained soils (sandy loams to gravelly limestone soils) in light to dense forest; sometimes in coastal sandy flats (Weber & Entwisle 1994).	0	N/A	No suitable habitat. **Unlikely to occur.**
Swamp Everlasting	*Xerochrysum palustre*	VU	L	Grows in wetlands including sedge-swamps and shallow freshwater marshes, often on heavy black clay soils. Commonly associated genera include Amphibromus, Baumea, Carex, Chorizandra, Craspedia, Eleocharis, Isolepis, Lachnagrostis, Lepidosperma, Myriophyllum, Phragmites australis, Themeda triandra and Villarsia (DoEE 2018).	2	19/02/2009	Suitable (but species depauperate) habitat within EVCs 125, 647 and 653. **Potential to occur.**

Notes: EPBC = threatened species status under EPBC Act: CR = critically endangered; EN = endangered; VU = vulnerable; **FFG** = threatened species status under the FFG Act: L = listed as threatened under the FFG Act.

5.4. Fauna habitats

The study area supported four habitat types.

- Rocky outcrops;
- Grazing paddocks (native and exotic pastures);
- Aquatic habitat (ephemeral watercourses and wetlands); and
- Treed vegetation.

Rocky outcrops

Many outcrops of basalt occurred forming a mosaic with grazing pastures and ephemeral wetlands throughout the study area. These supported both native and exotic pasture grasses and some had scattered native shrubs. These areas were used for grazing (primarily cattle). Native plant species diversity was moderate, but structural diversity was much reduced and dominated by graminoids. Outcropping rocks and soil cracks occurred, but large woody debris was absent.

Photograph 1: Rocky outcrop habitat

Grazing paddocks (native and exotic pastures)

This was the most abundant habitat type within the study area, and included exotic pasture dominated by species such as Phalaris, Soft Brome, Ryegrass and Hare's-tail Grass. There were small areas of derived native grassland that would have originally been Plains Grassy Woodland, but which now lack woody vegetation. The derived native grassland supported species including Kangaroo Grass, wallaby grasses and Weeping Grass. Both native and exotic pastures lacked native forb species.

Photograph 2: Grazing paddock habitat

Aquatic habitat (ephemeral watercourses and wetlands)

Aquatic habitat within the study area was ephemeral and mostly dry at the time of survey. It included small watercourses and wetlands that formed a mosaic with grazing pastures and rocky outcrops throughout the study area. These areas supported the highest cover, species diversity and structural diversity of native vegetation within the study area, and included wetlands dominated by grasses, sedges and aquatic herbs. Trees and shrubs were noted along the Moyne River and an unnamed, ephemeral watercourse near Coomete Road, although these appeared to have been planted.

Photograph 3: Aquatic habitat

Treed vegetation

Treed vegetation included planted windbreaks including Sugar Gums and Cypresses, and roadside vegetation dominated by Blackwoods and Black Wattles. The understorey lacked structural diversity and was dominated by exotic species.

Photograph 4: Treed habitat

5.5. Listed Fauna species

The review of existing information (including VBA records and the results of the EPBC Protected Matters Search Tool) indicated that within the search region there were records of, or there occurred potential suitable habitat for 60 fauna species listed under the Commonwealth EPBC Act and the state FFG Act. The likelihood of occurrence of these species in the study area was assessed and the results are presented in Table 4.

This analysis of potential occurrence of listed fauna species excludes:

- Marine fauna given that the study area is inland; and
- Migratory oceanic bird species (such as albatrosses and petrels) given that the study area is inland.

Species considered 'likely to occur' are those that have a very high chance of being in the study area given the existence of numerous records in the search region and suitable habitat in the study area. Using the precautionary approach, species considered to have the 'potential to occur' are those where suitable habitat exists, but recent records are scarce. This analysis indicates that 21 listed fauna species are likely to occur or have the potential to occur. These species are:

- Australasian Bittern EPBC: Endangered, FFG: Listed);
- Australian Painted Snipe (EPBC: Endangered, FFG: Listed);
- Baillon's Crake (FFG: Listed);
- Brolga (FFG: Listed);
- Common Greenshank (EPBC: Migratory);
- Common Sandpiper (EPBC: Migratory);
- Curlew Sandpiper (EPBC: Critically Endangered & Migratory, FFG: Listed);
- Double-banded Plover (EPBC: Migratory);
- Eastern Great Egret (FFG: Listed)
- Fork-tailed Swift (EPBC: Migratory);
- Glossy Ibis (EPBC: Migratory);
- Intermediate Egret (FFG: Listed)
- Latham's Snipe (EPBC: Migratory);
- Little Curlew (EPBC: Migratory);
- Magpie Goose (FFG: Listed)
- Marsh Sandpiper (EPBC: Migratory);
- Pectoral Sandpiper (EPBC: Migratory);
- Red-necked Stint (EPBC: Migratory);
- Sharp-tailed Sandpiper (EPBC: Migratory);
- White-throated Needletail (EPBC: Migratory, FFG: Listed); and
- Yarra Pygmy Perch (EPBC: Vulnerable, FFG: Listed).

The susceptibility of these species to impacts is discussed in the Section below.

Table 4: Listed fauna species from the search region and likelihood of occurrence in the study area

Common Name	EPBC-T	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Birds							
Australasian Bittern	EN		L	Terrestrial wetlands, including a range of wetland types but prefers permanent water bodies with tall dense vegetation, particularly those dominated by sedges, rush, reeds or cutting grass (Marchant & Higgins 1990).	16	24/05/2009	Suitable habitat. **Llikely to occur.**
Australian Painted Snipe	EN		L	Generally inhabits shallow terrestrial freshwater wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum *Muehlenbeckia* or canegrass or sometimes tea-tree (*Melaleuca*). Sometimes utilises areas that are lined with trees, or that have some scattered fallen or washed-up timber (DoEE 2018).	1	24/10/2000	Suitable habitat. **Likely to occur.**
Baillon's Crake			L	Occurs in a range of ephemeral and permanent wetlands such as swamps, creeks and lakes, with dense vegetation and abundant floating plants, but also in open waters with clumped vegetation (Marchant & Higgins 1993).	2	17/03/2009	Suitable habitat. **Likely to occur.**
Bar-tailed Godwit	VU	M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		Mainly coastal species, usually in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats (Higgins & Davies 1996).	8	15/01/2007	No suitable habitat. **Unlikely to occur.**
Blue-billed Duck			L	Terrestrial wetlands and prefers deep permanent, well vegetated water bodies (Marchant & Higgins 1990).	11	15/01/2007	No suitable habitat. **Unlikely to occur.**
Brolga			L	Wetlands that include permanent open water and deep freshwater marsh. Between 500 and 700 Brolgas are known to occur in southwestern Victoria. (Marchant & Higgins 1993).	18	21/11/2009	Suitable habitat. **Likely to occur.**
Bush Stone-curlew			L	Open woodlands with Grey Box, Yellow Box and/or River Red Gum, with a grassy understorey. The species is mainly found in N and W Vic.; the bird has declined since European settlement, especially in the S of the state. (Robinson & Johnson 1997).	1	18/01/1963	No suitable habitat. **Unlikely to occur.**
Common Greenshank		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		Inhabits wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands (Higgins & Davies 1996).	68	20/01/2007	Suitable habitat. **Likely to occur.**
Common Sandpiper		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H)		Inhabits a wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands. In Vic. Mostly found Westernport and Port Phillip Bay. (Higgins & Davies 1996).	20	3/03/2007	Suitable habitat. **Likely to occur.**
Curlew Sandpiper	CR	M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))	L	Inhabits wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands (Higgins & Davies 1996).	32	15/01/2007	Suitable habitat. **Likely to occur.**
Double-banded Plover		M (Bonn (A2H))		Inhabits wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands (Marchant & Higgins 1993).	12	9/03/2009	Suitable habitat. **Likely to occur.**
Eastern Curlew	CR	M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H)	L	Inhabits sheltered coasts, especially estuaries, embayment, harbours, inlets and coastal lagoons with large intertidal mudflats or sandflats, often with beds of sea grass (Higgins & Davies 1996).	8	15/01/2007	No suitable habitat. **Unlikely to occur.**
Eastern Great Egret			L	Occurs in a variety of wetlands including: permanent water bodies on flood plains; shallows of deep permanent lakes, either open or vegetated with shrubs or trees; semi-permanent swamps with tall emergent vegetation (e.g. bulrush) and herb dominated seasonal swamps with abundant aquatic flora (Marchant and Higgins 1990).	236	1/11/2011	Suitable habitat. **Likely to occur.**
Fork-tailed Swift		M (JAMBA,CAMBA, ROKAMBA)		The species can occur in wet sclerophyll forest but mainly prefers open forest or plains. It is almost exclusively aerial and feeds up to hundreds on metres above the ground but can feed among open forest canopy. The species breeds internationally and seldom roosts in trees (Higgins et al 2006b).	0	N/A	Suitable habitat. No records within 10km. **Potential to occur.**
Freckled Duck			L	Terrestrial wetlands; prefer fresh, densely vegetated waters, particularly floodwater swamps and creeks vegetated with lignum or cane grass. During dry seasons or droughts, move off ephemeral breeding swamps and occupy large permanent waters. (Marchant and Higgins 1990).	4	14/12/2006	No suitable habitat. **Unlikely to occur.**
Glossy Ibis		M (CAMBA, Bonn (A2S))		Prefer freshwater inland wetlands, in particular, permanent or ephemeral water bodies and swamps with abundant vegetation (Marchant & Higgins 1990).	20	1/11/2011	Suitable habitat. **Likely to occur.**

Common Name	EPBC-T	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Great Knot	CR	M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))	L	In Australasia, the species typically prefers sheltered coastal habitats, with large intertidal mudflats or sandflats. This includes inlets, bays, harbours, estuaries and lagoons. They are occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in saltworks, at swamps near the coast, saltlakes and non-tidal lagoons. The Great Knot rarely occurs on inland lakes and swamps (DoEE 2018).	4	9/10/1984	No suitable habitat. **Unlikely to occur.**
Grey Goshawk			L	Inhabit rainforests, open forests, swamp forests, woodlands and plantations; most abundant where forest or woodland provide cover for hunting from perches. in Vic., most common in Otway ranges. (Marchant & Higgins 1993).	3	24/06/2007	No suitable habitat. **Unlikely to occur.**
Grey Plover		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		Entirely coastal, but occasionally inland. Mainly on marine shores, inlets, estuaries and lagoons where there are nearby large tidal mudflats for feeding and sandy beaches for roosting (Marchant & Higgins 1993).	4	2/12/2000	No suitable habitat. **Unlikely to occur.**
Ground Parrot			L	Inhabiting mainly heathlands, sedgeland or button-grass plains providing dense cover. In Vic. Inhabits closed coastal heathland and sedgeland, mainly in Gippsland. (Higgins 1999).	1	17/04/1907	No suitable habitat. **Unlikely to occur.**
Hooded Robin			L	Occur mostly in open Grey Box, White Box, Yellow Box, Yellow Gum and Ironbark woodlands with pockets of saplings or taller shrubs, an open shrubby understorey, sparse grasses and patches of bare ground and leaf-litter, with scattered fallen timber. The population has declined throughout range, especially since the early 1980s. This species typically occurs north of the great divide in shrubland or woodland dominated by acacias. (Higgins and Peter 2002; Tzaros 2005).	2	18/01/1963	No suitable habitat. **Unlikely to occur.**
Intermediate Egret			L	It mainly inhabits terrestrial wetlands; only occasionally visit coastal wetlands and forages amongst aquatic vegetation in shallow water and requires trees for roosting and nesting. It often occurs in wetlands that contain vegetation, including bulrush (Marchant and Higgins 1990).	3	1/11/2011	Suitable habitat. **Likely to occur.**
Latham's Snipe		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H)		Occurs in wide variety of permanent and ephemeral wetlands; it prefers open freshwater wetlands with dense cover nearby, such as the edges of rivers and creeks, bogs, swamps, waterholes. The species is wide spread in southeast Australia and most of its population occurs in Vic. Except in the northwest of the state. (Naarding 1983; Higgins and Davies 1996).	68	2/11/2009	Suitable habitat. **Likely to occur.**
Little Curlew		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		Occurs in short, dry grasslands and sedgelands with scattered shallow freshwater pools. Occasionally occurs in open woodland with grassy or burn understorey. Can be found in coastal swamps and on sheltered coasts on mudflats or sandflats (Higgins and Davies 1996).	0	N/A	Suitable habitat exists but no records within 10km; very scarce throughout Victoria. **Potential to occur.**
Little Egret			L	It occurs in a range of coastal and terrestrial wetlands, including freshwater wetlands with vegetation such as bulrush and requires trees for roosting and nesting (Marchant & Higgins 1990).	9	15/01/2007	No suitable habitat. **Unlikely to occur.**
Magpie Goose			L	Terrestrial and aquatic habitats, but activities cantered on wetlands, mainly those on floodplains of rivers (Marchant & Higgins 1990).	41	13/06/2009	Suitable habitat. **Likely to occur.**
Marsh Sandpiper		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		Inhabits sandy, muddy or rocky shores, usually coastal, rarely far inland. Often on beaches and mudflats, sandflats and occasionally rock shelves (Higgins & Davies 1996).	24	15/01/2007	Suitable habitat. **Likely to occur.**
Orange-bellied Parrot	CE	M (JAMBA)	L	The Orange-bellied Parrot is endemic to south-eastern Australia. Its current non-breeding mainland distribution is from the mouth of the Murray River in South Australia, along the coast, to the east of Jack Smith Lake in South Gippsland, Victoria, covering approximately 1000 km of coastline. The most used sites in Victoria are around Port Phillip Bay and Bellarine Peninsula. In South Australia, Carpenter Rocks is the main site. During winter on the mainland, found mostly within 3 km of the coast. In Victoria, they mostly occur in sheltered coastal habitats, such as bays, lagoons and estuaries, or, rarely, saltworks. They are also found in low samphire herbland dominated by Beaded Glasswort (*Sarcocornia quinqueflora*), Sea Heath (Frankenia pauciflora) or Sea-blite (*Suaeda australis*), and in taller shrubland dominated by Shrubby Glasswort (*Sclerostegia arbuscula*). They are sometimes found in low samphire dominated by Grey Glasswort (*Halosarcia halocnemoides*) or in *Chenopodium* herbfields. Breeds at Melaleuca in Tas during spring/summer months (DoEE 2018).	21	25/05/2012	No suitable habitat. **Unlikely to occur.**

Common Name	EPBC-T	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Osprey		M (Bonn (A2S))		Rare vagrant to Victoria (Marchant & Higgins 1993). Littoral and coastal habitats and terrestrial wetlands. They are mostly found in coastal areas but occasionally travel inland along major rivers (Johnstone & Storr 1998; Marchant & Higgins 1993; Olsen 1995). They require extensive areas of open fresh, brackish or saline water for foraging (Marchant & Higgins 1993).	1	15/01/2007	No suitable habitat. **Unlikely to occur.**
Pectoral Sandpiper		M (JAMBA, ROKAMBA, Bonn (A2H))		Inhabit shallow fresh to saline wetlands, usually coastal to near-coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins & Davies 1996).	0	N/A	Suitable habitat. No records within 10km. **Potential to occur.**
Pin-tailed Snipe		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		Inhabit shallow fresh to saline wetlands, usually coastal to near-coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins & Davies 1996).	0	N/A	Suitable habitat but outside of known range. **Unlikely to occur.**
Plains-wanderer	CR		L	This species inhabits native grasslands with sparse cover, preferring grasslands that include wallaby grass and spear grass species (Marchant & Higgins 1993).	0	N/A	No suitable habitat. **Unlikely to occur.**
Red-necked Stint		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		Inhabit shallow fresh to saline wetlands, usually coastal to near-coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins & Davies 1996).	96	9/03/2009	Suitable habitat. **Likely to occur.**
Ruddy Turnstone		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		Inhabit shallow fresh to saline wetlands, usually coastal to near-coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins & Davies 1996).	8	15/01/2007	No suitable habitat. **Unlikely to occur.**
Rufous Fantail		M (Bonn (A2H))		In east and south-east Australia, mainly inhabits tall wet sclerophyll forests, often in gullies. When on passage, they are sometimes recorded in drier sclerophyll forests and woodlands, as well as parks and gardens (Higgins et al. 2006).	0	N/A	No suitable habitat. **Unlikely to occur.**
Satin Flycatcher		M (Bonn (A2H))		Tall forests and woodlands in wetter habitats but not in rainforest (Higgins et al. 2006)	0	N/A	No suitable habitat. **Unlikely to occur.**
Sharp-tailed Sandpiper		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		Inhabit shallow fresh to saline wetlands, usually coastal to near-coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins & Davies 1996).	144	2/11/2009	Suitable habitat. **Likely to occur.**
Swift Parrot	CR		L	Prefers a narrow range of eucalypts in Victoria, including White Box, Red Ironbark and Yellow Gum as well as River Red Gum when this species supports abundant 'lerp'. Breeds in Tasmania and migrates to the mainland of Australia for the autumn, winter and early spring months. It lives mostly north of the Great Dividing Range, passing through two areas of Victoria on migration: the Port Phillip district and Gippsland. (Emison et al. 1987; Higgins 1999; Kennedy and Tzaros 2005).	0	N/A	No suitable habitat. **Unlikely to occur.**
White-bellied Sea-Eagle			L	Maritime habitats, terrestrial large wetlands and coastal lands of tropical and temperate Australia and offshore islands, ranging far inland only over large rivers and wetlands. The eagles usually breed on coast and offshore islands and inland beside large lakes or rivers, usually in tall trees in or near water, also in cliffs, rock pinnacles and escarpments. (Marchant and Higgins 1993).	3	13/08/2009	No suitable habitat. **Unlikely to occur.**
White-throated Needletail		M (JAMBA, CAMBA, ROKAMBA)	L	Aerial, over all habitats, but probably more over wooded areas, including open forest and rainforest. Often over heathland and less often above treeless areas such as grassland and swamps or farmland (Higgins 1999).	12	15/01/2007	Suitable (but marginal) habitat. **Potential to occur.**
Wood Sandpiper		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		Inhabits well vegetated, shallow, freshwater wetlands, such as swamps, lakes, pools, and waterholes; typically with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reed. In Vic. Mostly from Port Phillip bay and in mid-Murray valley. (Higgins and Davies 1996).	0	N/A	No suitable habitat. **Unlikely to occur.**
Yellow Wagtail		M (JAMBA, CAMBA, ROKAMBA)		Extremely uncommon migrant. Few sightings in Victoria. Mostly occurs in well-watered open grasslands on the fringes of wetlands. Roosts in mangroves and other dense vegetation (DoEE 2018).	0	N/A	No suitable habitat. **Unlikely to occur.**
Fish							

