

# Hopkins and Settlement Road (Grid Connection), Fulham

## Flora and Fauna Assessment

**Prepared for Solis Renewable  
Energy Pty Ltd** c/- Ricardo Energy,  
Environment & Planning

September 2021  
Report No. 20138.2 (1.1)



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## 1. Executive summary

Nature Advisory Pty Ltd undertook a flora and fauna assessment of a 2.56-hectare area of land, comprising a portion of the eastern and western road reserves of Settlement Road, Fulham. The construction of a grid connection to the Fulham solar farm was proposed for this land, herein referred to as the ‘study area’. The study area is bordered by the Princes Highway to the north and farmland to the south, east and west.

Most vegetation in the study area consisted of introduced pasture grasses with herbaceous weeds interspersed throughout. Native patches occurred in the form of modified grassland, primarily on the eastern road reserves, and modified wetland along the western road reserves. Fauna habitat consisted of modified grassland and smaller sections of wetland restricted to drainage channels. No flora, fauna or ecological communities listed under the EPBC Act or FFG Act were recorded and there are no implications under either of these Acts for the proposed development.

The following native vegetation was recorded in the study area:

- 12 patches of native vegetation (absent of large trees), equating to a total extent of 0.201 hectares that comprised the following:
  - 10 patches of Latrobe Valley Plains Grassland (EVC 132\_61); and
  - 2 Patches of Plains grassy Wetland (EVC 125).

The composition of these vegetation classes is described in Table 1.

The final placement of the Fulham solar farm grid connection based on the development plan provided demonstrates that there will be no impacts to native vegetation and therefore a permit to clear vegetation under Clause 52.17 of the Victorian Planning Scheme will not be required for this project. There are no associated offset requirements. There are no implications under the EPBC Act, FFG Act or EE Act for this project.

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

Application requirement		Response
1.	Information about the native vegetation present	See Section 5.2
2.	Topographic and land information relating to the native vegetation present	See Section 5.1
3.	Recent, dated photographs of the native vegetation present	See Appendix 4
4.	Details of any other native vegetation approved to be removed or that was removed without the required approvals, on the same property or on contiguous land in the same ownership as the applicant, in the five-year period before the application for a permit is lodged	N/A
5.	An avoid and minimise statement	See Section 6.2.1

Application requirement		Response
6.	A copy of any Property Vegetation Plan contained within an agreement made pursuant to section 69 of the <i>Conservation, Forests and Lands Act 1987</i> that applies to the native vegetation to be removed	N/A
7.	Where the removal of native vegetation is to create defensible space, a written statement explaining why the removal of native vegetation is necessary  This statement is not required when the creation of defensible space is in conjunction with an application under the Bushfire Management Overlay	N/A
8.	If the application is under Clause 52.16, a statement that explains how the proposal responds to the Native Vegetation Precinct Plan considerations (at decision guideline 8)	N/A
9.	An offset statement providing evidence that an offset that meets the offset requirements for the native vegetation to be removed has been identified and can be secured in accordance with the Guidelines	N/A

Additional requirements for applications in the Detailed assessment pathway		
Application requirement		Response
10.	<p>A site assessment report of the native vegetation present, including:</p> <ul style="list-style-type: none"> <li>▪ A habitat hectare assessment of any patches of native vegetation, including the condition, extent (in hectares), Ecological Vegetation Class and bioregional conservation status</li> <li>▪ The location, number, circumference (in centimetres measured at 1.3 metres above ground level) and species of any large trees within patches</li> <li>▪ The location, number, circumference (in centimetres measured at 1.3 metres above ground level) and species of any scattered trees, and whether each tree is small or large</li> </ul>	See Section 5.2.1, Appendix 2

## 2. Introduction

Ricardo Energy, Environment & Planning engaged Nature Advisory Pty Ltd to conduct a flora and fauna assessment of a 2.56-hectare area of land in Fulham. The specific area investigated, referred to herein as the 'study area', comprised a portion of the eastern and western road reserves, adjacent to Settlement Road, Fulham. The construction of a grid connection to the Fulham solar farm was proposed for the study area.

This investigation was commissioned to provide information on the extent and condition of native vegetation in the study area according to Victoria's *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017a), herein referred to as 'the Guidelines', and any potential impacts on flora and fauna matters listed under the state *Flora and Fauna Guarantee Act 1988* (FFG Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This report outlines any implications under relevant national, state and local legislation and policy frameworks.

Specifically, the scope of the investigation included the following:

- A site survey involving:
  - Characterisation and mapping of native vegetation on the site, as defined in Victoria's *Guidelines for the removal, destruction or lopping of native vegetation* (the 'Guidelines');
  - Assessment of native vegetation in accordance with the Guidelines, including habitat hectare assessment and/or scattered tree assessment;
  - Compilation of flora and fauna species lists for the site;
  - Assessment of the nature and quality of native fauna habitat; and
  - Assessment of the likelihood of occurrence of EPBC Act- and *Flora and Fauna Guarantee Act 1988* (FFG Act)-listed flora, fauna and communities on the site.
- A report including the following:
  - A statement of the methods used and sources of information for the investigation, including any limitations, where applicable;
  - The results of the review of existing information and site survey, documenting the native vegetation and fauna habitat on the site;
  - A map of the site showing the results of the assessment based on aerial photographs obtained through *NearMap*;
  - A determination of the extent of any proposed native vegetation removal based on one development layout (to be provided by Solis in MGA coordinates);
  - A *Native Vegetation Removal* (NVR) report identifying any native vegetation removal, offset requirements and assessment pathway for a permit;
  - Discussion of the implications of the findings for the proposed use of the land, specifically addressing relevant legislative and policy requirements; and
  - Recommendations for mitigation and management strategies, and any further investigation required.

This report is divided into the following sections:

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

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

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

**Section 6** discusses the proposed impacts of the project.

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

This investigation was undertaken by a team from Nature Advisory comprising Gael Campbell-Young (Senior Ecologist & Project Manager), Arend Kwak (Botanist) and Felicity Smith (Botanist).

## 3. Planning and legislative considerations

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

### 3.1. Local planning provisions

The study area is located within the Wellington local government area and is currently zoned Farming Zone in the Wellington Planning Scheme.

The study area is located within a Bushfire-prone Area.

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

### 3.2. Overlays

No overlays relevant to this investigation cover the study area.

### 3.3. State planning provisions

State planning provisions are established under the *Victorian Planning and Environment Act 1987*.

Clause 52.17 of all Victorian Planning Schemes states that:

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

A permit is not required if:

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

#### 3.3.1. Exemptions

No exemptions to Clause 52.16 are relevant to this project.

#### 3.3.2. Application requirements

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

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

- *Assessor's handbook – applications to remove, destroy or lop native vegetation* (Version 1.1) (DELWP 2018a).
- Statewide biodiversity information maintained by DELWP.

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

#### 3.3.3. Referral to DELWP

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



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

- The impacts to native vegetation are in the Detailed Assessment Pathway;
- A property vegetation plan applies to the site; or
- The native vegetation is on Crown land that is occupied or managed by the responsible authority.

### 3.4. EPBC Act

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

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

Implications under the EPBC Act for the current proposal are discussed in Section 6.3.

### 3.5. FFG Act

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

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

Implications under the FFG Act for the current proposal are discussed in Section 6.4.

### 3.6. EE Act

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

The criteria related to flora, fauna and native vegetation that trigger a Referral are described below.

