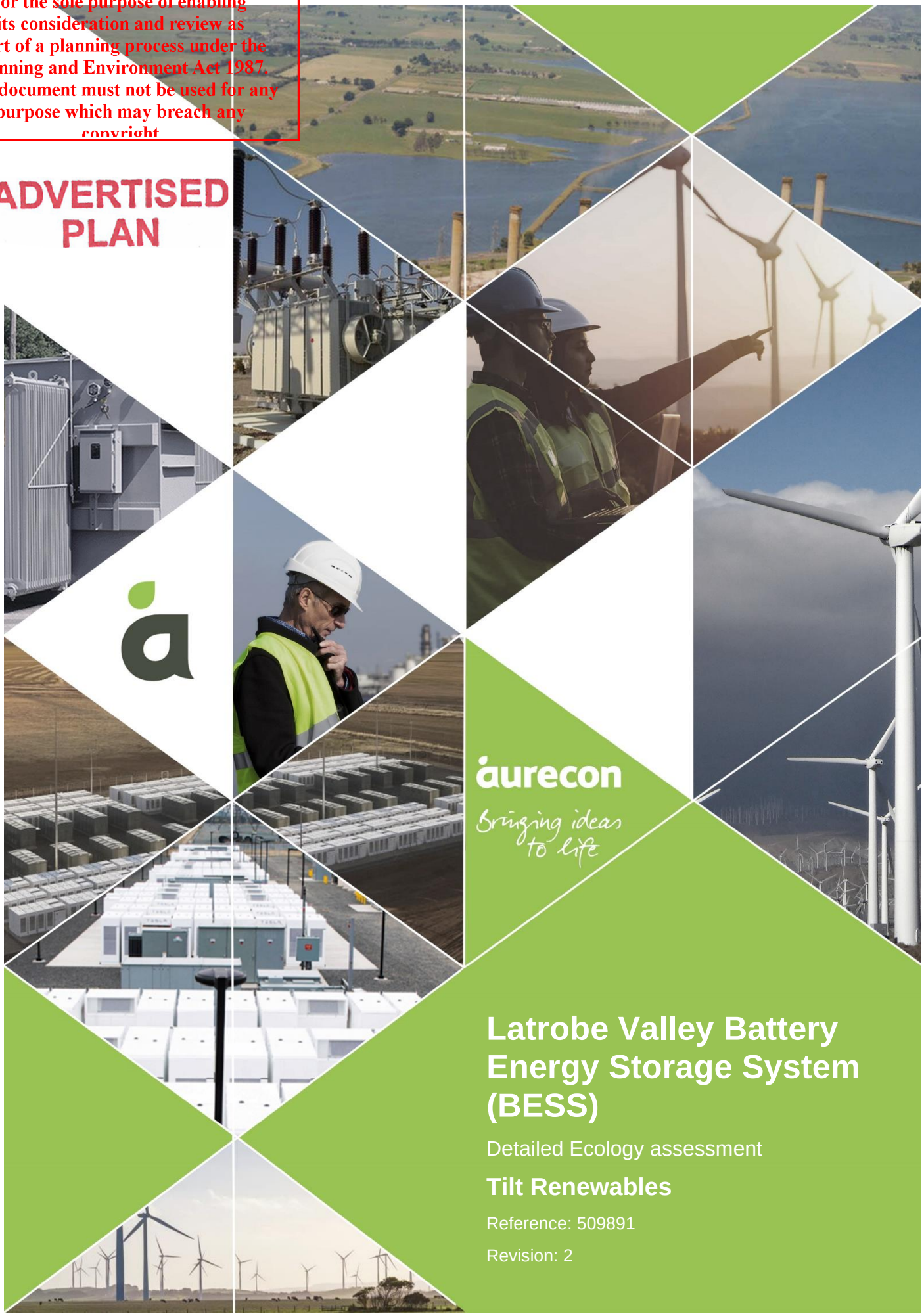

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Bringing ideas to life

Latrobe Valley Battery Energy Storage System (BESS)

Detailed Ecology assessment

Tilt Renewables

Reference: 509891

Revision: 2

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Executive summary

Aurecon was commissioned by Tilt Renewables (the Proponent) to undertake an ecological assessment to inform the design and planning approvals for a proposed Latrobe Valley Battery Energy Storage System (BESS) at Morwell in eastern Victoria (the Project).

The assessment determined that the Project area largely comprised of farmland and was dominated by large areas of introduced pasture grass. The Project area was otherwise distinguished by the presence of various aquatic habitats including small farm dams, shallow drains and other low-lying parts of the property that supported sitting water. Planted vegetation was recorded in the south east of the Project area as well as within and adjacent to the existing Morwell Terminal Station (MWTS).

Native vegetation was limited to seven patches of native vegetation and one scattered tree. This included:

- Five patches of native vegetation (Habitat Zones 1 to 5) that were associated with aquatic habitats;
- One linear patch of derived grassland near the western boundary (Habitat Zone 6);
- One small patch of treed vegetation comprised of Swamp Gum and Blackwood, located near the entrance to the site (Habitat Zone 7); and
- One large scattered Gippsland Red-gum, assumed to be remnant, within the MWTS.

Aquatic habitats in the Project area initially were considered to support potential habitat for two Commonwealth listed fauna species, Growling Grass Frog and Dwarf Galaxias. As such, detailed habitat assessment and targeted surveys were undertaken for both these species. Neither species was recorded during the targeted surveys. Based on the absence of these species in the targeted surveys, as well the presence of low-quality habitats, it has since been concluded that these species have a low likelihood of occurrence in the Project area. Furthermore, it is considered that the Growling Grass Frog and Dwarf Galaxias are unlikely to be subject to adverse impacts by the current proposal, and are not at risk of a significant impact under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

One additional fauna species, the Eastern Great Egret, listed as threatened under the *Flora and Fauna Guarantee Act 1988* (FFG Act), was considered to have a moderate likelihood of occurrence. The larger areas of aquatic habitat in the Project area support potential foraging habitat for this species. However, given the extent of similar and higher quality aquatic habitats in the broader region, it is considered unlikely that this species regularly utilises or is reliant on the habitats in the Project area. As such, the Eastern Great Egret is unlikely to be subject to adverse impacts by the current proposal.

Due to the disturbed nature of the vegetation within the Project area and long agricultural use of the site and surrounds, it was determined that no threatened flora or ecological communities are likely to occur in the Project area, and that no threatened fauna species are likely to occur regularly or be reliant on habitats in the Project area. As such, there are no implications for the Project under the EPBC Act, *Environment Effects Act 1978* (EE Act) or FFG Act.

Based on the current design, all infrastructure associated with the construction and operation of the Project is proposed to be located outside patches of native vegetation. As such, all patches of native vegetation within the Project area can be retained. AusNet have advised that the remnant scattered tree (Tree 1) in the southern end of the MWTS may require trimming to allow for the transportation of the 66 kV transformers. As such, as a worst-case scenario, it has been assumed that minimal lopping, limited to less than 1/3 of this trees foliage, will be undertaken to allow access of the transformer. Such minimal lopping is exempt from requiring a planning permit. As such, the Project would not trigger the requirement for a permit under Clause 52.17 of the Latrobe planning scheme.

Contents

Appendices

Figures

Tables

1 Introduction

1.1 Project background

Aurecon Australasia Pty Ltd (Aurecon) has been engaged by Tilt Renewables Australia Pty Ltd (the Proponent) to undertake a detailed ecology assessment to inform the proposed Latrobe Valley Battery Energy Storage System (BESS) at Morwell, Victoria (the Project).

The Proponent is seeking to install a BESS in Morwell to help maintain reliable and affordable energy supply for Victoria. The intention is to combine the operation of the Latrobe Valley BESS with renewable energy generation to support Victoria's transition away from reliance on fossil fuels.

Aurecon recently prepared a desktop ecological risk assessment for the Project (Aurecon 2020). This current report builds on the desktop assessment and provides the details from recent flora and fauna field investigations including targeted surveys for Growling Grass Frog (*Litoria raniformis*) and Dwarf Galaxias (*Galaxiella pusilla*).

This report documents the sources of information, methods and findings of the flora and fauna assessment. This assessment report has been prepared to inform the planning application for the Project and to determine the implications of the Project under relevant state and Commonwealth environmental legislation.

1.2 Scope and purpose of the assessment

The purpose of the ecological assessment was to provide an assessment of the biodiversity values in the Project area, 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 state and federal legislation. This assessment also provides identification of any key risk areas in the Project area 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 area, including preparation of database searches for native vegetation, flora and fauna (previously undertaken as part of the desktop assessment; Aurecon 2020);
- Undertake an ecological field survey to determine the type, extent and quality of native vegetation and fauna habitat present in the Project area;
- Undertake targeted surveys for Growling Grass Frog and Dwarf Galaxias in areas of suitable habitat;
- Identify any significant ecological values (including threatened species or communities) that have potential to occur in the Project area;
- Identify the potential implications for the Project based on relevant biodiversity legislation and policy including the following:
  - *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
  - *Environment Effects Act 1978* (EE Act);
  - *Flora and Fauna Guarantee Act 1988* (FFG Act);
  - *Planning and Environment Act 1987;*
  - *Wildlife Act 1975* and Wildlife Regulations 2002; *and*
  - *Catchment and Land Protection Act 1994* (CaLP Act).
- Provide recommendations to assist with the Project design and locating of infrastructure; and
- Identify the need for any additional ecological field surveys.

1.3 Limitations

The outcomes of this report are limited to the ecological assessment undertaken for the Project area and immediate surrounds. This report is limited to the scope defined in Section 1.2. Should further information become available regarding the conditions in the Project area, 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 when producing flowers or fruits. In general, spring is considered the optimal period to undertake ecological field assessments in Victoria. The spring timing of the ecological field survey that informed this assessment was therefore ideal to ascertain the extent and condition of native vegetation in the Project area. Also, the timing of the targeted surveys for both Growling Grass Frog and Dwarf Galaxias were also optimal to detect these species. Details of the timing and conditions for these targeted surveys are provided in Section 2.2.2.

It is noted that while this investigation included the area of the existing Morwell Terminal Station (MWTS), no access was allowed into this area. As such, assessment of this portion of the investigation area was limited to a visual assessment undertaken from beyond the perimeter fence.

1.4 Location

The Project area is located in Morwell, approximately 150 kilometres east of Melbourne in the Latrobe Valley area of Gippsland. The Project area is situated at 240 Monash Way, Morwell, adjacent to the existing MWTS. The survey area for this investigation comprises private landholding as well the MWTS which is owned and operated by AusNet. The survey area is shown in Figure 1.

The Project area is bounded by the Morwell Power Station to the west, Monash Way to the east and adjoining Industrial zoned land holdings to the north and south. The Project area runs adjacent to a waterway (Bennett's Creek) on its western border.

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Legend

- Survey area
- Planted vegetation
- Aquatic habitat

Native Vegetation

- Tall Marsh (EVC 821)
- Plains Sedgy Wetland (EVC 647)
- Plains Grassy Forest (EVC 151)
- Plains Grassy Woodland (EVC 55)
- Large Scattered Tree
- Morwell Power Station
- Road
- Rail
- Watercourse

Data Source: VicMap (2020); Aurecon (2020)

Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community.

Date: 23/03/2021 Version: 1

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Author: AL

A3 scale: 1:4,500

0 100 200 Metres

Job No: 509891

Coordinate System: GDA 1994 MGA Zone 55

Latrobe Valley BESS project

Figure 1 – Investigation area and ecological values

2 Methods

2.1 Desktop assessment

The desktop assessment comprised a review of existing technical reports for the site, as well as a review of current databases for information on native vegetation and threatened flora, fauna and ecological communities listed under the EPBC Act, FFG Act and/or Department of Environment, Land, Water and Planning (DELWP) Advisory lists.

The likelihood of occurrence was then considered for all threatened species and communities recorded or with potential to occur in the 5 km radius search area. Where a species was determined to have a 'High' or 'Moderate' likelihood of occurrence, it is considered further in light of the proposed impacts from the Project.

The methods adopted for the database search, likelihood of occurrence and impact assessment are outlined in the following sections.

2.1.1 Database search

Information on the occurrence of flora, fauna and ecological communities was obtained from a circular search area with a radius of 5 km centred on the Project area (coordinates: latitude 38˚ 15' 27" S and longitude 146˚ 25' 10" 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 2020a, see Appendix F); and
- The Victorian Biodiversity Atlas (DELWP 2020a) for records of listed threatened flora and fauna species (See Appendices D and E).

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

- The Victorian DELWP Native Vegetation Information Management System (NVIM) (DELWP 2020b);
- NatureKit (DELWP 2020c);
- VicPlan (DELWP 2020d); and
- Aerial imagery.