Common Name	EPBC-T	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Australian Grayling	VU		L	Large and small coastal streams and rivers with cool, clear waters with a gravel substrate and altering pools and riffles (Cadwallader & Backhouse 1983).	0	N/A	No suitable habitat. **Unlikely to occur.**
Dwarf Galaxias	VU		L	Barwon River to Mitchell River. Vegetated margins of still water, ditches, swamps and backwaters of creeks, both ephemeral and permanent (Allen et al. 2002).	0	N/A	Suitable (but marginal) habitat. No records within 10km. **Unlikely to occur.**
Macquarie Perch	EN		L	Cool, clear water of rivers and lakes. Favours slower moving water (Allen et al. 2002).	1	1/01/1970	No suitable habitat. **Unlikely to occur.**
Yarra Pygmy Perch	VU		L	Streams and small lakes, prefers flowing water with abundant aquatic vegetation (Allen et al. 2002).	114	4/02/2016	Suitable habitat within Austins Creek, Back Creek and Moyne River. **Likely to occur.**
Amphibians							
Brown Toadlet			L	Wet and dry forest, grassy areas besides small creeks, alpine grasslands and mossy bogs (Cogger 2000).	4	28/05/1976	No suitable habitat. **Unlikely to occur.**
Growling Grass Frog	VU		L	Permanent, still or slow flowing water with fringing and emergent vegetation in streams, swamps, lagoons and artificial wetlands such as farm dams and abandoned quarries (Clemann & Gillespie 2004).	1	28/05/1976	No suitable habitat. **Unlikely to occur.**
Insects							
Golden Sun Moth	CR		L	Areas that are, or have been native grasslands or grassy woodlands. It is known to inhabit degraded grasslands with introduced grasses being dominant, with a preference for the native wallaby grass being present (DEWHA 2009).	0	N/A	Suitable (but marginal) habitat. No records within 10km. **Unlikely to occur.**
Mammals							
Brush-tailed Phascogale			L	Dry forest and woodland in association with box, ironbark and stringybark eucalypts (Menkhorst 1995).	1	1/06/1946	No suitable habitat. **Unlikely to occur.**
Eastern Barred Bandicoot	EN		L	The habitat of the Eastern Barred Bandicoot (mainland) is perennial tussock grassland and eucalypt woodland with a grassy ground layer (Dufty 1994b; Seebeck 1995a, 2001). Drainage lines and areas of high vegetative cover have been identified as prime habitat. The key determining factor for persistence of this species appears to be high structural complexity and heterogeneity within the environment, reflected in its absence from agricultural areas but persistence in rubbish dumps and other variable habitats.	7	1/01/1976	No suitable habitat. **Unlikely to occur.**
Grey-headed Flying-fox	VU		L	Brisbane, Newcastle, Sydney and Melbourne are occupied continuously. Elsewhere, during spring, they are uncommon south of Nowra and widespread in other areas of their range. Roosts in aggregations of various sizes on exposed branches. Roost sites are typically located near water, such as lakes, rivers or the coast. Roost vegetation includes rainforest patches, stands of Melaleuca, mangroves and riparian vegetation, but colonies also use highly modified vegetation in urban and suburban areas (DoEE 2018).	0	N/A	No suitable habitat. **Unlikely to occur.**
Long-nosed Potoroo	VU		L	in Victoria coastal heathy woodland; in Tasmania moist forest with dense shrub layer; in the north edge of rainforest (Menkhorst 1995).	0	N/A	No suitable habitat. **Unlikely to occur.**
Southern Brown Bandicoot	EN		L	Species experts define suitable habitat for Southern Brown Bandicoots (eastern) to be any patches of native or exotic vegetation, within their distribution, which contains understorey vegetation structure with 50–80% average foliage density in the 0.2–1 m height range. In areas where native habitats have been degraded or diminished, exotic vegetation, such as Blackberry (*Rubus* spp.), can and often does, provide important habitat (DoEE 2018).	6	17/12/2012	No suitable habitat. **Unlikely to occur.**
Spot-tailed Quoll	EN		L	Rainforest, wet and dry forest, coastal heath and scrub and River Red-gum woodlands along inland rivers (Menkhorst 1995).	0	N/A	No suitable habitat. **Unlikely to occur.**

Common Name	EPBC-T	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Southern Bent-wing Bat (=Common Bent-wing Bat - southern subsp.)	CR		L	Roosts in caves during the day, dispersing over a range of habitats at night. Its feeding areas tend to be associated with major drainage systems (Menkhorst 1995).	0	N/A	Habitat likely to be traversed on migration. **Potential to occur.**
Swamp Antechinus	VU		L	Dense wet heath, tussock grassland, sedgeland heathy woodland and coastal heath and scrub (Menkhorst 1995).	0	N/A	Suitable (but marginal) habitat. No records within 10km. **Unlikely to occur.**
Yellow-bellied Sheathtail Bat			L	Known to occur from urban, agricultural semi-arid and tall wet forest habitats (Menkhorst 1995).	1	22/04/1969	No suitable habitat. **Unlikely to occur.**
Crustaceans							
Glenelg Spiny Crayfish	EN		L	Glenelg Spiny Freshwater Crayfish is considered a specialist species with typically low tolerance to environmental conditions (namely dissolved oxygen concentrations), ensuring that species requires specific habitat requirements. As with other *Euastacus* species, Glenelg Spiny Freshwater Crayfish have a preference for permanently-flowing, cool (and shaded) and well-oxygenated water (Morgan 1986; Morgan 1997). Other habitat requirements vary across Victorian and South Australian populations.	0	N/A	No suitable habitat. **Unlikely to occur.**
Reptiles							
Striped Legless Lizard	VU		L	Grassland specialist. Known to occur in some areas dominated by introduced species such as *Phalaris aquatica*, Serrated Tussock (*Nasella trichotoma*) and *Hypocharis radicata* and at sites with a history of grazing and pasture improvement. shelter in grass tussocks, thick ground cover, soil cracks, under rocks, spider burrows, and under ground debris such as timber. The majority of sites in Victoria and NSW occur on cracking clay soils with some surface rock which provide shelter for the species (DoEE 2018).	0	N/A	No suitable habitat. **Unlikely to occur.**

Notes: EPBC-T = threatened species status under EPBC Act; CR = critically endangered; EN = endangered; VU = vulnerable; **EPBC-M** = migratory status under the EPBC Act; M = listed migratory taxa; Bonn Convention (A2H) - Convention on the Conservation of Migratory Species of Wild Animals – listed as a member of a family; Bonn Convention (A2S) - Convention on the Conservation of Migratory Species of Wild Animals - species listed explicitly; CAMBA - China- Australia Migratory Birds Agreement; JAMBA - Japan-Australia Migratory Birds Agreement; ROKAMBA - Republic of Korea Australia Migratory Birds Agreement; **FFG** = threatened species status under the FFG Act: L = listed as threatened under the FFG Act.

5.5.1. Susceptibility of listed fauna to impacts

The following analysis identifies the susceptibility to development of listed fauna species which may utilise the study area. This analysis includes consideration of the factors below.

- The mobility of the species
- The availability and extent of other suitable habitat in the region and the degree to which each species may rely on habitat in the study area

Targeted surveys will be required to determine the presence or absence of any listed fauna species considered to be susceptible to impacts from development.

Birds

Seven listed non-migratory bird species are considered to have the potential to occur in the study area. The susceptibility of these species to possible impacts from any development in the study area is discussed below.

- **Australasian Bittern** (EPBC: Endangered, FFG: Listed)
- **Australian Painted Snipe** (EPBC: Endangered, FFG: Listed)
- **Baillon's Crake** (FFG: Listed)
- **Brolga** (FFG: Listed)
- **Eastern Great Egret** (FFG: Listed)
- **Intermediate Egret** (FFG: Listed)
- **Magpie Goose** (FFG: Listed)

These species are likely to occasionally use ephemeral wetland habitat within the study area. Given the seasonal nature of this habitat, the large amount of similar habitat available in the surrounding region, and the proportionally small impact of the proposed transmission line on this habitat, it is considered unlikely that these species would be impacted by the proposed development. Species that are most likely to be affected are discussed in more detail under Impacts, Section 6.3.4.

Migratory Birds

Thirteen listed migratory bird species (excluding oceanic species and shorebirds) have the potential to occur in the study area. The susceptibility of these species to possible impacts from any development in the study area is discussed below.

- **Common Greenshank** (EPBC: Migratory)
- **Common Sandpiper** (EPBC: Migratory)
- **Curlew Sandpiper** (EPBC: Critically Endangered & Migratory, FFG: Listed)
- **Double-banded Plover** (EPBC: Migratory)
- **Glossy Ibis** (EPBC: Migratory)
- **Latham's Snipe** (EPBC: Migratory)
- **Little Curlew** (EPBC: Migratory)
- **Marsh Sandpiper** (EPBC: Migratory)
- **Pectoral Sandpiper** (EPBC: Migratory)
- **Red-necked Stint** (EPBC: Migratory)
- **Sharp-tailed Sandpiper** (EPBC: Migratory)

These species are likely to occasionally use ephemeral wetland habitat within the study area. Given the seasonal nature of this habitat, the large amount of similar habitat available in the surrounding region, and the proportionally small impact of the proposed transmission line on this habitat, it is considered unlikely that these species would be impacted by the proposed development.

- **Fork-tailed Swift** (EPBC: Migratory)
- **White-throated Needletail** (EPBC: Migratory, FFG: Listed)

These species are likely to occasionally occur aerially over the study area. Given the aerial nature of these species and the large amount of similar habitat available in the surrounding region, it is considered unlikely that these species would be impacted by the proposed development.

Mammals, Reptiles, Frogs and Invertebrates

No listed reptile, frog or invertebrate species are considered to have the potential to occur in the study area. These species are therefore not considered susceptible to possible impacts from any development in the study area. One listed mammal species is considered to have the potential to occur in the study area. The susceptibility of this species to possible impacts from any development in the study area is discussed below.

- **Southern Bent-wing Bat** (EPBC: Critically Endangered; FFG: listed [as subspecies of Common Bent-wing Bat])

The Southern Bent-wing Bat has not been recorded in the10 km radius search region. However, the species' main breeding site in Victoria is at Starlight Cave, 8 km east of Warrnambool, and it is known to winter at caves at Byaduk and other caves to the west and north of the powerline alignment (Lumsden &and Jemison 2015). It is reasonable to assume it may be therefore susceptible to collision on migration between the breeding and wintering sites. Given the small number of the species which concentrate at only two known breeding caves in summer and disperse widely to wintering caves, it is expected that only small numbers would pass through the powerline alignment. The powerlines would therefore be expected to pose a very small additional risk to the Southern Bent-wing Bat, who would normally be able to readily avoid these static structures.

Fish

One listed fish species are considered to have the potential to occur in the study area. The susceptibility of this species to possible impacts from any development in the study area is discussed below.

- **Yarra Pygmy Perch** (EPBC: Vulnerable, FFG: Listed)

This species is likely to occur in Austins Creek, Back Creek and the Moyne River. Development within these watercourses could potentially impact this species.

5.6. Listed ecological communities

The EPBC Protected Matters Search Tool (DoEE 2018) indicated that five ecological communities listed under the EPBC Act had the potential to occur in the study area (Table 5). One listed ecological community was recorded within the study area, while a second listed ecological community is considered likely to occur but would require assessment in spring to confirm.

Table 5: EPBC Act listed ecological communities and likelihood of occurrence in the study area

Ecological Community	EPBC	Occurrence in the study area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain (GEWVVP)	CR	The community occurs within Habitat Zones BM, BN and BQ
Natural Temperate Grassland of the Victorian Volcanic Plain	CR	Does not occur within the study area
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains (SHWTLP)	CR	Likely to occur within the study area. Seasonal constraints meant that this could not be determined at the time of survey.
Subtropical and Temperate Coastal Saltmarsh	VU	Does not occur within the study area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	CR	Does not occur within the study area

Notes: EPBC = status under EPBC Act: CR = Critically Endangered; VU = Vulnerable.

Based on an assessment of native vegetation in the study area against published descriptions and condition thresholds for these communities, the following listed ecological communities were recorded in the study area:

- **Grassy Eucalypt Woodland of the Victorian Volcanic Plain (GEWVVP)** – listed as Critically Endangered under the EPBC Act (Habitat Zones BM, BN and BQ).

Habitat Zones BM, BN and BQ met the key diagnostic criteria and condition thresholds (TSSC 2008a) for the derived grassland form of the listed community, namely patches of native vegetation within the Victorian Volcanic plains that are greater than 0.5 hectares, in which the tree canopy would have been dominated by River Red-gum (or associated eucalypts) and the ground layer is dominated by Kangaroo Grass, Wallaby Grass, Spear Grass, Tussock Grass and/or Weeping Grass, which also comprise 50% or more of the perennial ground layer vegetation.

A further four ecological communities were modelled to potentially occur in the study area. Of these, the following ecological community is considered likely to occur in the study area due to the presence of corresponding site characteristics and general species composition:

- **Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains (SHWTLP)** – listed as Critically Endangered under the EPBC Act (EVCs 125, 647 and 653).

Some patches of Plains Grassy Wetland (EVC 125), Plains Sedgy Wetland (EVC 647) and Aquatic Herbland (EVC 653) within the study area are likely to meet the key diagnostic criteria and condition thresholds (TSSC 2012) for this community; however, to confirm the presence or otherwise of the community, these areas will be surveyed in a 'wet' cycle, typically in spring, as per the listing advice (TSSC 2012).

A targeted survey in spring 2020 will be undertaken to confirm whether this community is present in the study area.

Based on an assessment of native vegetation in the study area against published descriptions and condition thresholds, the following communities were found not to occur in the study area based on the factors described below.

- **Natural Temperate Grassland of the Victorian Volcanic Plain** – listed as Critically Endangered under the EPBC Act

No EVCs associated with this community (namely Plains Grassland (EVC 132) and Creekline Tussock Grassland (EVC 654) (TSSC 2008b)) were recorded within the study area.

- **Subtropical and Temperate Coastal Saltmarsh** – listed as Vulnerable under the EPBC Act

No EVCs associated with this community (namely Coastal saltmarsh aggregate (EVC 9) and Estuarine wetland (EVC 10) (DSEWPAC 2013)) were recorded within the study area.

- **White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland** – listed as Critically Endangered under the EPBC Act

The study area is beyond the extent of this community, which occurs in the Victorian Midlands and Riverina Bioregions (TSSC 2006).

6. IMPACTS OF PROPOSED DEVELOPMENT

6.1. Proposed development

The current proposal will involve the construction and operation of a transmission line that will connect the Hawkesdale and Ryan Corner Wind Farms with the Tarrone sub-station, as per figures 1-15.

Due to Covid-19 travel restrictions to the site, and thus further site investigations, the proponent is currently constrained in refining the existing design with further surveying, a worst-case native vegetation impact scenario was adopted for construction of the transmission line. This was considered to include the following:

- 6m wide access track along the entire alignment, with all vegetation cut to a minimum of 100mm ANGL and topped with a crusher run 100-150mm deep (when water is apparent and vehicles are in danger of getting bogged down. All native vegetation within the 6m wide track is considered removed, with the exception of the following:
    - Habitat zones CP, CN, CO, CR, CS & CT (impacts on these zones will trigger a species offset for Basalt Leek-orchid); and
    - Habitat Zones BM, BN & BQ (these zones qualify as GEWVVP).
- A working and vehicle/equipment laydown area of 15 m X 15 m has been assumed for pole installation, i.e. a further incursion on native vegetation of 4.5 m beyond the 6 m wide access track at each pole location. As per the 6 m wide access track, all native vegetation within these additional areas will be deemed lost;
- In order to comply with the Electricity Safety (Electric Line Clearance) Regulations 2010 for a 132kV transmission line, where the transmission line passes over native woody vegetation taller than five metres, all vegetation within these patches is considered removed. This affects habitat zones BR, BS, BT, BU, BV, BW, BX, BY, BZ, CJ, CK, DA, DB, & DE (figures 1-15).