One or more of the following would trigger a Referral:

- Potential clearing of 10 hectares of native vegetation or more from an area that:
  - Is of an Ecological Vegetation Class identified as endangered by the Department of Sustainability and Environment (in accordance with Appendix 2 of Victoria’s Native Vegetation Management Framework); or
  - Is, or is likely to be, of very high conservation significance (as defined in accordance with Appendix 3 of Victoria’s Native Vegetation Management Framework); and

- Is not authorised under an approved Forest Management Plan or Fire Protection Plan.
- Potential long-term loss of a significant proportion (e.g. 1 – 5% depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria.
- Potential long-term change to the ecological character of a wetland listed under the Ramsar Convention or in ‘A Directory of Important Wetlands in Australia’.
- Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term.

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

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

Implications under the *Environment Effects Act 1978* (EE Act) for the current proposal are discussed in Section 6.5.

### 3.7. CaLP Act

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

## 4. Existing information and methods

### 4.1. Existing information

Existing information used for this investigation is described below.

#### 4.1.1. Existing reporting and documentation

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

- Wellington Planning Scheme

#### 4.1.2. Native vegetation

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

- Relevant EVC benchmarks for the Gippsland Plain bioregion<sup>1</sup> (DSE 2004a); and
- *NatureKit* (DELWP 2021a).

#### 4.1.3. Listed matters

Existing flora and fauna species records and information regarding the potential occurrence of listed matters was obtained from an area termed the ‘search region’, defined here as an area with a radius of ten kilometres from the approximate centre point of the study area (coordinates: latitude 38° 07’ 45.14” S and longitude 146° 58’ 18.32” E).

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

The online EPBC Act *Protected Matters Search Tool* (DAWE 2021a) was consulted to determine whether nationally listed species or communities potentially occurred in the search region based on habitat modelling.

### 4.2. Field methods

The field assessment was conducted on 28 July 2021. During this assessment, the study area was surveyed on foot.

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

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

#### 4.2.1. Native vegetation

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

- Patch; or
- Scattered tree.

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

##### Patch

A patch of native vegetation is either:

- An area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native; or
- Any area with three or more native canopy trees<sup>2</sup> where the drip line<sup>3</sup> of each tree touches the drip line of at least one other tree, forming a continuous canopy; or
- Any mapped wetland included in the *Current wetlands map*, available at *MapShareVic* (DELWP 2021b).

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

The *Native Vegetation Information Management* (NVIM) system (DELWP 2021c) provides modelled condition scores for native vegetation to be used in certain circumstances.

##### Scattered tree

A scattered tree is:

- A native canopy tree<sup>2</sup> that does not form part of a patch.

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

#### 4.2.2. Flora species and habitats

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

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

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<sup>2</sup> A native canopy tree is a mature tree (i.e. able to flower) that is taller than 3 m and normally found in the upper layer of the relevant vegetation type.

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

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

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

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

#### **4.2.3. Fauna species and habitats**

The techniques below were used to detect fauna species utilising the study area.

- Incidental searches for mammal scats, tracks and signs (e.g. diggings, signs of feeding and nests/burrows).
- Turning over logs/rocks and other ground debris for reptiles, frogs and mammals.
- Daytime bird observations.
- General searches for reptiles and frogs; including identification of frog calls in seasonally wet areas.
- General searches for bat habitat including waterbodies and potential roosting sites such as caves, dead trees with hollows and underneath bark of trees.

Fauna habitats are described using habitat components that include old-growth trees, fallen timber, leaf litter and surface rocks.

The study area's habitat connectivity (i.e. degree of isolation/fragmentation), including linkages to other habitats in the region, was determined using field observations, recent aerial photography and *NatureKit* (DELWP 2021a).

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

#### **4.2.4. Threatened ecological communities**

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

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

### **4.3. Limitations of field assessment**

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



Difficulties in identifying flora in the current observed state due to the slashing of road reserves, limited the accuracy of determining the extent of patches of native vegetation. The timing of the survey and condition of vegetation were otherwise considered suitable to ascertain the extent and condition of native vegetation and fauna habitats.

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

Identification of EVCs considers vegetation types that would have naturally occupied the landscape prior to European impacts. Significant past vegetation clearance, and alteration of the study area's land form and hydrology has resulted in the emergence of an artificial site ecosystem that is likely to be notably different from what would have naturally occupied the study area. Identification of EVCs in altered areas was therefore based upon consideration of the following:

- Modelled EVC mapping (DELWP 2021a);
- Any observed indigenous flora species that are useful for determining EVCs; and
- Relevant published EVC benchmark descriptions.

If this information was not sufficient to allow for a reasonable conclusion to be made regarding which EVC would have naturally occurred and the observed vegetation resembled an EVC that is likely to have naturally occurred in the region, EVC identification was based upon the structure and floristic composition of current observed vegetation.

## 5. Assessment results

### 5.1. Site description

The study area for this investigation (Figure 1) was approximately 2.56 hectares of public land located at Settlement Road, Fulham, approximately eight kilometres west of Sale and 180 kilometres east-south-east of Melbourne's CBD. The study area is bordered by the Princes Highway to the north and farmland to the south, east and west.

The study area supported loamy soils on a relatively flat landscape. Drainage channels ran along both the east and west road reserves of Settlement Road. Planted immature treed vegetation was also present along the western road reserve.

The study area has historically served as road reserves for Settlement Road. Surrounding land predominantly supported stock grazing.

Native vegetation primarily consisted of Spear Grass and Wallaby Grass, with herbs such as Sheep's Burr, Berry Saltbush and Kidney Weed occasionally interspersed throughout. Native vegetation also occurred in inundated drainage channels and consisted of wetland species including Tall Rush and Marsh Club-rush. Weed cover in the study area was dominant and included introduced pasture grasses such as Cocksfoot, Toowoomba Canary Grass and Kikuyu. Introduced herbaceous groundcover notably included White Clover, Buck's-horn Plantain, Ribwort and Onion Grass.

Fauna habitat within the study area comprised the following:

- Grassland habitat: Most of the study area comprised grassland consisting of both native and non-native vegetation. Some sections had been slashed.
- Wetland habitat: Drainage channels running along both road reserves are periodically inundated, providing potential habitat for frogs and feeding sites for birds.

The following key fauna habitat areas occurred within the region:

- The Holey Plains State Park is situated approximately 7.5 kilometres south of the study area. Fauna habitat in the study area is isolated from this habitat by pine plantations that occur immediately to the north of the State Park.
- Sale Common, part of the Gippsland Lakes Ramsar Site, was located approximately 10 kilometres east of the study area. Fauna habitat in the study area was connected to this habitat via adjacent properties. There are several minor roads that pass between the study area and the Sale Common, however, these are unlikely to impede fauna movement.

The study area lies within the Gippsland Plain bioregion and falls within the West Gippsland catchment management area.

### 5.2. Native vegetation

#### 5.2.1. Patches of native vegetation

Pre-European EVC mapping (DELWP 2021a) indicated that the study area and surrounds would have supported Plains Grassy Woodland/Gilgai Wetland Mosaic (EVC 259), Swamp Scrub (EVC 53) and Plains Grassland (EVC 132) prior to European settlement based on modelling of factors including rainfall, aspect, soils and remaining vegetation.

Evidence on site, including floristic composition and soil characteristics, suggested that LaTrobe Valley Plains Grassland (EVC 132\_61) and Plains Grassy Wetland (EVC 125) were present within

the study area (Figure 1). Descriptions of these EVC's are provided within the EVC benchmarks in Appendix 5.

Twelve patches (referred to herein as habitat zones) comprising the abovementioned EVCs were identified in the study area (Table 1). This added up to a total area of 0.201 hectares of native vegetation in patches and included 0 large trees.

