Appendix D – Ecology Assessment

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Bringing ideas to life

Wooreen BESS

Ecology Assessment

EnergyAustralia

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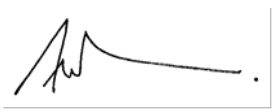
Author signature		Approver signature	
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Executive Summary

Aurecon was commissioned by EnergyAustralia (the Proponent) to undertake an ecological assessment to inform the design and planning approvals for a proposed Wooreen Battery Energy Storage System (WESS) at their existing Jeeralang Power Station site near Morwell in the Latrobe Valley, eastern Victoria.

Findings

The study area consists of three properties, each of which have been heavily altered for farming and/or energy generation, and as such lack extensive areas of native vegetation or significant ecological values. Extensive areas of planted vegetation exist within the study area, all of which was considered to be for the purpose of amenity and/or screening, and hence is exempt from permit consideration as native vegetation as defined under Clause 52.17-7 in the planning scheme.

Native vegetation was largely limited to small, disconnected patches that were heavily altered from their natural state. This included three narrow, treeless patches of Plains Grassy Woodland along the south of Bonds Lane, one large patch of treeless and heavily grazed Plains Grassy Woodland in the Ausnet property and multiple patches of treeless Swampy Riparian Woodland which occurred either side of a drainage line in the south west of the study area. Eight trees defined as native vegetation subject to Victoria's *Guidelines for the removal, destruction or lopping of native vegetation* (the Guidelines) were recorded in the study area, including seven scattered trees (five small and two large) and one large tree in a patch. Of these, two trees on the eastern side of Tramway Road were identified as Yarra Gum, which is listed as critically endangered on the *Flora and Fauna Guarantee Act 1988* (FFG Act).

No threatened species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were recorded in the study area and none were considered to have a moderate or high likelihood of occurrence. One EPBC Act listed ecological community, the Gippsland Red Gum *(Eucalyptus tereticornis subsp. mediana)* Grassy Woodland and Associated Native Grassland, was considered to have the potential to occur in one location in the study area (Habitat Zone D). The high grazing pressure from kangaroos in this area has meant the presence of this community was not able to be confirmed during the site inspection. Given the likelihood of continued grazing pressure by kangaroos in this location, it is recommended that the project adopts the precautionary approach and avoids any impacts to this area. Based on the concept design, no works or infrastructure are proposed in this area. Therefore, no EPBC Act listed communities are subject to any significant impacts from the Project and a referral is therefore not required.

Four flora species listed as threatened under the FFG Act were recorded in the study area. Three were planted and not indigenous to the study area and therefore are not considered as threatened for this assessment. The only native threatened flora species recorded was Yarra Gum, which was limited to the two individuals east of Tramway Road. Two additional flora species listed as protected under the FFG Act were recorded on public land in the Bonds Lane road reserve, namely Black Wattle and Hop Wattle. No threatened fauna or ecological communities listed under the FFG Act were recorded in the study area and none were considered to have a moderate or high likelihood of occurrence.

Following the ecological field assessment and draft report, EnergyAustralia have adopted initial recommendations and made refinements to the project design to avoid impacts to native vegetation. The proposed footprint for the WESS and associated grid connection infrastructure has now been situated to avoid impacts to native vegetation. While all native vegetation in the study area will be avoided, the development of the grid connection will result in the removal of a small area of planted vegetation. This vegetation has been planted for amenity/screening purposes and does not meet the definition of native vegetation in accordance with the Guidelines. Though this vegetation would provide habitat for common fauna, its removal would not result in any impacts to listed threatened species or communities.

Implications

Based on the project footprint, there are no implications for the Project under the EPBC Act or FFG Act and the Project will not trigger a referral under the *Environment Effects Act 1978* (EE Act) based on any criteria specifically relevant to flora, fauna or biodiversity.

Based on the current project footprint, no native vegetation (as defined in the Guidelines) is proposed for removal, therefore a permit under Clause 52.17 of the Latrobe Planning Scheme is not required.

Measures likely to be required by the Country Fire Authority (CFA) as per the renewable energy guidelines are outlined in this report and should be considered to inform the development of the Project.

Recommendations

Impacts to native vegetation have been avoided in the current design. It is recommended that no-go zone fencing around the canopy dripline for Habitat Zone E is installed prior to and throughout construction to avoid any impacts to native vegetation. No-go zone fencing should also be erected around native vegetation where works are proposed within 50 metres of such native vegetation (i.e. Habitat Zones B and D).

Appropriate firebreak widths between the proposed WESS and nearby vegetation are to be implemented and maintained. The width of the firebreak must be at least 10 metres wide. The firebreak should be achieved within the indicative project footprint outlined in the concept design to allow for the retention of the tree row along Bonds Lane, and other planted vegetation to the south east. The firebreak should also be located to avoid impacts to any native vegetation.

1 Introduction

EnergyAustralia (EA) is considering its future portfolio in Victoria given evolving consumer requirements, diversity in distributed energy resources, and the need for more flexible capacity given increasing use of renewables in the National Electricity Market (NEM). One component of the portfolio diversification is developing new battery energy storage systems (BESS).

EA has committed to building a BESS rated up to 1400MWh, which will be one of the largest operational batteries in Victoria. After a robust site selection process, EA's gas-fired Jeeralang Power Station, located in the Latrobe Valley, has been selected as the preferred location for the new WESS development. This was based on the planned Yallourn Power Station's closure in mid-2028, land availability, minimal environmental impacts and optimal connection to the grid.

The purpose of this ecological assessment is to provide information to enable EA to understand the potential ecological constraints for the Wooreen BESS (WESS / the Project). This ecological assessment report has been prepared to inform the planning application to the Minister for Planning and to determine the implications of the project under relevant Commonwealth and state biodiversity legislation, particularly the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), *Environment Effects Act 1978* (EE Act) and *Flora and Fauna Guarantee Act* 1988 (FFG Act).

The conclusions and recommendations have considered the current site context and the known Project scope of works to determine potential requirements under the aforementioned legislation.

1.1 Site Context

This section provides a description of the Project Land, locality and the broader geographical context of the Project.

The Project will be located at:

- Part of Jeeralang A and B Gas Power Plant (SPI: 2F~A\PP2749) 30 Bonds Lane, Hazelwood North 3840. Certificate of Title Volume 11919 Folio 204). Owned by EnergyAustralia Pty Ltd Part of Monash Way Plantation (SPI: 2E~A\PP2749) Monash Way, Hazelwood North 3840. Certificate of Title Volume 11740 Folio 187). Owned by Department of Treasury and Finance Victoria .

The project land (inclusive of both sites) is located approximately 4.5km south of central Morwell and 4km north of Churchill. The smaller regional community of Hazelwood North is located approximately 4.5km to the east of the proposed site. Both sites are within the municipality of City of Latrobe.

The Project Land includes the Jeeralang Power Station, which is a gas turbine (open cycle) power station. The local region is predominantly used for energy generation and distribution with Hazelwood Terminal Station directly beside the Project Land, Loy Yang Power Station 13km to the east and the now decommissioned Hazelwood Power Station 3km to the west. Beyond energy related uses, the broader area can be characterised as farmland with rural townships including Hazelwood North, Morwell, Traralgon and Moe to the north west and north east.

Existing access to the Project Land is from Bonds Lane, which connects to Monash Way to the west and Tramway Road to the east.

To allow for changes as the project design progresses, this ecology assessment covers a broader study area, which includes the WESS Project Land plus additional land to the south and southwest including land owned by EA, AusNet and the Department of Treasury and Finance (DTF). The study area for the ecology investigation is shown in Figure 1.

Figure 1 Study area

1.2 Project details

The Project comprises of the WESS, which primarily relates to the construction of battery storage enclosures (battery cells that are situated in enclosures). The WESS will be rated up to 1400MWh providing electricity back into the grid at 350MW for a maximum of 4 hours. Large scale batteries store electricity, such as excess renewable energy. When demand for power is higher and there is less energy available, such as at night, the stored energy is available for use. Battery storage can also help reduce the potential for blackouts and any need for load shedding when there is a supply imbalance.

The following contains an indicative list and quantities of the elements required to enable the WESS to function:

- Approx. 280 BESS enclosures (or equivalent) equating to 1400MWh of lithium batteries with low voltage inverters and 33kV to low voltage transformers
- A 220/33 kV substation including two 220kV/33kV transformers, 220 kV isolators and auxiliary services such as two 33 kV zig-zag transformers
- One 220kV overhead powerline proposed to connect the BESS transformers to the switchyard
- One control room likely located adjacent to the BESS enclosures
- Four 33kV switchrooms likely located adjacent to the BESS enclosures
- Provision of an office, an operation and maintenance shed/room, and two car parking spaces for maintenance staff
- Multiple indicative noise walls approx. 6m in height
- Secondary access from Bonds Lane into the WESS facility
- Installation of fire detection equipment
- Perimeter road encompassing WESS footprint and internal roads for access
- Retention pond and/or water storage tank
- Replace internal fencing and install CCTV
- Temporary construction laydown areas

1.3 Scope and purpose of this assessment

The purpose of the ecological assessment was to provide an assessment of the biodiversity values at the project site, including an assessment of any potential impacts to native vegetation and/or significant flora, fauna and ecological communities. This assessment identifies the environmental approvals that may be triggered under Commonwealth and state legislation. This assessment also provides identification of any key risk areas of the project site and recommendations for locating project infrastructure to avoid impacts.

The scope of the ecological assessment was to:

- Undertake a review of existing ecological information for the project site, including preparation of database searches for native vegetation, flora and fauna;
- Undertake an ecological field survey to determine the type, extent and quality of native vegetation and fauna habitat present in the study area;
- Identify any significant ecological values (including threatened species or communities) that have potential to occur in the study area;
- Identify the potential implications for the project based on relevant biodiversity legislation and policy;
- Provide recommendations to assist with project design and locating of project infrastructure; and
- Identify the need for any future targeted surveys.

1.4 Limitations

The outcomes of this report are limited to the ecological assessment undertaken for the project site and immediate surrounds (refer to Figure 1). This report is limited to the scope defined in Section 1.3. Should further information become available regarding the conditions at the project site, Aurecon reserves the right to review the report in the context of the additional information.

Ecological assessments can be undertaken at any time of year, however seasonal variations can result in some flora and fauna not being detectable at certain times. Particularly, many flowering plant species are only detectable/identifiable when producing flowers or fruits. The early spring timing of the ecological field survey that informed this assessment was suitable to ascertain the extent and condition of native vegetation and habitat in the study area.

The AusNet portion of the study area supported a large mob of resident Eastern Grey Kangaroos (approx. 40 individuals), which based on discussions with the land manager, are understood to be fenced in in this location. Given the high grazing pressure from kangaroos in this location, it was not possible to accurately determine the percentage cover of perennial native flora or species richness in the ground layer at the time of the survey. This limitation is considered in the findings and implications of this report.

While the study area had been subject to heavy rains a week prior to the flora and fauna survey, this did not create any limitations to access or assessment of the flora and fauna investigation. Rather, conditions on the day of the survey were clear, and only small areas of sitting water remained in the lowest parts of the site. Conditions were therefore considered optimal to ascertain the extent and condition of native vegetation and habitat in the study area.

2 Methodology

2.1 Desktop assessment

The desktop assessment comprised a review of current databases for information on native vegetation and threatened flora, fauna and ecological communities listed under the Commonwealth EPBC Act and Victorian FFG Act. The methods adopted for the database search, likelihood of occurrence and impact assessment are outlined in the following sections.

The database searches undertaken for the Project provided a shortlist of the potential flora, fauna and ecological communities that may occur within 5 km of the study area. Database information was obtained from a circular search area with a radius of 5 km centred on the study area (coordinates: latitude 38˚ 16' 39" S and longitude 146˚ 25' 26" E).

Records from the following databases were collated and reviewed for the search area:

- Protected Matters Search Tool (PMST) of the Australian Government Department of Agriculture, Water and the Environment (DAWE) for matters protected by the EPBC Act (DAWE 2021a, See Appendix F); and
- The Victorian Biodiversity Atlas (DELWP 2021a) for records of listed threatened flora and fauna species.

The following information was also reviewed for the study area as part of the desktop assessment:

- The Victorian DELWP Native Vegetation Information Management System (NVIM) (DELWP 2021b);
- NatureKit (DELWP 2021c);
- VicPlan (DELWP 2021d); and
- Aerial imagery.

2.1.1 Likelihood of occurrence analysis for threatened flora and fauna

The likelihood of occurrence of all threatened flora and fauna species collated in the database search was considered for the study area. The following threatened species were considered as part of this assessment:

- Threatened flora listed under the EPBC Act;
- Threatened and/or migratory fauna listed under the EPBC Act; and
- Threatened flora and fauna listed under the FFG Act.

Each of these species were considered against the suitability of habitat, to determine their likelihood of occurrence in the study area. The likelihood of a species occurring within the study area was classified as 'Negligible', 'Low', 'Moderate' or 'High' based on the consideration of:

- The presence/absence of previous records in the search region (as returned from the database search);
- The known habitat requirements and distribution of the species; and
- The suitability of habitat in the study area (based on the findings of the overview field assessment, and previous reports for the site).

The likelihood of occurrence of ecological communities are also considered in this report.

Details of the ranking criteria used to determine likelihood of occurrence of threatened flora and fauna in the study area is provided in Tables 1 and 2 respectively. Those determined to have a high to moderate likelihood of occurrence in the study area are considered further and discussed in Sections 3.2.4 and 3.2.5.

Table 1 Likelihood of occurrence criteria for threatened flora species

Likelihood of Occurrence	Criteria
High	Recent records of the species in the local vicinity (i.e. within the last 10 years)
	Known resident in the area based on site observations, database records or expert advice and/or the Project Land contains high quality habitat
Moderate	Previous reputable records of the species in the local vicinity and/or the Project Land contains moderate quality habitat
Low	Limited previous records of the species in the local vicinity; and/or, the Project Land contains poor or limited habitat. May also be considered low if other environmental factors are present such as fragmented or isolated habitat
Negligible	No suitable habitat and/or the Project Land falls outside the known species range

Table 2 Likelihood of occurrence criteria for threatened and migratory fauna species

Likelihood of Occurrence	Criteria
High	Known resident in the area based on site observations, database records or expert advice
	Recent reputable records (within 5 years) of the species in the local area
	The Project Land contains the species' preferred habitat
Moderate	The species is likely to visit the Project Land regularly (i.e. at least seasonally)
	Previous reputable records of the species in the local area
	The Project Land contains some characteristics of the species' preferred habitat
Low	The species is likely to visit the Project Land occasionally or opportunistically whilst en-route to more suitable sites
	There are only limited or historical records of the species in the local area (>20 years old)
	The Project Land contains few or no characteristics of the species' preferred habitat
Negligible	No previous records of the species in the local area
	Previous records of the species exist in the local area but >30 years old
	The species may fly over the area when moving between areas of more suitable habitat
	Out of the known species' range
	No suitable habitat present within the Project Land
	Species is known to be regionally extinct

2.1.2 Impact assessment

Listed threatened species and ecological communities determined as having a high or moderate likelihood of occurrence in the Project Land are then considered further in regard to the level of likely impact on these values from the proposed development.

2.2 Field assessment

The flora and fauna field assessment was undertaken on 9th September 2021, which is within the optimal time to undertake ecological surveys as it is during spring. All three portions of the study area were accessed as part of the field survey, including the land owned by EA, AusNet and DTF. Areas that supported native vegetation or fauna habitat were assessed in detail on foot. Parts of the site that were lacking in ecological value were assessed based on observations from a vehicle.

The field survey was undertaken by Justin Sullivan (Senior Ecologist), who is experienced in the identification of Victoria's flora and fauna and has accreditation to undertake the assessment of native vegetation as listed on DELWP's Vegetation Quality Assessment (VQA) Competency Register. The surveyors VQA certificate of accreditation relevant at the time of the survey is attached as Appendix H.

2.2.1 Flora survey

A vegetative description of the study area was recorded along with a list of the flora species observed. The presence of any suitable habitat for threatened flora species was recorded and mapped, to inform the likelihood of occurrence analysis and the potential requirement for future targeted species surveys.

All native vegetation (including patches and scattered trees) recorded in the study area was mapped using Arc Collector on a device with in-built GPS (with 4-5 metre accuracy). Patches of native vegetation were classified to Ecological Vegetation Class (EVC) and a VQA was undertaken. All scattered trees were identified to species and their diameter at breast height (DBH) was measured.

The assessment of native vegetation undertaken was consistent with DELWP's Habitat hectare method (DSE 2004) and Victoria's *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017a), herein referred to as the Guidelines.

2.2.2 Fauna survey

A list of all fauna species observed within the Project Land was recorded through active searching and general observations. The presence of any suitable habitat for threatened fauna species was recorded and mapped, to inform the likelihood of occurrence analysis as well as the potential requirement for future targeted fauna surveys.

3 Results

This section of the report presents the integrated results of the database review and field assessment.

3.1 Database review

The review of the relevant databases (PMST and VBA) returned 11 listed threatened flora species and 44 listed threatened and/or migratory fauna species (including 32 birds, six mammals, one reptile, two frogs and three fish) in the 5 km search area. Details of each of these species habitat requirements as well as an analysis of the likelihood of occurrence in the study area is provided in Appendix D and E.