Once Covid-19 travel restrictions have been lifted, and prior to commencement of construction of the transmission line, further site surveying will be undertaken to further endeavour to reduce the amount of Transmission pole placements and impacts on the native vegetation. It will also refine the required access and access routes form main roads to avoid impacts on native vegetation.

6.2. Design recommendations

The following design recommendations are provided to further avoid/minimise impacts on native vegetation, and flora and fauna habitats:

- Where feasible, to increase the span distance between power poles. This should be utilised to further avoid mapped native vegetation; and
- Construction should be scheduled for summer and autumn to avoid ground disturbance during the wetter months of the year.

6.3. Impacts of proposed development

Various design measures have been undertaken for this proposal to avoid and minimise impacts to native vegetation. These are detailed in Section 7.2.1.

6.3.1. Native vegetation

The current proposed footprint will result in the loss of a total extent of 3.458 hectares of native vegetation as represented in figures 1-15 and documented in the Native Vegetation Removal (NVR) report provided by DELWP (Appendix 7).

The native vegetation to be removed includes areas mapped as an endangered Ecological Vegetation Class.

It is understood that no native vegetation has been approved for removal on the property within the last five years.

Representative photographs of native vegetation proposed for removal are provided in Appendix 5.

6.3.2. Modelled species important habitat

The current proposal footprint will not have a significant impact on habitat for any DELWP listed rare or threatened species.

6.3.3. Listed flora species

The analysis of the likelihood of occurrence of listed flora species presented in Section 5.3.2 identified that the following species could potentially occur, and therefore could be impacted by any development in the study area:

- Curly Sedge
- Matted Flax-lily
- Clover Glycine
- Gorae Leek-orchid
- Maroon Leek-orchid
- Basalt Leek-orchid
- Swamp Fireweed
- Swamp Everlasting

Targeted surveys for these species for areas of potential habitat proposed to be impacted scheduled to be undertaken in spring and summer 2020 to determine potential impacts. If these species are identified micro-siting should take place to avoid impacts to these species.

6.3.4. Fauna habitat

The proposed transmission line will involve the removal of small, disparate patches of rocky outcrops, grassland and ephemeral aquatic habitat, and larger patches of treed vegetation.

The powerlines proposed for this project run for a distance of several kilometres and may pose a risk to some birds. Large, slowly reproducing bird species with poor manoeuvrability in flight are at highest risk of population impacts due to collisions with artificial structures including power lines (Bevanger 1994, 1998; Martin and Shaw, 2010). In the study area, members of the order Anseriformes such as Black Swan, Cape Barren Goose and Magpie Goose; Australian Pelican; Brolga; Australian Bittern, herons and egrets, Wedge-tailed Eagle and other raptors, may potentially be impacted. Swifts, i.e. White-throated Needletail and Fork-tailed Swift may collide with powerlines but tend to fly at higher levels so there are expected to be few collisions between swifts and

powerlines. Impacts on the populations of most susceptible species would be minimal owing to the relative abundance of most species, e.g. swans, herons, egrets, and Australian Pelicans.

In the Hawkesdale – Ryans Corner area, species that may experience population impacts from collisions with the powerlines are likely to be mainly listed species of waterbirds and open country species such as large raptors. These species are:

- Magpie Goose (Vic.: Near Threatened)
- Brolga (Vic.: Vulnerable)
- Australasian Bittern (EPBC: Endangered; Vic.: Endangered), and
- Wedge-tailed Eagle (Least Concern)

Quantifying the risk to such species is difficult. Potential impacts to the most likely species to be affected (because listed as threatened or near-threatened; or large raptors know from the region of the powerline alignment) are discussed below.

The **Magpie Goose** is a large species with somewhat lumbering flight and therefore susceptible to collision with power lines. It occurs in south-west Victoria seasonally after dispersing from the breeding site at Bool Lagoon, South Australia (Farnes 2007, DELWP 2018c). It is therefore likely to pass through the study area regularly. Given that the species is re-established and its population continues to increase (since the 1980s; Farnes 2007, in prep.), there is no reason to believe that its population would be adversely affected by the powerlines of this proposal.

Herring (2005) listed four instances over a two-year study, of collisions between **Brolgas** and transmission lines in northern Victoria and southern New South Wales (approximately bounded by Benalla, Rutherglen, Wagga Wagga, Yarrawonga, and Katamatite), comprising three adults and one fledgeling. This is a much larger geographical area than that covered by the Hawkesdale-Ryans Corner proposed transmission line but with only a small population of Brolga estimated at 80 to 100 birds (Herring 2005). Farnes (2007) stated that collisions of Brolgas into power lines in the Portland district 'continue to occur', but did not quantify the occurrence. Nevertheless, it is considered a Brolga collision with powerlines at Hawkesdale – Ryans Corner would be a rare event. With the south-western Victorian population of Brolga estimated at 800 individuals (R. Hill, pers. comm. 2018), this risk to the species is considered unlikely to translate into a significant impact upon the regional population of Brolga.

The **Australasian Bittern** is the world's most threatened Bittern species (Herring 2005). It has declined appreciably since 2000 to the point of being declared an endangered species at national level. Its estimated population nationwide is less than 2500 individuals (Garnett et al. 2011). This bittern inhabits tall dense vegetation in freshwater wetlands and may occur along the Hawkesdale – Ryans Corner power line alignment, seasonally at low densities. Once again quantifying the risk to this species from powerline collisions is difficult, but the risk posed by powerlines would be minimal compared to other risks known to be affecting the species, i.e. wetland drainage and diversion, loss of vegetative cover on wetlands due to grazing, predation by feral cats and foxes (Garnett et al 2011; DoEE 2018).

The **Wedge-tailed Eagle** may be susceptible to powerline collisions. In the northern hemisphere, large raptors are among the groups of birds colliding with or being electrocuted by powerlines relatively frequently (e.g. McNeil et al. 1985; Shobrak 2012). It is believed that a relatively static obstacle such as a powerline may be more readily avoided by eagles than a rotating blade of a turbine but there is little if any empirical evidence to support this. It can however be stated that the density of Wedge-tailed Eagles around Hawkesdale – Ryans Corner is no higher than most other sites in the Victorian Volcanic Plain, and there no recorded nesting sites near the transmission line,

so relatively risk and therefore low impact to the regional Wedge-tailed Eagle population would be expected.

6.3.5. Listed fauna species

The analysis of susceptibility of listed fauna species to impacts presented in Section 5.5.1 identified that the following species could be impacted by any development in the study area:

- Yarra Pygmy Perch

It is considered that the residual impacts of the proposal on fauna habitat would not impact any listed fauna species, provided construction mitigation measures to protect watercourses are in place during construction. Construction mitigation measures are discussed in Section 7.7.

6.3.6. Threatened ecological communities

The proposed development footprint will not result in any losses to EPBC Act listed ecological communities, as:

- All areas of *Seasonal Herbaceous Wetlands of the Temperate Lowland Plains* (SHWTLP) will be avoided, once a spring 2020 survey has been undertaken to determine which habitat zones qualify as this community; and
- The 0.29 hectares of confirmed *Grassy Eucalypt Woodland of the Victorian Volcanic Plain* (GEWVVP) - habitat zones BM, BN & BQ, will be avoided.

7. IMPLICATIONS UNDER LEGISLATION AND POLICY

7.1. Summary of planning implications

No overlays relevant to this investigation cover the study area.

A planning permit under Clause 52.17 of the Moyne Planning Scheme is required for the removal of native vegetation.

7.2. Implications under the Guidelines

7.2.1. Avoid and minimise statement

In accordance with the Guidelines, all applications to remove native vegetation must provide an avoid and minimise statement which details any efforts undertaken to avoid the removal of, and minimise the impacts on biodiversity and other values of native vegetation, and how these efforts focussed on areas of native vegetation that have the most value. Efforts to avoid and minimise impacts to native vegetation in the current application are presented as follows:

- Strategic level planning – the overall route was designed to avoid and minimise native vegetation by avoiding impacts on mapped wetlands and maintaining a route surveyed prior to 2012 that sought to avoid native vegetation;
- Site level planning – Every effort will be made to avoid and minimise impacts on native vegetation. Transmission poles have been located to avoid patches of native vegetation where possible, particularly on areas that will trigger a species offset for Basalt Leek-orchid, or areas that qualified, of have the potential to qualify as the EPBC Act listed communities GEWVVP and SHWTLP. However, given that the current Covid-19 travel restrictions, it is not currently possible to demonstrate fine-scale avoidance of native vegetation and instead a worst-case scenario of native vegetation removal has been proposed; and
- Furthermore, given the length of the transmission line, there are limited feasible opportunities to further avoid and minimise impacts on native vegetation without undermining the key objectives of the proposal.

7.2.2. Assessment pathway

The assessment pathway is determined by the location category and the extent of native vegetation as detailed for the study area as follows:

- Location Category: Location 2
- Extent of native vegetation: A total of 3.458 ha of native vegetation (including no large trees).

Based on these details, the Guidelines stipulate that the proposal is to be assessed under the **Detailed** assessment pathway.

This proposal **will** trigger a referral to DELWP based on the criteria specified in Section 3.2.3.

7.2.3. Offset requirements

Offsets required to compensate for the proposed removal of native vegetation from the study area are provided below.

- 1.706 *general habitat units* and must include the following offset attribute requirements:
  - Minimum strategic biodiversity value (SBV) of 0.451

- Occur within the Glenelg Hopkins CMA boundary or the Moyne municipal district.

Under the Guidelines all offsets must be secured prior to the removal of native vegetation.

7.2.4. Offset statement

The offset target for the current proposal will be achieved via a third-party offset.

An online search of the Native Vegetation Credit Register (NVCR) has shown that the required general offset **is** currently available for purchase from a native vegetation credit owner (DELWP 2020e).

Evidence that the required general offset is available is provided in Appendix 8. The required general offset would be secured following approval of the application to remove native vegetation.

7.3. 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.

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).

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

- Ecological communities:
  - Grassy Eucalypt Woodland of the Victorian Volcanic Plain
- Species:
  - Yarra Pygmy Perch

Impacts could not be assessed based on information obtained during the current assessment for the following listed values given that surveys were not undertaken in the appropriate season or at a sufficient level of detail to determine presence or otherwise:

- Ecological communities:
  - Seasonal Herbaceous Wetlands of the Temperate Lowland Plains
- Species:
  - Matted Flax-lily (Endangered)
  - Clover Glycine (Vulnerable)
  - Gorae Leek-orchid (Endangered)
  - Maroon Leek-orchid (Endangered)
  - Swamp Fireweed (Vulnerable)

- Swamp Everlasting (Vulnerable).

Targeted surveys are therefore required to determine the status of these values in the impact area and to assess any potential impacts on these values. The appropriate survey season for each species/ecological communities is included in Table 6, below. Based on Table 6, two surveys, one in October in EVC 55_63 and a second in December in EVCs 55_63, 125, and 647 are recommended.

Table 6: Targeted survey times for listed flora species/ecological communities

Common Name	Scientific name	J	F	M	A	M	J	J	A	S	O	N	D
Seasonal Herbaceous Wetlands of the Temperate Lowland Plains										■	■	■	
Matted Flax-lily	*Dianella amoena*	■	■										■
Clover Glycine	*Glycine latrobeana*									■	■	■	
Gorae Leek-orchid	*Prasophyllum diversiflorum*	■											■
Maroon Leek-orchid	*Prasophyllum frenchii*										■	■	■
Swamp Fireweed	*Senecio psilocarpus*	■	■	■								■	■
Swamp Everlasting	*Xerochrysum palustre*	■	■	■								■	■

A Referral under the EPBC Act will be required for any of the above-listed flora species/ecological communities, or a combination of such, found to be potentially significantly impacted upon based on the findings of the recommended targeted surveys. However, if found on the planned impact site, then micro siting will be undertaken, or an engineering solution devised, to avoid impacts on EPBC Act-listed species and communities.

7.4. FFG Act

The Victorian FFG Act lists threatened and protected species and ecological communities (DELWP 2017c, DELWP 2017d). 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.

On a number of road crossings, a 30-metre-wide easement in which woody vegetation taller than five metres is to be considered. It is our understanding from Ryan Corner Development that it is seeking to comply with the Electricity Safety (Electric Line Clearance) Regulations 2010 for a 132kV transmission line. We have been informed that the required vertical clearance between conductors at maximum sag and vegetation must be 3.7m. Horizontally, considering conductor sway clearance should be 4.6 m. The vegetation on these crossings are species of wattles. *Thus, for the purpose of this assessment this vegetation is not considered as lost – but rather retained and, if needed, managed in the locations on Figures 1-15.*

Should FFG Act values listed as threatened or protected are susceptible to impacts from the proposed development on public land a Protected Flora Permit would be required from DELWP to remove the abovementioned protected plant taxa from public land. Application forms for Protected Flora Permits can be obtained from DELWP offices or from their customer service centre.

7.5. EE Act

The "Ministerial Guidelines for Assessment of Environmental Effects under the *Environment Effects Act 1978"* (DSE 2006), identifies criteria which trigger a Referral to the State Minister for Planning. The criteria related to flora, fauna and native vegetation are outlined below.

One or more of the following would trigger a Referral:

- Potential clearing of 10 ha or more of native vegetation from an area that:
  - Is of an Ecological Vegetation Class identified as endangered by the Department of Sustainability and Environment (in accordance with Appendix 2 of Victoria's Native Vegetation Management Framework); or
  - Is, or is likely to be, of very high conservation significance (as defined in accordance with Appendix 3 of Victoria's Native Vegetation Management Framework); and
  - Is not authorised under an approved Forest Management Plan or Fire Protection Plan
- Potential long-term loss of a significant proportion (e.g. 1 to 5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria
- Potential long-term change to the ecological character of a wetland listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia'
- Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term

Two or more of the following would also trigger a Referral:

- Potential clearing of 10 ha or more of native vegetation, unless authorised under an approved Forest Management Plan or Fire Protection Plan
- Matters listed under the Flora and Fauna Guarantee Act 1988:
  - Potential loss of a significant area of a listed ecological community; or
  - Potential loss of a genetically important population of an endangered or threatened species (listed or nominated for listing), including as a result of loss or fragmentation of habitats; or
  - Potential loss of critical habitat; or
  - Potential significant effects on habitat values of a wetland supporting migratory bird species.

Based on these criteria, a Referral to the state Minister for Planning **will not** be required under the EE Act for the aspects covered by the current investigation.

7.6. CaLP Act

The *Catchment and Land Protection Act 1994* (CaLP Act) requires that land owners (or a third party to whom responsibilities have been legally transferred) must prevent the growth and spread of regionally controlled weeds.

In accordance with the *Catchment and Land Protection Act 1994*, the noxious weed species listed below, which were recorded in the study area, must be controlled.

- Blackberry

- Gorse
- Sweet Briar

Precision control methods that minimise off-target kills (e.g. spot spraying) should be used in environmentally sensitive areas (e.g. within or near native vegetation, waterways, etc.).

7.7. Mitigation recommendations

The following recommendations should be considered during the construction of the project to ensure there are no additional impacts to native vegetation and fauna habitat:

Pre-construction phase:

- Construction should be undertaken in a way that does not alter the site's hydrology, with a particular focus on protection of waterways.
- The proposed development should be designed and developed in a way that does not alter the site's hydrology in areas that support native vegetation or act as tributaries to rivers, creeks and significant drainage lines.
- Construction contractors should be inducted into an environmental management program for construction works.
- All environmental controls should be checked for compliance on a regular basis.

Construction phase:

- Construction should be scheduled for summer and autumn to avoid ground disturbance during the wetter months of the year.
- Environmentally sensitive areas including retained native vegetation within 50 metres of works (including access points and routes) should be securely fenced at two metres from the perimeter and appropriately signed. All machinery, vehicles, equipment, personnel, waste materials/spoil and earthworks are to be excluded from these areas.
- Any stockpiling should occur outside of environmentally sensitive areas.
- All machinery should enter and exit works sites along defined routes that do not impact on native vegetation or cause soil disturbance and weed spread.
- All machinery brought on site should be weed and pathogen free. This is important for environmental and agricultural protection. Soil borne pathogens such as Cinnamon Fungus and livestock diseases can be easily transported by machinery.
- All machinery wash down, lay down and personnel rest areas should be defined (fenced) and located in disturbed areas.
- All works must be undertaken in a manner that will minimise soil erosion and adhere to Construction Techniques for Sediment Pollution Control (EPAV 1991), with a particular focus on protecting watercourses.

Post-construction phase:

- Weed control, by an experienced bush regenerator, is to be carried out along disturbed areas after construction to control any weed outbreaks in native vegetation or watercourses.

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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 on the *Location* Map and occurring over most of Victoria.
  - Location 2 – shown in dark blue on the *Location* Map, and includes areas mapped as endangered EVCs and/or sensitive wetlands and coastal areas.
  - Location 3 – shown in orange on the *Location* Map and includes areas where the removal of less than 0.5 ha 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 10 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.