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

Habitat Zone	EVC	Description
A-I, K	LaTrobe Valley Plains Grassland (EVC 132_61)	These patches of native vegetation were predominantly composed of medium tufted graminoids such as Spear Grass and Wallaby Grass, with native herbs such as Sheep's Burr and Berry Saltbush occasionally interspersed throughout. Native cover was moderate for medium tufted graminoids (30%) and low for medium and small herbs (<1%). No large old trees or canopy trees were present. Weed cover was approximately 30% and notably included grasses such as Cocksfoot and Kikuyu, and herbs such as Onion Grass and Ribwort. Both bryophyte and soil crust cover were low (<1%). Organic litter occurred at 20% cover and was mostly native. No logs were present.
J, L	Plains Grassy Wetland (EVC 125)	Plains Grassy Wetland was restricted to inundated roadside drainage channels on the western road reserves. Native species included Native Rush and Marsh Club-rush at the highest cover (40%) and a lower amount of Tall Rush and Finger Rush (1%). No large old trees or canopy trees were present. Weed cover was 4% and mostly consisted of Cocksfoot, Yorkshire Fog and Toowoomba Canary Grass. Bryophyte and soil crust cover were low (<1%). Organic litter was approximately 10% and primarily native. No logs were present.

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

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

Habitat Zone	EVC	Area (ha)	Condition score (out of 100)	No. of Large Trees in HZ
A-I, K	LaTrobe Valley Plains Grassland (EVC 132_61)	0.194	22	0
J, L	Plains Grassy Wetland (EVC 125)	0.008	26	0
<b>Total</b>		<b>0.201</b>		<b>0</b>



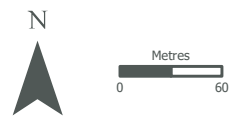
**Figure 1:** Study area and native vegetation

**Project:** Hopkins Road, Fulham **Client:** Solis Renewable Energy Pty Ltd **Date:** 3/08/2021

- ▭ Study area
- ▭ Solar farm site
- ▭ DELWP-mapped wetland

**Native vegetation**

- ▨ LaTrobe Valley Plains Grassland (EVC 132\_61)



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**Figure 2:** Study area and native vegetation

**Project:** Hopkins Road, Fulham **Client:** Solis Renewable Energy Pty Ltd **Date:** 3/08/2021

Study area

DELWP-mapped wetland

**Native vegetation**

LaTrobe Valley Plains Grassland (EVC 132\_61)

Plains Grassy Wetland (EVC 125)



N



Metres  
0 60



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### 5.2.2. *Scattered trees*

No scattered trees were recorded in the study area.

## 5.3. *Flora species*

### 5.3.1. *Species recorded*

During the field assessment 30 plant species were recorded, 11 (37%) of which were indigenous and 19 (63%) of which were introduced or non-indigenous in origin (Appendix 3).

### 5.3.2. *Listed species*

VBA records (DELWP 2021d) and the EPBC Protected Matters Search Tool (DAWE 2021a) indicated that within the search region there were records of, or potential suitable habitat occurred for 11 species listed under the Commonwealth EPBC Act and ten listed under the state FFG Act, including eight listed under both Acts. No flora species listed under the EPBC Act were recorded during the field survey.

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

This analysis indicates that no listed flora species are likely to occur or have the potential to occur in the study area.

Table 3: Listed flora species and the likelihood of their occurrence in the study area

Common Name	Scientific name	EPBC	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
River Swamp Wallaby-grass	<i>Amphibromus fluitans</i>	VU		River Swamp Wallaby-grass mostly grows in permanent swamps and also lagoons, billabongs, dams and roadside ditches. The species requires moderately fertile soils with some bare ground; conditions that are caused by seasonally-fluctuating water levels (DAWE 2021).	None	N/A	Study area was highly modified and there are no recent nearby records - <b>Unlikely to occur.</b>
Thick-lip Spider-orchid	<i>Caladenia tessellata</i>	VU		Coastal Open Woodlands, Lowland Forest, Heathy Woodland (Entwisle 1994).	None	N/A	Study area was unsuitable habitat, highly modified and there are no recent nearby records - <b>Unlikely to occur.</b>
Dwarf Kerrawang	<i>Commersonia prostrata</i>	EN	L	In Victoria, the Dwarf Kerrawang grows on swampy, sometimes ephemeral wetlands and lake margins, often dominated by <i>Lepidosperma</i> spp. (Short 1996; James 2003; Carter & Walsh 2010a). Dwarf Kerrawang is part of the Gippsland Red Gum ( <i>Eucalyptus tereticornis</i> subsp. <i>mediana</i> ) Grassy Woodland and associated native grassland ecological community, listed under the EPBC Act as critically endangered. The species also occurs in habitat of the Victorian listed communities Coastal Manna Gum ( <i>Eucalyptus viminalis</i> subsp. <i>pryoriana</i> ) Woodland and Lowland Forest dominated by White Stringybark ( <i>Eucalyptus globoidea</i> ) (James 2003).	None	N/A	Study area was highly modified and there are no recent nearby records - <b>Unlikely to occur.</b>
Small Scurf-pea	<i>Cullen parvum</i>		L	The species grows in grasslands and grassy (River Red-gum) woodlands in areas with rainfall of between 450 and 700 mm (Jeanes, 1996). These sites are subject to irregular flooding and have relatively rich soils derived from alluvium. An exception is the population near Shelford that grows on rocky clay soils derived from basalt (DSE 2005).	2	1/01/2005	Study area was highly modified - <b>Unlikely to occur.</b>
Matted Flax-lily	<i>Dianella amoena</i>	EN	L	Lowland grassland and grassy woodlands on well-drained to seasonally waterlogged fertile sandy loams to heavy cracking soils derived from sedimentary or volcanic Geology. Widely distributed from eastern to south-western Victoria (DAWE 2021).	None	N/A	Study area was highly modified and there are no recent nearby records - <b>Unlikely to occur.</b>
Purple Diuris	<i>Diuris punctata</i>		L	Principally in lowland native grasslands, grassy woodlands, heathy woodlands and open heathlands, usually on fertile, loamy soils and including periodically inundated areas (Earl & Barlow 2004).	12	7/10/2019	Study area was highly modified - <b>Unlikely to occur.</b>
Clover Glycine	<i>Glycine latrobeana</i>	VU	L	Found across south-eastern Australia in native grasslands, dry sclerophyll forests, woodlands and low open woodlands with a grassy ground layer. In Victoria, populations occur in lowland grasslands, grassy woodlands and sometimes in grassy heath (DAWE 2021).	None	N/A	Study area was highly modified and there are no recent nearby records - <b>Unlikely to occur.</b>
Basalt Peppergrass	<i>Lepidium hyssopifolium</i> s.s.	EN	L	Known to establish on open, bare ground with limited competition from other plants. Previously recorded from Eucalypt woodland with a grassy ground cover and low open Casuarina woodland with a grassy ground cover and tussock grassland. Now generally found amongst exotic pasture grasses and beneath exotic trees (DAWE 2021).	None	N/A	Study area was highly modified and there are no recent nearby records - <b>Unlikely to occur.</b>