2.1.2 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 Project area. The following threatened species were considered as part of this assessment:

- Flora listed as threatened under the EPBC Act;
- Fauna listed as threatened and/or migratory under the EPBC Act;
- Flora and fauna listed as threatened under the FFG Act; and
- Flora and fauna listed as 'critically endangered', 'endangered', 'vulnerable' or 'rare' on the DELWP Advisory List. Note that flora and fauna listed as 'near threatened' or 'data deficient' only were not considered.

The likelihood of a species occurring within the Project 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 Project 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 Project area is provided in Tables 1 and 2 respectively.

Table 1 Likelihood of occurrence criteria for threatened flora species

Likelihood of Occurrence	Criteria
High	Recent reputable 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 area contains high quality habitat
Moderate	Previous reputable records of the species in the local vicinity and/or the Project area contains moderate quality habitat
Low	Limited previous records of the species in the local vicinity; and/or, the Project area 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 area 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 area contains the species' preferred habitat
Moderate	The species is likely to visit the Project area regularly (i.e. at least seasonally)
	Previous reputable records of the species in the local area
	The Project area contains some characteristics of the species' preferred habitat
Low	The species is likely to visit the Project area 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 area 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 area
	Species is known to be regionally extinct

2.1.3 Impact assessment

Listed threatened species and ecological communities determined as having a High or Moderate likelihood of occurrence in the Project area have been considered regarding the level of likely impact on these values from the proposal.

In the case of Matters of National Environmental Significance (MNES), any threatened species or community determined as having a High or Moderate likelihood of occurrence in the Project area require assessment against the published MNES Significant Impact Guidelines 1.1 (DoE 2013) to determine whether the proposal may have a significant impact and whether a referral under the EPBC Act is required.

2.2 Field assessment

The initial ecological field assessment was undertaken on 5th November 2020. The Project area was surveyed in detail on foot.

The field survey was undertaken by Justin Sullivan, a Senior Ecologist, with experience in the identification of Victoria's flora and fauna, and accreditation to undertake the assessment of native vegetation as listed on DELWP's Vegetation Quality Assessment Competency Register. Relevant permits under the Victorian *Wildlife Act 1975* (No. 10008909) and FFG Act (No. 10008817) were in effect for this work.

2.2.1 Flora survey

A vegetative description of the Project area was recorded as well as a full 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 inform the potential requirement for any future targeted flora surveys.

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

2.2.2 Fauna survey

A list of all fauna species observed within the Project area was recorded through active searching, and general observations including identification of birds and frogs visually and by call. 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 any future targeted fauna surveys.

The desktop review and initial ecological field inspection identified that two EPBC Act listed fauna species, Growling Grass Frog and Dwarf Galaxias, may utilise the aquatic habitats within the Project area and as such, detailed habitat assessment and targeted surveys were undertaken for both these species. Details of the methods adopted for the targeted surveys are provided in the following sections.

Growling Grass Frog habitat assessment and targeted survey

Aquatic habitats in the Project area were initially assessed and mapped during the initial ecological field survey undertaken on 5th November 2020. Aquatic habitat in the Project area included farm dams and shallow vegetated drains, as well as low-lying areas in the east of the site which contained sitting water. A more detailed habitat assessment of each of these aquatic habitats, which included details of the presence/availability of water, water quality, the presence/absence of fringing, emergent and/or floating vegetation and the dominant flora species, was undertaken on 30th November 2020. These factors, as well as the consideration of habitat connectivity were considered to provide a determination on the quality of Growling Grass Frog habitat in the Project area, as follows:

- High quality habitat – aquatic habitat with high opportunity for refuge and/or basking (i.e. abundance of fringing vegetation, rocks and/or logs) and high connectivity with other aquatic habitats.
- Moderate quality habitat - aquatic habitat with some opportunity for refuge and/or basking (i.e. moderate presence of fringing vegetation, rocks and/or logs), and limited connectivity to other aquatic habitats (i.e. isolated farm dams).
- Low quality habitat – aquatic habitat with limited opportunity for refuge and/or basking (i.e. low to no fringing vegetation, rocks and/or logs), and limited connectivity to other aquatic habitats.

Targeted surveying for Growling Grass Survey was undertaken across two nights on the 30th November and 1st December 2020. Six sites (F1-6) were surveyed for Growling Grass Frog within the Project area

(Appendix G). Other areas of aquatic habitat in the Project area were discounted from formal Growling Grass Frog survey based on the lack of suitable habitat.

The methods adopted for the targeted survey followed the Commonwealth survey guidelines for the Growling Grass Frog (DEWHA 2009), which stipulate surveys are to be undertaken over two nights at the peak of activity of the species, when night time air temperatures are greater than 12°C, with moderate to no wind.

The targeted survey for Growling Grass Frog in the Project area was undertaken as follows:

- Surveys were undertaken over two nights (30th November and 1st December, between 8pm and 12am midnight) at the peak activity for the species. (Growling Grass Frogs are active between November and March, with calling primarily known to take place between November and December);
- The survey used a combination of call playback and active searching. At each site, a period of listening was undertaken for a minimum of 10 minutes, and any frog species present were identified by call. This was followed by call playback of the male Growling Grass Frog call from a speaker, at multiple (at least two) locations for each site. After playback of the call, another 10 minutes was spent listening for any response. This was followed by a period of active searching, during which spotlights and head torches were used to visually search for frogs on the water surface, amongst the fringing vegetation and on the land surrounding the area of aquatic habitat.

Times and weather conditions for the Growling Grass Frog targeted survey are detailed in Table 3, and discussed further in Section 3.2.

Table 3 Times and weather conditions for Growling Grass Frog targeted survey

Date	Survey Location	Survey time	Conditions at start time		
			Temperature (°C)	Humidity (%)	Wind (km/h)
30/11/2020	F1	11:30pm - 12am	15.9	70	0
	F2	10:00 - 10:30pm	16.6	75	3.2
	F3	9:20 - 10:00 pm	17.4	74	0
	F4	10:30 - 10:55pm	18.1	67	3.9
	F5	10:55 - 11:30pm	18.1	67	3.2
	F6	8:45 - 9:18pm	18.4	68	3.2
1/12/2020	F1	8:30 - 9pm	15.6	65	5.4
	F2	10:06 - 10:36pm	13.8	75	5.7
	F3	10:40 - 11:10pm	14.1	65	6.5
	F4	9:35 - 10:05pm	14.5	70	3.6
	F5	9:03 - 9:35pm	14.2	73	5.4
	F6	11:15 - 11:45pm	13.4	64	4.2

Results of the targeted survey for Growling Grass Frog are detailed in Section 3.3.5 of this report.

Dwarf Galaxias habitat assessment and targeted survey

The targeted survey for Dwarf Galaxias was undertaken by Aquatica Environmental on the 10th and 11th December 2020. Details of the survey methodology are provided in the Targeted Dwarf Galaxias Survey report in Appendix H. The timing of the targeted survey was optimal for detecting the species, as it corresponded with the end of the Dwarf Galaxias breeding season.

3 Results

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

3.1 Database review

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 Project area. The database search returned 14 threatened flora species and 42 threatened and/or migratory fauna species in the 5 km search area (refer details in Appendices D and E). Threatened and/or migratory flora and fauna species returned from the database search were considered against the suitability of habitat, to determine their likelihood of occurrence in the Project area. Threatened and/or migratory flora and fauna species determined to have a high to moderate likelihood of occurrence in the Project area are discussed in Sections 3.3.4 and 3.3.5. Two EPBC Act listed fauna species, the Growling Grass Frog and Dwarf Galaxias, were initially considered to have a moderate likelihood of occurrence in the Project area, and are discussed in Section 3.3.5.

3.2 Survey conditions

The initial ecological field survey was undertaken under warm, dry conditions during the peak of spring (early November 2020). The timing of this survey and condition of the vegetation was considered optimal to assess the extent and quality of native vegetation and fauna habitats in the Project area. Water was observed within the various areas of aquatic habitat during the initial ecological survey.

The timing of the Growling Grass Frog survey was scheduled to occur in the peak activity period of the Growling Grass Frog, during a window of warm weather in the Gippsland region (See Table 3). While some low-lying areas in the east of the Project area (near to Monash Way) had dried since the earlier site visit, the main aquatic habitats in the Project area supported sitting water. The night-time air temperatures during the Growling Grass Frog survey ranged from 13.4°C to 18.4°C across the two survey nights. Wind was low to negligible on the first survey night ranging from 0 to 3.9km/hr, and though slightly higher on the second survey night, was still considered to be low (ranging from 3.6 to 6.5km/hr). Overall, weather conditions for the Growling Grass Frog survey were considered to be optimal. This was supported by a high level of activity of other (common) frog species throughout both nights of the survey.

Details of the survey conditions during the targeted Dwarf Galaxias survey are provided in the Targeted Dwarf Galaxias Survey report in Appendix H.

3.3 Ecological assessment

3.3.1 Site description

The Project area comprised a private landholding to the west and south of the MWTS, as well as the MWTS itself. The privately owned portion of the Project area has been extensively modified for farming, evidenced by the dominance of introduced pasture grasses throughout, namely Yorkshire Fog, Toowoomba Canary-grass, Sweet Vernal-grass and Rye Grass (Photo 1). This area was heavily disturbed, with a large area of fill present in the south west corner. Disturbance was also evident in the northern half of the property, where large slabs of concrete and green waste were observed immediately adjacent to a small dam.

The Project area was otherwise distinguished by the presence of various aquatic habitat areas across the site. This includes multiple small farm dams, shallow drains and other low-lying parts of the property that supported sitting water (Photo 2). Of these aquatic habitat areas, those located along the western boundary of the Project area are likely to have some level of connectivity to Bennet's Creek which occurs immediately

to the west of the Project area boundary. Other aquatic habitats in the Project area lacked any connectivity with other aquatic habitats.

A small number of patches of native vegetation were recorded, most of which were associated with the aquatic habitats in the Project area. This included small areas of Tall Marsh (EVC 821) recorded within farm dams as well as a long patch of Plains Sedgy Wetland (EVC 647) associated with a shallow drainage line in the west (Photo 3). Other areas of native vegetation included a treeless form of Plains Grassy Woodland (EVC 55) near the western boundary, and a small treed patch of Plains Grassy Forest (EVC 151) near the entrance to the property in the south east. The area adjacent to the site entrance in the south east corner otherwise supported small rows of planted vegetation, namely Spotted Gums, River Red-gums and Bottlebrush.

One large row of planted trees occurred within the south east portion of the property near to Monash Way (Photo 4). Planted tree species in this area included Casuarina, River Red-gum, Yellow Gum and Sugar Gum. The ground layer underneath the trees in this area was disturbed by cattle, and comprised the presence of high threat weeds, namely African Box-thorn.

The MWTS portion of the Project area was fenced around the perimeter, though visual inspection was undertaken from outside the fence. The inner area of the MWTS comprised of hard surfaces and electrical infrastructure, while mowed lawn and landscaped garden beds comprising planted trees and shrubs occurred immediately inside the perimeter fence (Photo 5). Planted vegetation within the fenced area included a mixture of introduced and native planted species including African Box-thorn, Radiata Pine, Hakea, Melaleuca, Red Ironbark, Swamp Mallet, Casuarina, Red Box, Black Wattle and Blackwood. Similar planted vegetation occurred outside the perimeter fence, closer to Monash Way.

One large Gippsland Red-gum was recorded within the southern boundary of the MWTS fence (Photo 6). Based on the large size of this tree, estimated to be ≥80cm diameter at breast height (DBH), this tree has been assumed to be remnant and considered as a native Scattered Tree.

The Project area falls within the Gippsland Plain bioregion, the West Gippsland Catchment Management Authority (CMA) area and the Latrobe Local Government Area (LGA). The Project area is currently zoned Industrial (IN1Z). While no environmental significance overlays occur, portions of the Project area are subject to the following overlays:

- Floodway Overlay (FO) – along the western boundary; and
- Land Subject to Inundation Overlay (LSIO) – specified areas, particularly in the north.

The Project area is also entirely mapped as a Designated Bushfire Prone Area (BPA). Clause 13.02-1S of the Latrobe Planning Scheme lists types of applications for which bushfire risk should be considered. As the proposed development (energy storage facility) is not listed in Clause 13.02, the application requirements of Clause 13.02 do not apply and have not been considered further. As would be required in the case that the Minister for Planning refer the application to the CFA, it is recommended that the requirements of the *CFA guidelines for renewable energy facilities* (CFA 2019) are applied to the Project.

Photo 1: Introduced pasture across the Project area

Photo 2: Aquatic habitat (low lying area)

Photo 3: Native vegetation (Plains Sedgy Wetland) within the western boundary of the Project area

Photo 4: Planted tree row in the south east

Photo 5: Planted trees and shrubs within the MWTS

Photo 6: Scattered Tree (Gippsland Red-gum) within the MWTS

3.3.2 Native vegetation

Types of native vegetation that may be present within the Project area were ascertained through the database review (DELWP 2020b; DELWP 2020c). This review determined that prior to 1750, the Project area would have been likely to support Plains Grassy Forest (EVC 151) and Swamp Scrub (EVC 53). The site survey confirmed the presence of four EVCs.