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 are 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:

Habitat hectares = extent of native vegetation x 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 H*abitat importance map.*

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

General habitat score = habitat hectares x general landscape factor

Species habitat score = habitat hectares x 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.

General offset (amount of general habitat units) = general habitat score x 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.

Species offset (amount of species habitat units) = Species habitat score x 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			J	K	L	M	R	AA	AB	AC	AE
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number			642	642	642	642	125	649	649	649	649
Total area of Habitat Zone (ha)			0.065	0.051	0.056	0.074	0.097	0.122	0.043	0.048	0.367
Site Condition	Large Old Trees	/10	0	0	0	0	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	0	0	0	0	N/A	N/A	N/A	N/A	N/A
	Lack of Weeds	/15	0	4	4	4	4	4	4	4	4
	Understorey	/25	15	5	5	5	15	15	15	15	15
	Recruitment	/10	0	0	0	0	6	0	0	0	0
	Organic Matter	/5	2	5	5	5	4	4	4	4	4
	Logs	/5	0	0	0	0	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.00	1.00	1.00	1.00	1.36	1.36	1.36	1.36	1.36
	Site Condition subtotal		*17*	*14*	*14*	*14*	*39*	*31*	*31*	*31*	*31*
Landscape Context	Patch Size	/10	1	1	1	1	1	8	8	8	8
	Neighbourhood	/10	0	0	0	0	0	5	5	5	5
	Distance to Core	/5	0	0	0	0	0	4	4	4	4
Total Condition Score		**/100**	**18**	**15**	**15**	**15**	**40**	**48**	**48**	**48**	**48**
Condition score out of 1			0.18	0.15	0.15	0.15	0.40	0.48	0.48	0.48	0.48
Habitat Hectares in Habitat Zone#			**0.012**	**0.008**	**0.008**	**0.011**	**0.039**	**0.059**	**0.021**	**0.023**	**0.176**

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

Habitat Zone			AF	AG	AH	AI	AJ	AL	AO	AP	AR
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number			649	649	649	649	649	649	125	649	649
Total area of Habitat Zone (ha)			0.143	0.381	0.107	0.541	0.617	0.263	0.700	0.076	0.290
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Lack of Weeds	/15	4	4	4	4	4	4	4	4	4
	Understorey	/25	15	15	15	15	15	15	15	15	15
	Recruitment	/10	0	0	0	0	0	0	6	0	0
	Organic Matter	/5	4	4	4	4	4	4	4	4	4
	Logs	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36
	Site Condition subtotal		*31*	*31*	*31*	*31*	*31*	*31*	*39*	*31*	*31*
Landscape Context	Patch Size	/10	8	8	8	8	8	8	8	8	8
	Neighbourhood	/10	5	5	5	5	5	5	5	5	5
	Distance to Core	/5	4	4	4	4	4	4	4	4	4
Total Condition Score		**/100**	**48**	**48**	**48**	**48**	**48**	**48**	**56**	**48**	**48**
Condition score out of 1			0.48	0.48	0.48	0.48	0.48	0.48	0.56	0.48	0.48
Habitat Hectares in Habitat Zone#			**0.069**	**0.183**	**0.051**	**0.260**	**0.296**	**0.126**	**0.392**	**0.036**	**0.139**

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

Habitat Zone			AS	AU	AV	AX	AY	AZ	BA	BB	BC
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number			125	649	125	125	649	649	125	647	55_63
Total area of Habitat Zone (ha)			0.360	0.312	0.350	1.056	0.262	0.299	0.305	0.332	0.505
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0
	Tree Canopy Cover	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0
	Lack of Weeds	/15	4	4	4	4	4	4	4	4	4
	Understorey	/25	15	15	15	15	15	15	15	15	5
	Recruitment	/10	6	0	6	6	0	0	6	3	0
	Organic Matter	/5	4	4	4	4	4	4	4	3	2
	Logs	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0
	Site condition standardising multiplier*		1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.00
	Site Condition subtotal		*39*	*31*	*39*	*39*	*31*	*31*	*39*	*34*	*11*
Landscape Context	Patch Size	/10	8	8	8	8	8	8	8	6	6
	Neighbourhood	/10	5	5	5	5	5	5	5	3	5
	Distance to Core	/5	4	4	4	4	4	4	4	3	1
Total Condition Score		**/100**	**56**	**48**	**56**	**56**	**48**	**48**	**56**	**46**	**23**
Condition score out of 1			0.56	0.48	0.56	0.56	0.48	0.48	0.56	0.46	0.23
Habitat Hectares in Habitat Zone#			**0.202**	**0.150**	**0.196**	**0.591**	**0.126**	**0.144**	**0.171**	**0.153**	**0.116**

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

Habitat Zone			BD	BE	BF	BG	BH	BI	BJ	BK	BL
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number			647	55_63	649	649	125	649	125	649	647
Total area of Habitat Zone (ha)			0.256	0.283	0.145	0.292	0.076	1.130	0.682	0.835	0.017
Site Condition	Large Old Trees	/10	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Lack of Weeds	/15	4	4	4	4	4	4	4	4	4
	Understorey	/25	15	5	15	15	15	15	15	15	15
	Recruitment	/10	3	0	0	0	6	0	6	0	3
	Organic Matter	/5	3	2	4	4	4	4	4	4	3
	Logs	/5	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.36	1.00	1.36	1.36	1.36	1.36	1.36	1.36	1.36
	Site Condition subtotal		*34*	*11*	*31*	*31*	*39*	*31*	*39*	*31*	*34*
Landscape Context	Patch Size	/10	6	6	8	8	8	8	8	8	6
	Neighbourhood	/10	3	5	5	5	5	5	5	5	3
	Distance to Core	/5	3	1	4	4	4	4	4	4	3
Total Condition Score		**/100**	**46**	**23**	**48**	**48**	**56**	**48**	**56**	**48**	**46**
Condition score out of 1			0.46	0.23	0.48	0.48	0.56	0.48	0.56	0.48	0.46
Habitat Hectares in Habitat Zone#			**0.118**	**0.065**	**0.070**	**0.140**	**0.043**	**0.542**	**0.382**	**0.401**	**0.008**

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

Habitat Zone			BM	BN	BO	BP	BQ	BR	BS	BT	BU
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number			55_63	55_63	55_63	125	55_63	649	649	649	649
Total area of Habitat Zone (ha)			0.465	0.072	0.503	0.314	0.358	0.005	0.018	0.033	0.024
Site Condition	Large Old Trees	/10	0	0	0	N/A	0	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	0	0	0	N/A	0	N/A	N/A	N/A	N/A
	Lack of Weeds	/15	4	4	4	4	4	4	4	4	4
	Understorey	/25	5	5	5	15	5	5	5	5	5
	Recruitment	/10	0	0	0	6	0	5	5	5	5
	Organic Matter	/5	3	3	2	4	3	5	5	5	5
	Logs	/5	2	4	0	N/A	4	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.00	1.00	1.00	1.36	1.00	1.36	1.36	1.36	1.36
	Site Condition subtotal		*14*	*16*	*11*	*39*	*16*	*26*	*26*	*26*	*26*
Landscape Context	Patch Size	/10	6	6	6	8	6	1	1	1	1
	Neighbourhood	/10	5	5	5	5	5	3	3	2	1
	Distance to Core	/5	1	1	1	4	1	3	3	3	3
Total Condition Score		**/100**	**26**	**28**	**23**	**56**	**28**	**33**	**33**	**32**	**31**
Condition score out of 1			0.26	0.28	0.23	0.56	0.28	0.33	0.33	0.32	0.31
Habitat Hectares in Habitat Zone#			**0.121**	**0.020**	**0.116**	**0.176**	**0.100**	**0.002**	**0.006**	**0.011**	**0.007**

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

Habitat Zone			BV	BW	BY	BZ	CA	CB	CC	CD	CE
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number			649	649	649	649	649	649	125	649	55_63
Total area of Habitat Zone (ha)			0.030	0.078	0.030	0.007	0.082	0.047	0.253	0.196	0.809
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0
	Tree Canopy Cover	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0
	Lack of Weeds	/15	4	4	5	5	4	4	4	4	4
	Understorey	/25	5	5	0	0	15	15	15	15	5
	Recruitment	/10	5	5	0	0	0	0	6	0	0
	Organic Matter	/5	5	5	2	2	4	4	4	4	2
	Logs	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0
	Site condition standardising multiplier*		1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.00
	Site Condition subtotal		*26*	*26*	*10*	*10*	*31*	*31*	*39*	*31*	*11*
Landscape Context	Patch Size	/10	1	1	1	1	8	8	8	8	6
	Neighbourhood	/10	1	3	5	5	5	5	5	5	5
	Distance to Core	/5	3	3	1	1	4	4	4	4	1
Total Condition Score		**/100**	**31**	**33**	**17**	**17**	**48**	**48**	**56**	**48**	**23**
Condition score out of 1			0.31	0.33	0.17	0.17	0.48	0.48	0.56	0.48	0.23
Habitat Hectares in Habitat Zone#			**0.009**	**0.026**	**0.005**	**0.001**	**0.039**	**0.023**	**0.142**	**0.094**	**0.186**

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

Habitat Zone			CF	CG	CH	CI	CJ	CK	CL	CM	CN
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number			647	649	125	649	649	649	649	649	649
Total area of Habitat Zone (ha)			0.182	0.193	0.257	0.889	0.042	0.012	0.544	0.405	0.047
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Lack of Weeds	/15	4	4	7	4	5	5	4	4	4
	Understorey	/25	15	15	15	15	0	0	15	15	15
	Recruitment	/10	3	0	3	0	0	0	0	0	0
	Organic Matter	/5	3	4	3	4	2	2	4	4	4
	Logs	/5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36
	Site Condition subtotal		*34*	*31*	*38*	*31*	*10*	*10*	*31*	*31*	*31*
Landscape Context	Patch Size	/10	6	8	8	8	1	1	8	8	8
	Neighbourhood	/10	5	5	5	5	3	3	5	5	5
	Distance to Core	/5	1	4	4	4	4	4	4	4	4
Total Condition Score		**/100**	**46**	**48**	**55**	**48**	**18**	**18**	**48**	**48**	**48**
Condition score out of 1			0.46	0.48	0.55	0.48	0.18	0.18	0.48	0.48	0.48
Habitat Hectares in Habitat Zone#			**0.084**	**0.093**	**0.141**	**0.427**	**0.008**	**0.002**	**0.261**	**0.194**	**0.023**

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

Habitat Zone			CO	CP	CQ	CR	CS	CT	CU	CV	CY
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number			649	125	125	55_63	649	649	649	125	649
Total area of Habitat Zone (ha)			0.168	0.105	0.087	0.188	0.082	0.080	0.140	0.450	0.140
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A
	Lack of Weeds	/15	4	7	7	4	4	4	4	4	4
	Understorey	/25	15	10	10	5	15	15	15	15	15
	Recruitment	/10	0	0	0	0	0	0	0	6	0
	Organic Matter	/5	4	5	5	2	4	4	4	4	4
	Logs	/5	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.36	1.36	1.36	1.00	1.36	1.36	1.36	1.36	1.36
	Site Condition subtotal		*31*	*30*	*30*	*11*	*31*	*31*	*31*	*39*	*31*
Landscape Context	Patch Size	/10	8	6	6	6	8	8	8	8	8
	Neighbourhood	/10	5	5	5	5	5	5	5	5	5
	Distance to Core	/5	4	1	1	1	4	4	4	4	4
Total Condition Score		**/100**	**48**	**42**	**42**	**23**	**48**	**48**	**48**	**56**	**48**
Condition score out of 1			0.48	0.42	0.42	0.23	0.48	0.48	0.48	0.56	0.48
Habitat Hectares in Habitat Zone#			**0.081**	**0.044**	**0.037**	**0.043**	**0.039**	**0.038**	**0.067**	**0.252**	**0.067**

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

Habitat Zone			CZ	DA	DB	DC	DD	DE	DI	DK	DL
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number			649	651	651	653	647	53	649	649	649
Total area of Habitat Zone (ha)			0.562	0.037	0.047	0.275	0.653	0.260	0.012	0.239	0.099
Site Condition	Large Old Trees	/10	N/A	0	0	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	N/A	0	5	N/A	N/A	0	N/A	N/A	N/A
	Lack of Weeds	/15	4	4	0	9	0	0	4	4	4
	Understorey	/25	15	15	5	5	5	5	15	15	15
	Recruitment	/10	0	0	6	3	3	0	0	0	0
	Organic Matter	/5	4	3	2	3	4	3	4	4	4
	Logs	/5	N/A	0	0	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.36	1.00	1.00	1.36	1.36	1.25	1.36	1.36	1.36
	Site Condition subtotal		*31*	*22*	*18*	*27*	*16*	*10*	*31*	*31*	*31*
Landscape Context	Patch Size	/10	8	1	1	6	6	1	8	8	8
	Neighbourhood	/10	5	1	1	5	5	1	5	5	5
	Distance to Core	/5	4	0	0	1	1	0	4	4	4
Total Condition Score		**/100**	**48**	**24**	**20**	**39**	**28**	**12**	**48**	**48**	**48**
Condition score out of 1			0.48	0.24	0.20	0.39	0.28	0.12	0.48	0.48	0.48
Habitat Hectares in Habitat Zone#			**0.270**	**0.009**	**0.009**	**0.107**	**0.183**	**0.031**	**0.006**	**0.115**	**0.048**

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

Habitat Zone			DM	DN	DP	DQ	DR	DT	DU	DW	DX
Bioregion			VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC Number			649	649	649	649	649	649	53	53	53
Total area of Habitat Zone (ha)			0.363	0.069	0.155	0.194	0.019	0.033	0.013	0.050	0.047
Site Condition	Large Old Trees	/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tree Canopy Cover	/5	N/A	0	N/A	N/A	N/A	N/A	0	0	0
	Lack of Weeds	/15	4	9	4	4	4	4	9	9	9
	Understorey	/25	15	15	15	15	15	15	5	5	5
	Recruitment	/10	0	0	0	0	0	0	0	0	0
	Organic Matter	/5	4	5	4	4	4	4	3	3	3
	Logs	/5	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Site condition standardising multiplier*		1.36	1.12	1.36	1.36	1.36	1.36	1.25	1.25	1.25
	Site Condition subtotal		*31*	*32*	*31*	*31*	*31*	*31*	*21*	*21*	*21*
Landscape Context	Patch Size	/10	8	8	8	8	8	8	1	1	1
	Neighbourhood	/10	5	5	5	5	5	5	1	1	1
	Distance to Core	/5	4	4	4	4	4	4	0	0	0
Total Condition Score		**/100**	**48**	**49**	**48**	**48**	**48**	**48**	**23**	**23**	**23**
Condition score out of 1			0.48	0.49	0.48	0.48	0.48	0.48	0.23	0.23	0.23
Habitat Hectares in Habitat Zone#			**0.174**	**0.034**	**0.074**	**0.093**	**0.009**	**0.016**	**0.003**	**0.012**	**0.011**

* 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 and listed species known (or with the potential) to occur in the search region

Origin	Common name	Scientific name	EPBC	FFG-T	FFG-P	DELWP	CaLP Act	Recorded
	Black Wattle	*Acacia mearnsii*			p			X
	Blackwood	*Acacia melanoxylon*						X
	Prickly Moses	*Acacia verticillata subsp. verticillata*			p			X
	Sheep's Burr	*Acaena echinata*						X
	Bidgee-widgee	*Acaena novae-zelandiae*						X
*	Sheep Sorrel	*Acetosella vulgaris*						X
*	Brown-top Bent	*Agrostis capillaris*						X
	River Swamp Wallaby-grass	*Amphibromus fluitans*	VU					
	Common Wheat-grass	*Anthosachne scabra s.l.*						X
*	Sweet Vernal-grass	*Anthoxanthum odoratum*						X
	Spear Grass	*Austrostipa spp.*						X
*	Oat	*Avena spp.*						X
	Salt Club-sedge	*Bolboschoenus caldwellii*						X
*	Twiggy Turnip	*Brassica fruticulosa*						X
*	Great Brome	*Bromus diandrus*						X
*	Soft Brome	*Bromus hordeaceus subsp. hordeaceus*						X
	Sweet Bursaria	*Bursaria spinosa subsp. spinosa*						X
	Western Water-starwort	*Callitriche cyclocarpa*	VU	L	p			
	Tuberous Bitter-cress	*Cardamine gunnii s.s.*		L	p	x		
	Tall Sedge	*Carex appressa*						X
	Curly Sedge	*Carex tasmanica*		L	p	v		X
	Poong'ort	*Carex tereticaulis*						X
*	Common Centaury	*Centaurium erythraea*						X
	Windmill Grass	*Chloris truncata*						X
*	Spear Thistle	*Cirsium vulgare*					R	X
*	Mirror Bush	*Coprosma repens*						X
*	Water Buttons	*Cotula coronopifolia*						X
*	Hawthorn	*Crataegus monogyna*					R	X