The study area lies within the Gippsland Plain bioregion and falls within the West Gippsland Catchment Management Authority (CMA) area and the Latrobe Local Government Area. The portion of the study area that is owned by EA is currently zoned as Special Use Zone 1 (SUZ1). Remaining land in the study area is zoned as Farming Zone 1 (FZ1). The study area is not covered by any Environmental Significance Overlay (ESO) or Vegetation Protection Overlay (VPO). A large proportion of the study area is covered by the Bushfire Management Overlay (BMO), which is associated with the Monash Way Plantations.

3.2 Ecological assessment

3.2.1 Site description

The study area consists of three properties, each of which have been heavily altered for farming and/or industrial land uses (Photo 1). Much of the study area (particularly portions of the EA land and DTF land) comprises large farm paddocks which are currently used for grazing by cattle. These areas are dominated by introduced pasture grasses and lack any significant ecological values. It is also noted that a large proportion of the DTF land has previously been used for timber (Blue Gum) plantation, with historic aerial photography suggesting that timber plantations in the study area were last harvested between 2016 and 2017. At the time of the survey, this portion of the study area was heavily disturbed and comprised introduced pasture and dead thickets of Blackberry. Portions of both the EA and AusNet properties comprise existing power generation infrastructure with the Jeeralang Power Station and a portion of the Hazelwood Terminal Station intersecting the study area. Various handstand areas and access roads exist in and around these sites.

Extensive areas of planted vegetation exist within the study area, including throughout the AusNet property, in the northern extension of the DTF property and along the northern boundary of the study area, south of Bonds Lane. These plantings consisted of a mixture of Australian native trees and shrubs, and commonly included Giant Honey-myrtle, Red Ironbark, River Red-gum, Sugar Gum, Sweet Pittosporum and various wattles (Photo 2, Photo 3). Given the setting and the species mix chosen, planted vegetation in the study area was considered to be for the purpose of amenity and/or screening, and hence is exempt from permit consideration as native vegetation as defined under Clause 52.17-7 in the planning scheme.

Photo 1: Farmland (introduced pasture) north east of the Jeeralang Power Station (EA property)

Photo 2: Planted vegetation (amenity/screening) in east of study area (AusNet property)

Native vegetation was largely limited to small, disconnected patches that were heavily altered from their natural state. This included narrow strips of grassy and shrubby vegetation along the southern side of Bonds Lane (Photo 5), small patches of River Red-gum, Blackwood and Swamp Paperbark, as well as scattered occurrences of Swamp Gum and Yarra Gum (which is listed as critically endangered on the FFG Act; Photo 6). Four patches comprising native Rush were also recorded either side of a drainage line which runs through the south west of the study area (Photo 4).

Photo 3: Planted tree row south of Bonds Lane

Photo 4: Treeless area of Swampy Riparian Woodland comprised of native Rush; introduced pasture in foreground (towards western boundary of DTF property)

Photo 5: Derived grassland form of Plains Grassy Woodland (EVC 55) on southern side of Bonds Lane

Photo 6: Scattered Yarra Gums on the eastern side of Tramway Road (Trees 4 and 5)

The largest patch of native vegetation observed in the study area (Habitat Zone (HZ) D) occurred in an open grassy portion of the AusNet property. Despite heavy grazing by Eastern Grey Kangaroos, this area was observed to comprise a moderate cover of native flora in the ground layer, including grasses, sedges, moss and a high density of orchids. Further details of the native vegetation recorded in provided in Section 3.2.2.

A narrow drainage line intersected the western part of the study area. This drainage line, which connected to Bennetts Creek approximately 400 metres north of Bonds Lane, was highly disturbed and lacked any significant ecological value. Aquatic habitat in the study area was otherwise limited to small dams that lacked any significant fringing, floating or emergent vegetation. A small area of the grazing paddock in the EA property was observed to be holding a shallow area of water at the time of the survey, however this was considered to be due to the large rain event just prior to the survey and it is unlikely that this area would regularly hold water.

3.2.2 Native vegetation

Patches of native vegetation

Types of native vegetation that may be present within the study area were ascertained through the database review (DELWP 2021b; DELWP 2021c). This review noted the presence of various pre-1750 modelled vegetation communities within and nearby to the study area, namely Swamp Scrub (EVC 53), Plains Grassy Woodland (EVC 55), Plains Grassy Forest (EVC 151) and Swampy Riparian Woodland (EVC 83). Particularly, Plains Grassy Woodland (EVC 55) and Plains Grassy Forest (EVC 151) are both broadly modelled in the region, with Swamp Scrub (EVC 53) and Swampy Riparian Woodland (EVC 83) modelled along drainage lines. Plains Grassy Forest (EVC 151) has a bioregional conservation status of vulnerable in the Gippsland Plain bioregion, while Swamp Scrub (EVC 53), Plains Grassy Woodland (EVC 55) and Swampy Riparian Woodland (EVC 83) are considered endangered.

Patches of native vegetation in the study area were classified to EVC based on consideration of a combination of the following characteristics:

- Modelled EVC in the study area and surrounds;
- The location of the patch of native vegetation in the landscape;
- The dominant canopy species; and
- The flora species detectable at the time of the survey.

As per the assessment methodology outlined in the Guidelines, areas of uniform quality for each EVC within patches are termed ‘habitat zones’ and are assessed separately. Overall, 11 habitat zones were identified in the study area, as shown in Figure 2 and detailed in Table 3.

Given the altered state of most of the patches of native vegetation recorded in the study area (i.e. lack of tree canopy, or lack of understorey components), classification of EVC was made based on the characteristics available. Most native vegetation recorded in the study area (namely HZ A, B, C, D, E and G) was attributed to Plains Grassy Woodland (EVC 55) which is broadly modelled in the region. This was largely due to the presence of River Red-gum, Blackwood and various graminoid species that are representative of the benchmark EVC (including Kangaroo Grass, Common Bog-sedge and Wattle Mat-rush). Areas of Plains Grassy Woodland (EVC 55) recorded in the study area included three narrow, treeless patches of Plains Grassy Woodland along the south of Bonds Lane (HZs A, B, C), one large patch of treeless and heavily grazed Plains Grassy Woodland in the Ausnet property (HZ D), one small patch of Blackwoods (HZ E) and one small patch of River Red-gums (HZ F).

Habitat Zone F was classified as Swamp Scrub (EVC 53) on the basis that the patch comprised exclusively of Swamp Paperbark. Habitat Zones H, I, J and K were highly altered from their natural state and comprised exclusively of Tall Rush along lower parts of the site. These patches were classified as Swampy Riparian Woodland (EVC 83) due to this EVCs modelled occurrence along drainage lines in the surrounding area, and the presence of Tall Rush in the EVC benchmark.

Results of the vegetation quality assessment for each habitat zone are provided in Appendix B. Scanned copied of VQA field data sheets are provided in Appendix I.

Table 3 Details of patches of native vegetation recorded in the study area

Habitat Zone	Ecological Vegetation Class	Condition Score (/100)	Description	Area (ha)
A	Plains Grassy Woodland (EVC 55)	16	Row of Blackwood along southern side of Bonds Lane. High proportion of regrowth. Lacks native ground cover species.	0.220
B	Plains Grassy Woodland (EVC 55)	11	Narrow (treeless) strip of derived grassland in southern road reserve of Bonds Lane. Native flora species included Kangaroo Grass and spear grass at low cover levels. High cover of grassy weeds.	0.039
C	Plains Grassy Woodland (EVC 55)	12	Narrow (treeless) strip of derived grassland in southern road reserve of Bonds Lane. Native flora species included Kangaroo Grass and spear grass at low cover levels. High cover of grassy weeds.	0.069
D	Plains Grassy Woodland (EVC 55)	15	Expansive, treeless patch of vegetation subject to heavy grazing by Eastern Grey Kangaroos resident in this area. Common Bog-sedge provided the dominant floristic cover throughout, as well as high cover of bryophytes (mosses/lichens). Wallaby grass was present though heavily grazed. Most notably, this area supported a high cover of orchids (including *Microtis spp.* and *Thelymitra spp.*).	1.389
E	Plains Grassy Woodland (EVC 55)	19	Small patch of woodland comprised exclusively of two large Blackwood trees in the corner of existing carpark.	0.020
F	Swamp Scrub (EVC 53)	25	Small patch of Swamp Scrub comprising a sparse canopy of Swamp Paperbark.	0.035
G	Plains Grassy Woodland (EVC 55)	27	Small patch of woodland comprised exclusively of three River Red-gums, one being a large tree (Tree 3 in Table 4).	0.021
H	Swampy Riparian Woodland (EVC 83)	12	Four disconnected, treeless patches of native vegetation located in the low-lying sections of the study area along a drainage line. Each patch is distinguished by a moderate cover of native Rush.	0.059
I	Swampy Riparian Woodland (EVC 83)	12		0.187
J	Swampy Riparian Woodland (EVC 83)	12		0.044
K	Swampy Riparian Woodland (EVC 83)	12		0.131
Total area of native vegetation in patches recorded in study area (ha)				**2.214**

Scattered trees and Large trees in patches

Eight trees defined as native vegetation subject to the Guidelines were recorded in the study area. This included seven scattered trees (five small and two large) and one large tree in a patch (HZ G).

Swamp Gum and Yarra Gum scattered trees recorded were considered to have once comprised the canopy component of Swampy Riparian Woodland (EVC 83) which has a large tree diameter at breast height (DBH) threshold of 70 cm. The River Red-gum recorded in Habitat Zone G was classified as Plains Grassy Woodland (EVC 55) which has a large tree DBH threshold of 80 cm.

Details of all scattered trees and large trees in patches recorded in the study area are listed in Table 4.

Table 4 Details of native trees recorded in the study area

Tree Number	Common Name	Scientific Name	Size and type	DBH (cm)	TPZ (m)
1	Swamp Gum	*Eucalyptus ovata*	Small Scattered Tree	60	7.2
2	Swamp Gum	*Eucalyptus ovata*	Small Scattered Tree	21	2.52
3	River Red-gum	*Eucalyptus camaldulensis*	Large Tree in patch	87	10.44
4	Yarra Gum	*Eucalyptus yarraensis*	Large Scattered Tree	85	10.2
5	Yarra Gum	*Eucalyptus yarraensis*	Small Scattered Tree	63	7.56
6	Swamp Gum	*Eucalyptus ovata*	Small Scattered Tree	47	5.64
7	Swamp Gum	*Eucalyptus ovata*	Large Scattered Tree	84	10.08
8	Swamp Gum	*Eucalyptus ovata*	Small Scattered Tree	68	8.16

Figure 2 Study area and ecological values

3.2.3 Threatened ecological communities

One EPBC Act listed threatened ecological community was listed in the PMST as known or likely to occur within 5 km of the Project Land (DAWE 2021a). This included:

- Gippsland Red Gum (*Eucalyptus tereticornis subsp. mediana*) Grassy Woodland and Associated Native Grassland (listed as Critically Endangered)

It is noted that two forms of this ecological community can occur; a grassy woodland form which is dominated by Gippsland Red-gum, and a grassland form which was likely to have previously been dominated by Gippsland Red-gum but the tree canopy component has since been cleared, leaving only a native ground layer.

To meet the criteria for listing as this community, a patch of native vegetation must meet the following condition thresholds (as per DEWHA 2010):

- Occur in the central Gippsland Plain, and be dominated by native species;
- Have a ground layer dominated by native vegetation (>50% cover of the perennial ground layer);
- Meet a minimum size threshold of 0.04 ha for treeless remnants or 0.2 ha for treed remnants;
- For treed remnants, be dominated by Gippsland Red-gum;
- For treeless remnants, have 7 or more native ground flora species present.

Patches of native vegetation recorded in the study area are considered here as to whether they classify as the listed community:

- Habitat Zones A, B, C: While three patches of the derived grassland form of Plains Grassy Woodland (EVC 55) were recorded along the Bonds Lane road reserve in the study area, these patches lacked the required native species cover and diversity to classify as the above EPBC Act listed ecological community.
- Habitat Zone D: This patch comprised a treeless (grassland) form of Plains Grassy Woodland (EVC 55), though had been subject to heavy grazing by Eastern Grey Kangaroos which are resident in this area. Given the high grazing pressure, it was not possible to accurately determine the percentage cover of perennial native cover in the ground layer at the time of the survey, though Common Bog-sedge, mosses and lichens were observed to make up a large proportion of the ground cover. Furthermore, while low flora species diversity (<7 species) was recorded in this area at the time of the survey, there is potential that additional flora species would be recorded if grazing was restricted for a period. As such, **there is potential that the grassland form of the EPBC Act listed community occurs in Habitat Zone D.**
- Habitat Zones E and G: While these patches comprised Plains Grassy Woodland (EVC 55), they lacked a canopy of Gippsland Red Gum and/or native understorey. They were also too small to classify as the listed EPBC Act community.
- Habitat Zones F, H, I, J, K: These patches comprised different EVC's which do not meet the classification for the listed EPBC Act community.

Based on the above details, it is considered that Habitat Zone D has the potential to support the grassland form of the *Gippsland Red Gum (Eucalyptus tereticornis subsp. mediana) Grassy Woodland and Associated Native Grassland community*. Further assessment would be required when the current grazing pressure has been removed for a period of two months (DEWHA 2010) to make an accurate determination on the presence/absence of this ecological community. Given the likelihood of continued grazing pressure by kangaroos in this location, it is recommended that the precautionary approach is adopted and that no works are proposed in this area by the project.

Based on a review of the descriptions of FFG Act listed communities in the region, it is considered unlikely that any of the native vegetation recorded in the study area classifies as a FFG Act listed community.

3.2.4 Flora

Most of the study area comprised highly altered farm paddocks that consisted largely of introduced flora. During the field assessment 60 flora species were recorded, 22 (37%) of which were indigenous species considered to be naturally occurring in the study area. The remainder were either introduced species (pasture grasses and common farmland weeds) or species that had been planted for amenity (various native and non-native trees and shrubs). A full list of the flora species recorded in the study area is provided in Appendix C.

No flora listed as threatened under the EPBC Act were recorded in the study area during the assessment.

Four flora species listed as threatened under the FFG Act were recorded in the study area. This included one species that was naturally occurring (Yarra Gum) and three species that were planted for amenity/screening (Bog Gum, Giant Honey-myrtle and Spotted Gum). Only species naturally occurring in the area and not planted are afforded protection under the FFG Act. As such, Yarra Gum was the only species recorded that is considered as threatened for this assessment. The occurrence of Yarra Gum in the study area was limited to two scattered trees (Trees 4 and 5) on the eastern side of Tramway Road (See Figure 2). This species is known from a number of records east of the Morwell Power Station. The specimens recorded in the study area were identified as Yarra Gum on the basis of the rough fibrous bark to the upper branches, undulating leaves, and small rounded buds.

In addition to threatened flora species, the FFG Act also lists protected flora species which require additional approvals for any proposed impacts on public land. Two FFG Act protected flora species were recorded in the study area, namely Black Wattle and Hop Wattle, both which were recorded in the southern road reserve of Bonds Lane (See Figure 2).

The likelihood of all threatened flora species which were detected in the database searches within 5 km of the study area was considered in Appendix D. Due to the limited extent of native vegetation, high disturbance and current and previous land use of the study area, it was determined that no additional threatened flora species have a moderate or high likelihood of occurrence in the study area.

3.2.5 Fauna

Land within the study area largely consisted of farmland, which had been subject to a long history of farming and other land use. As such, fauna habitats were mainly limited to planted trees and shrubs, and low-quality aquatic habitat along the drainage line that intersects the west of the study area. Areas of planted vegetation, particularly those within the AusNet property and in the north of the DTF property comprised a mix of tree and shrub species that would provide foraging and dispersal opportunities for common fauna such as birds and arboreal mammals. Numerous bird species and evidence of possums (dreys) were observed in areas of planted vegetation during the survey. A large mob of Eastern Grey Kangaroos (approx. 40 individuals) were also observed resting in the shade of the planted vegetation in the AusNet property during the survey. Based on discussion with the land manager, it is understood that the kangaroos are fenced in in this location, which presents a potential management issue for the site.

A narrow drainage line, which connects with Bennetts Creek to the north, intersects the western part of the study area. Aquatic habitat in the study area was otherwise limited to small dams that lacked any significant fringing, floating or emergent vegetation. Aquatic habitats in the study area were disturbed and lacked any significant ecological value.

A total of 30 fauna species were recorded in the study area, 26 (87%) of which were common native fauna species. A full list of the fauna species recorded in the study area is provided in Appendix C. No threatened fauna species were recorded within the study area. The likelihood of the listed fauna species detected in the database searches within 5 km of the study area was considered in Appendix E. Due to the limited extent of native vegetation or fauna habitat, high disturbance and current and previous land use of the study area, it was determined that no threatened fauna species have a moderate or high likelihood of occurrence in the study area.

4 Proposed impacts and implications

EnergyAustralia propose to develop the WESS in the study area. The extent of the project footprint which includes the WESS and associated infrastructure is shown in Figure 3. The project footprint has been determined based on information provided by EA and includes:

- WESS Indicative Design (See Appendix G and Figure 3). This includes the WESS and associated buildings, temporary construction laydown area, cabling and transformers.
- Grid connection concept design (See Figure 3). This includes the extent of the area needed to provide the grid connection to the adjoining Hazelwood Terminal Station, including high voltage (HV) towers and associated construction hardstand and access roads.

