

## APPENDICES

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## APPENDIX 1

### Appendix 1.1 – Rare or Threatened Categories for Listed Victorian Taxa

Table A1.1. Rare or Threatened categories for listed Victorian taxa.

Rare or Threatened Categories
<b>Conservation Status in Australia (Based on the EPBC Act 1999)</b>
<b>EX</b> - Extinct: Extinct is when there is no reasonable doubt that the last individual of the species has died.
<b>CR</b> - Critically Endangered: A species is critically endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.
<b>EN</b> - Endangered: A species is endangered when it is not critically endangered but is facing a very high risk of extinction in the wild in the near future.
<b>VU</b> - Vulnerable: A species is vulnerable when it is not critically endangered or endangered but is facing a high risk of extinction in the wild in the medium-term future.
<b>R*</b> - Rare: A species is rare but overall is not currently considered critically endangered, endangered or vulnerable.
<b>K*</b> - Poorly Known: A species is suspected, but not definitely known, to belong to any of the categories extinct, critically endangered, endangered, vulnerable or rare.
<b>Conservation Status in Victoria (Based on DEPI 2014, DSE 2009b or 2013)</b>
<b>x</b> - Presumed Extinct in Victoria: not recorded from Victoria during the past 50 years despite field searches specifically for the plant, or, alternatively, intensive field searches (since 1950) at all previously known sites have failed to record the plant.
<b>e</b> - Endangered in Victoria: at risk of disappearing from the wild state if present land use and other causal factors continue to operate.
<b>v</b> - Vulnerable in Victoria: not presently endangered but likely to become so soon due to continued depletion; occurring mainly on sites likely to experience changes in land-use which would threaten the survival of the plant in the wild; or, taxa whose total population is so small that the likelihood of recovery from disturbance, including localised natural events such as drought, fire or landslip, is doubtful.
<b>r</b> - Rare in Victoria: rare but not considered otherwise threatened - there are relatively few known populations or the taxon is restricted to a relatively small area.
<b>k</b> - Poorly Known in Victoria: poorly known and suspected, but not definitely known, to belong to one of the above categories (x, e, v or r) within Victoria. At present, accurate distribution information is inadequate.

## Appendix 1.2 – Defining Ecological Significance

**Table A1.2.** Criteria for defining Ecological Significance ratings for significant flora, fauna and communities.

National Significance
<p><b>Flora:</b> National conservation status is based on the EPBC Act list of taxa considered threatened in Australia (i.e. extinct, critically endangered, endangered, vulnerable).</p>
<p><b>Fauna:</b> National conservation status is based on the EPBC Act list of taxa considered threatened in Australia (i.e. Extinct, Critically Endangered, Endangered, Vulnerable). Fauna listed as Extinct, Critically Endangered, Endangered, Vulnerable, or Rare under National Action Plans for terrestrial taxon prepared for DoE: mammals (Woinarski <i>et al.</i> 2014), bats (Duncan <i>et al.</i> 1999), birds (Garnett <i>et al.</i> 2011), reptiles (Cogger <i>et al.</i> 1993), amphibians (Tyler 1997) and butterflies (Sands and New 2002).</p>
<p><b>Communities:</b> Vegetation communities considered critically endangered, endangered or vulnerable under the EPBC Act and considering vegetation condition.</p>
State Significance
<p><b>Flora:</b> Threatened taxa listed under the provisions of the FFG Act. Flora listed in the State Government’s Advisory List of Rare or Threatened Plants in Victoria (DEPI 2014).</p>
<p><b>Fauna:</b> Threatened taxon listed under Schedule 2 of the FFG Act. Fauna listed as Extinct, Critically Endangered, Endangered and Vulnerable on the State Government’s Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2013a). Listed as Lower Risk (Near Threatened, Conservation Dependent or Least concern) or Data Deficient under National Action Plans for terrestrial species prepared for the DoE: mammals (Woinarski <i>et al.</i> 2014), bats (Duncan <i>et al.</i> 1999), birds (Garnett <i>et al.</i> 2011), reptiles (Cogger <i>et al.</i> 1993), amphibians (Tyler 1997) and butterflies (Sands and New 2002).</p>
<p><b>Communities:</b> Ecological communities listed as threatened under the FFG Act (DELWP 2016g). EVC listed as threatened (i.e. endangered, vulnerable) or rare in a Native Vegetation Plan for a particular bioregion and considering vegetation condition.</p>
Regional Significance
<p><b>Fauna:</b> Fauna with a disjunct distribution, or a small number of documented recorded or naturally rare in the particular Bioregion in which the study area is located. A particular taxon that is has an unusual ecological or biogeographical occurrence or listed as Lower Risk – Near Threatened, Data Deficient or Insufficiently Known on the State Government’s Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2013a).</p>
<p><b>Communities:</b> EVC listed as depleted or least concern in a Native Vegetation Plan for a particular bioregion) and considering vegetation condition. EVC considered rare by the author for a particular bioregion.</p>
Local Significance
<p>Local significance is defined as flora, fauna and ecological communities indigenous to a particular area, which are not considered rare or threatened on a national, state or regional level.</p>