Common Name	Scientific name	EPBC	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Maroon Leek-orchid	<i>Prasophyllum frenchii</i>	EN	L	Grows mainly in open sedge swampland or in wet grassland and wet heathland generally bordering swampy regions. Sites are generally low altitude, flat and moist. Soils are generally moderately rich damp sandy or black clay loams. Climate is mild, with an annual rainfall of 600–1100 mm, occurring predominantly in winter and spring (DAWE 2021).	None	N/A	Study area was highly modified and there are no recent nearby records – <b>Unlikely to occur.</b>
Wellington Mint-bush	<i>Prostanthera galbraithiae</i>	VU	L	Heathy open forest, usually on gravelly sand (Conn 1999).	61	14/09/2018	Study area was unsuitable habitat and highly modified – <b>Very unlikely to occur.</b>
Green-striped Greenhood	<i>Pterostylis chlorogramma</i>	VU	L	Occurs in mixed Box-Stringybark forest with a shrubby understorey, often with <i>Pteridium esculentum</i> as a major component on sandy or clay loam soils (Duncan <i>et al.</i> 2009).	None	N/A	Study area was unsuitable habitat, highly modified and there are no recent nearby records – <b>Very unlikely to occur.</b>
Swamp Fireweed	<i>Senecio psilocarpus</i>	VU		Herb-rich winter-wet swamps on volcanic clays or peaty soils (Walsh 1999). Known from approximately 10 sites between Wallan, about 45 km north of Melbourne and Honans Scrub in south-eastern South Australia (TSSC 2008).	None	N/A	Study area was highly modified and there are no recent nearby records – <b>Unlikely to occur.</b>
Swamp Everlasting	<i>Xerochrysum palustre</i>	VU	L	Grows in wetlands including sedge-swamps and shallow freshwater marshes, often on heavy black clay soils. Commonly associated genera include <i>Amphibromus</i> , <i>Baumea</i> , <i>Carex</i> , <i>Chorizandra</i> , <i>Craspedia</i> , <i>Eleocharis</i> , <i>Isolepis</i> , <i>Lachnagrostis</i> , <i>Lepidosperma</i> , <i>Myriophyllum</i> , <i>Phragmites australis</i> , <i>Themeda triandra</i> and <i>Villarsia</i> (DAWE 2021).	None	N/A	Study area was highly modified and there are no recent nearby records – <b>Unlikely to occur.</b>

**Notes:** EPBC = threatened species status under EPBC Act (EX = presumed extinct in the wild; CR = critically endangered; EN = endangered; VU = vulnerable); FFG = threatened species status under the FFG Act = listed as threatened (L) under the FFG Act.



#### 5.4. Fauna habitats

The study area supported the following fauna habitat types:

- Grassland habitat
- Wetland habitat



Photo 1: Grassland habitat

**Grassland habitat:** Native grassland covered the majority of the study area. Spear Grass and Wallaby Grass were the primary native cover. Almost the entire remainder of the study area supported non-native grassland dominated by Cocksfoot, Kikuyu and Toowoomba Canary-grass. Portions of the grassland habitat were slashed.



Photo 2: Wetland habitat

**Wetland habitat:** A small portion of the study area supported wetland habitat occurring in inundated drainage channels on the western road reserves. This habitat was degraded and supported dense pockets of native rushes amongst pasture grasses. These areas may attract frogs and some waterbirds, and provide a drinking spot for birds and other vertebrates.

## 5.5. Fauna species

### 5.5.1. Listed species

The review of existing information [including VBA records (DELWP 2021d) and results of the EPBC Protected Matters Search Tool (DAWE 2021a)] indicated that within the search region there were records of, or there was potential suitable habitat for, 34 fauna species listed under the Commonwealth EPBC Act and the state FFG Act. The likelihood of occurrence of these species in the study area was assessed and the results are presented in Table 4.

This analysis of potential occurrence of listed fauna species excludes:

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

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

- Black Falcon (listed under FFG Act);
- Fork-tailed Swift (Migratory under EPBC Act);
- Great Egret (listed under FFG Act);
- Latham's Snipe (Migratory under EPBC Act);
- Magpie Goose (listed under FFG Act);
- White-throated Needletail (Migratory under EPBC Act);

The susceptibility of these species to impacts from development is discussed in Section 5.5.2.



Table 4: Listed fauna species and the likelihood of their occurrence in the study area

Common Name	Scientific name	EPBC-T	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
<b>Birds</b>								
Australasian Bittern	<i>Botaurus poiciloptilus</i>	EN		L	Terrestrial wetlands, including a range of wetland types but prefers permanent water bodies with tall dense vegetation, particularly those dominated by sedges, rush, reeds or cutting grass (Marchant & Higgins 1990).	1	4/04/2019	Habitat in study area is highly modified - <b>Unlikely to occur.</b>
Australian Painted-snipe	<i>Rostratula australis</i>	EN		L	Generally inhabits shallow terrestrial freshwater wetlands, including temporary and permanent lakes, swamps and claypans. This species also uses inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of Lignum or Canegrass or sometimes Tea-tree. Sometimes utilises areas that are lined with trees or that have some scattered fallen or washed-up timber (DAWE 2021).	None	N/A	Suitable habitat in study area, however no records in the region and species very scarce in the SE of Australia - <b>Unlikely to occur.</b>
Black Falcon	<i>Falco subniger</i>			L	Woodlands, open country and terrestrial wetlands; in arid and semi-arid zones; mainly over open plains and undulating land with large tracts of low vegetation. More commonly found in north-western Victoria and only occasionally found in southern Victoria. A highly mobile species, moving in response to food availability and seasonal conditions (Marchant & Higgins 1993).	1	18/05/2020	Suitable open habitat in study area and recent records in the vicinity - <b>Potential to occur.</b>
Black-faced Monarch	<i>Monarcha melanopsis</i>		M (Bonn A2H)		Rainforests, eucalypt woodlands, coastal scrub and damp gullies (Higgins <i>et al.</i> 2006).	None	N/A	No suitable habitat in study area and no recent nearby records - <b>Unlikely to occur.</b>
Diamond Firetail	<i>Stagonopleura guttata</i>			L	Commonly found in box-ironbark forests and woodlands and also occurs along watercourses and in farmland areas. Widespread but scattered. Forages on a wide range of seeds, which in some cases a large portion can be derived from weed species (Read 1994). Populations had declined in Victoria since the 1950s (Emison <i>et al.</i> 1987; Tzaros 2005).	2	30/12/1998	No habitat in study area. Nearest suitable habitat at the foothills of the ranges - <b>Potential to occur.</b>
Fork-tailed Swift	<i>Apus pacificus</i>		M (CAMBA, ROKAMBA, JAMBA)		The species can occur in wet sclerophyll forest but mainly prefers open forest or plains. Almost exclusively aerial and feeds up to hundreds of metres above the ground, but can feed among open forest canopy. The species breeds internationally and seldom roosts in trees (Higgins 1999).	None	N/A	Highly mobile aerial species, occurs in the region annually - <b>Potential to occur.</b>
Freckled Duck	<i>Stictonetta naevosa</i>			L	Terrestrial wetlands; prefers fresh, densely vegetated waters, particularly floodwater swamps and creeks vegetated with Lignum or Cane Grass. During dry seasons or droughts, moves off ephemeral breeding swamps and occupies large permanent waters (Marchant & Higgins 1990).	117	13/06/2019	Habitat in study area is highly modified - <b>Unlikely to occur.</b>
Glossy Ibis	<i>Plegadis falcinellus</i>		M (Bonn A2S)		Prefers freshwater inland wetlands, in particular, permanent or ephemeral water bodies and swamps with abundant vegetation (Marchant & Higgins 1990).	8	18/05/2020	Habitat in study area is highly modified - <b>Unlikely to occur.</b>
Great Egret	<i>Ardea alba</i>			L	Occurs in a variety of wetlands including: permanent water bodies on flood plains; shallows of deep permanent lakes, either open or vegetated with shrubs or trees; semi-permanent swamps with tall emergent vegetation (e.g. Bulrush) and herb dominated seasonal swamps with abundant aquatic flora (Marchant & Higgins 1990).	61	6/05/2019	Suitable habitat in study area and recent records in the vicinity - <b>Potential to occur.</b>