This section outlines the proposed impacts to ecological values based on the project footprint (Section 4.1) and outlines the implications of relevant environmental legislation and policy (Section 4.2). High level consideration of bushfire risk is also provided in Section 4.3. Recommendations are provided where relevant to inform the detailed design phase of the Project.

4.1 Impacts to ecological values

4.1.1 WESS

The site proposed for the development of the WESS comprises farmland that is currently grazed by cattle and lacks any native vegetation or significant ecological value. This portion of the study area has had a long history of farming and is likely to have been subject to other previous disturbance, being located immediately north east of the existing Jeeralang Power Station. The proposal to locate the WESS in this location will not result in the removal of any native vegetation or other significant ecological values.

4.1.2 Grid connection

The location of infrastructure proposed for the grid connection largely occurs in disturbed farmland that lacks native vegetation or significant ecological value. While all native vegetation nearby will be avoided, the development of the grid connection may result in the removal of a small area of planted vegetation. This vegetation has been planted for amenity/screening purposes and does not meet the definition of native vegetation in accordance with the Guidelines. Though this vegetation would provide habitat for common fauna, its removal would not result in any impacts to listed threatened species or communities.

4.1.3 Access from adjoining roads

Ecological values along all adjoining roads have been mapped and assessed as part of this investigation (See Figure 2 and 3), with native vegetation and other ecological values being recorded along Bonds Lane and Tramway Road. It is understood that access for the Project will avoid all native vegetation recorded.

Figure 3 Indicative layout

4.2 Implications under relevant environmental legislation and policy

4.2.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act is Commonwealth legislation that provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, termed Matters of National Environmental Significance (MNES). Under the EPBC Act, an action that has, will have, or is likely to have, a significant impact on a MNES must be referred to the Commonwealth Minister for the Environment. The Minister will then determine whether the proposed action requires formal assessment and approval under the EPBC Act.

The results from the database search of the EPBC Act PMST identified multiple MNES potentially occurring within a 5 km radius search area. The MNES relevant to the Project Land are summarised in Table 5, with threatened and migratory species tabulated in Appendix D and E. The likelihood of occurrence of each relevant MNES are summarised in the following sub sections. Based on the information summarised below, there is unlikely to be any implications for the Project under the EPBC Act.

Table 5 Summary of Matters of National Environmental Significance (MNES) relevant to the search area

Matters of National Environmental Significance	MNES relevant to the project search area
World Heritage Properties	None
National Heritage Places	None
Wetlands of International Importance	1
Great Barrier Reef Marine Park	None
Commonwealth Marine Area	None
Listed Threatened Ecological Communities	1
Listed Threatened Species	29
Listed Migratory Species	14

Wetlands of international importance (Ramsar)

One wetland of international importance, the Gippsland Lakes Ramsar site, was identified in the PMST for the search area. At its closest point, the Gippsland Lakes Ramsar site is located approximately 60 kilometres east of the study area.

The study area is located well upstream of the Gippsland Lakes and does not drain directly into this Ramsar site. Construction and operation of the Project is therefore unlikely to result in a significant impact on the ecological character of this or any other wetlands of international importance.

Listed threatened species

Based on the assessments in Appendix D and E, and the detail provided in Sections 3.2.4 and 3.2.5, it has been determined that no threatened flora or fauna species have a high or moderate likelihood of occurrence in the study area. As such, no EPBC Act listed threatened species are considered to be at risk of a significant impact from the Project.

Listed threatened ecological communities

One EPBC Act listed threatened ecological community, the *Gippsland Red Gum (Eucalyptus tereticornis subsp. mediana) Grassy Woodland and Associated Native* Grassland, was listed in the PMST as potentially being present in the search area. As detailed in Section 3.2.3, there is potential that the grassland form of

this community occurs in Habitat Zone D, though this was not able to be confirmed during the site inspection given the disturbance in this area, namely the high grazing pressure from kangaroos. Given the likelihood of continued grazing pressure by kangaroos in this location, it has been recommended that the project adopts the precautionary approach and avoids any impacts to this area.

Based on the concept design, no works or infrastructure are proposed in this area. Therefore, no EPBC Act listed communities would be subject to any significant impacts from the Project.

Migratory and marine species

Based on the assessment in Appendix E, no EPBC Act migratory listed fauna species are considered to have a high or moderate likelihood of occurrence in the study area. As such, no EPBC Act migratory listed fauna species are at risk of a significant impact from the Project.

4.2.2 Environment Effects Act 1978

The *Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act 1978* (DSE 2006) outlines the triggers for referral of a project to the Victorian Minister for Planning who will determine if an Environmental Effects Statement (EES) is required. Criteria relevant to flora and fauna are broadly summarised to include:

- Extensive removal of native vegetation (>10 hectares);
- Specified significant impacts to threatened species listed in Victoria; and
- Long term changes to Ramsar wetlands.

Based on the results of the flora and fauna assessment, the project will not trigger a referral under the *Environment Effects Act 1978* (EE Act) based on any criteria specifically relevant to flora, fauna or biodiversity. Other criteria beyond those relating to flora and fauna that trigger a referral may apply but have not been considered as part of this assessment.

4.2.3 Flora and Fauna Guarantee Act 1988

The FFG Act is the key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes. Under the FFG Act a permit is required from DELWP to take (kill, injure, disturb or collect) threatened or protected flora species from public land.

The following FFG Act listed threatened species were recorded in the study area:

- Yarra Gum (*Eucalyptus yarraensis*) – Two individuals (Scattered Trees 4 and 5) were recorded in the eastern road reserve of Tramway Road (See Figure 2).

The following FFG Act protected flora species were recorded on public land in the study area:

- Black Wattle (*Acacia mearnsii*) – Three individuals were recorded in the northern road reserve of Bonds Lane, just west of the intersection with Tramway Road (shown as one point in Figure 2).
- Hop Wattle (*Acacia stricta*) – One individual was recorded in the southern road reserve of Bonds Lane, at the eastern end of Habitat Zone C (See Figure 2).

Based on the project footprint (See Figure 3), no FFG Act listed threatened or protected species will be subject to impacts from the Project, therefore a Protected Flora Permit is not required.

4.2.4 Planning and Environment Act 1987

The *Planning and Environment Act 1987* controls the planning and development of land in Victoria and provides for the development of planning schemes for all municipalities under the Planning Scheme and Planning Policy Framework.

Clause 12.01-2S (Native vegetation management) and Clause 52.17 (Native Vegetation) of the Victorian Planning Provision requires that the removal of native vegetation results in no net loss in the contribution

made by native vegetation to Victoria's biodiversity, and that this is achieved by applying the three-step approach outlined in Victoria's '*Guidelines for the removal, destruction or lopping of native vegetation'* (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 if a permit is granted to remove, destroy or lop native vegetation.*

A planning permit is required under Clause 52.17 to remove, destroy or lop native vegetation, including dead native vegetation. Decision guidelines must be considered by the Referral and Responsible Authorities in deciding to grant, or otherwise, the planning permit. Exemptions to the requirement for a permit to remove native vegetation are specified in Clause 52.17 and include themes such as regrowth, dead vegetation and planted vegetation.

The Guidelines are incorporated into the Victorian Planning Provisions to regulate the clearance of native vegetation across the state. The Guidelines use a risk-based approach to determine the significance of native vegetation based on the extent, quality and location of vegetation proposed to be removed. Further details on the application of the guidelines are provided in Appendix A.

Impacts to native vegetation and implications under the Guidelines

Based on the project footprint shown in Figure 3, the Project will not result in the loss of native vegetation. Following the ecological field assessment and draft report, EnergyAustralia have adopted initial recommendations and made refinements to the project design to avoid impacts to native vegetation. The proposed footprint for the WEGS and associated grid connection infrastructure has now been situated to avoid impacts to native vegetation.

Given no removal of native vegetation within the project footprint, there is no requirement for a permit under Clause 52.17 of the Latrobe Planning Scheme. Assessment under the Guidelines and/or native vegetation offsets are therefore not required.

Design refinements

At a strategic level, it is understood the location of the proposed action has been chosen due its proximity to the Jeeralang Power Station, existing infrastructure and minimal environmental impacts. It is also noted that the site has been subject to a long history of agricultural use and is highly modified.

At a site planning level, efforts have been made to avoid and minimise impacts to native vegetation as much as possible, without undermining the key objectives of the project. The location and extent of native vegetation has been considered during the planning and design phase, and Aurecon's project ecologists have met with EA to discuss recommendations for retention of native vegetation. This has led to the refinement of the design for the Project as shown in Figure 3 which allows for the retention of all native vegetation in the study area. Particularly, Habitat Zone E which under previous designs was required to be removed, will now be retained through revision to the grid connection footprint.

4.2.5 Wildlife Act 1975 and Wildlife Regulations 2002

The main legislation for protecting and managing fauna in Victoria is the *Wildlife Act 1975*. This covers indigenous vertebrate species (except declared pest species), invertebrate species listed under the FFG Act and some introduced game species. A Management Authorisation permit would be required under the Act if salvage and relocation of fauna are to be undertaken as part of any removal of habitat associated with the works. This may be required for the removal of planted (amenity/screening) vegetation in the event that any native animals and/or nests are found to be present.

4.2.6 Catchment and Land Protection Act 1994

The *Catchment and Land Protection Act 1994* (CaLP Act) identifies and classifies certain species as noxious weeds or pest animals and provides a system of controls on noxious species.

The CaLP Act also provides a legislative framework for the management of private and public land and sets out the responsibilities of land managers, stating that they must take all reasonable steps to:

- Avoid causing or contributing to land degradation which causes or may cause damage to land of another land owner;
- Protect water resources;
- Conserve soil;
- Eradicate regionally prohibited weeds;
- Prevent the growth and spread of regionally controlled weeds; and
- Prevent the spread of, and as far as possible eradicate, established pest animals.

The study area contains the following noxious weeds listed as regionally controlled within the West Gippsland Catchment Management Authority region:

- African Box-thorn (*Lycium ferocissimum*)
- Blackberry (*Rubus fruticosus spp. agg.*)
- Spear Thistle (*Cirsium vulgare*)
- Sweet Briar (*Rosa rubiginosa*)

Appropriate weed control and hygiene measures should be outlined in the Construction and Operational Environmental Management Plans for the Project. Specific attention should be given to ensuring appropriate measures are in place during construction to prevent the spread of high threat weeds.

4.3 Bushfire risk

While distinct areas of planted (amenity/screening) vegetation exist adjacent to the proposed WESS site as well as west of Monash Way, the broader surrounds are largely distinguished by open farmland. As such grassland presents the main bushfire hazard vegetation type in the region. The closest forested bushfire hazard in the region is at Hazelwood South, approximately 5km south east of the Project site.

A large proportion of the study area, particularly land in the west that is associated or immediately adjacent to the Monash Way Plantations, is covered by the Bushfire Management Overlay (BMO). Like much of Victoria, the entire study area is designated as a Bushfire Prone Area (BPA).

Clause 13.02-1S of the Latrobe Planning Scheme and Clause 44.06 of the Victorian Planning Scheme lists types of applications for which bushfire risk should be considered in a BPA and BMO respectively. As the proposed development (energy storage facility / utility installation) is not listed, the application requirements of Clause 13.02 and 44.06 are not considered to apply and have not been considered further in this report.

However, as the Minister for Planning refers the application to the Country Fire Authority (CFA), it is recommended that the requirements of the *CFA guidelines for renewable energy facilities* (CFA 2021) are applied to the Project. Details of how the Project will meet the requirements of the CFA guidelines is presented in a separate Bushfire Assessment which has been prepared for this Project (Aurecon 2022).

5 Summary and recommendations

5.1 Summary

Aurecon undertook a flora and fauna assessment to inform the development of the WESS located south of Morwell, in eastern Victoria.

The study area consists of three properties, each of which have been heavily altered for farming and/or industrial use, and as such lack extensive areas of native vegetation or significant ecological values.

The following summarises the key findings within the study area:

- Extensive areas of planted vegetation exist for the purpose of amenity and/or screening. These are exempt from permit consideration as native vegetation as defined under Clause 52.17-7 in the planning scheme.
- Native vegetation was largely limited to small, disconnected patches that were heavily altered from their natural state. This included three narrow, treeless patches of Plains Grassy Woodland, one large patch of treeless and heavily grazed Plains Grassy Woodland and multiple patches of treeless Swampy Riparian Woodland.
- Eight native vegetation trees were recorded, including seven scattered trees (five small and two large) and one large tree in a patch. Of these, two trees were identified as Yarra Gum, which is listed as critically endangered on the FFG Act.
- No threatened species listed under the EPBC Act were recorded nor considered to have a moderate or high likelihood of occurrence. One EPBC Act listed ecological community, the *Gippsland Red Gum (Eucalyptus tereticornis subsp. mediana) Grassy Woodland and Associated Native* Grassland, was considered to have the potential to occur in one location (HZ D). Based on the concept design, no works or infrastructure are proposed in this area. Therefore no EPBC Act listed communities would be subject to any significant impacts from the Project and referral is not required.
- Four flora species listed as threatened under the FFG Act were recorded, however only one is considered a native threatened flora species (Yarra Gum), which was limited to the two individuals east of Tramway Road. Black Wattle and Hop Wattle, which is listed as protected under the FFG Act were recorded on public land in the Bonds Lane road reserve. No threatened fauna or ecological communities listed under the FFG Act were recorded in the study area and none were considered to have a moderate or high likelihood of occurrence.

Following the ecological field assessment and draft report, EnergyAustralia have adopted initial recommendations and made refinements to the project design to avoid impacts to native vegetation. The proposed footprint for the WESS and associated grid connection infrastructure has now been situated to avoid impacts to native vegetation. While all native vegetation in the study area will be avoided, the development of the grid connection will result in the removal of a small area of planted vegetation. This vegetation has been planted for amenity/screening purposes and does not meet the definition of native vegetation in accordance with the Guidelines. Though this vegetation would provide habitat for common fauna, its removal would not result in any impacts to listed threatened species or communities

Based on the project footprint, there are no implications for the Project under the EPBC Act or FFG Act and the Project will not trigger a referral under the EE Act based on any criteria specifically relevant to flora, fauna or biodiversity. Furthermore, given the extensive measures to avoid and mitigate impacts to proposed removal of vegetation, namely Habitat Zone E, the project does not require a permit or offset requirements for the removal of native vegetation under the Latrobe Planning Scheme.

5.2 Recommendations

Impacts to native vegetation have been avoided in the current design. It is recommended that no-go zone fencing around the canopy dripline for Habitat Zone E is installed prior to and throughout construction to

avoid any impacts to native vegetation. No-go zone fencing should also be erected around native vegetation where works are proposed within 50 metres of such native vegetation (i.e. Habitat Zones B and D).

Appropriate firebreak widths between the proposed WESS and nearby vegetation are to be implemented and maintained. The width of the firebreak must be at least 10 metres wide. The firebreak should be achieved within the indicative project footprint outlined in the concept design to allow for the retention of the tree row along Bonds Lane, and other planted vegetation to the south east. The firebreak should also be located to avoid impacts to any native vegetation.

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Appendix A: Permitted clearing assessment (the Guidelines)

This section describes the Victorian permitted clearing guidelines and methods of applying those guidelines.

Risk-based Pathway

In Victoria, a permit is required to remove, destroy or lop native vegetation under Clause 52.17 of the Victorian Planning Provisions (VPP) empowered by the Victorian *Planning and Environment Act 1987*. These provisions are outlined in various guidelines discussed below.

In December 2017, the Victorian State Government released a set of reforms to regulate the approval and conditions associated with vegetation clearing.

The *Guidelines for the removal, destruction or lopping of native vegetation* (the Guidelines) outline how impacts on Victoria's biodiversity are assessed and the appropriate risk based pathway when an application to remove native vegetation is lodged (DELWP 2017a). The Guidelines are an incorporated document in all Victorian Planning Schemes and are applied alongside other requirements of the planning scheme when an application for a permit to remove native vegetation is considered by the responsible authority.

The risk based pathway approach categorises an application into one of three pathways. Taken from DELWP 2017a:

- Basic – limited impacts on biodiversity.
- Intermediate – could impact on large trees, endangered EVCs, and sensitive wetlands and coastal areas.
- Detailed – could impact on large trees, endangered EVCs, sensitive wetlands and coastal areas, and could significantly impact on habitat for rare or threatened species.

The location of the vegetation removal is then assessed in terms of significance for biodiversity. Three location categories have been assigned by DELWP (2007a) and in terms of importance include:

- Location 3 – includes locations where the removal of less than 0.5 hectares of native vegetation could have a significant impact on habitat for a rare or threatened species.
- Location 2 – includes locations that are mapped as endangered EVCs and/or sensitive wetlands and coastal areas (section 3.2.1) and are not included in Location 3.
- Location 1 – includes all remaining locations in Victoria.

Once the risk pathway and the location significance are known the application assessment pathway can be determined as per the table below.

Extent of native vegetation to be removed Content	Location 1	Location 2	Location 3
Less than 0.5 hectares and not including any large trees	Basic	Intermediate	Detailed
Less than 0.5 hectares and including one or more large trees	Intermediate	Intermediate	Detailed
0.5 hectares or more	Detailed	Detailed	Detailed

The vegetation removal pathway then determines the level of assessment and information required in an application to remove, lop or destroy native vegetation.