## Appendix 1.3 – Defining Site Significance

**Table A1.3.** Criteria for defining Site Significance ratings.

National Significance
<p>A site is of National significance if:</p> <ul style="list-style-type: none"> <li>It regularly supports, or has a high probability of regularly supporting individuals of a taxon listed as 'Critically Endangered' or 'Endangered' under the EPBC Act and/or under National Action Plans for terrestrial taxon prepared for the DoE.</li> <li>It regularly supports, or has a high probability of supporting, an 'important population' as defined under the EPBC Act of one or more nationally 'vulnerable' flora and fauna taxon.</li> <li>It is known to support, or has a high probability of supporting taxon listed as 'Vulnerable' under National Action Plans.</li> <li>It is known to regularly support a large proportion (i.e. greater than 1%) of a population of a taxon listed as 'Conservation Dependent' under the EPBC Act and/or listed as Rare or Lower Risk (near threatened, conservation dependent or least concern) under National Action Plans.</li> <li>It contains an area, or part thereof designated as 'critical habitat' under the EPBC Act, or if the site is listed under the Register of National Estate compiled by the Australian Heritage Commission.</li> <li>It is a site which forms part of, or is connected to a larger area(s) of remnant native vegetation or habitat of national conservation significance such as most National Park, and/or a Ramsar Wetland(s).</li> </ul>
State Significance
<p>A site is of State significance if:</p> <ul style="list-style-type: none"> <li>It occasionally (i.e. every 1 to 5 years) supports, or has suitable habitat to support taxon listed as 'Critically Endangered' or 'Endangered' under the EPBC Act and/or under National Action Plans. <ul style="list-style-type: none"> <li>It regularly supports, or has a high probability of regularly supporting (i.e. high habitat quality) taxon listed as 'Vulnerable', 'Near threatened', 'Data Deficient' or 'Insufficiently Known' in Victoria (DSE 2013a; DEPI 2014), or species listed as 'Data Deficient' or 'Insufficiently Known' under National Action Plans.</li> </ul> </li> <li>It contains an area, or part thereof designated as 'critical habitat' under the FFG Act.</li> <li>It supports, or likely to support a high proportion of any Victorian flora and fauna taxa.</li> <li>It contains high quality, intact vegetation/habitat supporting a high species richness and diversity in a particular bioregion.</li> <li>It is a site which forms part of, or connected to a larger area(s) of remnant native vegetation or habitat of state conservation significance such as most State Parks and/or Flora and Fauna Reserves.</li> </ul>
Regional Significance
<p>A site is of Regional significance if:</p> <ul style="list-style-type: none"> <li>It regularly supports, or has a high probability of regularly supporting regionally significant fauna as defined in Table 1.2.</li> <li>It contains a large population (i.e. greater than 1% or 5%) of flora considered rare in any regional Native Vegetation Plan for a particular bioregion.</li> <li>It supports a fauna population with a disjunct distribution, or a particular taxon that has an unusual ecological or biogeographical occurrence.</li> <li>It is a site which forms part of, or is connected to a larger area(s) of remnant native vegetation or habitat of regional conservation significance such as most Regional Parks and/or Flora and Fauna Reserves.</li> </ul>
Local Significance
<p>Most sites are considered to be of at least local significant for conservation, and in general a site of local significance can be defined as:</p> <ul style="list-style-type: none"> <li>An area which supports indigenous flora species and/or a remnant EVC, and habitats used by locally significant fauna species.</li> <li>An area which currently acts, or has the potential to act as a wildlife corridor linking other areas of higher conservation significance and facilitating fauna movement throughout the landscape.</li> </ul>