Common Name	Scientific name	EPBC-T	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Grey Falcon	<i>Falco hypoleucos</i>	VU		L	Inhabits arid and semi-arid zones; mainly on sandy and stony plains of inland drainage systems, lightly timbered with acacia. Hunts far into open areas, over spinifex, tussock grasslands and low shrublands. In Victoria, few records mostly in north and north-western regions (Marchant & Higgins 1993).	None	N/A	No suitable habitat in study area and no recent nearby records - <b>Unlikely to occur.</b>
Grey Goshawk	<i>Accipiter novaehollandiae</i>			L	Inhabits rainforests, open forests, swamp forests, woodlands and plantations; most abundant where forest or woodland provide cover for hunting from perches. In Victoria, most common in Otway ranges (Marchant & Higgins 1993).	2	18/05/2020	No suitable habitat in study area - <b>Unlikely to occur.</b>
Latham's Snipe	<i>Gallinago hardwickii</i>		M (Bonn A2H, ROKAMBA, JAMBA, CAMBA)		Occurs in wide variety of permanent and ephemeral wetlands; prefers open freshwater wetlands with dense cover nearby, such as the edges of rivers and creeks, bogs, swamps and waterholes. The species is widespread in south-eastern Australia and most of its population occurs in Victoria, except in the northwest of the state (Naarding 1983; Higgins & Davies 1996).	84	2/02/2019	Suitable habitat in study area and several recent nearby records - <b>Likely to occur.</b>
Little Egret	<i>Egretta garzetta</i>			L	Occurs in a range of coastal and terrestrial wetlands, including freshwater wetlands with vegetation such as Bulrush and requires trees for roosting and nesting (Marchant & Higgins 1990).	8	10/11/2018	Habitat in study area is highly modified - <b>Unlikely to occur.</b>
Magpie Goose	<i>Anseranas semipalmata</i>			L	Terrestrial and aquatic habitats, but activities centered on wetlands, mainly those on floodplains of rivers (Marchant & Higgins 1990).	6	31/03/2007	Suitable habitat in study area, records in the vicinity in similar habitat - <b>Potential to occur.</b>
Masked Owl	<i>Tyto novaehollandiae</i>			L	Open woodlands and forests that provide dense, tall tree cover, and adjoining open habitats such as cleared farmlands. In Victoria, most widespread in E. Gippsland (Higgins 1999).	1	30/03/2006	No suitable habitat in study area - <b>Unlikely to occur.</b>
Osprey	<i>Pandion cristatus</i>		M (Bonn A2S)		Rare vagrant to Victoria (Marchant & Higgins 1993). Littoral and coastal habitats and terrestrial wetlands. Mostly found in coastal areas but occasionally travel inland along major rivers (Marchant & Higgins 1993; Olsen 1995; Johnstone & Storr 1998). Require extensive areas of open fresh, brackish or saline water for foraging (Marchant & Higgins 1993).	None	N/A	No suitable habitat in study area and no recent nearby records - <b>Unlikely to occur.</b>
Painted Honeyeater	<i>Grantiella picta</i>	VU		L	Inhabits box-ironbark forests and woodlands and mainly feeds on the fruits of mistletoe. Strongly associated with mistletoe around the margins of open forests and woodlands. Can also be found in farmland containing remnant treed vegetation. Occurs at few localities. Uncommon breeding migrant from further north, arriving in October and leaving in February (Higgins <i>et al.</i> 2001; Tzaros 2005).	None	N/A	No suitable habitat in study area and no recent nearby records - <b>Unlikely to occur.</b>
Plumed Egret	<i>Ardea plumifera</i>			L	Mainly inhabits terrestrial wetlands; only occasionally visits coastal wetlands and forages amongst aquatic vegetation in shallow water and requires trees for roosting and nesting. Often occurs in wetlands that contain vegetation, including Bulrush (Marchant & Higgins 1990).	5	18/05/2020	Habitat in study area is highly modified - <b>Unlikely to occur.</b>

Common Name	Scientific name	EPBC-T	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Powerful Owl	<i>Ninox strenua</i>			L	Found in tall, open wet sclerophyll forests with sheltered gullies and old growth forest with dense understorey. Also found in dry forests with box and ironbark eucalypts and River Red-gum. Large old trees with hollows are required by this species for nesting. In Victoria, Powerful Owl is widespread, having been recorded from most of the state. However, throughout its range it is uncommon and occurs in low densities (Higgins 1999). Also occurs in highly urbanised areas, such as metropolitan Melbourne, heavily reliant upon various forms of movement corridors (riparian strips, roadside vegetation and recreational reserves) to both hunt within and navigate throughout the landscape (Carter <i>et al.</i> 2019).	2	30/03/2006	No suitable habitat in study area - <b>Unlikely to occur.</b>
Regent Honeyeater	<i>Anthochaera phrygia</i>	CR		L	Inhabits dry box-ironbark eucalypt forests near rivers and creeks on inland slopes of the Great Dividing Range. Can also occur in small remnant patches or in mature trees in farmland or partly cleared agricultural land (Higgins <i>et al.</i> 2001).	None	N/A	No suitable habitat in study area and no recent nearby records - <b>Unlikely to occur.</b>
Rufous Fantail	<i>Rhipidura rufifrons</i>		M (Bonn A2H)		In east and south-east Australia, mainly inhabits tall wet sclerophyll forests, often in gullies. When on passage in warmer months, sometimes recorded in drier sclerophyll forests and woodlands, and parks and gardens (Higgins <i>et al.</i> 2006). Virtually absent from south-eastern Australia during winter (Higgins <i>et al.</i> 2006).	1	4/02/2019	No suitable habitat in study area - <b>Unlikely to occur.</b>
Satin Flycatcher	<i>Myiagra cyanoleuca</i>		M (Bonn A2H)		Mostly found in eucalypt forest, particularly tall wet forests and woodland within gullies (Higgins <i>et al.</i> 2006). Also inhabits eucalypt woodland comprising an open understorey and a grassy ground layer (Higgins <i>et al.</i> 2006). Generally absent from rainforest (Higgins <i>et al.</i> 2006).	None	N/A	No suitable habitat in study area and no recent nearby records - <b>Unlikely to occur.</b>
Swift Parrot	<i>Lathamus discolor</i>	CR		L	Prefers a select range of eucalypts in Victoria, including Yellow Gum, Grey Box, White Box, Red Ironbark and Yellow Box, and River Red-gum when this species supports abundant 'lerp' (Saunders & Tzaros 2011). The species is also known to forage within planted stands of Spotted Gum and Sugar Gum (Nature Advisory; unpublished data). Breeds in Tasmania and migrates to the mainland of Australia for the autumn, winter and early spring months. It lives mostly north of the Great Dividing Range, passing through two areas of Victoria on migration: the Port Phillip district and Gippsland (Emison <i>et al.</i> 1987; Higgins 1999; Kennedy & Tzaros 2005), though it is also not uncommonly sighted in urban areas (Nature Advisory; unpublished data). Occurrence of this species on the mainland can substantially change from year to year depending on food availability, giving potential for this species to occur almost anywhere throughout its range (Emison <i>et al.</i> 1987).	None	N/A	No suitable habitat in study area and no recent nearby records - <b>Unlikely to occur.</b>
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>			L	Maritime habitats, large terrestrial wetlands and coastal lands of tropical and temperate Australia and offshore islands, ranging far inland only over large rivers and wetlands. The eagles usually breed on coast and offshore islands and inland beside large lakes or rivers, usually in tall trees in or near water, also in cliffs, rock pinnacles and escarpments (Marchant & Higgins 1993).	37	23/05/2019	No suitable habitat in study area - <b>Unlikely to occur.</b>
White-throated Needletail	<i>Hirundapus caudacutus</i>	VU	M (CAMBA, ROKAMBA, JAMBA)		Aerial, over all habitats, but probably more over wooded areas, including open forest and rainforest. Often over heathland and less often above treeless areas such as grassland and swamps or farmland (Higgins 1999).	8	21/01/2010	Highly mobile aerial species with recent nearby records - <b>Potential to occur.</b>