Appendix B: Vegetation quality assessment results

Habitat Hectare Criteria		Max score	A	B	C	D	E	F	G	H	I	J	K
Site Condition	**Area (ha)**		0.220	0.039	0.069	1.389	0.020	0.035	0.021	0.059	0.187	0.044	0.131
	Bioregion		Gippsland Plain										
	Ecological Vegetation Class (EVC)		Plains Grassy Woodland (EVC 55)	Plains Grassy Woodland (EVC 55)	Plains Grassy Woodland (EVC 55)	Plains Grassy Woodland (EVC 55)	Plains Grassy Woodland (EVC 55)	Swamp Scrub (EVC 53)	Plains Grassy Woodland (EVC 55)	Swampy Riparian Woodland (EVC 83)	Swampy Riparian Woodland (EVC 83)	Swampy Riparian Woodland (EVC 83)	Swampy Riparian Woodland (EVC 83)
	Large Old Trees	10	0	0	0	0	0	N/A	9	0	0	0	0
	Canopy Cover	5	0	0	0	0	0	2	4	0	0	0	0
	Lack of Weeds	15	2	2	2	6	9	9	9	6	6	6	6
	Understorey	25	5	5	5	5	5	5	0	5	5	5	5
	Recruitment	10	5	0	0	0	0	0	0	0	0	0	0
	Organic Matter	5	3	3	3	2	3	3	4	0	0	0	0
	Logs	5	0	0	0	0	0	N/A	0	0	0	0	0
	Total Site Score		15	10	10	13	17	19	26	11	11	11	11
	Standardiser		1	1	1	1	1	1.25	1	1	1	1	1
	Standardised Score		15	10	10	13	17	24	26	11	11	11	11
Landscape Value	Patch Size	10	1	1	1	1	1	1	1	1	1	1	1
	Neighbourhood	10	0	0	0	0	0	0	0	0	0	0	0
	Distance to Core	5	0	0	1	1	1	0	0	0	0	0	0
	Total Landscape Score		1	1	2	2	2	1	1	1	1	1	1
Final score	**Habitat Score (out of 100)**	100	16	11	12	15	19	25	27	12	12	12	12
	Condition Score (out of 1)	1	0.16	0.11	0.12	0.15	0.19	0.25	0.27	0.12	0.12	0.12	0.12

Appendix C Flora and fauna recorded in study area

Origin	Common Name	Scientific Name	EPBC Act	FFG Act	Recorded
Flora species recorded in the study area					
*	African Box-thorn	*Lycium ferocissimum*			X
*	Annual Meadow-grass	*Poa annua s.l.*			X
*	Bastard's Fumitory	*Fumaria bastardii*			X
	Black Wattle	*Acacia mearnsii*		P	X
*	Blackberry	*Rubus fruticosus spp. agg.*			X
	Blackwood	*Acacia melanoxylon*			X
(P)	Bog Gum	*Eucalyptus kitsoniana*		CE	X
*	Buck's-horn Plantain	*Plantago coronopus*			X
*	Cape Weed	*Arctotheca calendula*			X
*	Cat's Ear	*Hypochaeris spp.*			X
	Common Bog-sedge	*Schoenus apogon*			X
*	Common Centaury	*Centaurium erythraea*			X
*	Common Water-starwort	*Callitriche stagnalis*			X
* (P)	Cootamundra Wattle	*Acacia baileyana*			X
	Cotton Fireweed	*Senecio quadridentatus*			X
*	Couch	*Cynodon dactylon var. dactylon*			X
(P)	Cypress-pine	*Callitris spp.*			X
	Dock	*Rumex spp.*			X
*	Dock (naturalised)	*Rumex spp. (naturalised)*			X
(P)	Giant Honey-myrtle	*Melaleuca armillaris subsp. armillaris*		EN	X
	Hop Wattle	*Acacia stricta*		P	X
	Kangaroo Grass	*Themeda triandra*			X
(P)	Manna Gum	*Eucalyptus viminalis*			X
*	Medic	*Medicago spp.*			X
*	Onion Grass	*Romulea rosea*			X
	Onion Orchid	*Microtis spp.*		P	X
(P)	Ovens Wattle	*Acacia pravissima*			X
	Pale Sundew	*Drosera peltata s.l.*			X
* (P)	Prickly Paperbark	*Melaleuca styphelioides*			X
(P)	Red Box	*Eucalyptus polyanthemos*			X
(P)	Red Ironbark	*Eucalyptus tricarpa*			X
*	Red-ink Weed	*Phytolacca octandra*			X
*	Ribwort	*Plantago lanceolata*			X
(P) *	River Oak	*Casuarina cunninghamiana subsp. cunninghamiana*			X
	River Red-gum	*Eucalyptus camaldulensis*			X
	Rush	*Juncus spp.*			X
*	Rye Grass	*Lolium spp.*			X
(P)	Sallow Wattle	*Acacia longifolia*			X
	Sheep's Burr	*Acaena echinata*			X
(P)	Southern Blue-gum	*Eucalyptus globulus*			X
(P)	Southern Mahogany	*Eucalyptus botryoides*			X
*	Spear Thistle	*Cirsium vulgare*			X
	Spear-grass	*Austrostipa spp.*			X
(P)	Spotted Gum	*Corymbia maculata*		VU	X
* (P)	Sugar Gum	*Eucalyptus cladocalyx*			X
	Sun Orchid	*Thelymitra spp.*		P	X
	Swamp Gum	*Eucalyptus ovata*			X

Origin	Common Name	Scientific Name	EPBC Act	FFG Act	Recorded
	Swamp Paperbark	*Melaleuca ericifolia*			X
*	Sweet Briar	*Rosa rubiginosa*			X
*	Sweet Pittosporum	*Pittosporum undulatum*			X
*	Sweet Vernal-grass	*Anthoxanthum odoratum*			X
	Tall Rush	*Juncus procerus*			X
*	Toowoomba Canary-grass	*Phalaris aquatica*			X
	Wallaby Grass	*Rytidosperma spp.*			X
	Wattle Mat-rush	*Lomandra filiformis*			X
	Wood Sorrel	*Oxalis spp.*			X
	Yarra Gum	*Eucalyptus yarraensis*		CE	X
(P)	Yellow Box	*Eucalyptus melliodora*			X
	Yellow Rush-lily	*Tricoryne elatior*			X
*	Yorkshire Fog	*Holcus lanatus*			X
Fauna species recorded in the study area					
	Australian Magpie	*Gymnorhina tibicen*			X
*	Common Blackbird	*Turdus merula*			X
	Common Froglet	*Crinia signifera*			X
*	Common Myna	*Acridotheres tristis*			X
*	Common Starling	*Sturnus vulgaris*			X
	Crested Pigeon	*Ocyphaps lophotes*			X
	Crimson Rosella	*Platycercus elegans*			X
	Eastern Grey Kangaroo	*Macropus giganteus*			X
	Eastern Rosella	*Platycercus eximius*			X
	Fan-tailed Cuckoo	*Cacomantis flabelliformis*			X
	Galah	*Eolophus roseicapilla*			X
	Grey Fantail	*Rhipidura albiscapa*			X
	Grey Shrike-thrush	*Colluricincla harmonica*			X
*	House Sparrow	*Passer domesticus*			X
	Little Raven	*Corvus mellori*			X
	Magpie-lark	*Grallina cyanoleuca*			X
	Masked Lapwing	*Vanellus miles*			X
	New Holland Honeyeater	*Phylidonyris novaehollandiae*			X
	Pobblebonk Frog	*Limnodynastes dumerilii dumerilii*			X
	Rainbow Lorikeet	*Trichoglossus molucannus*			X
	Red Wattlebird	*Anthochaera carunculata*			X
	Red-browed Finch	*Neochmia temporalis*			X
	Spotted Marsh Frog (race unknown)	*Limnodynastes tasmaniensis*			X
	Straw-necked Ibis	*Threskiornis spinicollis*			X
	Striated Thornbill	*Acanthiza lineata*			X
	Striped Marsh Frog	*Limnodynastes peronii*			X
	Superb Fairy-wren	*Malurus cyaneus*			X
	Welcome Swallow	*Hirundo neoxena*			X
	White-faced Heron	*Egretta novaehollandiae*			X
	Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*			X

* introduced, (P) = Planted (and not considered as native); X = recorded in study area during survey;

FFG Act status: CE=critically endangered; EN=endangered; VU=vulnerable; P= Protected flora species.

Appendix D: Likelihood of occurrence analysis of threatened flora

Common Name	Scientific Name	EPBC Act	FFG Act	Habitat preference	Number of records within 5km	Most recent record within 5km	Likelihood of occurrence
Basalt Peppercress	*Lepidium hyssopifolium s.s.*	EN	EN	Collected from scattered sites on the volcanic plain. Recent collections are from disturbed, rather weedy sites.	None	N/A	**Low -** No suitable habitat in the study area. No records in the search region.
Clover Glycine	*Glycine latrobeana*	VU	VU	Widespread but of sporadic occurrence and rarely encountered. Grows mainly in grasslands and grassy woodlands.	None	N/A	**Low** - Native grassy habitats in the study area were limited to areas of derived grassland, which were highly disturbed and supported a high cover of introduced flora. No records in the search region.
Green-striped Greenhood	*Pterostylis chlorogramma*	VU	EN	Apparently localised in Victoria, but exact range uncertain due to confusion with closely allied species. Grows in moist areas of heathy and shrubby forest, on well-drained soils.	None	N/A	**Low -** No suitable habitat in the study area. No records in the search region.
Grey Billy-buttons	*Craspedia canens*		CR	Known in Victoria only from grassland (often bordering swamps) at low altitude between Cranbourne and Traralgon.	1	22/12/2004	**Low -** No suitable habitat in the study area.
Maroon Leek-orchid	*Prasophyllum frenchii*	EN	EN	Broad distribution across southern Victoria, but rare. Occurs in grassland, heathland and open forest on well-drained or water-retentive sand or clay loams.	None	N/A	**Low** - Native grassy habitats in the study area were limited to areas of derived grassland, which were highly disturbed and supported a high cover of introduced flora. No records in the search region.
Matted Flax-lily	*Dianella amoena*	EN	CR	Lowland grasslands, grassy woodlands, valley grassy forest and creeklines of herb-rich woodlands.	2	22/12/2004	**Low** - Native grassy habitats in the study area were limited to areas of derived grassland, which were highly disturbed and supported a high cover of introduced flora. No Dianella species recorded during initial survey. Limited records in the search region.
River Swamp Wallaby-grass	*Amphibromus fluitans*	VU		Permanent swamps, lagoons, billabongs and dams.	1	22/02/1996	**Low** - Aquatic habitat in the study area is limited to a degraded drainage line and other small dams that lacked any floating, emergent or fringing vegetation.

Common Name	Scientific Name	EPBC Act	FFG Act	Habitat preference	Number of records within 5km	Most recent record within 5km	Likelihood of occurrence
Strzelecki Gum	*Eucalyptus strzeleckii*	VU	CR	Largely restricted to the western section of the Strzelecki Range, from Neerim South in the north, south to Foster, and with a few isolated records from the Otway ranges. Favours ridges, slopes and streambanks and deep fertile soils.	2	19/10/2004	**Low -** No tree species that match the description of this species were recorded in the study area. All remnant trees in the study area were otherwise identified.
Swamp Everlasting	*Xerochrysum palustre*	VU	CR	Occurs in lowland swamps, usually on black cracking clay soils, scattered from near the South Australian border north-west of Portland to Bairnsdale district, but rare due to habitat depletion.	None	N/A	**Negligible -** No suitable habitat. No records in the search region.
Swamp Fireweed	*Senecio psilocarpus*	VU		Rare, restricted in Victoria to a few herb-rich winter-wet swamps throughout the south of the state, west from Sale, growing on volcanic clays or peaty soils.	None	N/A	**Negligible -** No suitable habitat. No records in the search region.
Thick-lip Spider-orchid	*Caladenia tessellata*	VU		Apparently confined to eastern Victoria from near-coastal heathy woodlands to open forests on well-drained sandy soils.	None	N/A	**Negligible -** No suitable habitat. No records in the search region.

Legend: EPBC Act (Status under the EPBC Act): CR = critically endangered, EN = endangered, VU = vulnerable; FFG Act (Status under the FFG Act): CR = critically endangered, EN = endangered, VU = vulnerable

Appendix E: Likelihood of occurrence analysis of threatened fauna

Common Name	Scientific Name	EPBC Act	FFG Act	Habitat preference	No. of records within 5km	Most recent record within 5km	Likelihood of occurrence
Birds							
Australasian Bittern	*Botaurus poiciloptilus*	EN	CR	Frequents reedbeds, and other vegetation in water such as cumbungi, lignum and sedges.	None	N/A	**Negligible** - No suitable habitat. No records in the search region.
Australasian Shoveler	*Spatula rhynchotis*		VU	Found in all kinds of wetlands, preferring large undisturbed heavily vegetated freshwater swamps. It is also found on open waters and occasionally along the coast.	3	13/06/1987	**Low -** No suitable wetland habitats in the study area.
Australian Painted-snipe	*Rostratula australis*	EN	CR	Inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. Also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains.	None	N/A	**Negligible** - No suitable habitat. No records in the search region.
Black-faced Monarch	*Monarcha melanopsis*	M		Rainforest ecosystems, including tropical, subtropical and cool temperate rainforest	None	N/A	**Negligible** - No suitable habitat. No records in the search region.
Blue-billed Duck	*Oxyura australis*		VU	Almost wholly aquatic. Non-breeding flocks congregate on large, deep open freshwater dams and lakes in autumn.	8	1/06/1979	**Low -** No suitable wetland habitats in the study area.
Caspian Tern	*Hydroprogne caspia*	M	VU	Widespread around the Australian coastline, and also occur inland along major rivers, especially in the Murray–Darling and Lake Eyre drainage basins.	3	3/12/2017	**Low** - No suitable habitat. Limited records in the search region.
Common Greenshank	*Tringa nebularia*	M	EN	Found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity, typically with large mudflats and saltmarsh, mangroves or seagrass.	None	N/A	**Negligible** - No suitable habitat. No records in the search region.
Common Sandpiper	*Actitis hypoleucos*	M	VU	Utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats.	None	N/A	**Negligible** - No suitable habitat. No records in the search region.

Common Name	Scientific Name	EPBC Act	FFG Act	Habitat preference	No. of records within 5km	Most recent record within 5km	Likelihood of occurrence
Curlew Sandpiper	*Calidris ferruginea*	CR, M	CR	Intertidal mudflats in sheltered coastal areas. Non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms.	None	N/A	**Negligible** - No suitable habitat. No records in the search region.
Eastern Curlew	*Numenius madagascariensis*	CR, M	CR	Largest shorebird in Australia. Breeds in Russia and north-eastern China, arrives back to Australia in August to feed on crabs and molluscs in intertidal mudflats on the coast.	None	N/A	**Negligible** - No suitable habitat. No records in the search region.
Eastern Great Egret	*Ardea alba modesta*		VU	Occurs in a wide range of wetland habitats including swamps and marshes; margins of rivers and lakes; damp or flooded grasslands, pastures or agricultural lands; reservoirs; sewage treatment ponds; drainage channels; salt marshes and mudflats.	3	22/06/2019	**Low** - No significant aquatic habitats occur in the study area, however the species may visit occasionally after particularly wet periods when areas may become inundated. Limited records in the search region.
Fork-tailed Swift	*Apus pacificus*	M		Almost exclusively aerial. In Australia, they mostly occur over inland plains but sometimes above foothills or in coastal areas	None	N/A	**Low** - No preferred habitat. No records in the search region.
Grey Falcon	*Falco hypoleucos*	VU	VU	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	None	N/A	**Low** - No preferred habitat. No records in the search region.
Hardhead	*Aythya australis*		VU	Found in freshwater swamps and wetlands and occasionally in sheltered estuaries	14	2/12/2018	**Low -** No suitable wetland habitats in the study area.
Latham's Snipe	*Gallinago hardwickii*	M		Occurs in a range of permanent and ephemeral wetlands including freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies)	6	1/09/1980	**Low** - Limited suitable aquatic habitat that would attract the species. No recent records in the search region.
Lewin's Rail	*Lewinia pectoralis*		VU	Freshwater to saline wetlands, either permanent or ephemeral.	1	22/12/2010	**Low** - No suitable wetland habitats in the study area. Limited records in the search region.
Little Eagle	*Hieraaetus morphnoides*		VU	Seen over woodland and forested lands and open country, extending into the arid zone. It tends to avoid rainforest and heavy forest.	4	1/03/1981	**Low** - No preferred habitat. No recent records in the search region.