Native vegetation recorded in the Project area comprised:

- Seven patches of native vegetation including:
  - Two patches of Plains Sedgy Wetland (EVC 647) and three patches of Tall Marsh (EVC 821), all of which were associated with areas of aquatic habitat in the Project area;
  - One treeless patch of Plains Grassy Woodland (EVC 55) near the western boundary;
  - One patch of Plains Grassy Forest (EVC 151) near the entrance to the site in the south east; and
- One large scattered tree, a Gippsland Red-gum, within the MWTS fence.

Individual patches of native vegetation are termed 'Habitat Zones' and have been assessed separately. A summary of the details for each habitat zone is provided in Table 4. The results of the habitat hectare assessment are provided in Appendix B.

The single scattered tree recorded is considered to have once comprised the canopy component of Plains Grassy Woodland (EVC 55). Details of this scattered tree is provided in Table 5.

Table 4 Descriptions of patches of native vegetation (habitat zones) recorded in the Project area

Habitat Zone	Ecological Vegetation Class (EVC)	Habitat Score (out of 100)	Description
1	Plains Sedgy Wetland (EVC 647)	17	Narrow band of vegetation adjacent to dam. Dominant species include Tall Rush, Knobby Club-Sedge, Common Swamp Wallaby-grass and Common Spike-sedge.
2	Tall Marsh (EVC 821)	20	Narrow-leaf Cumbungi in existing drain.
3	Tall Marsh (EVC 821)	20	Narrow-leaf Cumbungi in existing drain.
4	Tall Marsh (EVC 821)	31	Patch of marsh in farm dam located at the northern end of the Project area. Dominated by Narrow-leaf Cumbungi. Blackberry and other weeds present.
5	Plains Sedgy Wetland (EVC 647)	20	Broad, linear patch of shallow wetland in the west of the Project area. Dominated by Tall Rush, Poong'ort, Tall Sedge and Knobby Club-Sedge.
6	Plains Grassy Woodland (EVC 55)	15	Narrow, linear patch of derived grassland, distinguished by a consistent cover of native wallaby grass.
7	Plains Grassy Forest (EVC 151)	Unassessed (due to lack of access)	Small patch of treed vegetation adjacent to existing site office, comprising Swamp Gums and Blackwood.

Table 5 Details of native scattered trees recorded in the Project area

Tree Number	Size and type	DBH (cm)	Common Name	Scientific Name
1	Large Scattered Tree	80 *	Gippsland Red-gum	*Eucalyptus tereticornis ssp. mediana*

* Diameter at breast height (DBH) estimated

3.3.3 Ecological communities

EPBC Act listed ecological communities

One EPBC Act listed threatened ecological community was listed in the PMST as potentially being present in the search area (DAWE 2020a; See Appendix F), namely *Gippsland Red Gum (Eucalyptus tereticornis subsp. mediana) Grassy Woodland and Associated Native Grassland* (listed as Critically Endangered).

One scattered Gippsland Red Gum was recorded within the Project area, within an otherwise area of planted trees. This scattered tree does not form part of a patch of native vegetation and therefore does not meet the thresholds for the listed community.

No other areas of native vegetation recorded in the Project area were consistent with any ecological communities listed under the EPBC Act. It is therefore determined that no EPBC Act listed communities occur in the Project area.

FFG Act listed ecological communities

The EPBC Act listed Gippsland Red Gum community (considered above) is also recognised at a state level, being listed as the *Forest Red Gum Grassy Woodland Community* under the FFG Act. For the same reasons provided above, this community does not occur in the Project area.

The native vegetation recorded in the Project area is not considered to be consistent with any of the ecological communities listed under the FFG Act.

3.3.4 Flora

Most of the Project area comprises introduced flora; namely extensive areas of introduced pasture grass and a variety of planted trees and shrubs. Native flora was limited to the mapped patches of native vegetation and mainly consisted of aquatic species including Common Spike-sedge, Narrow-leaf Cumbungi, Tall Sedge and various rushes. During the field assessment 56 flora species were recorded, 40 (71%) of which were introduced species.

A full list of the flora species recorded in the Project area is provided in Appendix C. No threatened flora species were recorded within the Project area. The likelihood of the threatened flora species occurring within 5 km of the Project area which were detected in the database searches was considered in Appendix D. The areas of native vegetation within the Project area were small and disconnected and comprised a low native species diversity. Remaining parts of the Project area comprised almost exclusively of introduced pasture grasses and were heavily disturbed. Given the above condition, and long agricultural use of the overall Project area, it was determined that no suitable habitat for threatened flora exists and that no threatened flora species are likely to occur in the Project area.

3.3.5 Fauna

Fauna habitat

Fauna habitat within the Project area largely consisted of introduced pasture, with distinct areas of planted vegetation and aquatic habitat. The introduced pasture did not support any significant habitat for native fauna. No significant hollows were readily observed in the planted trees in and adjacent to the MWTS or the treeline in the south east of the Project area, however these trees would provide foraging and dispersal habitat for common fauna such as birds and arboreal mammals. A resident family group of Black-shouldered Kites were recorded in the south west treeline during the investigation. Aquatic habitats are discussed further in the following section.

Aquatic habitats

Areas of aquatic habitat in the Project area included farm dams, narrow to broad drainage lines and low-lying areas that supported sitting water. The aquatic habitats in the Project area were considered to support potential habitat for two EPBC Act listed fauna species, Growling Grass Frog and Dwarf Galaxias. As such, a detailed habitat assessment and targeted surveys were undertaken for both these species.

Details of the habitats surveyed for Dwarf Galaxias are discussed in the Dwarf Galaxias targeted survey report provided in Appendix H. Areas of aquatic habitat surveyed for Growling Grass Frog are detailed in Table 6, as well as a classification of the quality of habitat based on the definitions outlined in Section 2.2.2. The location of Growling Grass Frog survey locations are presented in Appendix G. Aquatic habitats in the Project area also supported habitat for a variety of common frog species, of which details are provided in the following section.

Table 6 Growling Grass Frog Survey locations

Growling Grass Frog survey location	Description	Representative photo
F1	Shallow drain in north east of Project area, comprising emergent vegetation, namely Narrow-leaf Cumbungi. (Associated with HZs 2 and 3). Low quality.	
F2	Small farm dam in the north of the Project area comprising emergent vegetation, namely Narrow-leaf Cumbungi and Common Spike-sedge. (Associated with HZ 4). Low to moderate quality.	
F3	Small farm dam in the centre of the Project area distinguished by a dense cover of Common Water Starwort (introduced). Fringing vegetation existed on the northern side (Tall Rush, Tall Sedge) associated with HZ 1. Concrete and green waste occurred on the southern side of the dam. Low to moderate quality.	
F4	Shallow broad drainage line, dominated by Tall Rush, Poong'ort, Tall Sedge and Knobby Club-Sedge. (Associated with HZ 5). Bennet's Creek occurred nearby to the west. Low to moderate quality.	

Growling Grass Frog survey location	Description	Representative photo
F5	Small farm dam, located near western boundary of Project area (between HZs 5 and 6). Distinguished by a low cover of emergent vegetation, namely Narrow-leaf Cumbungi. Fringed by introduced pasture. Bennet's Creek occurred nearby to the west. Low to moderate quality.	
F6	Low lying part of the Project area south of the MWTS land fence. Distinguished by the presence of sitting water, and dominated by introduced grasses and broad leaf weeds. Low quality.	

Fauna species

A total of 25 fauna species were recorded in the Project area during the ecological surveys. This included 17 birds (four of which were introduced species), six frogs and two reptiles. A full list of the fauna species recorded in the Project area is provided in Appendix C. No threatened fauna species were recorded within the Project area during the ecological surveys.

The likelihood of the listed fauna species detected in the database searches occurring within 5 km of the Project area was considered in Appendix E. Of these, two EPBC Act listed fauna species, the Growling Grass Frog and Dwarf Galaxias, were initially considered to have a moderate likelihood of occurrence in the Project area. Detailed habitat assessment and targeted surveys were undertaken for both these species, the details of which are provided in the subsequent sections. Based on the absence of these species in the targeted surveys, these two species are now considered to have a low likelihood of occurrence in the Project area.

One additional state listed fauna species, the Eastern Great Egret, was considered to have a moderate likelihood of occurrence. The larger areas of aquatic habitat in the Project area support potential foraging habitat for this species. However, given the extent of similar and higher quality aquatic habitats in the broader region, it is considered unlikely that this species regularly utilises or is reliant on the habitats in the Project area. As such, the Eastern Great Egret is unlikely to be subject to adverse impacts by the current proposal.

Growling Grass Frog

(EPBC Act: Vulnerable; FFG Act: threatened; DELWP Advisory list: endangered)

Habitat assessment and targeted surveying for Growling Grass Frog was undertaken as part of the current investigation as defined in Section 2.2.2. Results of the habitat assessment for Growling Grass Frog at the six sites surveyed in the Project area are presented in Table 6. Survey locations are shown in Appendix G. Surveys were undertaken in optimal conditions. As detailed in in Table 6, aquatic habitats in the Project area

were limited to low to moderate quality habitat for Growling Grass Frog. Details of the results of the Growling Grass Frog targeted survey are provided in Table 7.

Table 7 Results of the Growling Grass Frog targeted survey

Date	Survey Location	Survey time	Frogs recorded	GGF recorded (Yes/No)
30/11/2020	F1	11:30pm - 12am	None	No
	F2	10:00 - 10:30pm	Common Froglet (5+ individuals heard). Striped Marsh Frog (5+ individuals heard). Spotted Marsh Frog (50+ individuals heard; 2 individuals seen).	No
	F3	9:20 - 10:00 pm	None	No
	F4	10:30 - 10:55pm	None	No
	F5	10:55 - 11:30pm	Whistling Tree Frog (30+ individuals heard; 1 individual seen). Spotted Marsh Frog (1 individual seen).	No
	F6	8:45 - 9:18pm	Southern Bullfrog (1 individual heard)	No
1/12/2020	F1	8:30 - 9pm	None	No
	F2	10:06 - 10:36pm	Spotted Marsh Frog (30+ individuals heard; tadpoles seen). Common Froglet (3+ individuals heard). Striped Marsh Frog (10+ individuals heard).	No
	F3	10:40 - 11:10pm	None	No
	F4	9:35 - 10:05pm	Tadpoles seen	No
	F5	9:03 - 9:35pm	Whistling Tree Frog (20+ individuals heard; 2 individual seen). Spotted Marsh Frog (3+ individuals heard). Southern Brown Tree Frog (3+ individuals heard).	No
	F6	11:15 - 11:45pm	None	No

No Growling Grass Frogs were recorded during the targeted survey. Numerous individuals of other common frog species were recorded. The survey determined that a healthy population of other common frog species were resident at survey locations F2 and F5. Both these locations were small, isolated farm dams that comprised at least some presence of emergent vegetation, namely Narrow-leaf Cumbungi. The most common frog species recorded in the Project area were Spotted Marsh Frog (Photo 7) and Whistling Tree Frog (Photo 8).

Photo 7: Spotted Marsh Frog recorded in the Project area during targeted survey

Photo 8: Whistling Tree Frog recorded in the Project area during targeted survey

Previous records of the Growling Grass Frog in the region are present yet scarce, with the closest Growling Grass Frog record being from 1973, and located 5.5 km north west of the Project area (DELWP 2020c). The next closest Growling Grass Frog recorded from within the last 50 years is located 11 kms south west of the Project area (from 1978). Other records in the region are historic records. The aquatic habitats in the Project area are of low to moderate quality and are lacking in connectivity to other aquatic habitats. Importantly,

Growling Grass Frogs were not recorded during targeted surveys undertaken in the Project area across two optimal survey nights in November-December 2020.

Based on the above reasons, it is concluded that Growling Grass Frog has a low likelihood of occurrence in the Project area and the species is unlikely to be subject to adverse impacts by the current proposal.

Dwarf Galaxias

(EPBC Act: Vulnerable; FFG Act: threatened; DELWP Advisory list: endangered)

Aquatic habitat in the Project area observed during the initial ecological survey was considered to support potential habitat for the Dwarf Galaxias. A more detailed habitat assessment and targeted survey for the species was therefore recommended. This was undertaken by Aquatica Environmental on the 10th and 11th December 2020 during optimal conditions, and included assessment of all areas of potential habitat in the Project area, as well as at a nearby control site (See Appendix H).

No Dwarf Galaxias were recorded in the Project area during the survey. Dwarf Galaxias were recorded at the nearby control site, further supporting the unlikely occurrence of the species in the Project area. The targeted survey also concluded that the Project area lacked the habitat characteristics that could support a population of Dwarf Galaxias. Full details of the Dwarf Galaxias targeted survey are provided in Appendix H.