Common Name	Scientific name	EPBC-T	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Yellow Wagtail	<i>Motacilla flava</i>		M (CAMBA, JAMBA, ROKAMBA)		Regular non-breeding visitor in northern Australia mainly spring-summer, vagrant to the south. Occupies a wide range of habitats, usually open areas with low vegetation such as crop, grassland and even parkland. Often recorded near water (Higgins, Peter & Cowling 1999)	None	N/A	Species scarce in the south of Australia and no recent nearby records - <b>Unlikely to occur.</b>
<b>Mammals</b>								
Southern Greater Glider	<i>Petauroides volans</i>	VU		L	In Victoria, this species inhabits forest habitats dominated by peppermint, stringybark, ash and gum eucalypts (Menkhorst 1995). Restricted to the central highlands and eastern Victoria, and common in areas of high rainfall. Rare in dry stringybark-box and Snow Gum forest, and does not occur in the box-ironbark or River Red-gum dominated riverina regions (Menkhorst 1995).	None	N/A	No suitable habitat in study area and no recent nearby records - <b>Unlikely to occur.</b>
Spot-tailed Quoll	<i>Dasyurus maculatus maculatus</i>	EN		L	Rainforest, wet and dry forest, coastal heath and scrub and River Red-gum woodlands along inland rivers (Menkhorst 1995).	None	N/A	No suitable habitat in study area and no recent nearby records - <b>Unlikely to occur.</b>
White-footed Dunnart	<i>Sminthopsis leucopus</i>			L	Coastal tussock grassland and sedgeland, wet heath, and forest or woodland with a dense heathy understorey or mid-storey vegetation (Menkhorst 1995).	1	22/09/2017	No suitable habitat in study area - <b>Unlikely to occur.</b>
<b>Bats</b>								
Yellow-bellied Sheathtail Bat	<i>Saccolaimus flaviventris</i>			L	Known to occur from urban, agricultural semi-arid and tall wet forest habitats (Menkhorst 1995).	1	11/04/1990	Suitable habitat in study area. Species very scarce in southern Victoria- <b>Unlikely to occur.</b>
<b>Amphibians</b>								
Giant Burrowing Frog	<i>Heleioporus australiacus</i>	VU		L	Across its range, the Giant Burrowing Frog appears to be dependent on areas with native vegetation, as no Giant Burrowing Frogs have been recorded from cleared lands. However, it should be noted that no targeted surveys for the species have occurred in such lands. A BIOCLIM analysis suggests that the species is not climatically suited to large river valleys, most of which have now been cleared for agriculture. In the southern portion of its range, the Giant Burrowing Frog has been reported to occur in a wide range of forest communities including montane sclerophyll woodland, montane riparian woodland, and wet and dry sclerophyll forest (DAWE 2021).	None	N/A	No suitable habitat in study area and no recent nearby records - <b>Unlikely to occur.</b>
Green and Golden Bell Frog	<i>Litoria aurea</i>	VU			Permanent water with fringing or emergent vegetation in streams, swamps, lagoons, farm dams and ornamental ponds (Cogger 2000). Also occurs in disturbed sites such as disused industrial sites, brick pits, mines and council tips (Tyler 1997).	2	18/05/2020	No suitable habitat in study area and recent records nearby - <b>Unlikely to occur.</b>
<b>Fish</b>								
Australian Grayling	<i>Prototroctes maraena</i>	VU		L	Large and small coastal streams and rivers with cool, clear waters with a gravel substrate and altering pools and riffles (Cadwallader & Backhouse 1983).	1	3/02/2016	No suitable habitat in study area - <b>Unlikely to occur.</b>

Common Name	Scientific name	EPBC-T	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Dwarf Galaxias	<i>Galaxiella pusilla</i>	VU		L	Ranges from the far west of the state through to the Mitchell River basin in central Gippsland. Vegetated margins of still water, ditches, swamps and backwaters of creeks, both ephemeral and permanent (Allen <i>et al.</i> 2002). Some wetlands where it occurs may partially or completely dry up during summer, with such wetlands reliant on seasonal flooding plus linkages to other sites where the species occurs, for habitat and population replenishment (Saddler, Jackson & Hammer 2010). Also often found in association with burrowing freshwater crayfish ( <i>Engaeus</i> spp.), with the crayfish burrows reportedly providing refuge from predators and dry conditions for the species (Saddler, Jackson & Hammer 2010).	4	28/03/2012	No suitable habitat in study area is highly modified - <b>Unlikely to occur.</b>

**Notes:** EPBC-T = threatened species status under EPBC Act (EX = presumed extinct in the wild; CR = critically endangered; EN = endangered; VU = vulnerable); EPBC-M: migratory status under the EPBC Act (M = listed migratory taxa; Bonn Convention (A2H) - Convention on the Conservation of Migratory Species of Wild Animals – listed as a member of a family; Bonn Convention (A2S) - Convention on the Conservation of Migratory Species of Wild Animals - species listed explicitly; CAMBA - China-Australia Migratory Birds Agreement; JAMBA - Japan-Australia Migratory Birds Agreement; ROKAMBA - Republic of Korea Australia Migratory Birds Agreement); FFG = listed as threatened (L) under the FFG Act; DELWP = status under DELWP's (DSE 2009; DSE 2013) *Advisory List* (x = presumed extinct in the wild; cr = critically endangered; e = endangered; v = vulnerable; nt = lower risk near threatened; dd = data deficient).



### 5.5.2. Susceptibility of listed fauna to impacts

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

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

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

#### *Birds (non-migratory)*

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

- **Black Falcon (listed under FFG Act)**

This species mainly preys on small and medium-sized birds and the study area provides habitat for open farmland birds that constitute part of the diet. The species is uncommon in the region however and is therefore unlikely to be impacted by the development.

- **Great Egret (listed under FFG Act)**

Habitat on site for this species is suboptimal due to the lack of fringing vegetation and the shallow, ephemeral nature of roadside drainage ditches. However, due to the proximity of larger water bodies and wetlands the species may possibly occur incidentally in the study site. Due to the lack of quality habitat on site, Great Egret is unlikely to be impacted by the development.

- **Magpie Goose (listed under FFG Act)**

This species is scarce in Victoria and can use a variety of wetland habitats provided there are large wetlands with paddocks in the vicinity. The habitat on site is suboptimal due to the shallow and ephemeral nature of roadside drainage ditches. However, as high-quality habitat is found in the vicinity, the species may occur incidentally, however development of the site is unlikely to impact Magpie Goose.

#### *Migratory Birds*

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

- **White-throated Needletail (Vulnerable under EPBC Act)**

This species may occur in the study area, however only in the capacity of flying over due to the strictly aerial biology. White-throated Needletail depends mostly on extensive forests to forage but may occasionally use adjacent farmland. Due to the lack of forested areas in the vicinity this species is unlikely to be impacted by the development.

- **Fork-tailed Swift (Migratory under EPBC Act)**

This species may occur in the study area, however only in the capacity of flying over due to the strictly aerial biology. Unlike the White-throated Needletail, this species prefers open landscapes to forests.



However, due to the abundance of this habitat in the region and the scarce records of the species in the vicinity, this species is unlikely to be impacted by the development.

- **Latham’s Snipe (Migratory under EPBC Act)**

The site holds suitable habitat for the species in the form drainage ditches. The species may occur occasionally in the study area, however due to the wide availability of higher quality habitat in surrounding reserves, Latham’s Snipe is unlikely to be impacted by the development.

## 5.6. Listed ecological communities

The EPBC Protected Matters Search Tool (DAWE 2021a) indicated that three ecological communities listed under the EPBC Act had the potential to occur in the search region (Table 5). The occurrence in the study area was determined based on an assessment of the native vegetation present against published descriptions and condition thresholds for these communities.