## Appendix 1.4 – Vegetation Condition and Habitat Quality

**Table A1.4.1** Defining Vegetation Condition ratings.

Criteria for defining Vegetation Condition
<p><b>High Quality:</b> Vegetation dominated by a diversity of indigenous species, with defined structures (where appropriate), such as canopy layer, shrub layer, and ground cover, with little or few introduced species present.</p>
<p><b>Moderate Quality:</b> Vegetation dominated by a diversity of indigenous species, but is lacking some structures, such as canopy layer, shrub layer or ground cover, and/or there is a greater level of introduced flora species present.</p>
<p><b>Low Quality:</b> Vegetation dominated by introduced species, but supports low levels of indigenous species present, in the canopy, shrub layer or ground cover.</p>

**Table A1.4.2** Defining Habitat Quality.

Criteria for defining Habitat Quality
<p><b>High Quality:</b></p> <ul style="list-style-type: none"> <li>• High degree of intactness (i.e. floristically and structurally diverse), containing several important habitat features such as ground debris (logs, rocks, vegetation), mature hollow-bearing trees, and a dense understorey component.</li> <li>• High species richness and diversity (i.e. represented by a large number of species from a range of fauna groups).</li> <li>• High level of foraging and breeding activity, with the site regularly used by native fauna for refuge and cover.</li> <li>• Habitat that has experienced, or is experiencing low levels of disturbance and/or threatening processes (i.e. weed invasion, introduced animals, soil erosion, salinity).</li> <li>• High contribution to a wildlife corridor, and/or connected to a larger area(s) of high quality habitat.</li> <li>• Provides known, or likely habitat for one or more rare or threatened species listed under the EPBC Act, FFG Act, or species considered rare or threatened according to DEPI 2014; DSE 2009b or 2013.</li> </ul>
<p><b>Moderate Quality:</b></p> <ul style="list-style-type: none"> <li>• Moderate degree of intactness, containing one or more important habitat features such as ground debris (logs, rocks, vegetation), mature hollow-bearing trees, and a dense understorey component.</li> <li>• Moderate species richness and diversity - represented by a moderate number of species from a range of fauna groups.</li> <li>• Moderate levels of foraging and breeding activity, with the site used by native fauna for refuge and cover.</li> <li>• Habitat that has experienced, or is experiencing moderate levels of disturbance and/or threatening processes.</li> <li>• Moderate contribution to a wildlife corridor, or is connected to area(s) of moderate quality habitat.</li> <li>• Provides potential habitat for a small number of threatened species listed under the EPBC Act, FFG Act, or species considered rare or threatened according to DEPI 2014; DSE 2009b or 2013.</li> </ul>
<p><b>Low Quality:</b></p> <ul style="list-style-type: none"> <li>• Low degree of intactness, containing few important habitat features such as ground debris (logs, rocks, vegetation), mature hollow-bearing trees, and a dense understorey component.</li> <li>• Low species richness and diversity (i.e. represented by a small number of species from a range of fauna groups).</li> <li>• Low levels of foraging and breeding activity, with the site used by native fauna for refuge and cover.</li> <li>• Habitat that has experienced, or is experiencing high levels of disturbance and/or threatening processes.</li> <li>• Unlikely to form part of a wildlife corridor, and is not connected to another area(s) of habitat.</li> <li>• Unlikely to provide habitat for rare or threatened species listed under the EPBC Act, FFG Act, or considered rare or threatened according to DEPI 2014; DSE 2009b or 2013.</li> </ul>