Common Name	Scientific Name	EPBC Act	FFG Act	Habitat preference	No. of records within 5km	Most recent record within 5km	Likelihood of occurrence
Little Egret	*Egretta garzetta*		EN	Tidal mudflats, saltwater and freshwater wetlands, and mangroves.	5	17/09/2018	**Low** - No preferred aquatic habitats in the study area.
Musk Duck	*Biziura lobata*		VU	Range of wetland habitats	4	1/03/1979	**Low** - No preferred aquatic habitats. No recent records in the search region
Osprey	*Pandion haliaetus*	M		Occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. Found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia	None	N/A	**Negligible** - No suitable habitat. No records in the search region.
Painted Honeyeater	*Grantiella picta*	VU	VU	Found in dry open forests and woodlands, and is strongly associated with mistletoe.	None	N/A	**Negligible** - No suitable habitat. No records in the search region.
Pectoral Sandpiper	*Calidris melanotos*	M		Prefers shallow fresh to saline wetlands and is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	None	N/A	**Negligible -** No suitable habitat. No records in the search region.
Plumed Egret	*Ardea intermedia plumifera*		CR	Prefers freshwater swamps, billabongs, floodplains and wet grasslands with dense aquatic vegetation, and is only occasionally seen in estuarine or intertidal habitats.	4	18/03/2018	**Low** - No preferred aquatic habitats in the study area.
Powerful Owl	*Ninox strenua*		VU	Occurs in open forests and woodlands, as well as along sheltered gullies in wet forests with dense understoreys, especially along watercourses. Will sometimes be found in open areas near forests such as parks and suburban areas. Needs old growth trees to nest.	1	11/07/1981	**Low -** No suitable habitat. Planted treed vegetation lacked observable hollows. No recent records in the search region.
Regent Honeyeater	*Anthochaera phrygia*	CR	CR	Primarily occurs in box-ironbark woodland, but also occurs in other forest types. Mainly feeds on nectar from eucalypts and mistletoes with movements governed by the flowering of select eucalypt species.	None	N/A	**Negligible** - No suitable habitat. No records in the search region.
Rufous Fantail	*Rhipidura rufifrons*	M		Inhabits wet sclerophyll forests, often in gullies dominated by tall eucalypts, usually with a dense shrubby understorey and ferns.	7	1/03/1980	**Low** - No suitable habitat. No recent records in the search region.

Common Name	Scientific Name	EPBC Act	FFG Act	Habitat preference	No. of records within 5km	Most recent record within 5km	Likelihood of occurrence
Satin Flycatcher	*Myiagra cyanoleuca*	M		Inhabits heavily vegetated gullies in eucalypt-dominated forests and taller woodlands	6	21/04/1999	**Low** - No suitable habitat. No recent records in the search region.
Sharp-tailed Sandpiper	*Calidris acuminata*	M		Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	1	1/12/1978	**Negligible** - No suitable habitat. No recent records in the search region.
Swift Parrot	*Lathamus discolor*	CR	CR	Breeds in Tasmania and overwinters in Victoria. Found in dry sclerophyll forests and woodlands, suburban parks and gardens where it feeds on the nectar of flowering eucalypts, namely Grey, Red Ironbark, Mugga Ironbark, Yellow Gum and White Box. Also feed on lerp psyllids amongst Red Gum.	None	N/A	**Low -** No remnant habitat. Small number of planted trees in the study area included Red Ironbark, but not enough to be considered to present a reliable food resource to the species. No records in the search region, and limited records in the broader central Gippsland region.
White-bellied Sea-Eagle	*Haliaeetus leucogaster*		EN	Distributed along the coastline of mainland Australia, also extending inland along some of the larger waterways.	1	23/06/1981	**Low** - No suitable habitat. No recent records in the search region.
White-throated Needletail	*Hirundapus caudacutus*	VU, M	VU	Almost exclusively aerial, over a wide variety of habitats.	13	2/03/1981	**Low** - No particular habitat features in the study area that would attract the species. No recent records in the search region.
Yellow Wagtail	*Motacilla flava*	M		Regular non-breeding visitor in northern Australia mainly spring-summer, vagrant to the south. Wide range of habitats, including areas with low vegetation, often recorded near water.	None	N/A	**Low** - No preferred habitat. No records in the search region.
Mammals							
Broad-toothed Rat	*Mastacomys fuscus mordicus*	VU	VU	Occurs in a range of habitat types, from alpine habitats to swamps. Habitat suitability largely determined by the availability of cover and food (grasses).	None	N/A	**Low -** No preferred habitat. No records in the search region.

Common Name	Scientific Name	EPBC Act	FFG Act	Habitat preference	No. of records within 5km	Most recent record within 5km	Likelihood of occurrence
Grey-headed Flying-fox	*Pteropus poliocephalus*	VU	VU	Requires foraging resources and roosting sites. The primary food source is blossom from Eucalyptus and related genera but commonly forages on fruit trees in urban areas.	None	N/A	**Low** - While planted trees in the study area provide potential food resources for the species, no remnant or extensive foraging habitat occurs within the study area. No known colonies in or adjacent to the study area. No records in the search region.
Long-nosed Potoroo (SE Mainland)	*Potorous tridactylus tridactylus*	VU	VU	Occurs mainly in coastal heathy woodland. In north of range occurs in rainforest adjacent to wet sclerophyll forest. Requires dense cover for shelter.	None	N/A	**Negligible** - No suitable habitat. No records in the search region.
Southern Brown Bandicoot	*Isoodon obesulus obesulus*	EN	EN	Inhabits areas of dense ground cover in heathland, shrubland, sedgeland, heathy open forest and woodland. Suitable habitat includes any areas of vegetation (native or introduced) within the species range, that comprises an understorey vegetation structure with 50–80% foliage cover in the 0.2–1 m height range.	None	N/A	**Low** - No preferred habitat. Planted vegetation in the study area lacks the dense understorey habitat required for this species. No records in the search region.
Southern Greater Glider	*Petauroides volans*	VU	VU	Typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows.	1	6/09/1915	**Negligible** - No suitable habitat. No recent records in the search region.
Spot-tailed Quoll	*Dasyurus maculatus maculatus*	EN	EN	Temperate and subtropical rainforests in mountain areas wet sclerophyll forest lowland forests open and closed eucalypt woodlands.	None	N/A	**Negligible** - No suitable habitat. No records in the search region.
Reptiles							
Glossy Grass Skink	*Pseudemoia rawlinsoni*		EN	Low dense vegetation in moist situations along the margins of swamps and watercourses.	1	29/11/1992	**Low -** No preferred habitat. Vegetation in the study area associated with watercourses is limited to low quality patches of native Rush along a narrow drainage line. These patches otherwise comprised and were surrounded by introduced pasture, and lacked connectivity to other vegetated habitats.

Common Name	Scientific Name	EPBC Act	FFG Act	Habitat preference	No. of records within 5km	Most recent record within 5km	Likelihood of occurrence
Frogs							
Green and Golden Bell Frog	*Litoria aurea*	VU		Occurs in a range of still water and terrestrial habitats in the coastal plains and low foothills of the hinterland. Breeding habitat includes dams in both forested and cleared areas, swamps in farmlands, gravel pits, billabongs, marshes, coastal lagoon wetlands, wet swale herblands and isolated streamside pools.	None	N/A	**Low -** Aquatic habitat in the study area is limited to a degraded drainage line and other small dams that lacked any floating, emergent or fringing vegetation. No records in the search region.
Growling Grass Frog	*Litoria raniformis*	VU	VU	Persists in waterways and other aquatic habitats in the greater Melbourne region. Key habitat features for the species includes submerged vegetation for egg-laying, rocks and logs for basking, permanent freshwater lagoons for breeding and cracks, as well as debris and dense vegetation for refuge.	None	N/A	**Low -** Aquatic habitat in the study area is limited to a degraded drainage line and other small dams that lacked any floating, emergent or fringing vegetation. No records in the search region.
Fish							
Australian Grayling	*Prototroctes maraena*	VU	EN	Occurs in streams and rivers on the eastern and southern flanks of the Great Dividing Range, from Sydney, southwards to the Otway Ranges of Victoria and in Tasmania. The species is found in fresh and brackish waters of coastal lagoons.	None	N/A	**Low -** Aquatic habitat in the study area is limited to a degraded drainage line and other small dams that lacked any floating, emergent or fringing vegetation. No records in the search region.
Dwarf Galaxias	*Galaxiella pusilla*	VU	EN	Slow flowing, still shallow permanent and temporary freshwater habitats.	None	N/A	**Low -** Aquatic habitat in the study area is limited to a degraded drainage line and other small dams that lacked any floating, emergent or fringing vegetation. No records in the search region.
Flinders Pygmy Perch	*Nannoperca sp. 1*		VU	Inhabits slow or still waters with abundant aquatic vegetation, including lakes, ponds and slow-flowing rivers and creeks, along with pools in moderately-flowing streams.	3	14/10/2020	**Low -** Aquatic habitat in the study area is limited to a degraded drainage line and other small dams that lacked any floating, emergent or fringing vegetation. Records in the broader region associated with the Traralgon Creek and Morwell River.

Legend: EPBC Act (Status under the EPBC Act): CR = critically endangered, EN = endangered, VU = vulnerable, M = migratory; FFG Act (Status under the FFG Act): CR = critically endangered, EN = endangered, VU = vulnerable

Appendix F: EPBC Act Protected Matters Search Tool (PMST) Report

Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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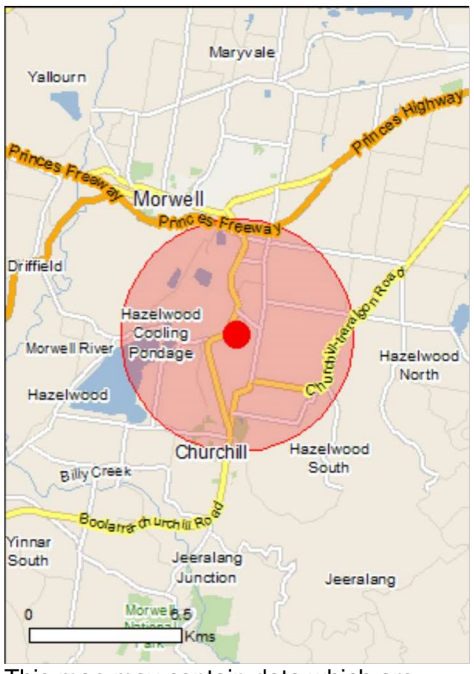

This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

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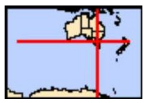

ADVERTISED PLAN

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	29
Listed Migratory Species:	14

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	19
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Regional Forest Agreements:	1
Invasive Species:	35
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Gippsland lakes	50 - 100km upstream

Listed Threatened Ecological Communities		[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.		
Name	Status	Type of Presence
Gippsland Red Gum (Eucalyptus tereticornis subsp. mediana) Grassy Woodland and Associated Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Fish		
Galaxiella pusilla Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Frogs		
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat may occur within area
Litoria raniformis Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat may occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Vulnerable	Species or species habitat may occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE Mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Plants		
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat likely to occur within area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat likely to occur within area
Eucalyptus strzeleckii Strzelecki Gum [55400]	Vulnerable	Species or species habitat known to occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat likely to occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat may occur within area
Prasophyllum frenchii Maroon Leek-orchid, Slaty Leek-orchid, Stout Leek-orchid, French's Leek-orchid, Swamp Leek-orchid [9704]	Endangered	Species or species habitat likely to occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat likely to occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Extra Information

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
Gippsland RFA	Victoria

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Carduelis chloris European Greenfinch [404]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Pycnonotus jocosus Red-whiskered Bulbul [631]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Turdus philomelos Song Thrush [597]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Carrichtera annua Ward's Weed [9511]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-38.2775 146.42389

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Canberra City ACT 2601 Australia
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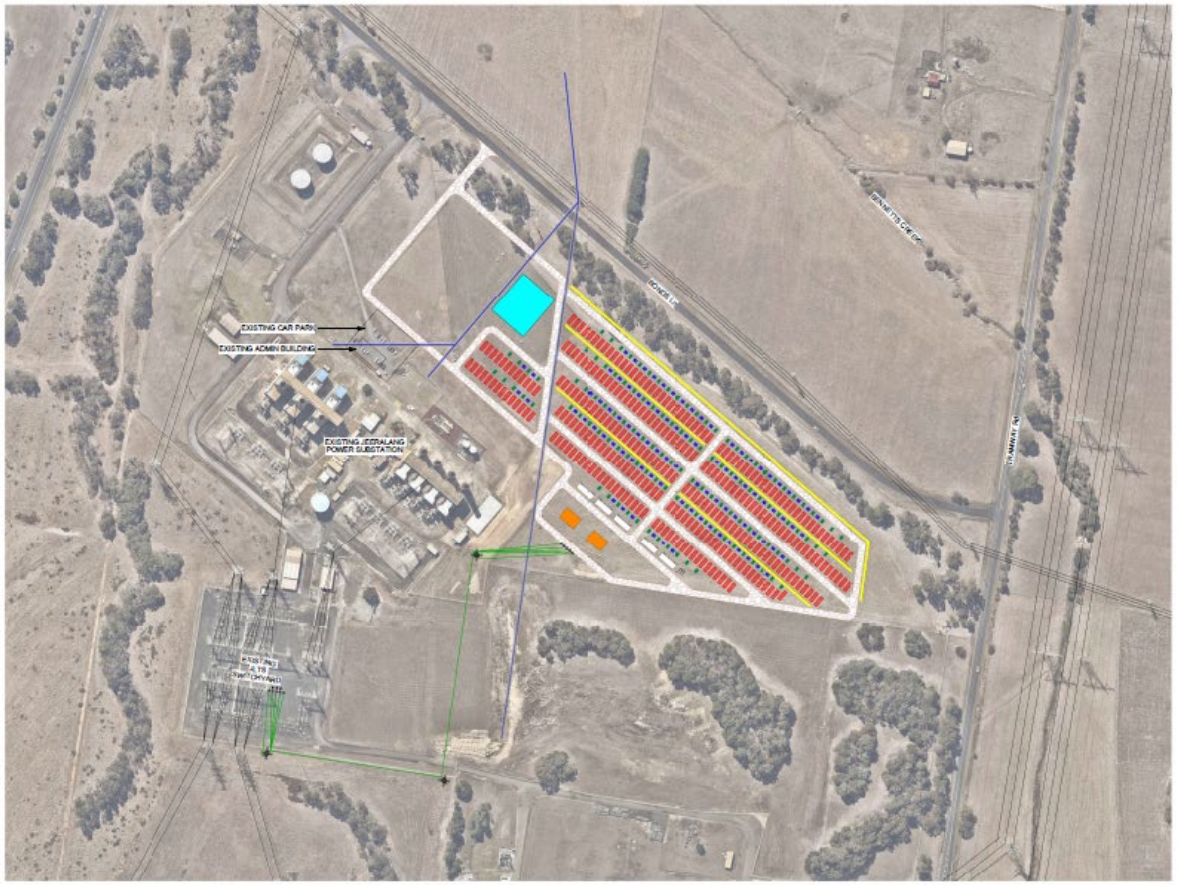
Appendix G: WESS concept design



WOOREEN SITE PLAN
SCALE 1 : 2000

LEGEND:
- INDICATIVE BATTERY STORAGE
- INDICATIVE INVERTER
- INDICATIVE TRANSFORMER
- HV TRANSFORMER
- 33/220kV TRANSFORMER LAYDOWN AREAS
- CONTROL AND SWITCH ROOMS
- ACCESS ROAD
- INDICATIVE NOISE WALL
- INDICATIVE STORMWATER RETENTION POND
- EXISTING DRAINAGE PIPE
- 220kV OHW

GENERAL VISUAL RENDERING ONLY
TO BE FINALISED BY APPOINTED EQUIPMENT SUPPLIER

CONSULTANT: aurecon www.aurecongroup.com
CLIENT: EnergyAustralia

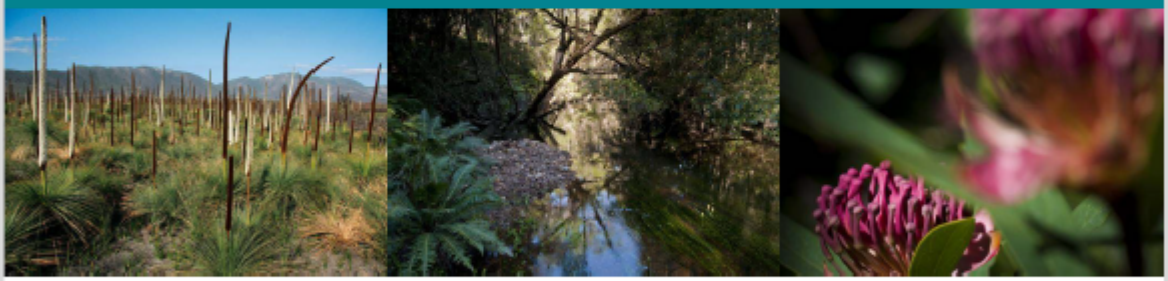
REV	DATE	REVISION DETAILS	APPROVAL
A	11/02/22	ISSUED FOR REVIEW	TJ

SCALE: As indicated | SIZE: A1
DRAWN: N. LE CORDEUR
DESIGNED: T. UNDERWOOD
CHECKED: K. MEKKI
PRELIMINARY
APPROVED: A. VAN DER MERWE
DATE:

PROJECT: WOOREEN ENERGY STORAGE SYSTEM P/511147
TITLE: OVERALL SITE PLAN
DRAWING No.: 511147 – 0000 – DRG – EE – 0102 –

Appendix H: Certificate of accredited VQA assessor

Certificate of Competency



Vegetation Quality Assessment (Habitat Hectares) Competency Check

This certifies that

Justin Sullivan

has met the Department of Environment, Land, Water and Planning standard for conducting Vegetation Quality Assessments (version 1.3)

Date of expiry: 30/01/2022

Penny Croucamp

Manager, Native Vegetation Regulations

VICTORIA State Government | Environment, Land, Water and Planning

Appendix I: WESS VQA Data sheets

Vegetation Quality Field Assessment Sheet

Version 1.3 - October 2004

Department of Sustainability and Environment

Site Name/No. HZ A. Location WODGEN. Date 9/9/21.