It is therefore concluded that Dwarf Galaxias has a low likelihood of occurrence in the Project area and the species is unlikely to be subject to adverse impacts by the current proposal.

4 Proposed impacts and implications

The Proponent is seeking to install a BESS in Morwell to help maintain reliable and affordable energy supply for Victoria. The intention is to combine the operation of the Project with renewable energy generation to support Victoria's transition away from reliance on fossil fuels.

The indicative concept design for the Project has been developed following inputs from the ecology team, and is shown in Figure 2. Based on the current design, all infrastructure associated with the construction and operation of the project is proposed to be located outside of all patches of native vegetation. As such, all patches of native vegetation within the Project area can be retained.

AusNet has advised that the remnant scattered tree (Tree 1) in the southern end of the MWTS may require trimming to allow for the transportation of the 66 kV transformers. As such, as a worst-case scenario, it has been assumed that minimal lopping, limited to less than on third of this trees foliage, will be undertaken to allow access of the transformer.

It is noted that the proposed design may also require a small area of removal of planted trees in the MWTS as well as to allow for the construction and use of the access track in the south. This is unlikely to result in any adverse impacts to threatened fauna. Project infrastructure is also proposed in the location of a narrow drain which runs east-west across the site. This drain comprised weedy vegetation and was not likely to support any threatened flora or fauna.

The proposed drainage of storm water run-off into the western farm dam may have an indirect impact on the common frog species that were recorded using this aquatic habitat. Based on the results of this assessment, particularly the absence of Growling Grass Frog and Dwarf Galaxias in the recent targeted surveys, it is concluded that the Project is unlikely to result in an adverse impact to any listed flora or fauna.

This section defines the impacts to ecological values based on the proposed development and outlines the implications under relevant environmental legislation and policy.

Legend

- Survey area
- Planted vegetation
- Aquatic habitat
- Tall Marsh (EVC 821)
- Plains Sedgy Wetland (EVC 647)
- Plains Grassy Forest (EVC 151)
- Plains Grassy Woodland (EVC 55)
- Large Scattered Tree
- Morwell Power Station
- Road
- Rail
- Watercourse
- BESS Location
- Development footprint

Data Source: VicMap (2020); Aurecon (2020)

Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community.

Date: 23/03/2021 Version: 1

C:\Users\ada.lan\Aurecon Group\Melbourne Geospatial - Project Work\J0067_509891_Morwell BESS Phase 1\Project\509891 Morwell BESS project - Ecology

Author: AL

A3 scale: 1:4,348

0 100 200 Metres

Job No: 509891

Coordinate System: GDA 1994 MGA Zone 55

Latrobe Valley BESS project

Figure 2 – Investigation area, ecological values and final design

4.1 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 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 the 5 km radius search area. The MNES relevant to the Project area are summarised in Table 8. The likelihood of occurrence analysis for all threatened and migratory species is tabulated in Appendix D and E.

No MNES have a high or moderate likelihood of occurrence in the Project area. As such, there are no implications for the Project under the EPBC Act.

Table 8 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	0
National Heritage Places	0
Wetlands of International Importance	1
Great Barrier Reef Marine Park	0
Commonwealth Marine Area	0
Listed Threatened Ecological Communities	1
Listed Threatened Species	30
Listed Migratory Species	14

Ramsar wetlands of international significance

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

The Project area is located well upstream of the Gippsland Lakes and does not drain directly into this Ramsar site. Construction and operation of the Latrobe Valley BESS is therefore unlikely to result in a significant impact on the ecological character of this wetland.

Listed threatened species

Threatened flora

As detailed in Section 3.3.4, due to the small and altered nature of the remnant areas of native vegetation, as well as the long agricultural use of the overall Project area, it was determined that no threatened flora species have a high or moderate likelihood of occurrence in the Project area. No EPBC Act listed threatened flora species are at risk of a significant impact from the proposed action

Threatened fauna

Two EPBC Act listed fauna species, the Growling Grass Frog and Dwarf Galaxias, were initially considered to have a moderate likelihood of occurrence in the Project area. Recent targeted surveys undertaken under optimal conditions did not record these species. Based on the absence of these species in the targeted surveys, as well the presence of low quality habitats, it has been concluded that these species have a low likelihood of occurrence in the Project area. Furthermore, it is considered that the Growling Grass Frog and Dwarf Galaxias are unlikely to be subject to adverse impacts by the current proposal, and are not at risk of a significant impact.

No other EPBC Act listed fauna species are considered to be at a risk of a significant impact from the proposed action.

Listed threatened ecological communities

One EPBC Act listed threatened ecological community was listed in the PMST as potentially being present in the search area (DAWE 2020a; See Appendix F).

As detailed in Section 3.3.3, no native vegetation in the Project area was consistent with any EPBC Act listed ecological communities. No EPBC Act listed threatened ecological communities are at risk of a significant impact from the proposed action.

Migratory and marine species

EPBC Act migratory listed fauna species were considered in Appendix E. No EPBC Act migratory listed species are at risk of a significant impact from the proposed action.

4.2 *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.

Individual criteria relevant to flora and fauna are summarised to include:

- Extensive removal of native vegetation (>10 hectares);
- Long-term loss of a significant proportion of known remaining habitat or population of a threatened species within Victoria; and
- Long term changes to Ramsar wetlands.

A combination of two of the following effects to matters listed under the FFG Act, may also trigger a referral under the EE Act:

- Potential loss of a significant area of a listed ecological community;
- Potential loss of a genetically important population of an endangered or threatened species;
- Potential loss of critical habitat; or
- Potential significant effects on habitat values of a wetland supporting migratory bird species.

The proposed action will not result in the removal of more than 10 hectares of native vegetation, or result in any of the relevant impacts to threatened species or critical habitat. Also, the proposed action will not impact a Ramsar wetland or habitat supporting migratory species. Based on the assessment, it is considered that the Project will not trigger any of the criteria relevant to flora and fauna. As such, the preparation of a referral under the EE Act is not required for matters associated with this investigation.

4.3 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 species or protected flora species from public land.

No FFG Act listed threatened or protected flora or fauna were recorded in the Project area.

One FFG Act listed fauna species, the Eastern Great Egret, was considered to have a moderate likelihood of occurrence. The larger areas of aquatic habitat in the Project area support potential foraging habitat for this species. However, given the extent of similar and higher quality aquatic habitats in the broader region, it is considered unlikely that this species regularly utilises or is reliant on the habitats in the Project area. As such, the Eastern Great Egret is unlikely to be subject to adverse impacts by the current proposal.

As such, there are no implications for the Project under the FFG Act.

4.4 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 State Planning Policy Framework 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.

Under Clause 66.02 a permit application to remove, destroy or lop native vegetation is required to be referred to DELWP as a recommending referral authority if any of the following apply:

- The application triggers the Detailed Assessment Pathway;
- A property vegetation plan applies to the site; or
- The native vegetation is on Crown land which is occupied or managed by the Responsible Authority.

As detailed in the table of exemptions in Clause 52.17 (DELWP 2017b), the requirement to obtain a permit does not apply to:

- Planted vegetation:

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

destruction or lopping of the native vegetation is in accordance with written permission of the agency (or its successor) that provided the funding.

Given the planted vegetation in the Project area was considered to have been planted for amenity purposes only, this vegetation is considered to be exempt from permit under Clause 52.17.

Native vegetation in the Project area subject to *the Guidelines* was limited to seven patches of native vegetation and one scattered tree. This included:

- Five patches of native vegetation (Habitat Zones 1 to 5) that were associated with aquatic habitats;
- One patch of derived grassland near the western boundary (Habitat Zone 6);
- One patch of treed vegetation dominated by Swamp Gum and Blackwood, located near the entrance to the site (Habitat Zone 7); and
- One large scattered Gippsland Red-gum, assumed to be remnant, within the MWTS.

Based on the current design, all infrastructure associated with the construction and operation of the Project is proposed to be located outside patches of native vegetation. As such, all patches of native vegetation within the Project area can be retained.

AusNet have advised that the remnant scattered tree (Tree 1) in the southern end of the MWTS may require trimming to allow for the transportation of the 66 kV transformers. As such, as a worst-case scenario, it has been assumed that minimal lopping, limited to less than 1/3 of this trees foliage, will be undertaken to allow access of the transformer. As detailed in the table of exemptions in Clause 52.17 (DELWP 2017b), the requirement to obtain a permit does not apply to:

- Lopping and pruning for maintenance:

  Lopping or pruning native vegetation, for maintenance only, provided no more than 1/3 of the foliage of each individual plant is lopped or pruned. This exemption does not apply to:

  ** The pruning or lopping of the trunk of a native tree; or*

  ** Native vegetation on a roadside or railway reservation.*

The DELWP Assessors Handbook (DELWP 2018) also stipulates that only excessive lopping, (defined as any lopping beyond 1/3 of the trees foliage), would result in the assumed loss of the tree. Therefore, as only minimal lopping of Tree 1 is considered to be required (limited to less than 1/3 of the trees foliage), this action would be exempt from requiring a planning permit under Clause 52.17.

As such, the Project would not trigger the requirement for a permit under Clause 52.17 of the Latrobe planning scheme, and no native vegetation offsets are required.

4.5 *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. It is recommended that an ecologist undertakes an inspection of any planted trees required to be removed/trimmed (along the access route and/or in the MWTS) prior to their removal to check for the presence of nesting fauna. In the case that nesting fauna are present, a management authorisation permit would be required and a salvage and translocation protocol should be implemented prior to construction.

4.6 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 Project 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*)
- Paterson's Curse (*Echium plantagineum*)
- Spear Thistle (*Cirsium vulgare*)
- Sweet Briar (*Rosa rubiginosa*)
- Variegated thistle (*Silybum marianum*)
- Winged Slender Thistle (*Carduus tenuiflorus*)

Appropriate weed control and hygiene measures should be outlined in the Construction and Operational Environmental Management Plans.

5 Summary and next steps

5.1 Summary

Aurecon undertook an ecological assessment of the site proposed for development of a BESS at Morwell. The assessment determined that the Project area largely comprised of farmland and was dominated by large areas of introduced pasture grass. The Project area was otherwise distinguished by the presence of various aquatic habitats including small farm dams, shallow drains and other low-lying parts of the property that supported sitting water. Planted vegetation was recorded in the south east of the Project area as well as within and adjacent to the MWTS.

Native vegetation was limited to seven patches of native vegetation and one scattered tree. This included:

- Five patches of native vegetation (Habitat Zones 1 to 5) that were associated with aquatic habitats;
- One linear patch of derived grassland near the western boundary (Habitat Zone 6);
- One small patch of treed vegetation comprised of Swamp Gum and Blackwood, located near the entrance to the site (Habitat Zone 7); and
- One large scattered Gippsland Red-gum, assumed to be remnant, within the MWTS.

Aquatic habitats in the Project area initially were considered to support potential habitat for two Commonwealth listed fauna species, Growling Grass Frog and Dwarf Galaxias. As such, detailed habitat assessment and targeted surveys were undertaken for both these species. Neither species was recorded during the targeted surveys. Based on the absence of these species in the targeted surveys, as well the presence of low-quality habitats, it has since been concluded that these species have a low likelihood of occurrence in the Project area. Furthermore, it is considered that the Growling Grass Frog and Dwarf Galaxias are unlikely to be subject to adverse impacts by the current proposal, and are not at risk of a significant impact under the EPBC Act.

One additional fauna species, the Eastern Great Egret, listed as threatened under the FFG Act, was considered to have a moderate likelihood of occurrence. The larger areas of aquatic habitat in the Project area support potential foraging habitat for this species. However, given the extent of similar and higher quality aquatic habitats in the broader region, it is considered unlikely that this species regularly utilises or is reliant on the habitats in the Project area. As such, the Eastern Great Egret is unlikely to be subject to adverse impacts by the current proposal

Due to the disturbed nature of the vegetation within the Project area and long agricultural use of the site and surrounds, it was determined that no threatened flora or ecological communities are likely to occur in the Project area, and that no threatened fauna species are likely to occur regularly or be reliant on habitats in the Project area. As such, there are no implications for the Project under the EPBC Act, EE Act or FFG Act.

Based on the current design, all infrastructure associated with the construction and operation of the Project is proposed to be located outside patches of native vegetation. As such, all patches of native vegetation within the Project area can be retained. AusNet have advised that the remnant scattered tree (Tree 1) in the southern end of the MWTS may require trimming to allow for the transportation of the 66 kV transformers. As such, as a worst-case scenario, it has been assumed that minimal lopping, limited to less than 1/3 of this trees foliage, will be undertaken to allow access of the transformer. Such minimal lopping is exempt from requiring a planning permit. As such, the Project would not trigger the requirement for a permit under Clause 52.17 of the Latrobe planning scheme.