Origin	Common name	Scientific name	EPBC	FFG-T	FFG-P	DELWP	CaLP Act	Recorded
	Common Water-ribbons	*Cycnogeton procerum s.s.*						X
*	Couch	*Cynodon dactylon var. dactylon*						X
*	Cocksfoot	*Dactylis glomerata*						X
	Matted Flax-lily	*Dianella amoena*	EN	L	p	e		
	Black-anther Flax-lily	*Dianella revoluta var. revoluta s.l.*						X
	Kidney-weed	*Dichondra repens*						X
	Bell-flower Hyacinth-orchid	*Dipodium campanulatum*	EN	L	p	e		
	Swamp Diuris	*Diuris palustris*		L	p	v		
#	Clammy Goosefoot	*Dysphania pumilio*						X
	Variable Willow-herb	*Epilobium billardierianum*						X
	Prickfoot	*Eryngium vesiculosum*						X
*	Sugar Gum	*Eucalyptus cladocalyx*						X
	Broad-leaf Peppermint	*Eucalyptus dives*						X
	Swamp Gum	*Eucalyptus ovata*						X
	Cudweed	*Euchiton spp.*			p			X
	Knobby Club-sedge	*Ficinia nodosa*						X
	Crane's Bill	*Geranium spp.*						X
	Australian Sweet-grass	*Glyceria australis*						X
	Clover Glycine	*Glycine latrobeana*	VU	L	p	v		
*	Ox-tongue	*Helminthotheca echioides*						X
	Mat Grass	*Hemarthria uncinata var. uncinata*						X
*	Yorkshire Fog	*Holcus lanatus*						X
*	Flatweed	*Hypochaeris radicata*						X
	Club Sedge	*Isolepis spp.*						X
	Coast Ixodia	*Ixodia achillaeoides subsp. arenicola*	VU		p	v		
	Grassy Rush	*Juncus caespiticius*						X
	Green Rush	*Juncus gregiflorus*						X
	Joint-leaf Rush	*Juncus holoschoenus*						X
	Loose-flower Rush	*Juncus pauciflorus*						X

Origin	Common name	Scientific name	EPBC	FFG-T	FFG-P	DELWP	CaLP Act	Recorded
	Adamson's Blown-grass	*Lachnagrostis adamsonii*	EN	L	p	v		
	Common Blown-grass	*Lachnagrostis filiformis s.l.*						X
	Purple Blown-grass	*Lachnagrostis punicea subsp. filifolia*		L	p	r		
*	Hare's-tail Grass	*Lagurus ovatus*						X
	Common Duckweed	*Lemna disperma*						X
	Basalt Peppercress	*Lepidium hyssopifolium*	EN	L	p	e		
	Prickly Tea-tree	*Leptospermum continentale*						X
	Woolly Tea-tree	*Leptospermum lanigerum*						X
*	Perennial Rye-grass	*Lolium perenne*						X
	Small Loosestrife	*Lythrum hyssopifolia*						X
	Scented Paperbark	*Melaleuca squarrosa*						X
	Tree Violet	*Melicytus dentatus s.s.*						X
	Weeping Grass	*Microlaena stipoides var. stipoides*						X
	Water Milfoil	*Myriophyllum spp.*						X
*	Watercress	*Nasturtium officinale*						X
	Running Marsh-flower	*Ornduffia reniformis*						X
	Grassland Wood-sorrel	*Oxalis perennans*						X
*	Paspalum	*Paspalum dilatatum*						X
	Slender Knotweed	*Persicaria decipiens*						X
*	Toowoomba Canary-grass	*Phalaris aquatica*						X
	Common Reed	*Phragmites australis*						X
*	Buck's-horn Plantain	*Plantago coronopus*						X
	Narrow Plantain	*Plantago gaudichaudii*						X
*	Ribwort	*Plantago lanceolata*						X
	Common Tussock-grass	*Poa labillardierei*						X
	Grey Tussock-grass	*Poa sieberiana var. sieberiana*						X
*	Hogweed	*Polygonum aviculare s.s.*						X
	Thin Pondweed	*Potamogeton australiensis*				k		X
	Pretty Leek-orchid	*Prasophyllum anticum*		L	p	e		

Origin	Common name	Scientific name	EPBC	FFG-T	FFG-P	DELWP	CaLP Act	Recorded
	Gorae Leek-orchid	*Prasophyllum diversiflorum*	EN	L	p	e		
	Maroon Leek-orchid	*Prasophyllum frenchii*	EN	L	p	e		
	Dense Leek-orchid	*Prasophyllum spicatum*	VU		p	e		
	Basalt Leek-orchid	*Prasophyllum viretrum*		L	p	e		
	Austral Bracken	*Pteridium esculentum*						X
	Green-striped Greenhood	*Pterostylis chlorogramma*	VU	L	p	v		
	Leafy Greenhood	*Pterostylis cucullata*	VU	L	p	P		
	Small Sickle Greenhood	*Pterostylis lustra*		L	p	e		
*	Onion Grass	*Romulea rosea*						X
*	Sweet Briar	*Rosa rubiginosa*					C	X
*	Blackberry	*Rubus fruticosus spp. agg.*					C	X
*	Clustered Dock	*Rumex conglomeratus*						X
*	Curled Dock	*Rumex crispus*						X
*	Dock (naturalised)	*Rumex spp. (naturalised)*						X
	Button Wrinklewort	*Rutidosis leptorhynchoides*	EN	L	p	e		
	Common Wallaby-grass	*Rytidosperma caespitosum*						X
	Brown-back Wallaby-grass	*Rytidosperma duttonianum*						X
	Bristly Wallaby-grass	*Rytidosperma setaceum*						X
	Wallaby Grass	*Rytidosperma spp.*						X
	River Club-sedge	*Schoenoplectus tabernaemontani*						X
	Shiny Swamp-mat	*Selliera radicans*						X
	Swamp Fireweed	*Senecio psilocarpus*	VU		p	v		
	Cotton Fireweed	*Senecio quadridentatus*			p			X
*	Rat-tail Grass	*Sporobolus africanus*						X
	Coast Dandelion	*Taraxacum cygnorum*	VU	L	p	e		
	Metallic Sun-orchid	*Thelymitra epipactoides*	EN	L	p	e		
	Spiral Sun-orchid	*Thelymitra matthewsii*	VU	L	p	v		
	Kangaroo Grass	*Themeda triandra*						X
*	White Clover	*Trifolium repens var. repens*						X

Origin	Common name	Scientific name	EPBC	FFG-T	FFG-P	DELWP	CaLP Act	Recorded
	Streaked Arrowgrass	*Triglochin striata*						X
	Narrow-leaf Cumbungi	*Typha domingensis*						X
*	Gorse	*Ulex europaeus*					C	X
	Ivy-leaf Violet	*Viola hederacea sensu Entwisle (1996)*						X
	Swamp Everlasting	*Xerochrysum palustre*	VU	L	p	v		

Notes: EPBC = threatened species status under EPBC Act: CR = critically endangered; EN = endangered; VU = vulnerable; **FFG-T** = threatened species status under the FFG Act: L = listed as threatened under the FFG Act; **FFG-P** = protected species status under the FFG Act: p = listed as protected; **DELWP** = status under DELWP's Advisory List (DEPI 2014); x = presumed extinct in the wild; cr = critically endangered; e = endangered; v = vulnerable; r = rare; k = insufficiently known; **CaLP Act** = declared noxious weeds status under the CaLP Act; S = State Prohibited Weeds (any infestations are to be reported to DELWP. DELWP is responsible for control of State Prohibited Weeds); P = Regionally Prohibited Weeds (Land owners must take all reasonable steps to eradicate regionally prohibited weeds on their land); 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).

X = recorded in the study area

* = introduced to Victoria

= Victorian native taxa occurring outside their natural range

Appendix 4: Terrestrial listed fauna species that have the potential to occur in the study area

Common name	Scientific name	EPBC-T	EPBC-M	FFG	DELWP
Birds					
Australasian Bittern	*Botaurus poiciloptilus*	EN		L	e
Australasian Shoveler	*Anas rhynchotis*				v
Australian Painted Snipe	*Rostratula australis*	EN		L	cr
Baillon's Crake	*Porzana pusilla palustris*			L	v
Bar-tailed Godwit	*Limosa lapponica*	VU	M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		
Black Falcon	*Falco subniger*				v
Blue-billed Duck	*Oxyura australis*			L	e
Brolga	*Grus rubicunda*			L	v
Bush Stone-curlew	*Burhinus grallarius*			L	e
Common Greenshank	*Tringa nebularia*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		v
Common Sandpiper	*Actitis hypoleucos*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H)		v
Curlew Sandpiper	*Calidris ferruginea*	CR	M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))	L	e
Double-banded Plover	*Charadrius bicinctus*		M (Bonn (A2H))		
Eastern Curlew	*Numenius madagascariensis*	CR	M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H)	L	v
Eastern Great Egret	*Ardea modesta*			L	v
Fork-tailed Swift	*Apus pacificus*		M (JAMBA,CAMBA, ROKAMBA)		
Freckled Duck	*Stictonetta naevosa*			L	e
Glossy Ibis	*Plegadis falcinellus*		M (CAMBA, Bonn (A2S))		nt
Great Knot	*Calidris tenuirostris*	CR	M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))	L	e
Grey Goshawk	*Accipiter novaehollandiae novaehollandiae*			L	v
Grey Plover	*Pluvialis squatarola*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		e
Ground Parrot	*Pezoporus wallicus wallicus*			L	e
Hardhead	*Aythya australis*				v
Hooded Plover	*Thinornis rubricollis rubricollis*	VU		L	v
Hooded Robin	*Melanodryas cucullata cucullata*			L	nt
Intermediate Egret	*Ardea intermedia*			L	e
Latham's Snipe	*Gallinago hardwickii*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H)		nt

Common name	Scientific name	EPBC-T	EPBC-M	FFG	DELWP
Little Curlew	*Numenius minutus*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		
Little Egret	*Egretta garzetta nigripes*			L	e
Magpie Goose	*Anseranas semipalmata*			L	nt
Marsh Sandpiper	*Tringa stagnatilis*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		v
Musk Duck	*Biziura lobata*				v
Orange-bellied Parrot	*Neophema chrysogaster*	CE	M (JAMBA)	L	cr
Osprey	*Pandion cristatus*		M (Bonn (A2S))		
Pacific Golden Plover	*Pluvialis fulva*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		v
Pectoral Sandpiper	*Calidris melanotos*		M (JAMBA, ROKAMBA, Bonn (A2H))		nt
Pin-tailed Snipe	*Gallinago stenura*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		
Plains-wanderer	*Pedionomus torquatus*	CR		L	cr
Red Knot	*Calidris canutus*	EN	M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H)		e
Red-necked Stint	*Calidris ruficollis*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		
Ruddy Turnstone	*Arenaria interpres*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		v
Rufous Fantail	*Rhipidura rufifrons*		M (Bonn (A2H))		
Sanderling	*Calidris alba*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		nt
Satin Flycatcher	*Myiagra cyanoleuca*		M (Bonn (A2H))		
Sharp-tailed Sandpiper	*Calidris acuminata*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		
Swift Parrot	*Lathamus discolor*	CR		L	e
White-bellied Sea-Eagle	*Haliaeetus leucogaster*			L	v
White-throated Needletail	*Hirundapus caudacutus*		M (JAMBA, CAMBA, ROKAMBA)	L	v
Wood Sandpiper	*Tringa glareola*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))		v
Yellow Wagtail	*Motacilla flava*		M (JAMBA, CAMBA, ROKAMBA)		
Fish					
Australian Grayling	*Prototroctes maraena*	VU		L	v
Dwarf Galaxias	*Galaxiella pusilla*	VU		L	e
Macquarie Perch	*Macquaria australasica*	EN		L	e
Western Plains Galaxiella	*Galaxiella sp. 1*				v
Yarra Pygmy Perch	*Nannoperca obscura*	VU		L	v

Common name	Scientific name	EPBC-T	EPBC-M	FFG	DELWP
Frogs					
Brown Toadlet	*Pseudophryne bibronii*			L	e
Growling Grass Frog	*Litoria raniformis*	VU		L	e
Southern Toadlet	*Pseudophryne semimarmorata*				v
Insects					
Golden Sun Moth	*Synemon plana*	CR		L	cr
Mammals					
Brush-tailed Phascogale	*Phascogale tapoatafa*			L	v
Common Bent-wing Bat (southern ssp.)	*Miniopterus schreibersii bassanii*	CR		L	cr
Dingo	*Canis lupus dingo*			L	dd
Eastern Barred Bandicoot	*Perameles gunnii*	EN		L	wx
Grey-headed Flying-fox	*Pteropus poliocephalus*	VU		L	v
Long-nosed Potoroo	*Potorous tridactylus tridactylus*	VU		L	nt
Southern Brown Bandicoot	*Isoodon obesulus obesulus*	EN		L	nt
Spot-tailed Quoll	*Dasyurus maculatus maculatus*	EN		L	e
Swamp Antechinus	*Antechinus minimus maritimus*	VU		L	nt
Yellow-bellied Sheathtail Bat	*Saccolaimus flaviventris*			L	dd
Crustaceans					
Glenelg Spiny Crayfish	*Euastacus bispinosus*	EN		L	
Reptiles					
Glossy Grass Skink	*Pseudemoia rawlinsoni*				v
Striped Legless Lizard	*Delma impar*	VU		L	e
Tussock Skink	*Pseudemoia pagenstecheri*				v

Notes: EPBC-T = threatened species status under EPBC Act; CR = critically endangered; EN = endangered; VU = vulnerable; **EPBC-M** = migratory status under the EPBC Act; M = listed migratory taxa; Bonn (A2H) - Convention on the Conservation of Migratory Species of Wild Animals – listed as a member of a family; Bonn (A2S) - Convention on the Conservation of Migratory Species of Wild Animals - species listed explicitly; CAMBA - China- Australia Migratory Birds Agreement; JAMBA - Japan-Australia Migratory Birds Agreement; ROKAMBA - Republic of Korea Australia Migratory Birds Agreement; **FFG** = threatened species status under the FFG Act: L = listed as threatened under the FFG Act; **DELWP** = status under DELWP's Advisory List (DSE 2013); cr = critically endangered; e = endangered; v = vulnerable; nt = lower risk near threatened; dd = data deficient

Appendix 5: Representative photographs of native vegetation proposed for removal

Stony Knoll Shrubland (EVC 649)

Plains Grassy Wetland (EVC 125)

Plains Sedgy Wetland (EVC 647)

Plains Grassy Woodland (EVC 55_63) – derived grassland form

Plains Swampy Woodland (EVC 651)

Swamp Scrub (EVC 53)

Basalt Shrubby Woodland (EVC 642)

Appendix 6: EVC benchmarks

Victorian Volcanic Plain Bioregion:

- Stony Knoll Shrubland (EVC 649)
- Basalt Shrubby Woodland (EVC 642)
- Plains Grassy Wetland (EVC 125)
- Plains Sedgy Wetland (EVC 647)
- Higher Rainfall Plains Grassy Woodland (EVC 55_63)
- Plains Swampy Woodland (EVC 651)
- Aquatic Herbland (EVC 653)
- Swamp Scrub (EVC 53)

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EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 649: Stony Knoll Shrubland

Description:
Stony Knoll Shrubland is a shrubland to 3 m tall or low non-eucalypt woodland to 8 m tall with a grassy understorey. It occurs on low stony rises on basalt flows. The soils are fertile and well drained but shallow with out cropping rock, causing severe summer dryness.