Assessor(s) JS. Map Name/No. AMG / MGA

Tenure EVC 55. Bioregion GP.

'Site Condition Score'

Large Trees Score 0

Category & Description	% Canopy Health* > 70%	30-70%	< 30%
None present	0	0	0
> 0 to 20% of the benchmark number of large trees/ha	3	2	1
> 20% to 40% of the benchmark number of large trees/ha	4	3	2
> 40% to 70% of the benchmark number of large trees/ha	6	5	4
> 70% to 100% of the benchmark number of large trees/ha	8	7	6
≥ the benchmark number of large trees/ha	10	9	8

Large trees are defined by diameter at breast height (dbh) - see EVC benchmark.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Tree Canopy Cover Score 0

Category & Description	% Canopy Health * > 70%	30-70%	< 30%
< 10% of benchmark cover	0	0	0
< 50% or > 150% of benchmark cover	3	2	1
≥ 50% or ≤ 150% of benchmark cover	5	4	3

Tree canopy is defined as those canopy tree species reaching ≥ 80% of mature height - see EVC benchmark description.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Lack of Weeds Score 2

Category & Description	'high threat' weeds* None	≤ 50%	> 50%
> 50% cover of weeds	4	(2)	0
25 - 50% cover of weeds	7	6	4
5 - 25% cover of weeds	11	9	7
< 5% cover of weeds**	15	13	11

* proportion of weed cover due to 'high threat' weeds - see EVC benchmark for guide.

'High threat' weed species are defined as those introduced species (including non-indigenous 'natives') with the ability to out-compete and substantially reduce one or more indigenous life forms in the longer term assuming on-going current site characteristics and disturbance regime.

The EVC benchmark lists typical weed species for the EVC in the bioregion and provides an estimate of their 'invasiveness' and 'impact'. In general, those weed species considered to have a *high impact* are considered *high threat* regardless of their invasiveness.

** if total weed cover is negligible (<1%) and high threat weed species are present then score '13'.

Understorey Life forms

LF Code from EVC benchmark	# spp observed / Benchmark spp.	% cover observed / Benchmark % cover	Present (✓)	Modified (✓)
HT	1	1		
T	1 1 1	10 1 5	✓	
MS	1 1 2	10 1 10	✓	
SS	1 1 1	5 1 1	✓	
PS	1	1		
LH	1	1		
MH	1	1		
SH	1	1		
LG	1	1		
WR	1	1		
MG	1 1 9	1 1 35	x	
MW	1	1		
BL	1	1		
	1	1	3/13.	
	1	1		
	1	1		

Present For life forms with benchmark cover of < 10%, considered 'present' if
- any specimens are observed.

For life forms with benchmark cover of ≥ 10%, considered 'present' if
- the life form occupies at least 10% of benchmark cover.

Modified (apply only where life form is 'present')

For life forms with benchmark cover of <10%, then considered substantially 'modified' if the life form has either:
- < 50% of the benchmark species diversity; or
- no reproductively-mature specimens are observed.

For life forms with benchmark cover of ≥ 10%, then considered substantially 'modified' if the life form has either:
- < 50% of benchmark cover; or
- < 50% of benchmark species diversity; or
- ≥ 50% of benchmark cover due largely to immature canopy specimens but the cover of reproductively-mature specimens is < 10% of the benchmark cover.

Understorey Score 5

Category & Description		
All strata and Life forms effectively absent		0
Up to 50% of life forms present		5
≥ 50% to 90% of Life forms present	• of those present, ≥ 50% substantially modified	10
	• of those present, < 50% substantially modified	15
≥ 90% of Life forms present	• of those present, ≥ 50% substantially modified	15
	• of those present, < 50% substantially modified	20
	• of those present, none substantially modified	25

Victoria The Place To Be

Vegetation Quality Field Assessment Sheet

Version 1.3 - October 2004

Department of Sustainability and Environment

Recruitment

Score: 5

Category & Description			High diversity*°	Low diversity*°
No evidence of a recruitment 'cohort'+	within EVC not driven by episodic events		0	0
	within EVC driven by episodic events^	clear evidence of appropriate episodic event	0	0
		no clear evidence of appropriate episodic event	5	5
Evidence of at least one recruitment 'cohort' in at least one life-form	proportion of native woody species present that have adequate recruitment°	< 30%	3	1
		30 - 70%	6	3
		≥ 70%	10	5

+ 'cohort' refers to a group of woody plants established in a single episode (can include suppressed canopy species individuals).
^ refer to EVC benchmark for clarification.
° treat multiple eucalypt canopy species as one species.
* high diversity defined as ≥ 50% of benchmark woody species diversity.

Species Recruitment

Woody species recorded in habitat zone	Adequate Recruitment (✓)
Eucalypt canopy (combined species)	
Blackwood	✓
number of woody spp. in EVC benchmark (SS and taller)	

Logs

Score: 0

Category & Description	Large logs present*	Large logs absent#
< 10% of benchmark length	0	0
< 50% of benchmark length	3	2
≥ 50% of benchmark length	5	4

Large logs defined as those with diameter ≥ 0.5 of benchmark large tree dbh.
* present if large log length is ≥ 25% of EVC benchmark log length.
# absent if large log length is < 25% of EVC benchmark log length.

Organic Litter

Score: 3

Category & Description	Dominated by native organic litter	Dominated by non-native organic litter
< 10% of benchmark cover	0	0
< 50% or > 150% of benchmark cover	3	2
≥ 50% or ≤ 150% of benchmark cover	5	4

'Landscape Context Score'

Patch Size

Score: 1

Category & Description	
< 2 ha	1
Between 2 and 5 ha	2
Between 5 and 10 ha	4
Between 10 and 20 ha	6
≥ 20 ha, but 'significantly disturbed'*	8
≥ 20 ha, but not 'significantly disturbed'*	10

* 'significantly disturbed' defined as per RFA 'Old Growth' analyses eg. roading, coupes, grazing etc. – effectively most patches within fragmented landscapes.

Distance to Core Area

Score: 0

Distance	Core Area not significantly disturbed*	Core Area significantly disturbed*
> 5 km	0	0
1 to 5 km	2	1
< 1 km	4	3
contiguous	5	4

* defined as per RFA 'Old Growth' analyses.

Neighbourhood

Score: 0

Radius from site	% Native vegetation*	Weighting	
100 m		0.03	
1 km		0.04	
5 km		0.03	
	subtract 2 if the neighbourhood is 'significantly disturbed'		
		Add Values and 'round-off'	

* to nearest 20%.
Multiply % native vegetation x Weighting for each radius from the zone (eg. 40% x 0.03 = 1.2); then add values to obtain final Neighbourhood Value.

Final Habitat Score

	'Site Condition Score'							'Landscape Context Score'			
Component	Large Trees	Tree Canopy Cover	Lack of Weeds	Understorey	Recruitment	Organic Litter	Logs	Patch Size	Neighbourhood	Distance to Core Area	Total
Score	0	0	2	5	5	3	0	1	0	0	16
											100

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Vegetation Quality Field Assessment Sheet

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Department of Sustainability and Environment

Site Name/No. B. Location WOOREEN Date 9/9/21

Assessor(s) JS Map Name/No. AMG / MGA

Tenure EVC 55 Bioregion GP.

'Site Condition Score'

Large Trees — Score 0

Category & Description	% Canopy Health* > 70%	30-70%	< 30%
None present	0	0	0
> 0 to 20% of the benchmark number of large trees/ha	3	2	1
> 20% to 40% of the benchmark number of large trees/ha	4	3	2
> 40% to 70% of the benchmark number of large trees/ha	6	5	4
> 70% to 100% of the benchmark number of large trees/ha	8	7	6
≥ the benchmark number of large trees/ha	10	9	8

Large trees are defined by diameter at breast height (dbh) - see EVC benchmark.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Tree Canopy Cover — Score 0

Category & Description	% Canopy Health * > 70%	30-70%	< 30%
< 10% of benchmark cover	0	0	0
< 50% or > 150% of benchmark cover	3	2	1
≥ 50% or ≤ 150% of benchmark cover	5	4	3

Tree canopy is defined as those canopy tree species reaching ≥ 80% of mature height - see EVC benchmark description.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Lack of Weeds — Score 2

Category & Description	'high threat' weeds* None	≤ 50%	> 50%
> 50% cover of weeds	4	2	0
25 - 50% cover of weeds	7	6	4
5 - 25% cover of weeds	11	9	7
< 5% cover of weeds**	15	13	11

* proportion of weed cover due to 'high threat' weeds - see EVC benchmark for guide.

'High threat' weed species are defined as those introduced species (including non-indigenous 'natives') with the ability to out-compete and substantially reduce one or more indigenous life forms in the longer term assuming on-going current site characteristics and disturbance regime.

The EVC benchmark lists typical weed species for the EVC in the bioregion and provides an estimate of their 'invasiveness' and 'impact'. In general, those weed species considered to have a *high impact* are considered *high threat* regardless of their invasiveness.

** if total weed cover is negligible (<1%) and high threat weed species are present then score '13'.

Understorey Life forms

LF Code from EVC benchmark	# spp observed / Benchmark spp.	% cover observed / Benchmark % cover	Present (✓)	Modified (✓)
LT	1	1		
T	1	1		
MS	1	1		
SS	2 1 1	7 1 1	✓	
PS	1	1		
LH	1	1		
MH	2 1 10	1 1 20	x	
RH	1	1		
LTG	1	1		
CWE	1	1		
MRG	4 1 9	20 1 35	✓	✓
MWG	1	1		
BL	1	1		
	1	1		
	1	1		
	1	1		

Present

For life forms with benchmark cover of < 10%, considered 'present' if

- any specimens are observed.

For life forms with benchmark cover of ≥ 10%, considered 'present' if

- the life form occupies at least 10% of benchmark cover.

Modified (apply only where life form is 'present')

For life forms with benchmark cover of <10%, then considered substantially 'modified' if the life form has either:

- < 50% of the benchmark species diversity; or
- no reproductively-mature specimens are observed.

For life forms with benchmark cover of ≥ 10%, then considered substantially 'modified' if the life form has either:

- < 50% of benchmark cover; or
- < 50% of benchmark species diversity; or
- ≥ 50% of benchmark cover due largely to immature canopy specimens but the cover of reproductively-mature specimens is < 10% of the benchmark cover.

Understorey — Score 5

Category & Description		
All strata and Life forms effectively absent		0
Up to 50% of life forms present		5
≥ 50% to 90% of Life forms present	• of those present, ≥ 50% substantially modified	10
	• of those present, < 50% substantially modified	15
≥ 90% of Life forms present	• of those present, ≥ 50% substantially modified	15
	• of those present, < 50% substantially modified	20
	• of those present, none substantially modified	25

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Department of Sustainability and Environment

Recruitment

Score 0

Category & Description			High diversity*^	Low diversity*^
No evidence of a recruitment 'cohort'+	within EVC not driven by episodic events		0	0
	within EVC driven by episodic events^	clear evidence of appropriate episodic event	0	0
		no clear evidence of appropriate episodic event	5	5
Evidence of at least one recruitment 'cohort' in at least one life-form	proportion of native woody species present that have adequate recruitment°	< 30%	3	1
		30 - 70%	6	3
		≥ 70%	10	5

+ 'cohort' refers to a group of woody plants established in a single episode (can include suppressed canopy species individuals).
^ refer to EVC benchmark for clarification.
° treat multiple eucalypt canopy species as one species.
* high diversity defined as ≥ 50% of benchmark woody species diversity.

Species Recruitment

Woody species recorded in habitat zone	Adequate Recruitment (✓)
Eucalypt canopy (combined species)	
number of woody spp. in EVC benchmark (SS and taller)	

Logs

Score 0

Category & Description	Large logs present*	Large logs absent#
< 10% of benchmark length	0	0
< 50% of benchmark length	3	2
≥ 50% of benchmark length	5	4

Large logs defined as those with diameter ≥ 0.5 of benchmark large tree dbh.
* present if large log length is ≥ 25% of EVC benchmark log length.
# absent if large log length is < 25% of EVC benchmark log length.

Organic Litter

Score 3

Category & Description	Dominated by native organic litter	Dominated by non-native organic litter
< 10% of benchmark cover	0	0
< 50% or > 150% of benchmark cover	3	2
≥ 50% or ≤ 150% of benchmark cover	5	4

'Landscape Context Score'

Patch Size

Score 1

Category & Description	
< 2 ha	1
Between 2 and 5 ha	2
Between 5 and 10 ha	4
Between 10 and 20 ha	6
≥ 20 ha, but 'significantly disturbed'*	8
≥ 20 ha, but not 'significantly disturbed'*	10

* 'significantly disturbed' defined as per RFA 'Old Growth' analyses eg. roading, coupes, grazing etc. – effectively most patches within fragmented landscapes.

Distance to Core Area

Score 0

Distance	Core Area not significantly disturbed*	Core Area significantly disturbed*
> 5 km	0	0
1 to 5 km	2	1
< 1 km	4	3
contiguous	5	4

* defined as per RFA 'Old Growth' analyses.

Neighbourhood

Score 0

Radius from site	% Native vegetation *	Weighting	
100 m		0.03	
1 km		0.04	
5 km		0.03	
subtract 2 if the neighbourhood is 'significantly disturbed'			
		Add Values and 'round-off'	

* to nearest 20%.
Multiply % native vegetation x Weighting for each radius from the zone (eg. 40% x 0.03 = 1.2); then add values to obtain final Neighbourhood Value.

Final Habitat Score

	'Site Condition Score'							'Landscape Context Score'			
Component	Large Trees	Tree Canopy Cover	Lack of Weeds	Understorey	Recruitment	Organic Litter	Logs	Patch Size	Neighbourhood	Distance to Core Area	Total
Score	0	0	2	5	0	3	0	1	0	0	11

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Vegetation Quality Field Assessment Sheet

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Department of Sustainability and Environment

Site Name/No. HZ C Location WOORREEN Date 9/9/21

Assessor(s) JS. Map Name/No. ..... AMG / MGA .....

Tenure ..... EVC 55 Bioregion GP

'Site Condition Score'

Large Trees — Score: 0

Category & Description	% Canopy Health*		
	> 70%	30-70%	< 30%
None present	0	0	0
> 0 to 20% of the benchmark number of large trees/ha	3	2	1
> 20% to 40% of the benchmark number of large trees/ha	4	3	2
> 40% to 70% of the benchmark number of large trees/ha	6	5	4
> 70% to 100% of the benchmark number of large trees/ha	8	7	6
≥ the benchmark number of large trees/ha	10	9	8

Large trees are defined by diameter at breast height (dbh) - see EVC benchmark.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Tree Canopy Cover — Score: 0

Category & Description	% Canopy Health *		
	> 70%	30-70%	< 30%
< 10% of benchmark cover	0	0	0
< 50% or > 150% of benchmark cover	3	2	1
≥ 50% or ≤ 150% of benchmark cover	5	4	3

Tree canopy is defined as those canopy tree species reaching ≥ 80% of mature height - see EVC benchmark description.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Lack of Weeds — Score: 2

Category & Description	'high threat' weeds*		
	None	≤ 50%	> 50%
> 50% cover of weeds	4	2	0
25 - 50% cover of weeds	7	6	4
5 - 25% cover of weeds	11	9	7
< 5% cover of weeds**	15	13	11

* proportion of weed cover due to 'high threat' weeds - see EVC benchmark for guide.

'High threat' weed species are defined as those introduced species (including non-indigenous 'natives') with the ability to out-compete and substantially reduce one or more indigenous life forms in the longer term assuming on-going current site characteristics and disturbance regime.

The EVC benchmark lists typical weed species for the EVC in the bioregion and provides an estimate of their 'invasiveness' and 'impact'. In general, those weed species considered to have a *high impact* are considered *high threat* regardless of their invasiveness.

** if total weed cover is negligible (<1%) and high threat weed species are present then score '13'.

Understorey Life forms (same as for HZB)

LF Code from EVC benchmark	# spp observed / Benchmark spp.	% cover observed / Benchmark % cover	Present (✓)	Modified (✓)
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		

Present

For life forms with benchmark cover of < 10%, considered 'present' if
- any specimens are observed.

For life forms with benchmark cover of ≥ 10%, considered 'present' if
- the life form occupies at least 10% of benchmark cover.

Modified (apply only where life form is 'present')

For life forms with benchmark cover of <10%, then considered substantially 'modified' if the life form has either:
- < 50% of the benchmark species diversity; or
- no reproductively-mature specimens are observed.

For life forms with benchmark cover of ≥ 10%, then considered substantially 'modified' if the life form has either:
- < 50% of benchmark cover; or
- < 50% of benchmark species diversity; or
- ≥ 50% of benchmark cover due largely to immature canopy specimens but the cover of reproductively-mature specimens is < 10% of the benchmark cover.