5.2 Next steps

- No further ecological assessments are considered to be required to inform the environmental planning approvals for the Project. Any changes at the detailed design stage should be assessed by an ecologist to determine if such changes would result in any loss to native vegetation.
- Where any works are required in close proximity to the areas of native vegetation recorded, appropriate vegetation protection zones should be established to ensure no construction vehicles or personnel enter these areas. A tree protection zone should also be established around the large scattered tree recorded in the MWTS. Vegetation/tree protection zones should be fenced beyond the canopy drip line of the vegetation/tree and appropriately signed as 'no-go zones'.

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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 (2017a) 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	Habitat Zone ID						
			1	2	3	4	5	6	7*
Area (ha)			0.004	0.007	0.003	0.024	0.290	0.045	0.040
Bioregion			Gippsland Plain						
EVC			647	821	821	821	647	55	151
Site Condition	Large Old Trees	10	NA	NA	NA	NA	NA	0	
	Canopy Cover	5	NA	NA	NA	NA	NA	0	
	Lack of Weeds	15	0	4	4	7	2	6	
	Understorey	25	5	5	5	5	5	5	
	Recruitment	10	3	3	3	6	3	0	
	Organic Matter	5	4	2	2	4	4	3	
	Logs	5	NA	NA	NA	NA	NA	0	
	Total Site Score		12	14	14	22	14	14	
	Standardiser		1.36	1.36	1.36	1.36	1.36	1	
	Standardised Score		16	19	19	30	19	14	
	Patch Size	10	1	1	1	1	1	1	
	Neighbourhood	10	0	0	0	0	0	0	
	Distance to Core	5	0	0	0	0	0	0	
	Total Landscape Score		1	1	1	1	1	1	
Final score	**Habitat Score (out of 100)**	100	17	20	20	31	20	15	
	Condition Score (out of 1)	1	0.17	0.2	0.2	0.31	0.2	0.15	

* Vegetation Quality Assessment was not undertaken for Habitat Zone 7 due to lack of detailed access to this location.

Appendix C: Flora and fauna recorded in Project area

Origin	Common Name	Scientific Name	Recorded
Flora recorded in the Project area			
*	African Box-thorn	*Lycium ferocissimum*	x
*	Annual Beard-grass	*Polypogon monspeliensis*	x
*	Barley-grass	*Hordeum leporinum*	x
*	Bastards Fumitory	*Fumaria bastardii*	x
	Black Wattle	*Acacia mearnsii*	x
*	Blackberry	*Rubus fruticosus spp. agg.*	x
*	Brown-top Bent	*Agrostis capillaris*	x
*	Cape Weed	*Arctotheca calendula*	x
*	Chilean Needle-grass	*Nassella neesiana*	x
*	Cleavers	*Galium aparine*	x
*	Cocksfoot	*Dactylis glomerata*	x
*	Common Peppercress	*Lepidium africanum*	x
*	Common Sow-thistle	*Sonchus oleraceus*	x
	Common Spike-sedge	*Eleocharis acuta*	x
	Common Swamp Wallaby-grass	*Amphibromus nervosus*	x
*	Common Water-starwort	*Callitriche stagnalis*	x
	Cotton Fireweed	*Senecio quadridentatus*	x
*	Curled Dock	*Rumex crispus*	x
*	Cut-leaf Crane's-bill	*Geranium dissectum*	x
*	Drain Flat-sedge	*Cyperus eragrostis*	x
*	English Daisy	*Bellis perennis*	x
*	Flatweed	*Hypochaeris radicata*	x
*	Flaxleaf Fleabane	*Erigeron bonariensis*	x
	Gippsland Red-gum	*Eucalyptus tereticornis subsp. Mediana*	x
*	Kentucky Blue-grass	*Poa pratensis*	x
	Knobby Club-sedge	*Ficinia nodosa*	x
*	Mallow of Nice	*Malva nicaeensis*	x
	Narrow-leaf Cumbungi	*Typha domingensis*	x
	Pale Rush	*Juncus pallidus*	x
*	Pampas grass	*Cortaderia selloana*	x
*	Panic Veldt-grass	*Ehrharta erecta*	x
*	Paterson's Curse	*Echium plantagineum*	x
	Poong'ort	*Carex tereticaulis*	x
*	Prairie Grass	*Bromus catharticus*	x
*	Ribwort	*Plantago lanceolata*	x
	Rush	*Juncus spp.*	x
*	Rye Grass	*Lolium spp.*	x
*	Salsify	*Tragopogon porrifolius*	x
*	Small Nettle	*Urtica urens*	x
	Smooth Willow-herb	*Epilobium billardiereanum subsp. billardiereanum*	x
*	Spear Thistle	*Cirsium vulgare*	x
*	Suckling Clover	*Trifolium dubium*	x
	Sugar Gum	*Eucalyptus cladocalyx*	x
	Swamp Paperbark	*Melaleuca ericifolia*	x
*	Sweet Briar	*Rosa rubiginosa*	x
*	Sweet Vernal-grass	*Anthoxanthum odoratum*	x
*	Tall Fleabane	*Erigeron sumatrensis*	x
	Tall Rush	*Juncus procerus*	x
	Tall Sedge	*Carex appressa*	x

Origin	Common Name	Scientific Name	Recorded
*	Timothy grass	*Phleum pratense*	x
*	Toowoomba Canary-grass	*Phalaris aquatica*	x
*	Variegated thistle	*Silybum marianum*	x
	Wallaby grass	*Rytidosperma spp.*	x
*	White Clover	*Trifolium repens var. repens*	x
*	Winged Slender Thistle	*Carduus tenuiflorus*	x
*	Yorkshire Fog	*Holcus lanatus*	x
Fauna recorded in the Project area			
Birds			
	Australian Magpie	*Gymnorhina tibicen*	x
	Black-shouldered Kite	*Elanus axillaris*	x
*	Common Blackbird	*Turdus merula*	x
*	Common Myna	*Acridotheres tristis*	x
*	Common Starling	*Sturnus vulgaris*	x
*	European Goldfinch	*Carduelis carduelis*	x
	Golden-headed Cisticola	*Cisticola exilis*	x
	Magpie-lark	*Grallina cyanoleuca*	x
	Masked Lapwing	*Vanellus miles*	x
	Red Wattlebird	*Anthochaera carunculata*	x
	Striated Pardalote	*Pardalotus striatus*	x
	Superb Fairy-wren	*Malurus cyaneus*	x
	Welcome Swallow	*Hirundo neoxena*	x
	White-browed Scrubwren	*Sericornis frontalis*	x
	White-faced Heron	*Egretta novaehollandiae*	x
	Willie Wagtail	*Rhipidura leucophrys*	x
	Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	x
Frogs			
	Common Froglet	*Crinia signifera*	x
	Southern Brown Tree Frog	*Litoria ewingii*	x
	Southern Bullfrog	*Limnodynastes dumerilii*	x
	Spotted Marsh Frog	*Limnodynastes tasmaniensis*	x
	Striped Marsh Frog	*Limnodynastes peronii*	x
	Whistling Tree Frog	*Litoria verreauxii*	x
Reptiles			
	Red bellied Black Snake	*Pseudechis porphyriacus*	x
	Weasel Skink	*Saproscincus mustelinus*	x

Legend: * = introduced, X = recorded in Project area during survey.

Appendix D: Likelihood of occurrence analysis of threatened flora

Common Name	Scientific Name	EPBC Act	FFG Act	DELWP Advisory List	Habitat preference	Last Record in the search region	Likelihood of occurrence within the Project area
Clover Glycine	*Glycine latrobeana*	VU	L	vu	Widespread but of sporadic occurrence and rarely encountered. Grows mainly in grasslands and grassy woodlands.	None	No suitable habitat in the Project area. No records in the search region. **Negligible**
Green-striped Greenhood	*Pterostylis chlorogramma*	VU	L	vu	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	No suitable habitat in the Project area. No records in the search region. **Negligible**
Grey Billy-buttons	*Craspedia canens*		L	en	Known in Victoria only from grassland (often bordering swamps) at low altitude between Cranbourne and Traralgon.	22/12/2004	No suitable habitat in the Project area. **Negligible**
Heath Platysace	*Platysace ericoides*			r	In Victoria confined to the coastal plain and foothills mostly between Moe and Orbost, usually occurring in dry forest, often with shallow, rocky soils.	1/09/2003	No suitable habitat in the Project area. **Negligible**
Maroon Leek-orchid	*Prasophyllum frenchii*	EN	L	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	No suitable habitat in the Project area. No records in the search region. **Negligible**
Matted Flax-lily	*Dianella amoena*	EN	L	en	Lowland grasslands, grassy woodlands, valley grassy forest and creeklines of herb-rich woodlands.	22/12/2004	No suitable habitat in the Project area. **Negligible**
River Swamp Wallaby-grass	*Amphibromus fluitans*	VU			Permanent swamps, lagoons, billabongs and dams.	None	Aquatic habitats in the Project area lacked a diversity of native species, and were located in an otherwise heavily disturbed landscape. Aquatic habitats were therefore not considered suitable to support this species. No records in the search region. **Low**
Southern Blue-gum	*Eucalyptus globulus subsp. globulus*			r	Typical subsp. globulus thought to occur in Victoria only in the area south of the Strzelecki Range	1/06/2017	No eucalypts that represented this or any other closely related species were observed in the Project area during the site survey. **Negligible**

Common Name	Scientific Name	EPBC Act	FFG Act	DELWP Advisory List	Habitat preference	Last Record in the search region	Likelihood of occurrence within the Project area
Spiral Sun-orchid	*Thelymitra matthewsii*	VU	L	vu	Widely distributed but rare, in coastal sandy flats or slightly elevated sites (to 400 m) in well-drained soils (sandy loams to gravelly limestone soils) in open forest. Plants colonise disturbed sites and slowly disappear as these sites stabilise.	None	No suitable habitat in the Project area. No records in the search region. **Negligible**
Strzelecki Gum	*Eucalyptus strzeleckii*	VU	L	vu	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.	19/10/2004	No eucalypts that represented this or any other closely related species were observed in the Project area during the site survey. **Negligible**
Swamp Everlasting	*Xerochrysum palustre*	VU	L	vu	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	No suitable habitat in the Project area. No records in the search region. **Negligible**
Swamp Fireweed	*Senecio psilocarpus*	VU		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	No suitable habitat in the Project area. No records in the search region. **Negligible**
Thick-lip Spider-orchid	*Caladenia tessellata*	VU		vu	Apparently confined to eastern Victoria from near-coastal heathy woodlands to open forests on well-drained sandy soils.	None	No suitable habitat in the Project area. No records in the search region. **Negligible**
Yarra Gum	*Eucalyptus yarraensis*			r	Endemic in Victoria. Extending west from Glengarry (near Traralgon) to Melbourne and north-west to Daylesford and Ararat.	1/09/2003	No eucalypts that represented this or any other closely related species were observed in the Project area during the site survey. **Negligible**

Legend: EPBC Act: CR = critically endangered, EN = endangered, VU = vulnerable; FFG Act: L=listed as threatened; DELWP Advisory list: en = endangered, vu = vulnerable, r=rare.
References: Australian Museum 2020; Birdlife Australia 2020; DAWE 2020a; DAWE 2020b; DELWP 2020a; VICFLORA 2020

Appendix E: Likelihood of occurrence analysis of threatened fauna

Common Name	*Scientific Name*	EPBC Act	FFG Act	DELWP Advisory List	Habitat preference	Last Record in the search region	Likelihood of occurrence within the Project area
Birds							
Australasian Bittern	*Botaurus poiciloptilus*	EN	L	en	Frequents reedbeds, and other vegetation in water such as cumbungi, lignum and sedges.	None	The area of tall sedges and rushes near the western boundary of the Project area (HZ 5) supports potential foraging habitat for this species. However, this area is disturbed and is disconnected from other significant aquatic habitats in the region. No records exist in the search region. The species is unlikely to regularly use or be reliant on this habitat. **Low**.
Australasian Shoveler	*Spatula rhynchotis*			vu	Found in all kinds of wetlands, preferring large undisturbed heavily vegetated freshwater swamps.	23/02/1991	No suitably large aquatic habitats occur in the Project area. **Low**
Australian Painted-snipe	*Rostratula australis*	EN	L	ce	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	No suitable aquatic habitats occur in the Project area. No records in the search region**. Negligible**
Black-faced Monarch	*Monarcha melanopsis*	M			Rainforest ecosystems, including tropical, subtropical and cool temperate rainforest	None	No suitable habitat in the Project area. No records in the search region. **Negligible**
Blue-billed Duck	*Oxyura australis*		L	en	Almost wholly aquatic. Non-breeding flocks congregate on large, deep open freshwater dams and lakes in autumn.	8/03/1994	No suitably large aquatic habitats occur in the Project area. **Low**
Caspian Tern	*Hydroprogne caspia*		L	nt	Widespread around the Australian coastline, and also occur inland along major rivers, especially in the Murray–Darling and Lake Eyre drainage basins.	1/07/1978	No suitable aquatic habitats occur in the Project area. **Negligible**
Common Greenshank	*Tringa nebularia*	M		*vu*	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	No suitable aquatic habitats occur in the Project area. No records in the search region**. Negligible**