[+] woodland only components (ignore when assessing treeless areas and standardise final score as appropriate)

Canopy Cover[+]:

%cover	Character Species	Common Name
15%	*Allocasuarina verticillata*	Drooping Sheoak
	Bursaria spinosa	Sweet Bursaria

Understorey:

Life form	#Spp	%Cover	LF code
Medium Shrub	3	10%	MS
Prostrate Shrub	1	1%	PS
Large Herb	2	1%	LH
Medium Herb	11	10%	MH
Small or Prostrate Herb	4	5%	SH
Medium to Small Tufted Graminoid	10	25%	MTG
Tiny Tufted Graminoid	2	5%	TTG
Medium to Tiny Non-tufted Graminoid	2	5%	MNG
Ground Fern	2	5%	GF
Bryophytes/Lichens	na	10%	BL
Soil Crust	na	10%	S/C
Total understorey projective foliage cover		**85%**	

LF Code	Species typical of at least part of EVC range	Common Name
MS	*Hymenanthera dentata* s.l.	Tree Violet
MS	*Acacia paradoxa*	Hedge Wattle
PS	*Kennedia prostrata*	Running Postman
LH	*Senecio quadridentatus*	Cotton Fireweed
LH	*Senecio glomeratus*	Annual Fireweed
MH	*Oxalis perennans*	Grassland Wood-sorrel
MH	*Rumex brownii*	Slender Dock
MH	*Hypericum gramineum*	Small St John's Wort
MH	*Acaena ovina*	Australian Sheep's Burr
SH	*Dichondra repens*	Kidneyweed
SH	*Hydrocotyle laxiflora*	Stinking Pennywort
SH	*Crassula sieberiana*	Sieber Crassula
MTG	*Themeda triandra*	Kangaroo Grass
MTG	*Poa sieberiana*	Grey Tussock-grass
MTG	*Austrodanthonia caespitosa*	Common Wallaby-grass
MTG	*Austrodanthonia setacea*	Bristly Wallaby-grass
TTG	*Carex breviculmis*	Short-stem Sedge
MNG	*Microlaena stipoides* var. *stipoides*	Weeping Grass
GF	*Pteridium esculentum*	Austral Bracken
GF	*Adiantum aethiopicum*	Common Maidenhair
SC	*Convolvulus erubescens* spp. agg.	Pink Bindweed

Recruitment:
Continuous

Organic Litter:
20 % cover

Logs+:
5 m/0.1 ha. (note: large log class does not apply)

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
T	*Schinus molle*	Pepper Tree	high	high
MS	*Lycium ferocissimum*	African Box-thorn	high	high
MS	*Genista monspessulana*	Montpellier Broom	high	high
SS	*Marrubium vulgare*	Horehound	high	high
LH	*Sonchus oleraceus*	Common Sow-thistle	high	low
LH	*Helminthotheca echioides*	Ox-tongue	high	low
LH	*Lactuca serriola*	Prickly Lettuce	high	low
LH	*Sisymbrium officinale*	Hedge Mustard	high	low
LH	*Sonchus asper* s.l.	Rough Sow-thistle	high	low
LH	*Verbascum thapsus* ssp. *thapsus*	Great Mullein	high	high
LH	*Echium plantagineum*	Paterson's Curse	high	high
LH	*Centaurium tenuiflorum*	Slender Centaury	high	low
LH	*Foeniculum vulgare*	Fennel	high	high
MH	*Hypochoeris radicata*	Cat's Ear	high	low
MH	*Trifolium arvense* var. *arvense*	Hare's-foot Clover	high	low
MH	*Trifolium subterraneum*	Subterranean Clover	high	low
MH	*Trifolium campestre* var. *campestre*	Hop Clover	high	low
MH	*Trifolium angustifolium* var. *angustifolium*	Narrow-leaf Clover	high	low
MH	*Lotus suaveolens*	Hairy Bird's-foot Trefoil	high	low
MH	*Cerastium glomeratum* s.l.	Common Mouse-ear Chickweed	high	low
SH	*Medicago polymorpha*	Burr Medic	high	low
SH	*Trifolium glomeratum*	Cluster Clover	high	low
SH	*Modiola caroliniana*	Red-flower Mallow	high	low
SH	*Aptenia cordifolia*	Heart-leaf Ice-plant	high	high
LTG	*Phalaris aquatica*	Toowoomba Canary-grass	high	high
LNG	*Holcus lanatus*	Yorkshire Fog	high	high
LNG	*Avena fatua*	Wild Oat	high	low
MTG	*Nassella trichotoma*	Serrated Tussock	high	high
MTG	*Ehrharta longiflora*	Annual Veldt-grass	high	low
MTG	*Briza maxima*	Large Quaking-grass	high	low
MTG	*Bromus hordeaceus* ssp. *hordeaceus*	Soft Brome	high	low
MTG	*Sporobolus africanus*	Rat-tail Grass	high	high
MTG	*Vulpia bromoides*	Squirrel-tail Fescue	high	low
MTG	*Romulea rosea*	Onion Grass	high	low
MTG	*Pentaschistis airoides* ssp. *airoides*	False Hair-grass	high	low
MTG	*Lolium perenne*	Perennial Rye-grass	high	low
MTG	*Dactylis glomerata*	Cocksfoot	high	high
MTG	*Vulpia myuros*	Rat's-tail Fescue	high	low
MTG	*Bromus rubens*	Red Brome	high	low
MTG	*Avena barbata*	Bearded Oat	high	low
MTG	*Aira caryophyllea*	Silvery Hair-grass	high	low
SC	*Vicia sativa* ssp. *sativa*	Common Vetch	low	low

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EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 642: Basalt Shrubby Woodland

Description:
Eucalypt-dominated woodland to 15 m tall with an understorey of shrubs and grasses, presumed originally quite species-rich. Occurs on well-drained to seasonally damp fertile soils in higher rainfall areas of volcanic plain.

Large trees:

Species	DBH(cm)	#/ha
Eucalyptus spp.	70 cm	15 / ha

Tree Canopy Cover:

%cover	Character Species	Common Name
15%	*Eucalyptus ovata*	Swamp Gum
	Eucalyptus viminalis	Manna Gum

Understorey:

Life form	#Spp	%Cover	LF code
Immature Canopy Tree		5%	IT
Understorey Tree or Large Shrub	2	10%	T
Medium Shrub	2	5%	MS
Prostrate Shrub	2	1%	PS
Large Herb	2	1%	LH
Medium Herb	10	15%	MH
Small or Prostrate Herb	5	10%	SH
Large Tufted Graminoid	3	5%	LTG
Large Non-tufted Graminoid	1	5%	LNG
Medium to Small Tufted Graminoid	10	25%	MTG
Medium to Tiny Non-tufted Graminoid	3	10%	MNG
Ground Fern	1	15%	GF
Bryophytes/Lichens	na	10%	BL
Soil Crust	na	10%	S/C

LF Code	Species typical of at least part of EVC range	Common Name
T	*Acacia melanoxylon*	Blackwood
T	*Acacia mearnsii*	Black Wattle
MS	*Leptospermum continentale*	Prickly Tea-tree
MS	*Acacia verticillata*	Prickly Moses
PS	*Bossiaea prostrata*	Creeping Bossiaea
PS	*Astroloma humifusum*	Cranberry Heath
LH	*Senecio glomeratus*	Annual Fireweed
MH	*Drosera peltata ssp. auriculata*	Tall Sundew
MH	*Lagenophora stipitata*	Common Bottle-daisy
SH	*Oxalis exilis*	Shady Wood-sorrel
SH	*Kennedia prostrata*	Running Postman
SH	*Lobelia pedunculata s.l.*	Matted Pratia
SH	*Leptostigma reptans*	Dwarf Nertera
LTG	*Austrostipa pubinodis*	Tall Spear-grass
LTG	*Lepidosperma elatius*	Tall Sword-sedge
LTG	*Deyeuxia quadriseta*	Reed Bent-grass
MTG	*Dichelachne rara*	Common Plume-grass
MTG	*Lomandra filiformis ssp. filiformis*	Wattle Mat-rush
MTG	*Dichelachne crinita*	Long-hair Plume-grass
MTG	*Austrodanthonia pilosa*	Velvet Wallaby-grass
MNG	*Poa tenera*	Slender Tussock-grass
MNG	*Microlaena stipoides var. stipoides*	Weeping Grass
GF	*Pteridium esculentum*	Austral Bracken

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Recruitment:
Continuous

Organic Litter:
20 % cover

Logs:
15 m/0.1 ha.

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
T	*Pinus radiata*	Radiata Pine	high	high
LH	*Centaurium tenuiflorum*	Slender Centaury	high	low
LH	*Plantago lanceolata*	Ribwort	high	low
LH	*Sonchus oleraceus*	Common Sow-thistle	high	low
LH	*Cirsium vulgare*	Spear Thistle	high	high
MH	*Hypochoeris radicata*	Cat's Ear	high	low
MH	*Centaurium erythraea*	Common Centaury	high	low
MH	*Gamochaeta purpurea s.s.*	Spiked Cudweed	high	low
MH	*Leontodon taraxacoides ssp. taraxacoides*	Hairy Hawkbit	high	low
LNG	*Holcus lanatus*	Yorkshire Fog	high	high
MTG	*Vulpia bromoides*	Squirrel-tail Fescue	high	low
MTG	*Briza minor*	Lesser Quaking-grass	high	low
MTG	*Briza maxima*	Large Quaking-grass	high	low
MTG	*Anthoxanthum odoratum*	Sweet Vernal-grass	high	high
MNG	*Aira elegantissima*	Delicate Hair-grass	high	low
MNG	*Cynosurus echinatus*	Rough Dog's-tail	high	low
SNG	*Sisyrinchium iridifolium*	Blue Pigroot	high	low

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EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 125: Plains Grassy Wetland

Description:
This EVC is usually treeless, but in some instances can include sparse River Red Gum *Eucalyptus camaldulensis* or Swamp Gum *Eucalyptus ovata*. A sparse shrub component may also be present. The characteristic ground cover is dominated by grasses and small sedges and herbs. The vegetation is typically species-rich on the outer verges but is usually species-poor in the wetter central areas.

Life Forms:

Life form	#Spp	%Cover	LF code
Large Herb	5	5%	LH
Medium Herb	6	10%	MH
Small or Prostrate Herb	3	10%	SH
Large Tufted Graminoid	3	15%	LTG
Large Non-tufted Graminoid	1	5%	LNG
Medium to Small Tufted Graminoid	8	30%	MTG
Medium to Tiny Non-tufted Graminoid	2	10%	MNG
Bryophytes/Lichens	na	10%	BL

LF Code	Species typical of at least part of EVC range	Common Name
LH	*Epilobium billardierianum*	Variable Willow-herb
LH	*Villarsia reniformis*	Running Marsh-flower
LH	*Epilobium billardierianum ssp. cinereum*	Grey Willow-herb
MH	*Potamogeton tricarinatus s.l.*	Floating Pondweed
MH	*Lilaeopsis polyantha*	Australian Lilaeopsis
MH	*Utricularia dichotoma s.l.*	Fairies' Aprons
SH	*Eryngium vesiculosum*	Prickfoot
SH	*Neopaxia australasica*	White Purslane
SH	*Lobelia pratioides*	Poison Lobelia
LTG	*Juncus flavidus*	Gold Rush
LTG	*Deyeuxia quadriseta*	Reed Bent-grass
LTG	*Amphibromus nervosus*	Common Swamp Wallaby-grass
LTG	*Poa labillardierei*	Common Tussock-grass
MTG	*Triglochin procerum s.l.*	Water Ribbons
MTG	*Glyceria australis*	Australian Sweet-grass
MTG	*Juncus holoschoenus*	Joint-leaf Rush
MTG	*Austrodanthonia duttoniana*	Brown-back Wallaby-grass
MNG	*Eleocharis acuta*	Common Spike-sedge
MNG	*Eleocharis pusilla*	Small Spike-sedge

Recruitment:
Episodic/Flood. Desirable period between disturbances is 5 years.

Organic Litter:
20% cover

Logs:
5 m/0.1 ha.(where trees are overhanging the wetland)

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
LH	*Cirsium vulgare*	Spear Thistle	high	high
MH	*Leontodon taraxacoides ssp. taraxacoides*	Hairy Hawkbit	high	low
MH	*Hypochoeris radicata*	Cat's Ear	high	low
LTG	*Phalaris aquatica*	Toowoomba Canary-grass	high	high
LNG	*Holcus lanatus*	Yorkshire Fog	high	high
MTG	*Briza minor*	Lesser Quaking-grass	high	low
MTG	*Romulea rosea*	Onion Grass	high	low
TTG	*Cyperus tenellus*	Tiny Flat-sedge	high	low

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EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 647: Plains Sedgy Wetland

Description:
Occurs in seasonally wet depressions on volcanic and sedimentary plains, typically associated with fertile, silty, peaty or heavy clay paludal soils. Primarily sedgy-herbaceous vegetation, sometimes with scattered or fringing eucalypts or tea-tree/paperbark shrubs in higher rainfall areas. A range of aquatic herbs can be present, and species-richness is mostly relatively low to moderate, but higher towards drier margins.

Life Forms:

Life form	#Spp	%Cover	LF code
Large Herb	2	5%	LH
Medium Herb	5	40%	MH
Small or Prostrate Herb	5	10%	SH
Large Tufted Graminoid	2	5%	LTG
Large Non-tufted Graminoid	1	5%	LNG
Medium to Small Tufted Graminoid	4	25%	MTG
Medium to Tiny Non-tufted Graminoid	2	5%	MNG

LF Code		Species typical of at least part of EVC range	Common Name
LH		*Epilobium billardierianum*	Variable Willow-herb
MH		*Potamogeton tricarinatus s.l.*	Floating Pondweed
MH		*Myriophyllum simulans*	Amphibious Water-milfoil
MH		*Stellaria angustifolia*	Swamp Starwort
MH		*Lilaeopsis polyantha*	Australian Lilaeopsis
SH		*Neopaxia australasica*	White Purslane
SH		*Lobelia pratioides*	Poison Lobelia
SH	v	*Helichrysum aff. rutidolepis (Lowland Swamps)*	Pale Swamp Everlasting
SH		*Eryngium vesiculosum*	Prickfoot
LTG		*Carex tereticaulis*	Hollow Sedge
MTG	k	*Lachnagrostis filiformis (perennial variety)*	Wetland Blown-grass
MTG		*Lachnagrostis filiformis*	Common Blown-grass
MTG		*Glyceria australis*	Australian Sweet-grass
MNG		*Eleocharis acuta*	Common Spike-sedge
MNG	v	*Amphibromus sinuatus*	Wavy Swamp Wallaby-grass

Recruitment:
Episodic/Flood. Desirable period between disturbances is 5 years.

Organic Litter:
10% cover

Logs:
5 m/0.1 ha.(where trees are overhanging the wetland)

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
MTG	*Juncus bulbosus*	Bulbous Rush	high	high

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EVC 647: Plains Sedgy Wetland - Victorian Volcanic Plain bioregion

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EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 55_63: Higher Rainfall Plains Grassy Woodland

Description:

An open, eucalypt woodland to 15 m tall or acacia/sheoak woodland to 10 m tall. Occupies poorly drained, fertile soils on flat or gently undulating plains at low elevations. The understorey consists of a few sparse shrubs over a species-rich grassy and herbaceous ground layer. This variant occupies areas receiving greater than 700 mm annual rainfall.

Large trees:

Species	DBH(cm)	# / ha
Eucalyptus spp.	70 cm	15 / ha
Acacia melanoxylon	40 cm	
Allocasuarina verticillata	40 cm	

Tree Canopy Cover:

% cover	Character Species	Common Name
20%	*Eucalyptus ovata*	Swamp Gum
	Eucalyptus viminalis	Manna Gum
	Acacia melanoxylon	Blackwood
	Allocasuarina verticillata	Drooping Sheoak

Understorey:

Life form	# Spp	% Cover	LF code
Immature Canopy Tree		5%	IT
Understorey Tree or Large Shrub	1	5%	T
Medium Shrub	3	10%	MS
Small Shrub	2	1%	SS
Prostrate Shrub	1	1%	PS
Large Herb	3	5%	LH
Medium Herb	8	15%	MH
Small or Prostrate Herb	3	5%	SH
Large Tufted Graminoid	2	5%	LTG
Medium to Small Tufted Graminoid	12	45%	MTG
Medium to Tiny Non-tufted Graminoid	2	5%	MNG
Bryophytes/Lichens	na	10%	BL
Soil Crust	na	10%	S/C

LF Code	Species typical of at least part of EVC range	Common Name
MS	*Acacia pycnantha*	Golden Wattle
MS	*Acacia paradoxa*	Hedge Wattle
SS	*Pimelea humilis*	Common Rice-flower
PS	*Astroloma humifusum*	Cranberry Heath
PS	*Bossiaea prostrata*	Creeping Bossiaea
MH	*Leptorhynchos squamatus*	Scaly Buttons
MH	*Chysocephalum apiculatum*	Common Everlasting
MH	*Gonocarpus tetragynus*	Common Raspwort
MH	*Acaena echinata*	Sheep's Burr
SH	*Dichondra repens*	Kidney-weed
SH	*Hydrocotyle laxiflora*	Stinking Pennywort
LTG	*Austrostipa mollis*	Supple Spear-grass
LTG	*Austrostipa bigeniculata*	Kneed Spear-grass
MTG	*Themeda triandra*	Kangaroo Grass
MTG	*Poa morrisii*	Soft Tussock-grass
MTG	*Austrodanthonia setacea*	Bristly Wallaby-grass
MTG	*Austrodanthonia racemosa* var. *racemosa*	Stiped Wallaby-grass
MNG	*Microlaena stipoides* var. *stipoides*	Weeping Grass

Recruitment:

Continuous

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Organic Litter:
10 % cover

Logs:
10 m/0.1 ha.

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
MS	*Lycium ferocissimum*	African Box-thorn	high	high
LH	*Cirsium vulgare*	Spear Thistle	high	high
LH	*Sonchus oleraceus*	Common Sow-thistle	high	low
LH	*Plantago lanceolata*	Ribwort	high	low
MH	*Hypochoeris radicata*	Cat's Ear	high	low
LNG	*Holcus lanatus*	Yorkshire Fog	high	high
MTG	*Vulpia bromoides*	Squirrel-tail Fescue	high	low
MTG	*Romulea rosea*	Onion Grass	high	low
MTG	*Briza minor*	Lesser Quaking-grass	high	low
MTG	*Briza maxima*	Large Quaking-grass	high	low

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Department of Sustainability and Environment

EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 651: Plains Swampy Woodland

Description:
Eucalypt woodland to 15 m tall with ground layer dominated by tussock grasses, sedges and herbs. Shrubs are often scattered throughout. Occurs on poorly drained, seasonally waterlogged heavy soils.