Understorey — Score: 5

Category & Description		
All strata and Life forms effectively absent		0
Up to 50% of life forms present		5
≥ 50% to 90% of Life forms present	• of those present, ≥ 50% substantially modified	10
	• of those present, < 50% substantially modified	15
≥ 90% of Life forms present	• of those present, ≥ 50% substantially modified	15
	• of those present, < 50% substantially modified	20
	• of those present, none substantially modified	25

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Recruitment

Score: 0

Category & Description			High diversity*°	Low diversity*°
No evidence of a recruitment 'cohort'+	within EVC not driven by episodic events		0	0
	within EVC driven by episodic events^	clear evidence of appropriate episodic event	0	0
		no clear evidence of appropriate episodic event	5	5
Evidence of at least one recruitment 'cohort' in at least one life-form	proportion of native woody species present that have adequate recruitment°	< 30%	3	1
		30 - 70%	6	3
		≥ 70%	10	5

+ 'cohort' refers to a group of woody plants established in a single episode (can include suppressed canopy species individuals).
^ refer to EVC benchmark for clarification.
* treat multiple eucalypt canopy species as one species.
* high diversity defined as ≥ 50% of benchmark woody species diversity.

Species Recruitment

Woody species recorded in habitat zone	Adequate Recruitment (✓)
Eucalypt canopy (combined species)	
number of woody spp. in EVC benchmark (SS and taller)	

Logs

Score: 0

Category & Description	Large logs present*	Large logs absent#
< 10% of benchmark length	0	0
< 50% of benchmark length	3	2
≥ 50% of benchmark length	5	4

Large logs defined as those with diameter ≥ 0.5 of benchmark large tree dbh.
* present if large log length is ≥ 25% of EVC benchmark log length.
# absent if large log length is < 25% of EVC benchmark log length.

Organic Litter

Score: 3

Category & Description	Dominated by native organic litter	Dominated by non-native organic litter
< 10% of benchmark cover	0	0
< 50% or > 150% of benchmark cover	3	2
≥ 50% or ≤ 150% of benchmark cover	5	4

'Landscape Context Score'

Patch Size

Score: 1

Category & Description	
< 2 ha	1
Between 2 and 5 ha	2
Between 5 and 10 ha	4
Between 10 and 20 ha	6
≥ 20 ha, but 'significantly disturbed'*	8
≥ 20 ha, but not 'significantly disturbed'*	10

* 'significantly disturbed' defined as per RFA 'Old Growth' analyses eg. roading, coupes, grazing etc. – effectively most patches within fragmented landscapes.

Distance to Core Area

Score: 1

Distance	Core Area not significantly disturbed*	Core Area significantly disturbed*
> 5 km	0	0
1 to 5 km	2	(1)
< 1 km	4	3
contiguous	5	4

* defined as per RFA 'Old Growth' analyses.

Neighbourhood

Score: 0

Radius from site	% Native vegetation*	Weighting	
100 m		0.03	
1 km		0.04	
5 km		0.03	
subtract 2 if the neighbourhood is 'significantly disturbed'			
Add Values and 'round-off'			

* to nearest 20%.
Multiply % native vegetation x Weighting for each radius from the zone (eg. 40% x 0.03 = 1.2); then add values to obtain final Neighbourhood Value.

Final Habitat Score

	'Site Condition Score'							'Landscape Context Score'			
Component	Large Trees	Tree Canopy Cover	Lack of Weeds	Understorey	Recruitment	Organic Litter	Logs	Patch Size	Neighbourhood	Distance to Core Area	Total
Score	0	0	2	5	0	3	0	1	0	1	12 / 100

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Vegetation Quality Field Assessment Sheet

Version 1.3 - October 2004

Department of Sustainability and Environment

Site Name/No. WOOREEN BESS · HZ D Location WOOREEN Date 9/9/21

Assessor(s) JS. Map Name/No. AMG / MGA

Tenure EVC 55. Bioregion GP.

'Site Condition Score'

Large Trees — Score: 0

Category & Description	% Canopy Health* > 70%	30-70%	< 30%
None present	0	0	0
> 0 to 20% of the benchmark number of large trees/ha	3	2	1
> 20% to 40% of the benchmark number of large trees/ha	4	3	2
> 40% to 70% of the benchmark number of large trees/ha	6	5	4
> 70% to 100% of the benchmark number of large trees/ha	8	7	6
≥ the benchmark number of large trees/ha	10	9	8

Large trees are defined by diameter at breast height (dbh) - see EVC benchmark.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Tree Canopy Cover — Score: 0

Category & Description	% Canopy Health * > 70%	30-70%	< 30%
< 10% of benchmark cover	0	0	0
< 50% or > 150% of benchmark cover	3	2	1
≥ 50% or ≤ 150% of benchmark cover	5	4	3

Tree canopy is defined as those canopy tree species reaching ≥ 80% of mature height - see EVC benchmark description.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Lack of Weeds — Score: 6

Category & Description	'high threat' weeds* None	≤ 50%	> 50%
> 50% cover of weeds	4	2	0
25 - 50% cover of weeds	7	(6)	4
5 - 25% cover of weeds	11	9	7
< 5% cover of weeds**	15	13	11

* proportion of weed cover due to 'high threat' weeds - see EVC benchmark for guide.

'High threat' weed species are defined as those introduced species (including non-indigenous 'natives') with the ability to out-compete and substantially reduce one or more indigenous life forms in the longer term assuming on-going current site characteristics and disturbance regime.

The EVC benchmark lists typical weed species for the EVC in the bioregion and provides an estimate of their 'invasiveness' and 'impact'. In general, those weed species considered to have a *high impact* are considered *high threat* regardless of their invasiveness.

** if total weed cover is negligible (<1%) and high threat weed species are present then score '13'.

Understorey Life forms

LF Code from EVC benchmark	# spp observed / Benchmark spp.	% cover observed / Benchmark % cover	Present (✓)	Modified (✓)
IT	/	/		
T	/	/		
MS	/	/		
SS	/	/		
FS	/	/		
LH	/	/		
MH	2 / 10	5 / 20	✓	✓
SH	2 / 3	1 / 5	✓	
LTG	/	/		
LNG	/	/		
MTG	2 / 9	10 / 35	✓	
MWL	/	/		
BL	n/a	10 / 10	✓	
	/	/		
	/	/		
	/	/		

Present: For life forms with benchmark cover of < 10%, considered 'present' if
- any specimens are observed.

For life forms with benchmark cover of ≥ 10%, considered 'present' if
- the life form occupies at least 10% of benchmark cover.

Modified (apply only where life form is 'present'): For life forms with benchmark cover of <10%, then considered substantially 'modified' if the life form has either:
- < 50% of the benchmark species diversity; or
- no reproductively-mature specimens are observed.

For life forms with benchmark cover of ≥ 10%, then considered substantially 'modified' if the life form has either:
- < 50% of benchmark cover; or
- < 50% of benchmark species diversity; or
- ≥ 50% of benchmark cover due largely to immature canopy specimens but the cover of reproductively-mature specimens is < 10% of the benchmark cover.

Understorey — Score: 5

Category & Description		
All strata and Life forms effectively absent		0
Up to 50% of life forms present		5
≥ 50% to 90% of Life forms present	• of those present, ≥ 50% substantially modified	10
	• of those present, < 50% substantially modified	15
≥ 90% of Life forms present	• of those present, ≥ 50% substantially modified	15
	• of those present, < 50% substantially modified	20
	• of those present, none substantially modified	25

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Department of Sustainability and Environment

Recruitment

Score: 0

Category & Description			High diversity*°	Low diversity*°
No evidence of a recruitment 'cohort'+	within EVC not driven by episodic events		0	0
	within EVC driven by episodic events^	clear evidence of appropriate episodic event	0	0
		no clear evidence of appropriate episodic event	5	5
Evidence of at least one recruitment 'cohort' in at least one life-form	proportion of native woody species present that have adequate recruitment°	< 30%	3	1
		30 - 70%	6	3
		≥ 70%	10	5

+ 'cohort' refers to a group of woody plants established in a single episode (can include suppressed canopy species individuals).
^ refer to EVC benchmark for clarification.
* treat multiple eucalypt canopy species as one species.
° high diversity defined as ≥ 50% of benchmark woody species diversity.

Species Recruitment

Woody species recorded in habitat zone	Adequate Recruitment (✓)
Eucalypt canopy (combined species)	
number of woody spp. in EVC benchmark (SS and taller)	

Logs

Score: 0

Category & Description	Large logs present*	Large logs absent#
< 10% of benchmark length	0	0
< 50% of benchmark length	3	2
≥ 50% of benchmark length	5	4

Large logs defined as those with diameter ≥ 0.5 of benchmark large tree dbh.
* present if large log length is ≥ 25% of EVC benchmark log length.
# absent if large log length is < 25% of EVC benchmark log length.

Organic Litter

Score: 2

Category & Description	Dominated by native organic litter	Dominated by non-native organic litter
< 10% of benchmark cover	0	0
< 50% or > 150% of benchmark cover	3	(2)
≥ 50% or ≤ 150% of benchmark cover	5	4

'Landscape Context Score'

Patch Size

Score: 1

Category & Description	
< 2 ha	1
Between 2 and 5 ha	2
Between 5 and 10 ha	4
Between 10 and 20 ha	6
≥ 20 ha, but 'significantly disturbed'*	8
≥ 20 ha, but not 'significantly disturbed'*	10

* 'significantly disturbed' defined as per RFA 'Old Growth' analyses eg. roading, coupes, grazing etc. – effectively most patches within fragmented landscapes.

Distance to Core Area

Score: 1

Distance	Core Area not significantly disturbed*	Core Area significantly disturbed*
> 5 km	0	0
1 to 5 km	2	(1)
< 1 km	4	3
contiguous	5	4

* defined as per RFA 'Old Growth' analyses.

Neighbourhood

Score: 0

Radius from site	% Native vegetation*	Weighting	
100 m		0.03	
1 km		0.04	
5 km		0.03	
subtract 2 if the neighbourhood is 'significantly disturbed'			
		Add Values and 'round-off'	

* to nearest 20%.
Multiply % native vegetation x Weighting for each radius from the zone (eg. 40% x 0.03 = 1.2); then add values to obtain final Neighbourhood Value.

Final Habitat Score

	'Site Condition Score'							'Landscape Context Score'			
Component	Large Trees	Tree Canopy Cover	Lack of Weeds	Understorey	Recruitment	Organic Litter	Logs	Patch Size	Neighbourhood	Distance to Core Area	Total
											100
Score	0	0	6	5	0	0	2	1	0	1	15

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Vegetation Quality Field Assessment Sheet

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Department of Sustainability and Environment

Site Name/No. HZ E. Location WOOREEN. Date 9/9/21.

Assessor(s) JS. Map Name/No. AMG / MGA

Tenure EVC 55 Bioregion Gipp P.

'Site Condition Score'

Large Trees — Score: 0

Category & Description	% Canopy Health*		
	> 70%	30-70%	< 30%
None present	0	0	0
> 0 to 20% of the benchmark number of large trees/ha	3	2	1
> 20% to 40% of the benchmark number of large trees/ha	4	3	2
> 40% to 70% of the benchmark number of large trees/ha	6	5	4
> 70% to 100% of the benchmark number of large trees/ha	8	7	6
≥ the benchmark number of large trees/ha	10	9	8

Large trees are defined by diameter at breast height (dbh) - see EVC benchmark.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Tree Canopy Cover — Score: 0

Category & Description	% Canopy Health *		
	> 70%	30-70%	< 30%
< 10% of benchmark cover	0	0	0
< 50% or > 150% of benchmark cover	3	2	1
≥ 50% or ≤ 150% of benchmark cover	5	4	3

Tree canopy is defined as those canopy tree species reaching ≥ 80% of mature height - see EVC benchmark description.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Lack of Weeds — Score: 9

Category & Description	'high threat' weeds*		
	None	≤ 50%	> 50%
> 50% cover of weeds	4	2	0
25 - 50% cover of weeds	7	6	4
5 - 25% cover of weeds	11	(9)	7
< 5% cover of weeds**	15	13	11

* proportion of weed cover due to 'high threat' weeds - see EVC benchmark for guide.

'High threat' weed species are defined as those introduced species (including non-indigenous 'natives') with the ability to out-compete and substantially reduce one or more indigenous life forms in the longer term assuming on-going current site characteristics and disturbance regime.

The EVC benchmark lists typical weed species for the EVC in the bioregion and provides an estimate of their 'invasiveness' and 'impact'. In general, those weed species considered to have a *high impact* are considered *high threat* regardless of their invasiveness.

** if total weed cover is negligible (<1%) and high threat weed species are present then score '13'.

Understorey Life forms

LF Code from EVC benchmark	# spp observed / Benchmark spp.	% cover observed / Benchmark % cover	Present (✓)	Modified (✓)
LT	1 /	1 /		
T.	1 1 1	60 1 5	✓	
MS	/	/		
	/	/		
	/	/		
	/	2 / Blackwood's only		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		

Present

For life forms with benchmark cover of < 10%, considered 'present' if
- any specimens are observed.

For life forms with benchmark cover of ≥ 10%, considered 'present' if
- the life form occupies at least 10% of benchmark cover.

Modified (apply only where life form is 'present')

For life forms with benchmark cover of <10%, then considered substantially 'modified' if the life form has either:
- < 50% of the benchmark species diversity; or
- no reproductively-mature specimens are observed.

For life forms with benchmark cover of ≥ 10%, then considered substantially 'modified' if the life form has either:
- < 50% of benchmark cover; or
- < 50% of benchmark species diversity; or
- ≥ 50% of benchmark cover due largely to immature canopy specimens but the cover of reproductively-mature specimens is < 10% of the benchmark cover.

Understorey — Score: 5

Category & Description		
All strata and Life forms effectively absent		0
Up to 50% of life forms present		5
≥ 50% to 90% of Life forms present	• of those present, ≥ 50% substantially modified	10
	• of those present, < 50% substantially modified	15
≥ 90% of Life forms present	• of those present, ≥ 50% substantially modified	15
	• of those present, < 50% substantially modified	20
	• of those present, none substantially modified	25

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Recruitment — Score: 0

Category & Description			High diversity*°	Low diversity*°
No evidence of a recruitment 'cohort'+	within EVC not driven by episodic events		0	0
	within EVC driven by episodic events^	clear evidence of appropriate episodic event	0	0
		no clear evidence of appropriate episodic event	5	5
Evidence of at least one recruitment 'cohort' in at least one life-form	proportion of native woody species present that have adequate recruitment°	< 30%	3	1
		30 - 70%	6	3
		≥ 70%	10	5

+ 'cohort' refers to a group of woody plants established in a single episode (can include suppressed canopy species individuals).
^ refer to EVC benchmark for clarification.
° treat multiple eucalypt canopy species as one species.
* high diversity defined as ≥ 50% of benchmark woody species diversity.

Species Recruitment

Woody species recorded in habitat zone	Adequate Recruitment (✓)
Eucalypt canopy (combined species)	
number of woody spp. in EVC benchmark (SS and taller)	

Logs — Score: 0

Category & Description	Large logs present*	Large logs absent#
< 10% of benchmark length	0	0
< 50% of benchmark length	3	2
≥ 50% of benchmark length	5	4

Large logs defined as those with diameter ≥ 0.5 of benchmark large tree dbh.
* present if large log length is ≥ 25% of EVC benchmark log length.
# absent if large log length is < 25% of EVC benchmark log length.

Organic Litter — Score: 3

Category & Description	Dominated by native organic litter	Dominated by non-native organic litter
< 10% of benchmark cover	0	0
< 50% or > 150% of benchmark cover	3	2
≥ 50% or ≤ 150% of benchmark cover	5	4

'Landscape Context Score'

Patch Size — Score: 1

Category & Description	
< 2 ha	1
Between 2 and 5 ha	2
Between 5 and 10 ha	4
Between 10 and 20 ha	6
≥ 20 ha, but 'significantly disturbed'*	8
≥ 20 ha, but not 'significantly disturbed'*	10

* 'significantly disturbed' defined as per RFA 'Old Growth' analyses eg. roading, coupes, grazing etc. – effectively most patches within fragmented landscapes.

Distance to Core Area — Score: 1

Distance	Core Area not significantly disturbed*	Core Area significantly disturbed*
> 5 km	0	0
1 to 5 km	2	1
< 1 km	4	3
contiguous	5	4

* defined as per RFA 'Old Growth' analyses.

Neighbourhood — Score: 6

Radius from site	% Native vegetation*	Weighting	
100 m		0.03	
1 km		0.04	
5 km		0.03	
		subtract 2 if the neighbourhood is 'significantly disturbed'	
		Add Values and 'round-off'	

* to nearest 20%.
Multiply % native vegetation x Weighting for each radius from the zone (eg. 40% x 0.03 = 1.2); then add values to obtain final Neighbourhood Value.

Final Habitat Score

	'Site Condition Score'							'Landscape Context Score'			
Component	Large Trees	Tree Canopy Cover	Lack of Weeds	Understorey	Recruitment	Organic Litter	Logs	Patch Size	Neighbourhood	Distance to Core Area	Total 100
Score	0	0	9	5	0	3	0	1	0	1	19

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Vegetation Quality Field Assessment Sheet

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Department of Sustainability and Environment

Site Name/No. HZ F. Location WOOREEN Date 9/9/21

Assessor(s) Justin S. Map Name/No. AMG / MGA

Tenure EVC 53 (Swamp Scrub) Bioregion Gipps P.