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

Ecological Community	EPBC Status	Occurrence in the study area
Gippsland Red Gum ( <i>Eucalyptus tereticornis</i> subsp. <i>mediana</i> ) Grassy Woodland and Associated Native Grassland	CR	The study area was highly modified and does not support any native treed vegetation – <b>Does not occur.</b>
Natural Damp Grassland of the Victorian Coastal Plains	CR	The study area was highly modified and any areas with the potential to host the community were less than 0.5 hectares – <b>Does not occur.</b>
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	CR	The study area was highly modified and any areas with the potential to host the community were less than 0.5 hectares – <b>Does not occur.</b>

**Notes:** EPBC = status under the EPBC Act (CR = Critically Endangered; EN = Endangered; VU = Vulnerable).

## 6. Implications under legislation and policy

As per the development plan, no native vegetation will be impacted by this proposal. Therefore a planning permit under Clause 52.17 of the Wellington Planning Scheme will not be required for the removal of native vegetation for this proposal. There will also be no implications under the EPBC Act, FFG Act or EE Act for this proposal.

## 7. References

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- Parkes D, Newell G, & Cheal D 2003, 'Assessing the Quality of Native Vegetation: The 'habitat hectares' approach', *Ecological Management and Restoration* 4:29–38.
- Scientific Advisory Committee (SAC) 2015, *Flora and Fauna Guarantee Act 1988 – Threatened List: Characteristics of Threatened Communities*, Department of Environment, Land, Water and Planning, East Melbourne.

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

### Purpose and objective

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

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

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

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

### Assessment pathways

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

- Basic;
- Intermediate; or
- Detailed.

This assessment pathway is determined by two factors:

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

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

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

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

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

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

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

The strategic biodiversity value (SBV) is a measure of a location's importance to Victoria's biodiversity, relative to other locations across the state. It is represented as a score between 0 and 1 and determined from the Strategic biodiversity value map, available from NVIM (DELWP 2021c).

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

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

This includes two groups of habitat:

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

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

#### *Biodiversity value*

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

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

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

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

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

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

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

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

#### Offset requirements

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

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

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

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

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

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

#### Offset attributes

Offsets must meet the following attribute requirements, as relevant:

- General offsets
  - **Offset amount** – general offset = general habitat score x 1.5



- **Strategic biodiversity value (SBV)** – the offset has at least 80% of the SBV of the native vegetation removed
  - **Vicinity** – the offset is in the same CMA boundary or municipal district as the native vegetation removed
  - **Habitat for rare and threatened species** – N/A
  - **Large trees** – the offset include the protection of at least one large tree for every large tree to be removed
- **Species offsets**
    - **Offset amount** – species offset = species habitat score x 2
    - **Strategic biodiversity value (SBV):** N/A
    - **Vicinity:** N/A
    - **Habitat for rare and threatened species** – the offset comprises mapped habitat according to the Habitat importance map for the relevant species
    - **Large trees** – the offset include the protection of at least one large tree for every large tree to be removed

## Appendix 2: Detailed habitat hectare assessment results

Habitat Zone		A	B	C	D	E	F	G	H	I	J	K	L		
Bioregion		GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP	GipP		
EVC Number		132_61	132_61	132_61	132_61	132_61	132_61	132_61	132_61	132_61	125	132_61	125		
Total area of Habitat Zone (ha)		0.0254	0.0145	0.0492	0.0051	0.0638	0.0181	0.0026	0.0046	0.005	0.0043	0.0058	0.0021		
	Lack of Weeds	/15	4	4	4	4	4	4	4	4	4	7	4	7	
	Understorey	/25	5	5	5	5	5	5	5	5	5	5	5	5	
	Recruitment	/10	3	3	3	3	3	3	3	3	3	3	3	3	
	Organic Matter	/5	3	3	3	3	3	3	3	3	3	3	3	3	
	Logs	/5	0	0	0	0	0	0	0	0	0	0	0	0	
	Site condition standardising multiplier*		1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36
	<i>Site Condition subtotal</i>		20	20	20	20	20	20	20	20	20	24	20	24	
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1	1	1	1	1	
	Neighbourhood	/10	0	0	0	0	0	0	0	0	0	0	0	0	
	Distance to Core	/5	1	1	1	1	1	1	1	1	1	1	1	1	
<b>Total Condition Score</b>		<b>/100</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>26</b>	<b>22</b>	<b>26</b>	

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

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

Origin	Common name	Scientific name	EPBC	FFG-T	FFG-P	CaLP Act
	Black Wattle	<i>Acacia mearnsii</i>			P	
	Sheep's Burr	<i>Acaena ovina</i>				
*	Cape weed	<i>Arctotheca calendula</i>				
	Spear Grass	<i>Austrostipa</i> sp.				
	Marsh Club-rush	<i>Bolboschoenus caldwellii</i>				
*	Kikuyu	<i>Cenchrus clandestinus</i>				
	Stonecrop	<i>Crassula</i> sp.				
*	Cocksfoot	<i>Dactylis glomerata</i>				
	Kidney Weed	<i>Dichondra repens</i>				
	Native Rush	<i>Eleocharis macbarronii</i>				
*	Crane's Bill	<i>Geranium</i> sp.				
*	Yorkshire Fog	<i>Holcus lanatus</i>				
*	Flatweed	<i>Hypochaeris radicata</i>				
	Tall Rush	<i>Juncus procerus</i>				
	Finger Rush	<i>Juncus subsecundus</i>				
*	Small Loosestrife	<i>Lythrum hyssopifolia</i>				
*	Medic	<i>Medicago</i> sp.				
*	Toowoomba Canary-grass	<i>Phalaris aquatica</i>				
*	Buck's-horn Plantain	<i>Plantago coronopus</i>				
*	Ribwort	<i>Plantago lanceolata</i>				
*	Annual Meadow-grass	<i>Poa annua</i> s.l.				
	Common Tussock-grass	<i>Poa labillardierei</i>				
*	Cherry Plum	<i>Prunus cerasifera</i>				
*	Onion Grass	<i>Romulea rosea</i>				
*	Dock	<i>Rumex</i> sp.				
	Wallaby Grass	<i>Rytidosperma</i> sp.				
*	Common Sow-thistle	<i>Sonchus oleraceus</i>				
*	Hare's-foot Clover	<i>Trifolium arvense</i>				
*	White Clover	<i>Trifolium repens</i>				
*	Common Vetch	<i>Vicia sativa</i>				

**Notes:** EPBC = threatened species status under the EPBC Act (EX = presumed extinct in the wild; CR = critically endangered; EN = endangered; VU = vulnerable); FFG-T = listed as threatened (L) under the FFG Act; FFG-P: listed as protected (P) under the FFG Act; CaLP Act: declared noxious weeds under the CaLP Act (S = State Prohibited Weeds [any infestations are to be reported to DELWP. DELWP is responsible for control of State Prohibited Weeds]; P = Regionally Prohibited Weeds [Land owners must take all reasonable steps to eradicate regionally prohibited weeds on their land]; C = Regionally Controlled Weeds [Land owners have the responsibility to take all reasonable steps to prevent the growth and spread of Regionally controlled weeds on their land]; R = Restricted Weeds [Trade in these weeds and their propagules, either as plants, seeds or contaminants in other materials is prohibited].

\* = introduced to Victoria

# = Victorian native taxa occurring outside their natural range



**Appendix 4: Photographs of native vegetation proposed for removal**



Plains Grassland on the eastern road reserve, with a notable presence of native Spear Grass.



Typical native groundcover, including Spear Grass and Sheep's Burr.





Plains Grassy Wetland on the western road reserves.



Dense clumping of natives rushes amongst introduced pasture grasses.

# EVC/Bioregion Benchmark for Vegetation Quality Assessment

## Gippsland Plain bioregion

### EVC 132\_61: *LaTrobe Valley Plains Grassland*

#### Description:

Treeless vegetation dominated by largely grass and herb life forms. Shrubs and trees may be also occasionally present.