Large trees:

Species	DBH(cm)	#/ha
Eucalyptus spp.	80 cm	10 / ha

Tree Canopy Cover:

%cover	Character Species	Common Name
10%	*Eucalyptus ovata*	Swamp Gum

Understorey:

Life form	#Spp	%Cover	LF code
Immature Canopy Tree		5%	IT
Understorey Tree or Large Shrub	1	5%	T
Medium Shrub	4	15%	MS
Large Herb	3	5%	LH
Medium Herb	8	20%	MH
Small or Prostrate Herb	5	5%	SH
Large Tufted Graminoid	3	30%	LTG
Large Non-tufted Graminoid	1	1%	LNG
Medium to Small Tufted Graminoid	7	10%	MTG
Medium to Tiny Non-tufted Graminoid	2	5%	MNG
Bryophytes/Lichens	na	20%	BL

LF Code		Species typical of at least part of EVC range	Common Name
T		*Acacia melanoxylon*	Blackwood
MS		*Melaleuca gibbosa*	Slender Honey-myrtle
MS		*Leptospermum continentale*	Prickly Tea-tree
MS		*Ozothamnus ferrugineus*	Tree Everlasting
MS		*Allocasuarina paludosa*	Scrub Sheoak
LH		*Senecio tenuiflorus*	Slender Fireweed
LH		*Villarsia reniformis*	Running Marsh-flower
MH		*Asperula conferta*	Common Woodruff
MH		*Centella cordifolia*	Centella
MH		*Lobelia anceps*	Angled Lobelia
MH		*Acaena novae-zelandiae*	Bidgee-widgee
SH		*Eryngium vesiculosum*	Prickfoot
SH		*Oxalis exilis*	Shady Wood-sorrel
SH	R r	*Lobelia beaugleholei*	Showy Lobelia
SH		*Hypericum japonicum*	Matted St John's Wort
LTG		*Gahnia trifida*	Coast Saw-sedge
LTG		*Carex appressa*	Tall Sedge
LTG		*Poa labillardierei* var. *labillardierei*	Common Tussock-grass
MTG		*Poa clelandii*	Noah's Ark
MTG		*Lomandra filiformis*	Wattle Mat-rush
MTG		*Themeda triandra*	Kangaroo Grass
MNG		*Poa tenera*	Slender Tussock-grass
MNG		*Hemarthria uncinata* var. *uncinata*	Mat Grass

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Recruitment:
Continuous

Organic Litter:
10 % cover

Logs:
10 m/0.1 ha.

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
LH	*Plantago lanceolata*	Ribwort	high	low
LH	*Sonchus oleraceus*	Common Sow-thistle	high	low
LH	*Sonchus asper* s.l.	Rough Sow-thistle	high	low
LH	*Cirsium vulgare*	Spear Thistle	high	high
MH	*Trifolium dubium*	Suckling Clover	high	low
MH	*Hypochoeris radicata*	Cat's Ear	high	low
MH	*Prunella vulgaris*	Self-heal	high	low
MH	*Leontodon taraxacoides* ssp. *taraxacoides*	Hairy Hawkbit	high	low
LTG	*Festuca arundinacea*	Tall Fescue	high	high
LNG	*Holcus lanatus*	Yorkshire Fog	high	high
MTG	*Briza minor*	Lesser Quaking-grass	high	low
MTG	*Romulea rosea*	Onion Grass	high	low
MTG	*Vulpia bromoides*	Squirrel-tail Fescue	high	low
MTG	*Anthoxanthum odoratum*	Sweet Vernal-grass	high	high
MNG	*Holcus setosus*	Annual Fog	high	low
MNG	*Juncus capitatus*	Capitate Rush	high	low
TTG	*Cyperus tenellus*	Tiny Flat-sedge	high	low

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Department of Sustainability and Environment

EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 653: Aquatic Herbland

Description:
Herbland of permanent to semi-permanent wetlands, dominated by sedges (especially on shallower verges) and/or aquatic herbs. Occurs on fertile paludal soils, typically heavy clays beneath organic accumulations.

Life Forms:

Life form	#Spp	%Cover	LF code
Large Herb	2	10%	LH
Medium Herb	5	40%	MH
Small or Prostrate Herb	2	10%	SH
Large Non-tufted Graminoid	1	5%	LNG
Medium to Small Tufted Graminoid	4	10%	MTG
Medium to Tiny Non-tufted Graminoid	2	10%	MNG
Total understorey projective foliage cover		**85%**	

LF Code	Species typical of at least part of EVC range	Common Name
LH	*Villarsia reniformis*	Running Marsh-flower
MH	*Myriophyllum simulans*	Amphibious Water-milfoil
MH	*Potamogeton tricarinatus s.l.*	Floating Pondweed
MH	*Potamogeton pectinatus*	Fennel Pondweed
MH	*Marsilea drummondii*	Common Nardoo
SH	*Azolla filiculoides*	Pacific Azolla
SH	*Lobelia pratioides*	Poison Lobelia
SH	*Lemna disperma*	Duckweed
LNG	*Eleocharis sphacelata*	Tall Spike-sedge
MTG	*Triglochin procerum s.l.*	Water Ribbons
MTG	*Lachnagrostis filiformis*	Common Blown-grass
MTG	*Glyceria australis*	Australian Sweet-grass
MTG	*Austrodanthonia duttoniana*	Brown-back Wallaby-grass
MNG	*Eleocharis pusilla*	Small Spike-sedge
MNG	*Eleocharis acuta*	Common Spike-sedge

Recruitment:
Episodic/Flood. Desirable period between disturbances is 5 years.

Organic Litter:
10% cover

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
LH	*Aster subulatus*	Aster-weed	high	low
LH	*Rumex crispus*	Curled Dock	high	low
MH	*Plantago coronopus*	Buck's-horn Plantain	high	high
MH	*Cotula coronopifolia*	Water Buttons	high	high
MTG	*Lolium rigidum*	Wimmera Rye-grass	high	low
MTG	*Romulea rosea*	Onion Grass	high	low

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EVC 653: Aquatic Herbland - Victorian Volcanic Plain bioregion

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EVC/Bioregion Benchmark for Vegetation Quality Assessment

Victorian Volcanic Plain bioregion

EVC 53: Swamp Scrub

Description:

Closed scrub to 8 m tall at low elevations on alluvial deposits along streams or on poorly drained sites with high nutrient and water availability. Soils vary from organic loams to fine silts and peats which are inundated during the wetter months of the year and is dominated by Woolly Tea-tree *Leptospermun lanigerum* which often forms a dense impenetrable thicket, out-competing other species. Emergent trees (eg. Swamp Gum *Eucalyptus ovata*) may some times be present. Where light penetrates to ground level, a moss/lichen/liverwort herbaceous ground cover is often present.

Canopy Cover:

%cover	Character Species	Common Name
60%	*Leptospermum lanigerum*	Woolly Tea-tree
	Melaleuca squarrosa	Scented Paperbark
	Acacia melanoxylon	Blackwood

Understorey:

Life form	#Spp	%Cover	LF code
Large Herb	5	10%	LH
Medium Herb	13	30%	MH
Small or Prostrate Herb	2	5%	SH
Large Tufted Graminoid	9	15%	LTG
Large Non-tufted Graminoid	1	1%	LNG
Medium to Small Tufted Graminoid	7	15%	MTG
Bryophytes/Lichens	na	20%	BL

LF Code		Species typical of at least part of EVC range	Common Name
LH		*Persicaria decipiens*	Slender Knotweed
LH		*Villarsia reniformis*	Running Marsh-flower
LH		*Epilobium pallidiflorum*	Showy Willow-herb
MH		*Hydrocotyle pterocarpa*	Wing Pennywort
MH		*Lilaeopsis polyantha*	Australian Lilaeopsis
MH		*Hydrocotyle muscosa*	Mossy Pennywort
SH		*Lobelia pedunculata s.l.*	Matted Pratia
SH		*Crassula helmsii*	Swamp Crassula
LTG		*Juncus procerus*	Tall Rush
LTG		*Gahnia clarkei*	Tall Saw-sedge
LTG		*Deyeuxia quadriseta*	Reed Bent-grass
LTG		*Amphibromus recurvatus*	Dark Swamp Wallaby-grass
MTG		*Schoenus maschalinus*	Leafy Bog-sedge
MTG	k	*Lachnagrostis filiformis (perennial variety)*	Wetland Blown-grass
MTG		*Juncus planifolius*	Broad-leaf Rush

Recruitment:

Continuous

Organic Litter:

20% Cover

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
LH	*Rumex crispus*	Curled Dock	high	low
MH	*Lotus suaveolens*	Hairy Bird's-foot Trefoil	high	high
MH	*Leontodon taraxacoides ssp. taraxacoides*	Hairy Hawkbit	high	low
MH	*Hypochoeris radicata*	Cat's Ear	high	low
LNG	*Holcus lanatus*	Yorkshire Fog	high	high
MTG	*Juncus bulbosus*	Bulbous Rush	high	high

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Appendix 7: Native Vegetation Removal (NVR) report

Scenario test – native vegetation removal

This report provides offset requirements for internal testing of different proposals to remove native vegetation. **This report DOES NOT support an application to remove, destroy or lop native vegetation under Clause 52.16 or 52.17 of planning schemes in Victoria.** A report must be obtained from the Department of Environment, Land, Water and Planning (DELWP).

Date of issue: **17/09/2020**
Time of issue: **12:18 pm**

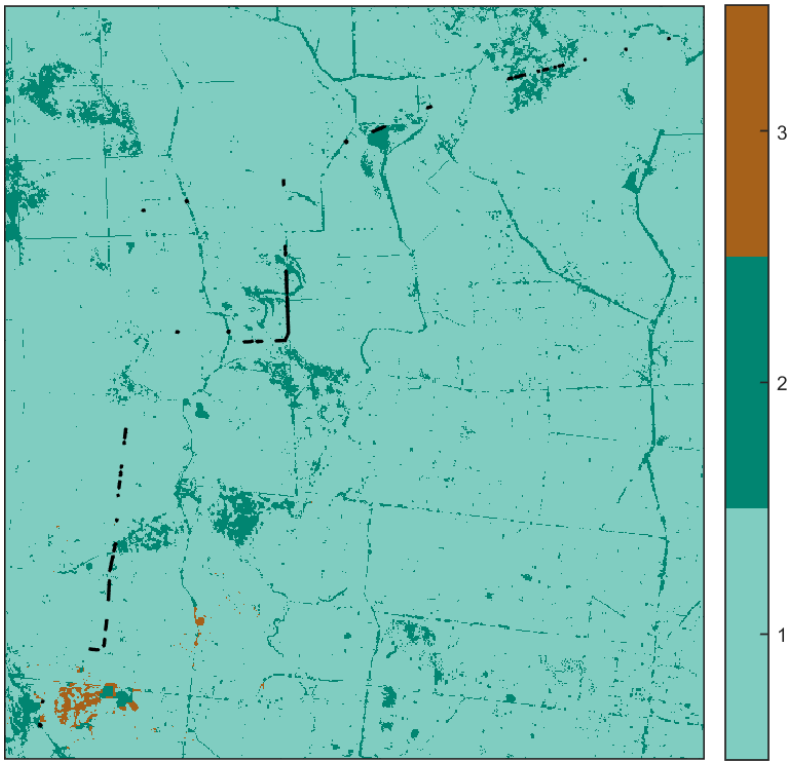
Report ID: Scenario Testing

Project ID	14144_Txl_6m_200917

Assessment pathway

Assessment pathway	**Detailed Assessment Pathway**
Extent including past and proposed	3.458 ha
Extent of past removal	0.000 ha
Extent of proposed removal	3.458 ha
No. Large trees proposed to be removed	0
Location category of proposed removal	Location 2 The native vegetation is in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map). Removal of less than 0.5 hectares of native vegetation in this location will not have a significant impact on any habitat for a rare or threatened species.

1. Location map



Scenario test – native vegetation removal

Offset requirements if a permit is granted

Any approval granted will include a condition to obtain an offset that meets the following requirements:

General offset amount[1]	1.706 general habitat units
Vicinity	Glenelg Hopkins Catchment Management Authority (CMA) or Moyne Shire Council
Minimum strategic biodiversity value score[2]	0.451
Large trees	0 large trees

NB: values within tables in this document may not add to the totals shown above due to rounding

Appendix 1 includes information about the native vegetation to be removed

Appendix 2 includes information about the rare or threatened species mapped at the site.

Appendix 3 includes maps showing native vegetation to be removed and extracts of relevant species habitat importance maps

1 The general offset amount required is the sum of all general habitat units in Appendix 1.

2 Minimum strategic biodiversity score is 80 per cent of the weighted average score across habitat zones where a general offset is required

Scenario test – native vegetation removal

Next steps

Any proposal to remove native vegetation must meet the application requirements of the Detailed Assessment Pathway and it will be assessed under the Detailed Assessment Pathway.

This report DOES NOT support an application to remove, destroy or lop native vegetation under Clause 52.16 or 52.17 of planning schemes in Victoria.

If you wish to remove the mapped native vegetation you must submit the related shapefiles to the Department of Environment, Land, Water and Planning (DELWP) for processing, by email to ensymnvrtool.support@delwp.vic.gov.au. DELWP will provide a *Native vegetation removal report* that is required to meet the permit application requirements in accordance with *Guidelines for the removal, destruction or lopping of native vegetation* (Guidelines).

Appendix 1: Description of native vegetation to be removed

The species-general offset test was applied to your proposal. This test determines if the proposed removal of native vegetation has a proportional impact on any rare or threatened species habitats above the species offset threshold. The threshold is set at 0.005 per cent of the mapped habitat value for a species. When the proportional impact is above the species offset threshold a species offset is required. This test is done for all species mapped at the site. Multiple species offsets will be required if the species offset threshold is exceeded for multiple species.

Where a zone requires species offset(s), the species habitat units for each species in that zone is calculated by the following equation in accordance with the Guidelines:

Species habitat units = extent x condition x species landscape factor x 2, where the species landscape factor = 0.5 + (habitat importance score/2)

The species offset amount(s) required is the sum of all species habitat units per zone

Where a zone does not require a species offset, the general habitat units in that zone is calculated by the following equation in accordance with the Guidelines:

General habitat units = extent x condition x general landscape factor x 1.5, where the general landscape factor = 0.5 + (strategic biodiversity value score/2)

The general offset amount required is the sum of all general habitat units per zone.

Native vegetation to be removed

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
1-AA	Patch	vvp_0649	Endangered	0	no	0.480	0.030	0.030	0.430		0.015	General
1-AB	Patch	vvp_0649	Endangered	0	no	0.480	0.008	0.008	0.410		0.004	General
1-AC	Patch	vvp_0649	Endangered	0	no	0.480	0.010	0.010	0.410		0.005	General
1-AE	Patch	vvp_0649	Endangered	0	no	0.480	0.097	0.097	0.430		0.050	General
1-AF	Patch	vvp_0649	Endangered	0	no	0.480	0.039	0.039	0.410		0.020	General
1-AG	Patch	vvp_0649	Endangered	0	no	0.480	0.082	0.082	0.410		0.041	General
1-AH	Patch	vvp_0649	Endangered	0	no	0.480	0.022	0.022	0.410		0.011	General
1-AY	Patch	vvp_0649	Endangered	0	no	0.480	0.066	0.066	0.460		0.035	General
1-AZ	Patch	vvp_0649	Endangered	0	no	0.480	0.061	0.061	0.816		0.040	General
1-BA	Patch	vvp_0125	Endangered	0	no	0.560	0.059	0.059	0.710		0.043	General
1-BB	Patch	vvp_0647	Endangered	0	no	0.460	0.074	0.074	0.415		0.036	General

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
1-BC	Patch	vvp_0055_63	Endangered	0	no	0.230	0.116	0.116	0.406		0.028	General
1-BD	Patch	vvp_0647	Endangered	0	no	0.460	0.053	0.053	0.420		0.026	General
1-BE	Patch	vvp_0055_63	Endangered	0	no	0.230	0.061	0.061	0.553		0.016	General
1-BF	Patch	vvp_0649	Endangered	0	no	0.480	0.028	0.028	0.416		0.014	General
1-BG	Patch	vvp_0649	Endangered	0	no	0.480	0.054	0.054	0.400		0.027	General
1-BH	Patch	vvp_0125	Endangered	0	no	0.560	0.016	0.016	0.940		0.013	General
1-BJ	Patch	vvp_0125	Endangered	0	no	0.560	0.157	0.157	0.801		0.119	General
1-BK	Patch	vvp_0649	Endangered	0	no	0.480	0.170	0.170	0.641		0.101	General
1-BL	Patch	vvp_0647	Endangered	0	no	0.460	0.001	0.001	0.450		0.001	General
1-BO	Patch	vvp_0055_63	Endangered	0	no	0.230	0.108	0.108	0.440		0.027	General
1-BP	Patch	vvp_0125	Endangered	0	no	0.560	0.058	0.058	0.471		0.036	General
1-CA	Patch	vvp_0649	Endangered	0	no	0.480	0.018	0.018	0.440		0.009	General
1-CB	Patch	vvp_0649	Endangered	0	no	0.480	0.003	0.003	0.430		0.001	General
1-CC	Patch	vvp_0125	Endangered	0	no	0.560	0.049	0.049	0.805		0.037	General
1-CD	Patch	vvp_0649	Endangered	0	no	0.480	0.040	0.040	0.880		0.027	General
1-CE	Patch	vvp_0055_63	Endangered	0	no	0.230	0.173	0.173	0.417		0.042	General
1-CF	Patch	vvp_0647	Endangered	0	no	0.460	0.043	0.043	0.400		0.021	General
1-CG	Patch	vvp_0649	Endangered	0	no	0.480	0.044	0.044	0.420		0.022	General
1-CH	Patch	vvp_0125	Endangered	0	no	0.550	0.051	0.051	0.420		0.030	General
1-CI	Patch	vvp_0649	Endangered	0	no	0.480	0.190	0.190	0.428		0.098	General
1-CZ	Patch	vvp_0649	Endangered	0	no	0.480	0.121	0.121	0.696		0.074	General
1-CM	Patch	vvp_0649	Endangered	0	no	0.480	0.090	0.090	0.494		0.048	General