Common Name	*Scientific Name*	EPBC Act	FFG Act	DELWP Advisory List	Habitat preference	Last Record in the search region	Likelihood of occurrence within the Project area
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	No suitable aquatic habitats occur in the Project area. No records in the search region. **Negligible**
Curlew Sandpiper	*Calidris ferruginea*	CR, M	L	en	Intertidal mudflats in sheltered coastal areas. Non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms.	None	No suitable aquatic habitats occur in the Project area. No records in the search region. **Negligible**
Eastern Curlew	*Numenius madagascariensis*	CR, M	L	vu	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	No suitable aquatic habitats occur in the Project area. No records in the search region. **Negligible**
Eastern Great Egret	*Ardea alba modesta*		L	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.	22/06/2019	The larger areas of aquatic habitat in the Project area support potential foraging habitat for this species. **Moderate**.
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	Mostly aerial. Unlikely to rely on any habitats in the Project area. No records in the search region. **Negligible**
Grey Falcon	*Falco hypoleucos*	VU	L	en	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	No suitable habitat in the Project area. No records in the search region. **Negligible**
Hardhead	*Aythya australis*			vu	Found in freshwater swamps and wetlands and occasionally in sheltered estuaries	26/04/2017	No suitably large aquatic habitats occur in the Project area. **Low**

Common Name	*Scientific Name*	EPBC Act	FFG Act	DELWP Advisory List	Habitat preference	Last Record in the search region	Likelihood of occurrence within the Project area
Latham's Snipe	*Gallinago hardwickii*	M		nt	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)	1/09/1980	The area of tall sedges and rushes near the western boundary of the Project area (HZ 5) supports potential foraging habitat for this species. However, this area is disturbed and is disconnected from other significant aquatic habitats in the region. No records exist in the search region for the last 40 years. The species is unlikely to regularly use or be reliant on this habitat. **Low**.
Little Egret	*Egretta garzetta*		L	en	Tidal mudflats, saltwater and freshwater wetlands, and mangroves.	17/09/2018	No preferred aquatic habitat for this species occurs in the Project area. **Low**
Musk Duck	*Biziura lobata*			vu	Range of wetland habitats	4/03/1995	No suitably large aquatic habitats occur in the Project area. **Low**
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	No suitable aquatic habitats occur in the Project area. No records in the search region**. Negligible**
Painted Honeyeater	*Grantiella picta*	VU	L	vu	Found in dry open forests and woodlands, and is strongly associated with mistletoe.	None	No suitable habitat in the Project area. No records in the search region. **Negligible**
Pectoral Sandpiper	*Calidris melanotos*	M		nt	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	No suitable aquatic habitats occur in the Project area. No records in the search region**. Negligible**
Plumed Egret	*Ardea intermedia plumifera*		L	en	Prefers freshwater swamps, billabongs, floodplains and wet grasslands with dense aquatic vegetation, and is only occasionally seen in estuarine or intertidal habitats.	18/03/2018	No suitable aquatic habitats occur in the Project area. **Negligible**
Powerful Owl	*Ninox strenua*		L	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.	11/07/1981	No suitable habitat in the Project area. **Negligible**

Common Name	*Scientific Name*	EPBC Act	FFG Act	DELWP Advisory List	Habitat preference	Last Record in the search region	Likelihood of occurrence within the Project area
Regent Honeyeater	*Anthochaera phrygia*	CR	L	ce	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	No suitable habitat in the Project area. No records in the search region. **Negligible**
Rufous Fantail	*Rhipidura rufifrons*	M			Inhabits wet sclerophyll forests, often in gullies dominated by tall eucalypts, usually with a dense shrubby understorey and ferns.	1/03/1980	No suitable habitat in the Project area. **Negligible**
Satin Flycatcher	*Myiagra cyanoleuca*	M			Inhabits heavily vegetated gullies in eucalypt-dominated forests and taller woodlands	1/03/1980	No suitable habitat in the Project area. **Negligible**
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.	1/12/1978	No suitable aquatic habitats occur in the Project area. **Negligible**
Swift Parrot	*Lathamus discolor*	CR	L	en	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	Very limited number of Yellow Gum (feed tree) were planted in the Project area. Limited foraging habitat. No records in the search region. **Negligible**
White-bellied Sea-Eagle	*Haliaeetus leucogaster*		L	vu	Distributed along the coastline of mainland Australia, also extending inland along some of the larger waterways.	23/06/1981	No suitable aquatic habitats occur in the Project area. **Negligible**
White-throated Needletail	*Hirundapus caudacutus*	VU, M	L	vu	Almost exclusively aerial, over a wide variety of habitats.	2/03/1981	Mostly aerial. Unlikely to rely on any habitats in the Project area. **Negligible**
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	No suitable aquatic habitats in the Project area. **Negligible**
Mammals							
Broad-toothed Rat	*Mastacomys fuscus mordicus*	VU	L	en	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	No suitable habitat in the Project area. No records in the search region. **Negligible**

Common Name	*Scientific Name*	EPBC Act	FFG Act	DELWP Advisory List	Habitat preference	Last Record in the search region	Likelihood of occurrence within the Project area
Grey-headed Flying-fox	*Pteropus poliocephalus*	VU	L	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. Two known Flying Fox camps occur in the greater Melbourne region including one at Yarra Bend and one at Doveton.	None	Lack of suitable roosting or foraging habitat in the Project area. Limited number of planted eucalypts in south east of site unlikely to be regularly utilised by the species. No records in the search region. **Low**
Long-nosed Potoroo	*Potorous tridactylus trisulcatus*	VU	L	nt	Occurs in a variety of wooded habitats in six known populations across Victoria.	None	No suitable habitat in the Project area. No records in the search region. **Negligible**
Southern Brown Bandicoot	*Isoodon obesulus obesulus*	EN	L	nt	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	No suitable habitat in the Project area. No records in the search region. **Negligible**
Southern Greater Glider	*Petauroides volans*	VU	L	vu	Typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows.	6/09/1915	No suitable habitat in the Project area. No records in the search region for >100 years. **Negligible**
Spot-tailed Quoll	*Dasyurus maculatus maculatus*	EN	L	en	Temperate and subtropical rainforests in mountain areas wet sclerophyll forest lowland forests open and closed eucalypt woodlands.	None	No suitable habitat in the Project area. No records in the search region. **Negligible**
Frogs							
Green and Golden Bell Frog	*Litoria aurea*	VU		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	The Project area is beyond the known distribution for the species (species is known from further east). Species not recorded during frog surveys undertaken in the Project area. **Negligible**

Common Name	*Scientific Name*	EPBC Act	FFG Act	DELWP Advisory List	Habitat preference	Last Record in the search region	Likelihood of occurrence within the Project area
Growling Grass Frog	*Litoria raniformis*	VU	L	en	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	Farm dams, drains and low-lying areas of the Project area initially were considered to support potential habitat for the species. Presence of several other frog species recorded in these areas. Closest records of Growling Grass Frog exist >5km from the Project area. Targeted surveys undertaken for Growling Grass Frog in all areas of potentially suitable habitat in the Project area, in which no Growling Grass Frog were recorded during optimal conditions. **Low.**
Fish							
Australian Grayling	*Prototroctes maraena*	VU	L	vu	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	No suitable aquatic habitat. No records in the search region. **Negligible**
Dwarf Galaxias	*Galaxiella pusilla*	VU	L	en	Slow flowing, still shallow permanent and temporary freshwater habitats.	None	Shallow drains in the Project area initially considered to support potential habitat for the species. Closest records of Dwarf Galaxias exist 6.1 km from the Project area. Targeted Dwarf Galaxias surveys were undertaken by Aquatica Environmental in areas of potential habitat in the Project area, in which no Dwarf Galaxias were recorded during optimal conditions. **Low**.
Flinders Pygmy Perch	*Nannoperca sp. 1*			vu	East from LaTrobe River	29/11/2001	No suitable aquatic habitat. No records in the search region. **Negligible**
Invertebrates							
Golden Sun Moth	*Synemon plana*	CR	L	ce	Occurs in grassy areas in the greater Melbourne region, mainly in areas dominated by native grasses such as wallaby grass and spear grass, but also in areas of introduced grasses such as Chilean Needle-grass.	None	No extensive areas of native grassland and/or Chilean Needle grass occur in the Project area. No records in the search region. **Low**.

Legend: EPBC Act: CR = critically endangered, EN = endangered, VU = vulnerable, M = migratory; FFG Act: L=listed as threatened; DELWP Advisory list: cr=critically endangered, en = endangered, vu = vulnerable, nt = near threatened. **References**: Australian Museum 2020; Birdlife Australia 2020; DAWE 2020a; DAWE 2020b; DELWP 2020a; VICFLORA 2020.

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

Australian Government
Department of the Environment and Energy

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.

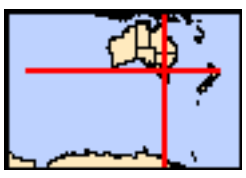
Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 21/07/20 15:31:58

This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates

Buffer: 5.0Km



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:	30
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:	20
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:	36
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 known 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 may 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
Insects		
Synemon plana		
Golden Sun Moth [25234]	Critically Endangered	Species or species habitat may 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 known 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
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

Name	Status	Type of Presence within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat likely to occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat may 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 known 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 may 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
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 alba		
Great Egret, White Egret [59541]		Species or species habitat known 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 may 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

Name	Threatened	Type of Presence
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 known 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
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

Name	Status	Type of Presence
		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
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
Feral deer Feral deer species in Australia [85733]		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

Name	Status	Type of Presence
		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 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

-38.2575 146.41944

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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Appendix G: Growling Grass Frog survey locations

Legend

- Survey area
- Growling Grass Frog Survey Locations
- Aquatic habitat
- Morwell Power Station
- Road
- Rail
- Watercourse

Data Source: VicMap (2020); Aurecon (2020)

Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community.

Date: 23/03/2021 Version: 1

Author: AL

C:\Users\ada.lan\Aurecon Group\Melbourne Geospatial - Project Work\J0067_509891_Morwell BESS Phase 1\Project\509891 Morwell BESS project - Ecology

A3 scale: 1:4,348

0 100 200 Metres

Job No: 509891

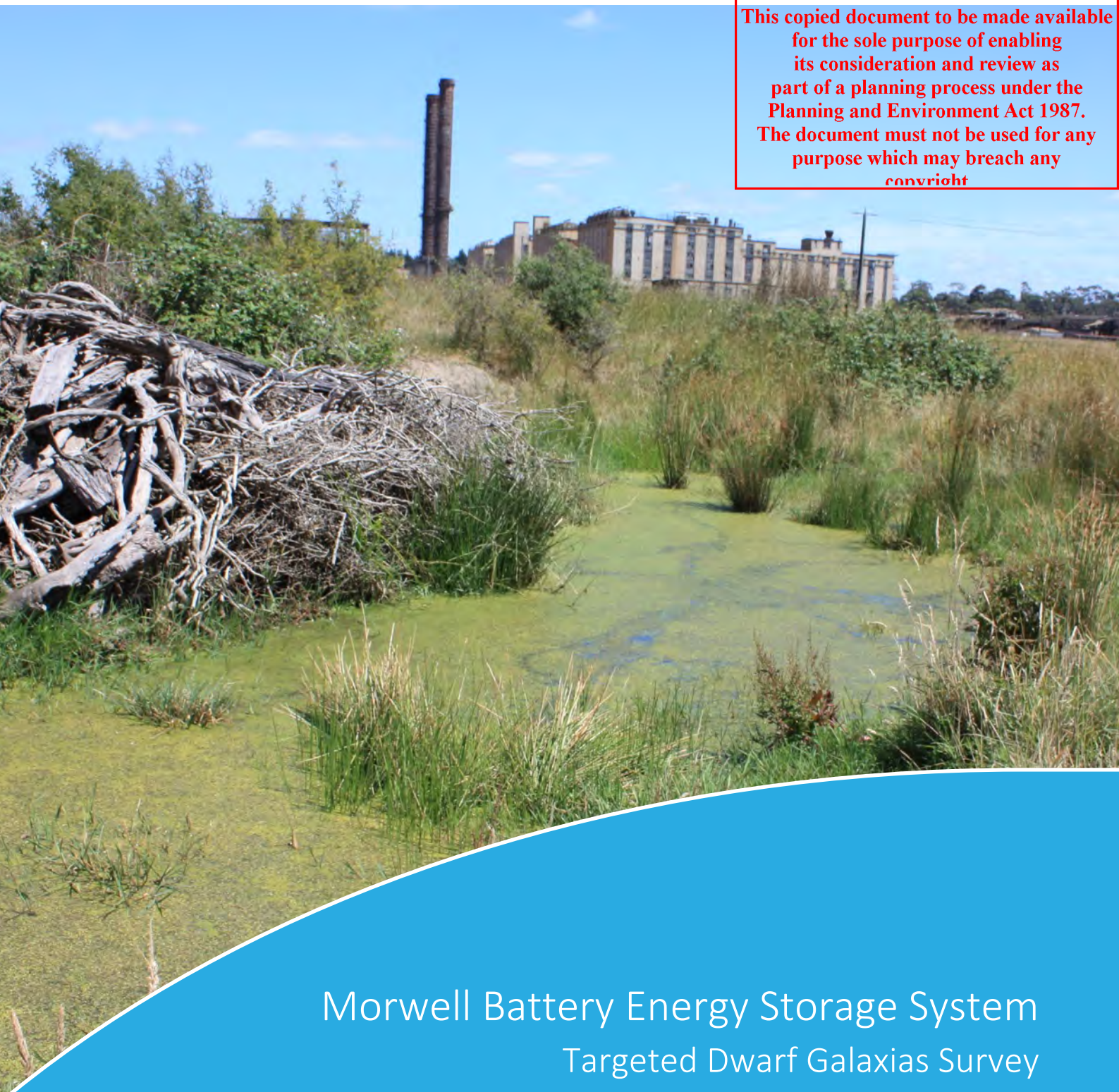
Coordinate System: GDA 1994 MGA Zone 55

Latrobe Valley BESS project

Appendix G – Growling Grass Frog survey locations

Appendix H: Dwarf Galaxias targeted survey report

AQUATICA ENVIRONMENTAL



Morwell Battery Energy Storage System

Targeted Dwarf Galaxias Survey

Draft Report Prepared for Tilt Renewables

January 2021

AQUATIC ECOSYSTEM & ENVIRONMENTAL MANAGEMENT CONSULTING

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Cover Photograph: Aurecon Habitat Zone 1, December 2020 (T. Curmi)