#### Life Forms:

Life form	#Spp	%Cover	LF code
Small Shrub	1	1%	SS
Large Herb	2	5%	LH
Medium Herb	12	30%	MH
Small or Prostrate Herb	3	5%	SH
Large Tufted Graminoid	1	1%	LTG
Medium to Small Tufted Graminoid	10	40%	MTG
Medium to Tiny Non-tufted Graminoid	2	5%	MNG
Bryophytes/Lichens	na	10%	BL
<b>Total understorey projective foliage cover</b>		<b>95%</b>	

LF Code	Species typical of at least part of EVC range	Common Name
LH	<i>Calocephalus citreus</i>	Lemon Beauty-heads
MH	<i>Eryngium ovinum</i>	Blue Devil
MH	<i>Acaena echinata</i>	Sheep's Burr
MH	<i>Drosera peltata ssp. peltata</i>	Pale Sundew
MH	<i>Leptorhynchos squamatus</i>	Scaly Buttons
SH	<i>Solenogyne dominii</i>	Smooth Solenogyne
MTG	<i>Themeda triandra</i>	Kangaroo Grass
MTG	<i>Schoenus apogon</i>	Common Bog-sedge
MTG	<i>Austrodanthonia setacea</i>	Bristly Wallaby-grass
MNG	<i>Microlaena stipoides var. stipoides</i>	Weeping Grass
SC	<i>Convolvulus erubescens</i> spp. agg.	Pink Bindweed

#### Recruitment:

Episodic/Fire or Grazing. Desirable period between disturbances is 5 years.

#### Organic Litter:

10 % cover



## Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
SS	<i>Galenia pubescens</i> var. <i>pubescens</i>	Galenia	high	high
LH	<i>Rumex conglomeratus</i>	Clustered Dock	high	low
LH	<i>Plantago lanceolata</i>	Ribwort	high	low
LH	<i>Senecio jacobaea</i>	Ragwort	high	high
LH	<i>Rapistrum rugosum</i>	Giant Mustard	high	high
LH	<i>Lepidium africanum</i>	Common Peppergrass	high	low
LH	<i>Urtica dioica</i>	Giant Nettle	high	low
LH	<i>Cirsium vulgare</i>	Spear Thistle	high	high
MH	<i>Plantago coronopus</i>	Buck's-horn Plantain	high	low
MH	<i>Hypochoeris radicata</i>	Cat's Ear	high	low
MH	<i>Cerastium glomeratum</i> s.l.	Common Mouse-ear Chickweed	high	low
SH	<i>Trifolium repens</i> var. <i>repens</i>	White Clover	high	low
LNG	<i>Holcus lanatus</i>	Yorkshire Fog	high	high
MTG	<i>Paspalum dilatatum</i>	Paspalum	high	high
MTG	<i>Sporobolus africanus</i>	Rat-tail Grass	high	high
MTG	<i>Bromus catharticus</i>	Prairie Grass	high	low
MTG	<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	Soft Brome	high	low
MTG	<i>Romulea rosea</i>	Onion Grass	high	low
MTG	<i>Agrostis capillaris</i> s.l.	Brown-top Bent	high	high
MTG	<i>Vulpia bromoides</i>	Squirrel-tail Fescue	high	low
MTG	<i>Lolium rigidum</i>	Wimmera Rye-grass	high	low
MTG	<i>Ehrharta erecta</i> var. <i>erecta</i>	Panic Veldt-grass	high	high
MTG	<i>Ehrharta longiflora</i>	Annual Veldt-grass	high	low
MNG	<i>Dactylis glomerata</i>	Cocksfoot	high	high

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# EVC/Bioregion Benchmark for Vegetation Quality Assessment

## Gippsland Plain bioregion

### EVC 125: Plains Grassy Wetland

#### Description:

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

#### Life forms:

Life form	#Spp	%Cover	LF code
Large Herb	3	10%	LH
Medium Herb	10	20%	MH
Small or Prostrate Herb	2	10%	SH
Large Tufted Graminoid	2	5%	LTG
Large Non-tufted Graminoid	2	10%	LNG
Medium to Small Tufted Graminoid	10	20%	MTG
Medium to Tiny Non-tufted Graminoid	4	10%	MNG
Bryophytes/Lichens	na	10%	BL
<b>Total understorey projective foliage cover</b>		<b>95%</b>	

LF Code	Species typical of at least part of EVC range	Common Name
LH	v <i>Craspedia paludicola</i>	Swamp Billy-buttons
LH	<i>Villarsia reniformis</i>	Running Marsh-flower
MH	<i>Myriophyllum crispatum</i>	Upright Water-milfoil
MH	<i>Lythrum hyssopifolia</i>	Small Loosestrife
MH	<i>Centella cordifolia</i>	Centella
SH	<i>Neopaxia australasica</i>	White Purslane
SH	<i>Myriophyllum integrifolium</i>	Tiny Water-milfoil
LTG	<i>Amphibromus nervosus</i>	Common Swamp Wallaby-grass
LNG	<i>Baumea arthropphylla</i>	Fine Twig-sedge
MTG	<i>Schoenus tesquorum</i>	Soft Bog-sedge
MTG	<i>Triglochin alcockiae</i>	Southern Water-ribbons
MTG	<i>Notodanthonia semiannularis</i>	Wetland Wallaby-grass
MTG	<i>Austrodanthonia duttoniana</i>	Brown-back Wallaby-grass
MNG	<i>Eleocharis acuta</i>	Common Spike-sedge
MNG	<i>Hemarthria uncinata</i> var. <i>uncinata</i>	Mat Grass
MNG	k <i>Eleocharis macbarronii</i>	Grey Spike-sedge
MNG	<i>Triglochin striatum</i>	Streaked Arrowgrass

#### Recruitment:

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

#### Organic Litter:

10% cover

# EVC 125: Plains Grassy Wetland - Gippsland Plain bioregion

## Logs:

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

## Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
LH	<i>Rumex conglomeratus</i>	Clustered Dock	high	high
LH	<i>Plantago lanceolata</i>	Ribwort	high	low
MH	<i>Leontodon taraxacoides</i> ssp. <i>taraxacoides</i>	Hairy Hawkbit	high	low
MH	<i>Lotus corniculatus</i>	Bird's-foot Trefoil	high	high
MH	<i>Mentha pulegium</i>	Pennyroyal	high	high
MH	<i>Centaureum erythraea</i>	Common Centaury	high	low
MH	<i>Plantago coronopus</i>	Buck's-horn Plantain	high	high
MH	<i>Hypochaeris radicata</i>	Cat's Ear	high	low
MH	<i>Anagallis arvensis</i>	Pimpernel	high	low
SH	<i>Trifolium repens</i> var. <i>repens</i>	White Clover	high	high
LTG	<i>Watsonia meriana</i> var. <i>bulbillifera</i>	Bulbil Watsonia	high	high
LNG	<i>Holcus lanatus</i>	Yorkshire Fog	high	high
MTG	<i>Paspalum dilatatum</i>	Paspalum	high	high
MTG	<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	high	high
MTG	<i>Gladiolus undulatus</i>	Wild Gladiolus	high	low
MTG	<i>Juncus articulatus</i>	Jointed Rush	high	high
MTG	<i>Lolium perenne</i>	Perennial Rye-grass	high	high
MTG	<i>Briza minor</i>	Lesser Quaking-grass	high	low
MTG	<i>Agrostis capillaris</i> s.l.	Brown-top Bent	high	high
MNG	<i>Paspalum distichum</i>	Water Couch	high	high
TTG	<i>Cyperus tenellus</i>	Tiny Flat-sedge	high	low
SNG	<i>Sisyrinchium iridifolium</i>	Blue Pigroot	high	high

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