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
1-CL	Patch	vvp_0649	Endangered	0	no	0.480	0.121	0.121	0.450		0.063	General
1-CQ	Patch	vvp_0125	Endangered	0	no	0.420	0.018	0.018	0.470		0.008	General
1-CY	Patch	vvp_0649	Endangered	0	no	0.480	0.035	0.035	0.360		0.017	General
1-DD	Patch	vvp_0647	Endangered	0	no	0.280	0.141	0.141	0.766		0.052	General
1-DC	Patch	vvp_0653	Endangered	0	no	0.390	0.058	0.058	0.230		0.021	General
1-DK	Patch	vvp_0649	Endangered	0	no	0.480	0.055	0.055	0.460		0.029	General
1-DL	Patch	vvp_0649	Endangered	0	no	0.480	0.023	0.023	0.460		0.012	General
1-DM	Patch	vvp_0649	Endangered	0	no	0.480	0.080	0.080	0.470		0.042	General
1-DN	Patch	vvp_0649	Endangered	0	no	0.490	0.013	0.013	0.930		0.009	General
1-DP	Patch	vvp_0649	Endangered	0	no	0.480	0.030	0.030	0.900		0.021	General
1-DQ	Patch	vvp_0649	Endangered	0	no	0.480	0.043	0.043	0.802		0.028	General
1-DR	Patch	vvp_0649	Endangered	0	no	0.480	0.008	0.008	0.900		0.006	General
1-DT	Patch	vvp_0649	Endangered	0	no	0.480	0.007	0.007	0.900		0.005	General
1-DU	Patch	vvp_0053	Endangered	0	no	0.230	0.004	0.004	0.430		0.001	General
1-DW	Patch	vvp_0053	Endangered	0	no	0.230	0.009	0.009	0.240		0.002	General
1-DX	Patch	vvp_0053	Endangered	0	no	0.230	0.010	0.010	0.260		0.002	General
1-BI	Patch	vvp_0649	Endangered	0	no	0.480	0.253	0.253	0.947		0.178	General
1-R	Patch	vvp_0125	Endangered	0	no	0.400	0.020	0.020	0.200		0.007	General
1-DE	Patch	vvp_0053	Endangered	0	no	0.120	0.054	0.054	0.379		0.007	General
1-BR	Patch	vvp_0649	Endangered	0	no	0.330	0.001	0.001	0.390		0.001	General
1-CU	Patch	vvp_0649	Endangered	0	no	0.480	0.003	0.003	0.950		0.002	General

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
1-CK	Patch	vvp_0649	Endangered	0	no	0.180	0.012	0.012	0.950		0.003	General
1-CJ	Patch	vvp_0649	Endangered	0	no	0.180	0.042	0.042	0.950		0.011	General
1-BY	Patch	vvp_0649	Endangered	0	no	0.170	0.030	0.030	0.880		0.007	General
1-BZ	Patch	vvp_0649	Endangered	0	no	0.170	0.007	0.007	0.880		0.002	General
1-BS	Patch	vvp_0649	Endangered	0	no	0.330	0.018	0.018	0.390		0.006	General
1-BT	Patch	vvp_0649	Endangered	0	no	0.320	0.033	0.033	0.390		0.011	General
1-BU	Patch	vvp_0649	Endangered	0	no	0.310	0.024	0.024	0.370		0.008	General
1-BV	Patch	vvp_0649	Endangered	0	no	0.310	0.030	0.030	0.370		0.009	General
1-DB	Patch	vvp_0651	Endangered	0	no	0.200	0.047	0.047	0.400		0.010	General
1-DA	Patch	vvp_0651	Endangered	0	no	0.240	0.037	0.037	0.400		0.009	General

Appendix 2: Information about impacts to rare or threatened species' habitats on site

This table lists all rare or threatened species' habitats mapped at the site.

Species common name	Species scientific name	Species number	Conservation status	Group	Habitat impacted	% habitat value affected
Curly Sedge	*Carex tasmanica*	500650	Vulnerable	Dispersed	Habitat importance map	0.0006
Lacey River Buttercup	*Ranunculus amplus*	505019	Rare	Dispersed	Habitat importance map	0.0002
Squat Picris	*Picris squarrosa*	504827	Rare	Dispersed	Habitat importance map	0.0001
Showy Lobelia	*Lobelia beaugleholei*	502733	Rare	Dispersed	Habitat importance map	0.0001
Wavy Swamp Wallaby-grass	*Amphibromus sinuatus*	503625	Vulnerable	Dispersed	Habitat importance map	0.0001
Swamp Flax-lily	*Dianella callicarpa*	505086	Rare	Dispersed	Habitat importance map	0.0001
Plains Yam-daisy	*Microseris scapigera s.s.*	504657	Vulnerable	Dispersed	Habitat importance map	0.0001
Leafy Twig-sedge	*Cladium procerum*	500786	Rare	Dispersed	Habitat importance map	0.0001
Purple Blown-grass	*Lachnagrostis punicea subsp. punicea*	504206	Rare	Dispersed	Habitat importance map	0.0001
Bog Gum	*Eucalyptus kitsoniana*	501290	Rare	Dispersed	Habitat importance map	0.0001
Swamp Fireweed	*Senecio psilocarpus*	504659	Vulnerable	Dispersed	Habitat importance map	0.0001
Swamp Everlasting	*Xerochrysum palustre*	503763	Vulnerable	Dispersed	Habitat importance map	0.0001
Purple Blown-grass	*Lachnagrostis punicea subsp. filifolia*	504222	Rare	Dispersed	Habitat importance map ; special site	0.0001
Pale Swamp Everlasting	*Coronidium gunnianum*	504655	Vulnerable	Dispersed	Habitat importance map	0.0001
Blotched Sun-orchid	*Thelymitra benthamiana*	503369	Vulnerable	Dispersed	Habitat importance map	0.0001
Parsley Xanthosia	*Xanthosia leiophylla*	504562	Rare	Dispersed	Habitat importance map	0.0001
Salt Blown-grass	*Lachnagrostis robusta*	504223	Rare	Dispersed	Habitat importance map	0.0001
Western Peppermint	*Eucalyptus falciformis*	505358	Rare	Dispersed	Habitat importance map	0.0000
Golden Cowslips	*Diuris behrii*	501061	Vulnerable	Dispersed	Habitat importance map	0.0000

Dense Leek-orchid	*Prasophyllum spicatum*	504506	Endangered	Dispersed	Habitat importance map	0.0000
Metallic Sun-orchid	*Thelymitra epipactoides*	503367	Endangered	Dispersed	Habitat importance map	0.0000
Small Sickle Greenhood	*Pterostylis lustra*	504876	Endangered	Dispersed	Habitat importance map	0.0000
Dwarf Brooklime	*Gratiola pumilo*	503753	Rare	Dispersed	Habitat importance map	0.0000
Clover Glycine	*Glycine latrobeana*	501456	Vulnerable	Dispersed	Habitat importance map	0.0000
Western Golden-tip	*Goodia medicaginea*	501518	Rare	Dispersed	Habitat importance map	0.0000
Australasian Bittern	*Botaurus poiciloptilus*	10197	Endangered	Dispersed	Habitat importance map	0.0000
Glossy Grass Skink	*Pseudemoia rawlinsoni*	12683	Vulnerable	Dispersed	Habitat importance map	0.0000
Freckled Duck	*Stictonetta naevosa*	10214	Endangered	Dispersed	Habitat importance map	0.0000
Blue-billed Duck	*Oxyura australis*	10216	Endangered	Dispersed	Habitat importance map	0.0000
Southern Bent-wing Bat	*Miniopterus schreibersii bassanii*	61343	Critically endangered	Dispersed	Habitat importance map	0.0000
Intermediate Egret	*Ardea intermedia*	10186	Endangered	Dispersed	Habitat importance map	0.0000
Baillon's Crake	*Porzana pusilla palustris*	10050	Vulnerable	Dispersed	Habitat importance map	0.0000
Growling Grass Frog	*Litoria raniformis*	13207	Endangered	Dispersed	Habitat importance map	0.0000
Eastern Great Egret	*Ardea modesta*	10187	Vulnerable	Dispersed	Habitat importance map	0.0000
Musk Duck	*Biziura lobata*	10217	Vulnerable	Dispersed	Habitat importance map	0.0000
Lewin's Rail	*Lewinia pectoralis pectoralis*	10045	Vulnerable	Dispersed	Habitat importance map	0.0000
Little Egret	*Egretta garzetta nigripes*	10185	Endangered	Dispersed	Habitat importance map	0.0000
Hardhead	*Aythya australis*	10215	Vulnerable	Dispersed	Habitat importance map	0.0000
Australasian Shoveler	*Anas rhynchotis*	10212	Vulnerable	Dispersed	Habitat importance map	0.0000
One-flower Early Nancy	*Wurmbea uniflora*	503583	Rare	Dispersed	Habitat importance map	0.0000
Black Falcon	*Falco subniger*	10238	Vulnerable	Dispersed	Habitat importance map	0.0000
Gull-billed Tern	*Gelochelidon nilotica macrotarsa*	10111	Endangered	Dispersed	Habitat importance map	0.0000
Grey Goshawk	*Accipiter novaehollandiae novaehollandiae*	10220	Vulnerable	Dispersed	Habitat importance map	0.0000

White-throated Needletail	*Hirundapus caudacutus*	10334	Vulnerable	Dispersed	Habitat importance map	0.0000
Brolga	*Grus rubicunda*	10177	Vulnerable	Dispersed	Habitat importance map	0.0000

Habitat group

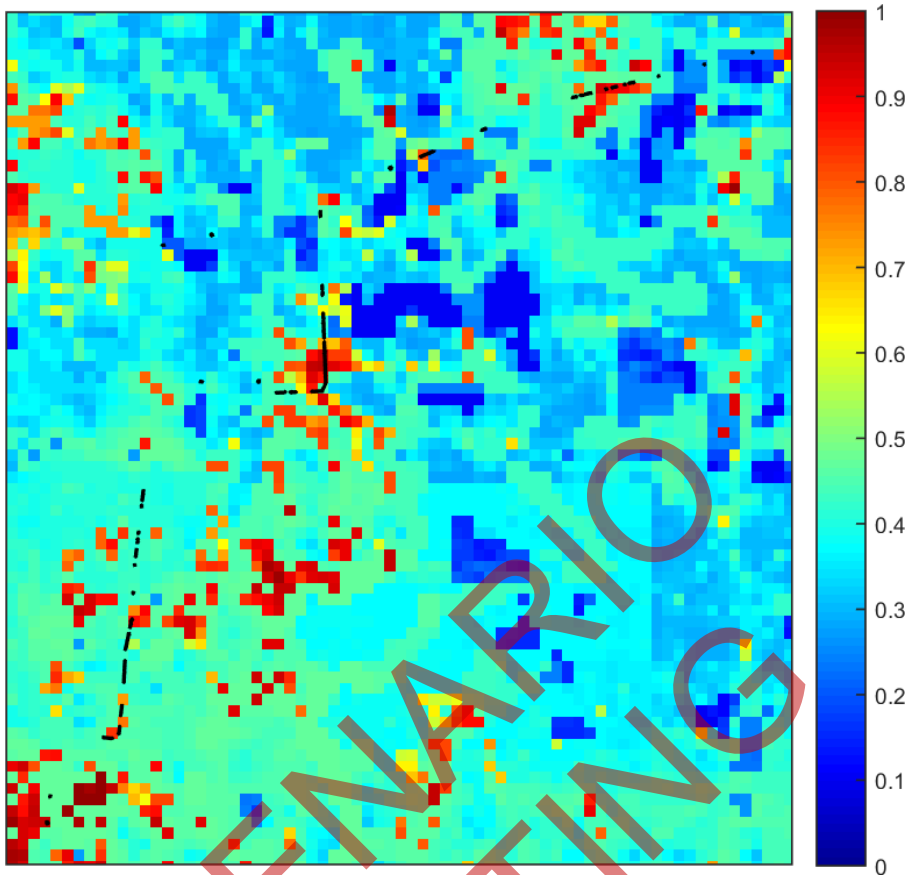
- Highly localised habitat means there is 2000 hectares or less mapped habitat for the species
- Dispersed habitat means there is more than 2000 hectares of mapped habitat for the species

Habitat impacted

- Habitat importance maps are the maps defined in the Guidelines that include all the mapped habitat for a rare or threatened species
- Top ranking maps are the maps defined in the Guidelines that depict the important areas of a dispersed species habitat, developed from the highest habitat importance scores in dispersed species habitat maps and selected VBA records
- Selected VBA record is an area in Victoria that represents a large population, roosting or breeding site etc.

Appendix 3 – Images of mapped native vegetation

2. Strategic biodiversity values map



SCENARIO TESTING

Appendix 8: Evidence of third party offset availability

Report of available native vegetation credits

This report lists native vegetation credits available to purchase through the Native Vegetation Credit Register.

This report is **not evidence** that an offset has been secured. An offset is only secured when the units have been purchased and allocated to a permit or other approval and an allocated credit extract is provided by the Native Vegetation Credit Register.

Date and time: 17/09/2020 02:56 **Report ID: 5848**

What was searched for?

General offset

General habitat units	Strategic biodiversity value	Large trees	Vicinity (Catchment Management Authority or Municipal district)	
1.706	0.451	0	CMA	Glenelg Hopkins
			or LGA	Moyne Shire

Details of available native vegetation credits on 17 September 2020 02:56

These sites meet your requirements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
BBA-0639	7.442	0	Glenelg Hopkins	Moyne Shire	Yes	Yes	No	Bio Offsets
BBA-1139_05	3.950	0	Glenelg Hopkins	Moyne Shire	Yes	Yes	No	VegLink
BBA-2467	7.051	80	Glenelg Hopkins	Glenelg Shire	Yes	Yes	No	VegLink
BBA-3027	2.518	267	Glenelg Hopkins	Pyrenees Shire	Yes	Yes	No	VegLink
BBA-3041	15.584	283	Glenelg Hopkins	Moyne Shire	Yes	Yes	No	VegLink
TFN-C0228	2.246	0	Glenelg Hopkins	Glenelg Shire	Yes	Yes	No	VegLink

These sites meet your requirements using alternative arrangements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)

There are no sites listed in the Native Vegetation Credit Register that meet your offset requirements when applying the alternative arrangements as listed in section 11.2 of the Guidelines for the removal, destruction or lopping of native vegetation.

These potential sites are not yet available, land owners may finalise them once a buyer is confirmed.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)

There are no potential sites listed in the Native Vegetation Credit Register that meet your offset requirements.

LT - Large Trees *CMA - Catchment Management Authority* *LGA - Municipal District or Local Government Authority*

Next steps

If applying for approval to remove native vegetation
Attach this report to an application to remove native vegetation as evidence that your offset requirement is currently available.

If you have approval to remove native vegetation
Below are the contact details for all brokers. Contact the broker(s) listed for the credit site(s) that meet your offset requirements. These are shown in the above tables. If more than one broker or site is listed, you should get more than one quote before deciding which offset to secure.

Broker contact details

Broker Abbreviation	Broker Name	Phone	Email	Website
Abezco	Abzeco Pty. Ltd.	(03) 9431 5444	offsets@abzeco.com.au	www.abzeco.com.au
Baw Baw SC	Baw Baw Shire Council	(03) 5624 2411	bawbaw@bawbawshire.vic.gov.au	www.bawbawshire.vic.gov.au
Bio Offsets	Biodiversity Offsets Victoria	0452 161 013	info@offsetsvictoria.com.au	www.offsetsvictoria.com.au
Contact NVOR	Native Vegetation Offset Register	136 186	nativevegetation.offsetregister@delwp.vic.gov.au	www.environment.vic.gov.au/native-vegetation
Ecocentric	Ecocentric Environmental Consulting	0410 564 139	ecocentric@me.com	Not avaliable
Ethos	Ethos NRM Pty Ltd	(03) 5153 0037	offsets@ethosnrm.com.au	www.ethosnrm.com.au
Nillumbik SC	Nillumbik Shire Council	(03) 9433 3316	offsets@nillumbik.vic.gov.au	www.nillumbik.vic.gov.au
TFN	Trust for Nature	8631 5888	offsets@tfn.org.au	www.trustfornature.org.au
VegLink	Vegetation Link Pty Ltd	(03) 5470 5232	offsets@vegetationlink.com.au	www.vegetationlink.com.au
Yarra Ranges SC	Yarra Ranges Shire Council	1300 368 333	biodiversityoffsets@yarraranges.vic.gov.au	www.yarraranges.vic.gov.au

For more information contact the DELWP Customer Service Centre 136 186 or the Native Vegetation Credit Register at nativevegetation.offsetregister@delwp.vic.gov.au