Citation: *Aquatica Environmental (2021). Morwell Battery Energy Storage System Targeted Dwarf Galaxias Survey. Draft report prepared for Tilt Renewables.12 January 2021*.

Version	Author	Reviewer	Issued To	Date Issued
Draft	A Jenkin	S Jenkin J Sullivan	J Sullivan	14/1/2021
Final				

Contents

Tables

Figures

Photos

1. INTRODUCTION

1.1 Project Background

Aquatica Environmental was engaged by Tilt Renewables to undertake a targeted survey for the state and federally protected Dwarf Galaxias (*Galaxiella pusilla*) at the site of proposed new Battery Energy Storage System (BESS), on Monash Way Road, Morwell (Figure 1).

It is understood that Aurecon Group (Aurecon) are currently completing a flora and fauna assessment of the site. Aurecon's assessment identified a number of areas, or aquatic habitat "zones" on the site as having potential Dwarf Galaxias habitat (Figure 1). Based on this assessment Aurecon recommended that Tilt Renewables consult with a species expert to determine the likelihood of presence and potential impacts of the proposed project on Dwarf Galaxias, if found to be present.

Figure 1 BESS site and identified aquatic habitat (Source: Aurecon)

1.2 Scope of Work

The scope of this assessment was to undertake a two-day (including overnight trapping) targeted survey for Dwarf Galaxias in aquatic and semi-aquatic (ephemeral) habitat on and near the site.

Where suitable habitat was identified a survey of the habitat undertaken in accordance with the Dwarf Galaxias-specific methods outlined in the Dwarf Galaxias Species Profile and Threats Database (SPRAT; DoE 2020), Survey Guidelines for Australia's Threatened Fish (DSEWPaC 2004) and Biodiversity Precinct Structure Planning Kit (BPSPK, DSE 2010).

1.3 Project Aim

The aim of the survey was to:

- Determine the likelihood of Dwarf Galaxias being present on, or within a reasonable range of potential impact of the site;
- Assess the potential impacts to Dwarf Galaxias and implications for the project if Dwarf Galaxias were found to be present or likely present; and
- Provide recommendations for 'next steps' should Dwarf Galaxias be found present or likely present on or near the site.

2. SPECIES DESCRIPTION

2.1 General Description

Dwarf Galaxias are a small freshwater fish endemic to south-eastern Australia that occur only in Victoria, South Australia and Tasmania. Typical maximum lengths are 40 millimetres (mm) for males and 34 mm for females with records up to 48 mm (Allen et. al. 2003) (Photo 1).

Dwarf Galaxias are a non-migratory species adapted primarily to wetland environments (Saddlier et. al. 2010). Within wetland-type environments Dwarf Galaxias have a wide range of habitat requirements but typically occur in slow flowing, still, shallow, permanent and temporary, freshwater to slightly brackish waterways including wetlands, swamps, the backwaters of streams and creeks, drains and ditches, usually with dense aquatic, emergent or flooded vegetation (DEE 2019; Allen et. al. 2003 and Saddlier et. al. 2010). The species also occurs in slower flowing lotic habitats where there is sufficient aquatic and emergent vegetation to provide harbour from higher flows. Tolerant of a wide range of variations in temperature, salinity and pH, they are only found at lower elevations.

The species can occur in habitats that are ephemeral and partially or completely dry up during summer, where the wetlands/waterways rely on seasonal flooding and linkages to more permanent waterbodies, including connectivity to rivers and creeks. Dwarf Galaxias are also understood to seek refuge in freshwater crayfish/yabby burrows and are capable of aestivating (dormancy) in damp mud during drier periods (Coleman et. al. 2019; McDowall 1996 and Inland Fisheries Service 2000 in DEE 2019).

The National Recovery Plan for Dwarf Galaxias (DEE 2019; Saddlier et. al. 2010) notes that Dwarf Galaxias have different habitat requirements depending on life stage and season including:

- Transient habitat: ephemeral habitat that retains water for less than one month following inundation and is mostly used for dispersal.
- Spawning habitat: ephemeral habitat with abundant aquatic or submerged vegetation that retains water for 1-3 months following inundation and during the May to October breeding season.
- Short-term refuge habitat: ephemeral water bodies that retain water for more than three months but do not have the attributes to support a permanent population.
- Long-term refuge habitat: permanent water bodies that provide permanent refuge for Dwarf Galaxias populations and where source stock can disperse and repopulate transient, spawning and short-term refuge habitats (i.e. those listed above).

Dwarf Galaxias spend their entire life cycle in freshwater environments and their diet consists primarily of small aquatic macroinvertebrates. Spawning occurs in late winter to spring (mostly April through to October) when females lay from 65 to 250 eggs on the underside of aquatic or submerged vegetation or on hard surfaces (DEE 2019; Saddlier et. al. 2010). They are a short-lived fish with only one year's age-class having been observed and adults dying after spawning, indicating they are an annual species (Humphries 1986 in DEE 2019).

Photo 1 Dwarf Galaxias adult male (lower left) and females (top and right) from the control site during a previous survey (Photo: A. Jenkin)

2.2 Legislative Status

Dwarf Galaxias are listed as:

- Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- Endangered (Barwon to Mitchell Rivers) on the DELWP Advisory List of Threatened Vertebrate Fauna (DEPI 2013);
- Listed as Threatened under the FFG Act (DELWP 2017);
- Endangered on the IUCN Red List of Threatened Species (Coleman et. al. 2019); and
- Listed as 'Vulnerable' on the Australian Society for Fish Biology threatened species list (ASFB 2016).

2.3 Distribution

Although the species is still widely distributed across south-eastern Australia (Figure 2), populations are fragmented and patchy across the landscape (Saddlier et. al. 2010). A decline in their abundance has been attributed to habitat loss due to wetland drainage, alterations to flow regimes, climate change, habitat damage (i.e. grazing and agriculture) and competition and predation by introduced fish species such as the Eastern Gambusia (*Gambusia holbrooki*, also referred to as Mosquito fish) (DEE 2019).

In the Morwell/BESS region the nearest and most recent records are located approximately 6.1 kilometres northwest where the Princess freeway crosses the Morwell River and approximately 6.8 kilometres northeast (Figure 3). Both of these records were made between 2018 and 2020. The site to the North East of the BSF also acted as the control site for this current survey, given there is a known population of Dwarf Galaxias residing at the site.

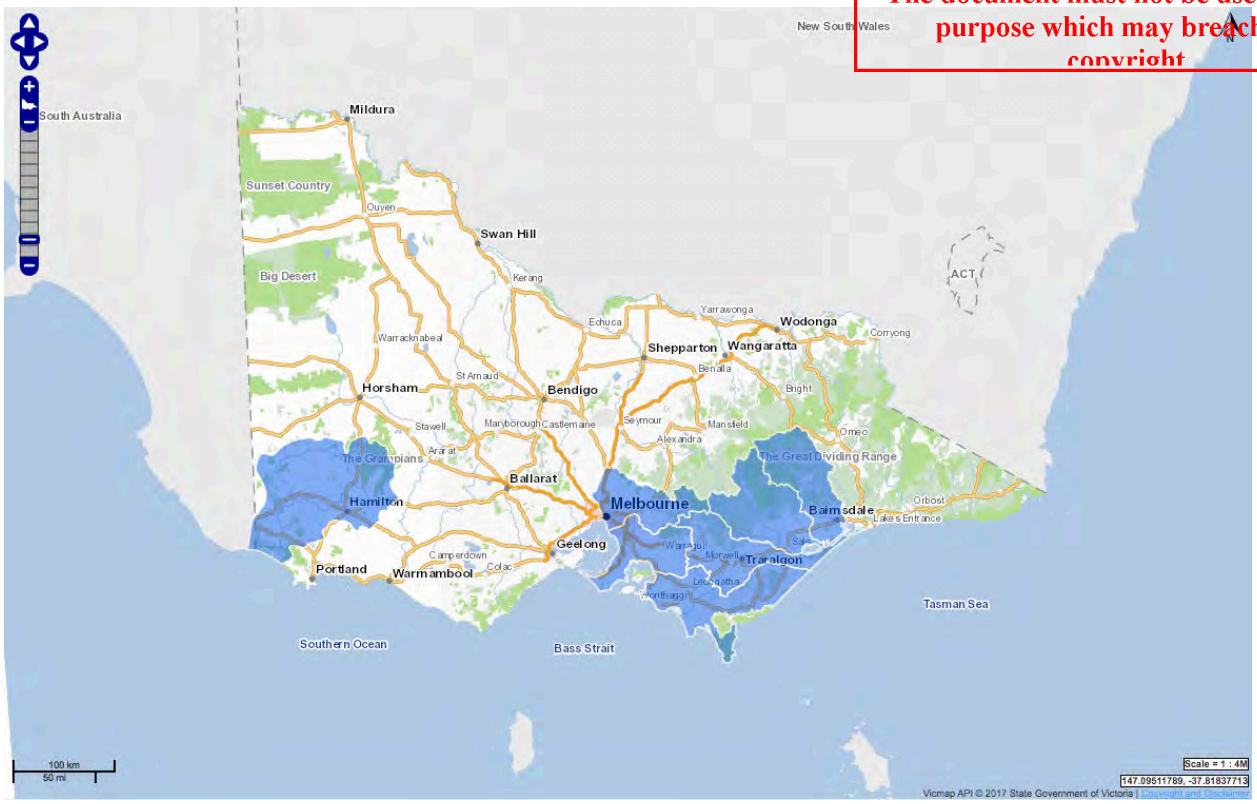

Figure 2 Dwarf Galaxias distribution on south-eastern Australian mainland (VBA 2020)