'Site Condition Score'

Large Trees — Score: NA

Category & Description	% Canopy Health *		
	> 70%	30-70%	< 30%
None present	0	0	0
> 0 to 20% of the benchmark number of large trees/ha	3	2	1
> 20% to 40% of the benchmark number of large trees/ha	4	3	2
> 40% to 70% of the benchmark number of large trees/ha	6	5	4
> 70% to 100% of the benchmark number of large trees/ha	8	7	6
≥ the benchmark number of large trees/ha	10	9	8

Large trees are defined by diameter at breast height (dbh) - see EVC benchmark.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Tree Canopy Cover — Score: 2

Category & Description	% Canopy Health *		
	> 70%	30-70%	< 30%
< 10% of benchmark cover	0	0	0
< 50% or > 150% of benchmark cover	3	(2)	1
≥ 50% or ≤ 150% of benchmark cover	5	4	3

Tree canopy is defined as those canopy tree species reaching ≥ 80% of mature height - see EVC benchmark description.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Lack of Weeds — Score: 9

Category & Description	'high threat' weeds*		
	None	≤ 50%	> 50%
> 50% cover of weeds	4	2	0
25 - 50% cover of weeds	7	6	4
5 - 25% cover of weeds	11	(9)	7
< 5% cover of weeds**	15	13	11

* proportion of weed cover due to 'high threat' weeds - see EVC benchmark for guide.

'High threat' weed species are defined as those introduced species (including non-indigenous 'natives') with the ability to out-compete and substantially reduce one or more indigenous life forms in the longer term assuming on-going current site characteristics and disturbance regime.

The EVC benchmark lists typical weed species for the EVC in the bioregion and provides an estimate of their 'invasiveness' and 'impact'. In general, those weed species considered to have a *high impact* are considered *high threat* regardless of their invasiveness.

** if total weed cover is negligible (<1%) and high threat weed species are present then score '13'.

Understorey Life forms

LF Code from EVC benchmark	# spp observed / Benchmark spp.	% cover observed / Benchmark % cover	Present (✓)	Modified (✓)
MP	1 / 2	10 / 10	✓	
SS	/	/		
LH	/	/		
MH	/	/		
SM	/	/		
LTG	/	/		
LWG	/	/		
MTG	/	/		
MWG	/	/		
GF	/	/		
SC	/	/		
BL	/	/		
	/	/		
	/	/		
	/	/		
	/	/		

Present

For life forms with benchmark cover of < 10%, considered 'present' if

- any specimens are observed.

For life forms with benchmark cover of ≥ 10%, considered 'present' if

- the life form occupies at least 10% of benchmark cover.

Modified (apply only where life form is 'present')

For life forms with benchmark cover of <10%, then considered substantially 'modified' if the life form has either:

- < 50% of the benchmark species diversity; or
- no reproductively-mature specimens are observed.

For life forms with benchmark cover of ≥ 10%, then considered substantially 'modified' if the life form has either:

- < 50% of benchmark cover; or
- < 50% of benchmark species diversity; or
- ≥ 50% of benchmark cover due largely to immature canopy specimens but the cover of reproductively-mature specimens is < 10% of the benchmark cover.

Understorey — Score: 5

Category & Description		
All strata and Life forms effectively absent		0
Up to 50% of life forms present		5
≥ 50% to 90% of Life forms present	• of those present, ≥ 50% substantially modified	10
	• of those present, < 50% substantially modified	15
≥ 90% of Life forms present	• of those present, ≥ 50% substantially modified	15
	• of those present, < 50% substantially modified	20
	• of those present, none substantially modified	25

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Vegetation Quality Field Assessment Sheet

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Recruitment — Score: 0

Category & Description			High diversity*°	Low diversity*°
No evidence of a recruitment 'cohort'+	within EVC not driven by episodic events		0	0
	within EVC driven by episodic events^	clear evidence of appropriate episodic event	0	0
		no clear evidence of appropriate episodic event	5	5
Evidence of at least one recruitment 'cohort' in at least one life-form	proportion of native woody species present that have adequate recruitment*	< 30%	3	1
		30 - 70%	6	3
		≥ 70%	10	5

+ 'cohort' refers to a group of woody plants established in a single episode (can include suppressed canopy species individuals).
^ refer to EVC benchmark for clarification.
° treat multiple eucalypt canopy species as one species.
* high diversity defined as ≥ 50% of benchmark woody species diversity.

Species Recruitment

Woody species recorded in habitat zone	Adequate Recruitment (✓)
Eucalypt canopy (combined species)	
number of woody spp. in EVC benchmark (SS and taller)	

Logs — Score: NA

Category & Description	Large logs present*	Large logs absent#
< 10% of benchmark length	0	0
< 50% of benchmark length	3	2
≥ 50% of benchmark length	5	4

Large logs defined as those with diameter ≥ 0.5 of benchmark large tree dbh.
* present if large log length is ≥ 25% of EVC benchmark log length.
# absent if large log length is < 25% of EVC benchmark log length.

Organic Litter — Score: 3

Category & Description	Dominated by native organic litter	Dominated by non-native organic litter
< 10% of benchmark cover	0	0
< 50% or > 150% of benchmark cover	3	2
≥ 50% or ≤ 150% of benchmark cover	5	4

'Landscape Context Score'

Patch Size — Score: 1

Category & Description	
< 2 ha	1
Between 2 and 5 ha	2
Between 5 and 10 ha	4
Between 10 and 20 ha	6
≥ 20 ha, but 'significantly disturbed'*	8
≥ 20 ha, but not 'significantly disturbed'*	10

* 'significantly disturbed' defined as per RFA 'Old Growth' analyses eg. roading, coupes, grazing etc. – effectively most patches within fragmented landscapes.

Distance to Core Area — Score: 0

Distance	Core Area not significantly disturbed*	Core Area significantly disturbed*
> 5 km	0	0
1 to 5 km	2	1
< 1 km	4	3
contiguous	5	4

* defined as per RFA 'Old Growth' analyses.

Neighbourhood — Score: 0

Radius from site	% Native vegetation*	Weighting	
100 m		0.03	
1 km		0.04	
5 km		0.03	
subtract 2 if the neighbourhood is 'significantly disturbed'			
Add Values and 'round-off'			

* to nearest 20%.
Multiply % native vegetation x Weighting for each radius from the zone (eg. 40% x 0.03 = 1.2); then add values to obtain final Neighbourhood Value.

Final Habitat Score

Component	'Site Condition Score'							'Landscape Context Score'			Total
	Large Trees	Tree Canopy Cover	Lack of Weeds	Understorey	Recruitment	Organic Litter	Logs	Patch Size	Neighbourhood	Distance to Core Area	100
Score	NA	2	9	5	0	3	NA	1	0	0	

19 x 1.25 = 24 + 1 = 25

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Vegetation Quality Field Assessment Sheet

Version 1.3 - October 2004

Department of Sustainability and Environment

Site Name/No. G. Location WOORGEN Date 9/9/21.

Assessor(s) JS. Map Name/No. AMG / MGA

Tenure EVC 55 (PGW) Bioregion Gipp Plain

'Site Condition Score'

Large Trees

1xLT.

Score: 9

Category & Description	% Canopy Health* > 70%	30-70%	< 30%
None present	0	0	0
> 0 to 20% of the benchmark number of large trees/ha	3	2	1
> 20% to 40% of the benchmark number of large trees/ha	4	3	2
> 40% to 70% of the benchmark number of large trees/ha	6	5	4
> 70% to 100% of the benchmark number of large trees/ha	8	7	6
≥ the benchmark number of large trees/ha	10	(9)	8

Large trees are defined by diameter at breast height (dbh) - see EVC benchmark.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Tree Canopy Cover

Score: 4

Category & Description	% Canopy Health * > 70%	30-70%	< 30%
< 10% of benchmark cover	0	0	0
< 50% or > 150% of benchmark cover	3	2	1
≥ 50% or ≤ 150% of benchmark cover	5	(4)	3

Tree canopy is defined as those canopy tree species reaching ≥ 80% of mature height - see EVC benchmark description.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Lack of Weeds

Score: 9

Category & Description	'high threat' weeds* None	≤ 50%	> 50%
> 50% cover of weeds	4	2	0
25 - 50% cover of weeds	7	6	4
5 - 25% cover of weeds	11	(9)	7
< 5% cover of weeds**	15	13	11

* proportion of weed cover due to 'high threat' weeds - see EVC benchmark for guide.

'High threat' weed species are defined as those introduced species (including non-indigenous 'natives') with the ability to out-compete and substantially reduce one or more indigenous life forms in the longer term assuming on-going current site characteristics and disturbance regime.

The EVC benchmark lists typical weed species for the EVC in the bioregion and provides an estimate of their 'invasiveness' and 'impact'. In general, those weed species considered to have a *high impact* are considered *high threat* regardless of their invasiveness.

** if total weed cover is negligible (<1%) and high threat weed species are present then score '13'.

Understorey Life forms

LF Code from EVC benchmark	# spp observed / Benchmark spp.	% cover observed / Benchmark % cover	Present (✓)	Modified (✓)
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		

No understorey

Patch comprises 3x RRG only

Present

For life forms with benchmark cover of < 10%, considered 'present' if

- any specimens are observed.

For life forms with benchmark cover of ≥ 10%, considered 'present' if

- the life form occupies at least 10% of benchmark cover.

Modified (apply only where life form is 'present')

For life forms with benchmark cover of <10%, then considered substantially 'modified' if the life form has either:

- < 50% of the benchmark species diversity; or
- no reproductively-mature specimens are observed.

For life forms with benchmark cover of ≥ 10%, then considered substantially 'modified' if the life form has either:

- < 50% of benchmark cover; or
- < 50% of benchmark species diversity; or
- ≥ 50% of benchmark cover due largely to immature canopy specimens but the cover of reproductively-mature specimens is < 10% of the benchmark cover.

Understorey

Score: 0

Category & Description		
All strata and Life forms effectively absent		0
Up to 50% of life forms present		5
≥ 50% to 90% of Life forms present	of those present, ≥ 50% substantially modified	10
	of those present, < 50% substantially modified	15
≥ 90% of Life forms present	of those present, ≥ 50% substantially modified	15
	of those present, < 50% substantially modified	20
	of those present, none substantially modified	25

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Vegetation Quality Field Assessment Sheet

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Department of Sustainability and Environment

Recruitment

Score: 0

Category & Description			High diversity*°	Low diversity*°
No evidence of a recruitment 'cohort'+	within EVC not driven by episodic events		0	0
	within EVC driven by episodic events^	clear evidence of appropriate episodic event	0	0
		no clear evidence of appropriate episodic event	5	5
Evidence of at least one recruitment 'cohort' in at least one life-form	proportion of native woody species present that have adequate recruitment°	< 30%	3	1
		30 - 70%	6	3
		≥ 70%	10	5

+ 'cohort' refers to a group of woody plants established in a single episode (can include suppressed canopy species individuals).
^ refer to EVC benchmark for clarification.
° treat multiple eucalypt canopy species as one species.
* high diversity defined as ≥ 50% of benchmark woody species diversity.

Species Recruitment

Woody species recorded in habitat zone	Adequate Recruitment (✓)
Eucalypt canopy (combined species)	
number of woody spp. in EVC benchmark (SS and taller)	

Logs

Score: 0

Category & Description	Large logs present *	Large logs absent#
< 10% of benchmark length	0	0
< 50% of benchmark length	3	2
≥ 50% of benchmark length	5	4

Large logs defined as those with diameter ≥ 0.5 of benchmark large tree dbh.
* present if large log length is ≥ 25% of EVC benchmark log length.
# absent if large log length is < 25% of EVC benchmark log length.

Organic Litter

Score: 4

Category & Description	Dominated by native organic litter	Dominated by non-native organic litter
< 10% of benchmark cover	0	0
< 50% or > 150% of benchmark cover	3	2
≥ 50% or ≤ 150% of benchmark cover	5	4

'Landscape Context Score'

Patch Size

Score: 1

Category & Description	
< 2 ha	1
Between 2 and 5 ha	2
Between 5 and 10 ha	4
Between 10 and 20 ha	6
≥ 20 ha, but 'significantly disturbed'*	8
≥ 20 ha, but not 'significantly disturbed'*	10

* 'significantly disturbed' defined as per RFA 'Old Growth' analyses eg. roading, coupes, grazing etc. – effectively most patches within fragmented landscapes.

Distance to Core Area

Score: 0

Distance	Core Area not significantly disturbed*	Core Area significantly disturbed*
> 5 km	0	0
1 to 5 km	2	1
< 1 km	4	3
contiguous	5	4

* defined as per RFA 'Old Growth' analyses.

Neighbourhood

Score: 10

Radius from site	% Native vegetation *	Weighting	
100 m		0.03	
1 km		0.04	
5 km		0.03	
	subtract 2 if the neighbourhood is 'significantly disturbed'		
		Add Values and 'round-off'	

* to nearest 20%.
Multiply % native vegetation x Weighting for each radius from the zone (eg. 40% x 0.03 = 1.2); then add values to obtain final Neighbourhood Value.

Final Habitat Score

	'Site Condition Score'							'Landscape Context Score'			
Component	Large Trees	Tree Canopy Cover	Lack of Weeds	Understorey	Recruitment	Organic Litter	Logs	Patch Size	Neighbourhood	Distance to Core Area	Total
											100
Score	9	4	7	0	0	4	0	1	0	0	27

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Vegetation Quality Field Assessment Sheet

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Department of Sustainability and Environment

Site Name/No. WOOREEN (HZ's H, I, J, K) Location WOOREEN Date 9/9/21

Assessor(s) JS Map Name/No. AMG / MGA

Tenure EVC 83 Bioregion GP.

'Site Condition Score'

Large Trees — Score: 0

Category & Description	% Canopy Health*		
	> 70%	30-70%	< 30%
None present	0	0	0
> 0 to 20% of the benchmark number of large trees/ha	3	2	1
> 20% to 40% of the benchmark number of large trees/ha	4	3	2
> 40% to 70% of the benchmark number of large trees/ha	6	5	4
> 70% to 100% of the benchmark number of large trees/ha	8	7	6
≥ the benchmark number of large trees/ha	10	9	8

Large trees are defined by diameter at breast height (dbh) - see EVC benchmark.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Tree Canopy Cover — Score: 0

Category & Description	% Canopy Health *		
	> 70%	30-70%	< 30%
< 10% of benchmark cover	0	0	0
< 50% or > 150% of benchmark cover	3	2	1
≥ 50% or ≤ 150% of benchmark cover	5	4	3

Tree canopy is defined as those canopy tree species reaching ≥ 80% of mature height - see EVC benchmark description.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Lack of Weeds — Score: 6

Category & Description	'high threat' weeds*		
	None	≤ 50%	> 50%
> 50% cover of weeds	4	2	0
25 - 50% cover of weeds	7	6	4
5 - 25% cover of weeds	11	9	7
< 5% cover of weeds**	15	13	11

* proportion of weed cover due to 'high threat' weeds - see EVC benchmark for guide.

'High threat' weed species are defined as those introduced species (including non-indigenous 'natives') with the ability to out-compete and substantially reduce one or more indigenous life forms in the longer term assuming on-going current site characteristics and disturbance regime.

The EVC benchmark lists typical weed species for the EVC in the bioregion and provides an estimate of their 'invasiveness' and 'impact'. In general, those weed species considered to have a *high impact* are considered *high threat* regardless of their invasiveness.

** if total weed cover is negligible (<1%) and high threat weed species are present then score '13'.

Understorey Life forms

LF Code from EVC benchmark	# spp observed / Benchmark spp.	% cover observed / Benchmark % cover	Present (✓)	Modified (✓)
LT	1 /	1 /		
T	1 /	1 /		
MS	1 /	1 /		
SS	1 /	1 /		
B	1 /	1 /		
LH	1 /	1 /		
MH	1 /	1 /		
SH	1 /	1 /		
GC	13 / 13	30 / 15	✓	
LNG	1 /	1 /		
MTC	1 / 15	20 / 10	✓	
MNC	1 /	1 /		
CF	1 /	1 /		
SC	1 /	1 /		
BL	1 /	1 /		
	1 /	1 /		

Present — For life forms with benchmark cover of < 10%, considered 'present' if
- any specimens are observed.

For life forms with benchmark cover of ≥ 10%, considered 'present' if
- the life form occupies at least 10% of benchmark cover.

Modified (apply only where life form is 'present') — For life forms with benchmark cover of <10%, then considered substantially 'modified' if the life form has either:
- < 50% of the benchmark species diversity; or
- no reproductively-mature specimens are observed.

For life forms with benchmark cover of ≥ 10%, then considered substantially 'modified' if the life form has either:
- < 50% of benchmark cover; or
- < 50% of benchmark species diversity; or
- ≥ 50% of benchmark cover due largely to immature canopy specimens but the cover of reproductively-mature specimens is < 10% of the benchmark cover.

Understorey — Score: 5

Category & Description		
All strata and Life forms effectively absent		0
Up to 50% of life forms present		5
≥ 50% to 90% of Life forms present	• of those present, ≥ 50% substantially modified	10
	• of those present, < 50% substantially modified	15
≥ 90% of Life forms present	• of those present, ≥ 50% substantially modified	15
	• of those present, < 50% substantially modified	20
	• of those present, none substantially modified	25

Victoria The Place To Be

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