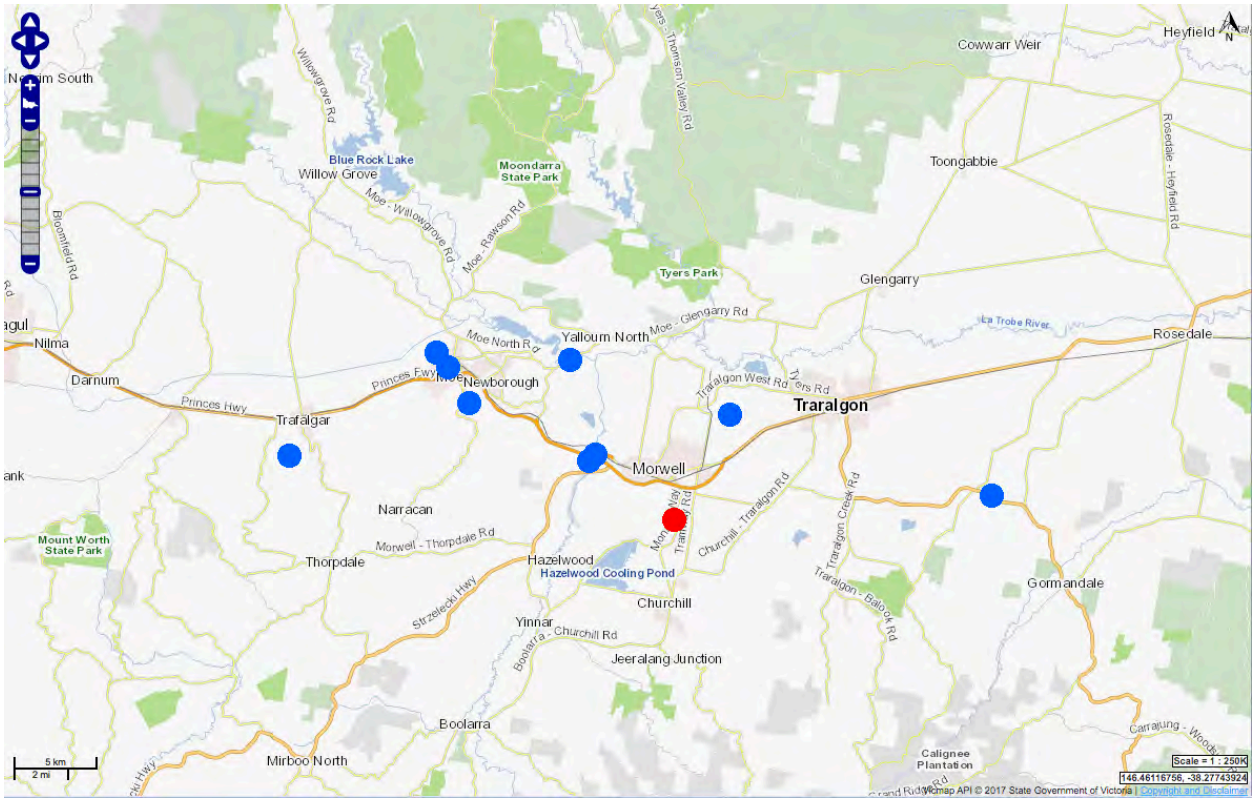

Figure 3 Dwarf Galaxias records (blue dots) in proximity to the BESS (red dot) (VBA 2020)

2.4 Key Threats

Major threats to the Dwarf Galaxias in the region include (DEE 2019):

- Degradation and loss of habitat throughout its range, caused by wetland drainage, wetland inundation, fouling by livestock, ploughing, concreting of waterways, chemical pollution and Carp (*Cyprinus carpio*) associated degradation.
- Alteration to flow regime and reduced connectivity throughout its range, caused by dam and levee construction, surface and groundwater abstraction, drawdown associated with forestry/revegetation.
- Drying caused by climate change, reducing suitable habitat and connectivity throughout its range.
- Competition and predation by legally and illegally introduced aquatic species such as the Eastern Mosquitofish, Brown Trout (*Salmo trutta*), Rainbow Trout (*Onycorhynchus mykiss*) and Redfin (*Perca fluviatilis*).
- Illegal collection leading to localised depletions, possibly intensifying with increased community awareness.

3. METHODOLOGY

3.1 Survey Timing

Aquatica Environmental undertook the two-day survey on the 10th and 11th December 2020.

Weather on the days of survey was fine and cool to mild with a minimum nigh time temperature of 11.5°C and maximum daytime of 22.5 °C (BOM 2020 at Latrobe Valley). Approximately 15.4 mm of rain fell broadly across the week prior to the survey, with a daily maximum of 6.4 mm falling on the 8th December. However, ephemeral habitats on and near the site appeared to be drying rapidly at the time of the survey.

The seasonal timing of the survey corresponded with the end of the Dwarf Galaxias breeding season, were new decent numbers of sub/young adults would be expected to be observed.

3.2 Survey Sites

Nine sites were established on the BESS, four in Bennett's Creek abutting and near the site and a single reference or 'control' site. The control site was used as its contains a known Dwarf Galaxia population, which was most recently confirmed by Aquatica Environmental during an unrelated survey in July 2020 (Aquatica Environmental 2020).

3.3 Survey Methodology

Dwarf Galaxias were surveyed using standard methods as outlined in the Dwarf Galaxias Species Profile and Threats Database (SPRAT; DoE 2020), Survey Guidelines for Australia's Threatened Fish (DSEWPaC 2011) and Biodiversity Precinct Structure Planning Kit (DSE 2010) including:

- Hand-held dip-netting, sampling for adult and juvenile Dwarf Galaxias in and around areas of suitable habitat;
- Overnight setting of standard bait traps (unbaited); and
- Visual survey for larval and juvenile fish by placing water collected from the waterway into a large white tray where the small (<5mm) fish can be observed.

Sampling was undertaken through the range of suitable habitat identified at each site, focusing primarily on habitat that would predominantly suit Dwarf Galaxias (i.e. habitat with dense aquatic and/or emergent vegetation).

All fish caught were identified and enumerated. All native fish were returned to the waterway, as close to the point of capture as is practicable. Any species listed as noxious aquatic species (NAS) under Section 75 of the *Fisheries Act 1995* (Fisheries Act) were euthanised using the fish anaesthetic Aqui-S and their carcasses removed for appropriate disposal.

The surveys were undertaken in accordance with the following approvals and permits held by Aquatica Environmental:

- Department of Economic Development, Jobs, Transport and Resources Wildlife and Small Institutions Animal Ethics Committee approval (No. 11.18);
- Scientific procedures Fieldwork Licence (No. SPFL20394)
- *Fisheries Act 1995* (Fisheries Act) General Research permit (No. RP1312);
- *Wildlife Act 1975* research permit (No. 10008802); and
- *Flora and Fauna Guarantee Act 1988* (FFG Act) permit to "take protected fish" (No. 10008802).

N

Spatial Reference
Name: GDA2020 MGA Zone 55
PCS: GDA2020 MGA Zone 55
GCS: GDA2020
Datum: GDA2020
Projection: Transverse Mercator

- Study Boundary
- Control Site
- Survey Site
- Structure
- Connector or drain
- Stream
- River
- Subject to inundation
- Pondage
- Watercourse area
- Lake

Tilt Renewables

BESS Site

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4. RESULTS

4.1 Site Habitat

At each survey site the habitat characteristics and suitability for Dwarf Galaxias was assessed. The results and site reference photos are outlined in Table 1.

Overall, there were aspects of Dwarf Galaxias habitat present on the site and in Bennett's Creek, though none to a degree that could potentially support a population of the species. However, there was amenable habitat for some life stages, such as dispersal (should there be a population upstream that disburses down Bennett's Creek) or breeding in the more ephemeral and complex vegetation sites (i.e. maybe Site 1, 3 and 4).

The habitat at the control site was ideal for the species, being that it was a deeper water body, likely never fully dries, was sheltered and shaded, heavily vegetated and semi-connected to a more permanent waterway. Comparatively, the BESS and Bennett's Creek sites were sub-standard to the control site.

Table 1 Dwarf Galaxias habitat survey results

Site No.	Aurecon Site No.	Habitat Description	Reference Photographs
1	HZ1	Shallow depression Some standing water Likely to be permanent water No aquatic plants Covered in floating Pondweed (*Lemna minor*).	
2	HZ2	Small drain Mostly dry Choked with Bullrush (*Typha* sp.) Some crayfish chimneys present	

Site No.	Aurecon Site No.	Habitat Description	Reference Photographs
3	HZ3	Small drain Mostly dry Choked with Bullrush (*Typha* sp.) Some crayfish chimneys present	
4	HZ4	Small dam with permanent water Used to water cattle Evidence of cattle damage to substrate Mostly choked with Bullrush (*Typha* sp.) with some open water Edges with *Juncus* sp. and *Eleocharis* sp. One aquatic plant (see photos) Tadpoles & some aquatic macroinvertebrates No fish	
5	HZ5	Shallow depression Small amount of standing water – will dry very soon No aquatic plants Covered with water couch grass	
6	HZ6	Small dam with permanent water Used to water cattle Some Bullrush (*Typha* sp.) on edges and small clump in middle Some edges with water couch Evidence of cattle damage to substrate	

Site No.	Aurecon Site No.	Habitat Description	Reference Photographs
7	NA	Shallow depression Small amount of standing water – will dry very soon No aquatic plants Covered with water couch grass and other grasses/weeds	
8	NA	Small drain Almost dry Choked with Bullrush (*Typha* sp.)	
9	NA	Shallow depression Completely dry No aquatic plants	
10	NA	Bennett's Creek Small deep section Concrete lined and choked with Bullrush	
11	NA	Footbridge over Bennett's Creek Completely choked with Bullrush Small amount of standing water – will dry very soon	

Site No.	Aurecon Site No.	Habitat Description	Reference Photographs
12	NA	Bennett's Creek Upstream from site – at road bridge Almost dry Some Phragmites australis	
13	NA	Bennett's Creek Downstream from site - at road bridge Concrete lined drain Standing water with some habitat (Bullrush & water couch)	
Control	NA	Deep wetland/sink that lies off the main channel of a tributary of Wades Creek Dense emergent vegetation including *Persicaria* sp., *Typha* sp. and overhanging terrestrial grass Dense riparian overstory offering shading and shelter	

4.2 Dwarf Galaxias Targeted Survey

No Dwarf Galaxias were recorded at the 13 survey sites located on or near the BESS (i.e. Sites 1 to 13). However, a small number of Dwarf Galaxias were recorded/reconfirmed at the control site (Photo 2). The ease of detection at the control site, with no detection at any of the sites on or near the BESS, despite greater survey effort, indicated a low likelihood of presence on/near the BESS site.

The only other fish recorded during the survey was the Fisheries Act listed as noxious Mosquitofish (also known as Eastern Gambusia or Plague Minnow) at the control site (i.e. again not on/near the BESS).

Table 3 provides a summary of the fish and other aquatic fauna recorded at each site during the survey.

Table 2 Dwarf Galaxias and other aquatic fauna recorded during the survey

Site No.	FIsh		Amphibians	Aquatic Invertebrates	
	Dwarf Galaxias	Mosquitofish (*Gambusia holbrooki*)	Tadpoles	Aquatic Micro/Macro Invertebrates	Burrowing Crayfish Chimneys
1	×	-	✓	✓	-
2	×	-	-	-	✓
3	×	-	-	-	✓
4	×	-	✓	✓	-
5	×	-	✓	✓	-
6	×	-	✓	✓	-
7	×	-	✓	✓	-
8	×	-	-	-	-
9	×	-	-	-	-
10	×	-	-	✓	-
11	×	-	-	-	-
12	×	-	-	-	-
13	×	-	-	✓	-
Control	✓ 2	✓	✓	✓	-

Key: recorded =✓; not recorded =×/-

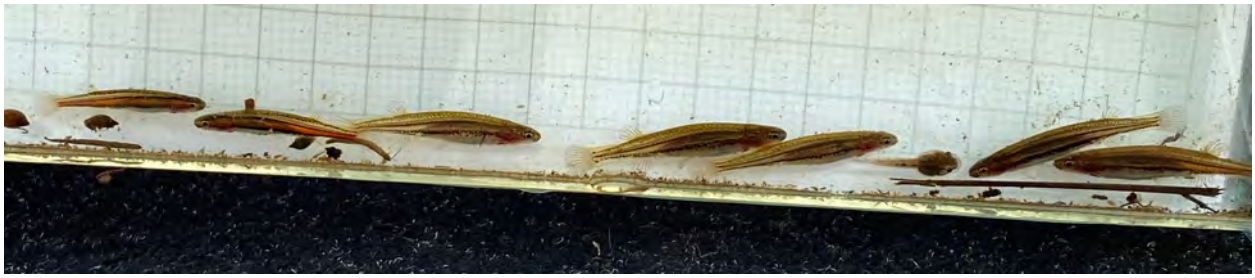

Photo 2 Dwarf Galaxias from control site

5. SUMMARY

No Dwarf Galaxias or any other fish species were recorded at the nine survey sites on the BESS or the four sites established in Bennet's Creek near the BESS, despite significant survey effort being deployed. Aspects of Dwarf Galaxias habitat were found to be present, but not to a degree that could potentially support a population of the species. Therefore, it is our assessment that Dwarf Galaxias are unlikely to occur on or near the BESS site.

As noted in Section 2.3, in the Morwell/BESS region the nearest and most recent records are located approximately 6.1 kilometres northwest where the Princess freeway crosses the Morwell River and approximately 6.8 kilometres northeast. Both of these records were made between 2018 and 2020 and in catchments unrelated to Bennet's Creek.

Further, a survey of a known population (i.e. the control site) reconfirmed Dwarf Galaxias were present and validated that the survey methods and effort deployed was more than sufficient to detect the species if present.

Accordingly, it is highly unlikely that development of the BESS site could reasonably result in a significant impact Dwarf Galaxias and/or their habitat.

Based on the findings of this assessment there are no implications or the proposed works under state for federal policy or legislation relating to Dwarf Galaxias and no further surveys or actions relating to the species are considered warranted at this time.

However, irrespective of these findings, any works on the BESS site should include standard environmental management measures to mitigate potential impacts to downstream surface water quality such as controls for the discharge of sediments, chemicals and fuels from BESS site and to negate any impacts or changes to downstream surface water flows and hydrology to Bennett's Creek and its downstream receiving waterways.

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