## Appendix 1.5 – Offsets and Exemptions

**Table A1.5.1.** Calculation of Biodiversity Equivalence Scores and General or Specific Offsets (DEPI 2013a)

Pathway	Biodiversity Assessment Tools	Information Source
Low Risk-based pathway	Condition Score	Modelled data, NVIM Tool (DELWP 2016c)
	Habitat Hectares	= Condition Score x Extent (ha)
	Strategic Biodiversity Score	Modelled data, NVIM Tool (DELWP 2016c)
	General Biodiversity Equivalence Score	= Habitat Hectares x Strategic Biodiversity Score
Moderate or High Risk-based pathway	Condition Score	Habitat hectare assessment
	Habitat Hectares	= Condition Score x Extent (ha)
	Strategic Biodiversity Score and Habitat Importance Score	Modelled data, determined by DEPI
	Specific Biodiversity Equivalence Score <b>(A)</b>	= Habitat Hectares x Habitat Importance Score
	Sum of Specific Biodiversity Equivalence Scores of remaining habitat <b>(B)</b>	Data gathered during the field assessment is provided to DEPI for analysis and a resulting assessment offset report is provided by the Department.
	Specific Offset Threshold <b>(C)</b>	
	General/Specific Threshold Test: If <b>A + B &gt; C</b> a <b>Specific</b> offset is required If <b>A + B &lt; C</b> a <b>General</b> offset required	

**Table A1.5.2.** Summary of offset requirements (DEPI 2013a)

Risk-based Pathway	Offset Type	Offset Amount (Risk adjusted biodiversity equivalence score)	Habitat for Species	Offset Attributes	
				Vicinity	Strategic Biodiversity Score
Low Risk	General offset	1.5 times the general biodiversity equivalence score of the native vegetation to be removed.	No restrictions	In the same Catchment Management Authority or Local Government Area boundary as the native vegetation to be removed.	At least 80 per cent of the strategic biodiversity score of the native vegetation to be removed.
Moderate or High Risk	General offset	1.5 times the general biodiversity equivalence score of the native vegetation to be removed.	No restrictions	In the same Catchment Management Authority or Local Government Area boundary as the native vegetation to be removed.	At least 80 per cent of the strategic biodiversity score of the native vegetation to be removed.
Moderate or High Risk	Specific offset	For each species impacted, 2 times the specific biodiversity equivalence score of the native vegetation to be removed.	Likely habitat for each rare or threatened species that a specific offset is required for, according to the specific-general offset test.	No restrictions	No restrictions

## Appendix 1.6 – Flora and Fauna Guarantee Act 1988 Protected Species

Protected flora and fauna under the *Flora and Fauna Guarantee Act 1988* (FFG Act) are defined as those that have legal protection under the Act (DELWP 2017d). Protected taxa includes plants and animals from three sources:

- Plant or animal taxa (species, subspecies or varieties) listed as threatened under the FFG Act;
- Plant taxa belonging to communities listed as threatened under the FFG Act; and,
- Plant taxa which are not threatened but require protection for other reasons.

Note that representative plants of a given community are protected as well as the community itself (for example scattered wallaby-grasses *Rytidosperma* spp. are protected in degraded areas previously supporting the listed Western [Basalt] Plains Grassland Community).

A list of plant groups protected under the FFG Act is provided (Table A1.6).

**Table A1.6.** Plant groups (Families, Genera and Kingdom Divisions) protected under the FFG Act (DELWP 2016).

Family/Genera	Common Name	Exclusions
Pteridophyta	Clubmosses, ferns and fern allies	Austral Bracken <i>Pteridium esculentum</i>
Asteraceae	Daisies	N/A
Ericaceae (formerly Epacridaceae)	Heaths	N/A
Orchidaceae	Orchids	N/A
<i>Acacia</i>	Wattles	<i>Acacia dealbata</i> , <i>Acacia decurrens</i> , <i>Acacia implexa</i> , <i>Acacia melanoxylon</i> and <i>Acacia paradoxa</i>
<i>Baeckea</i>	Baeckeeas	N/A
<i>Boronia</i>	Boronias	N/A
<i>Calytrix</i>	Fringe-myrtles	N/A
<i>Correa</i> -	Correas	N/A
<i>Darwinia</i>	Darwinias	N/A
<i>Eremophila</i>	Emu-bushes	N/A
<i>Eriostemon</i>	Wax-flowers	N/A
<i>Gompholobium</i>	Wedge-peas	N/A
<i>Grevillea</i>	Grevilleas	N/A
<i>Prostanthera</i>	Mint-bushes	N/A
<i>Sphagnum</i>	Sphagnum mosses	N/A
<i>Stylidium</i>	Trigger-plants	N/A
<i>Thryptomene</i>	Thryptomenes	N/A
<i>Thysanotus</i>	Fringe-lilies	N/A
<i>Xanthorrhoea</i>	Grass-trees	N/A

## APPENDIX 2 - FLORA

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### Appendix 2.1 – Targeted Flora Surveys

#### Methods

Targeted surveys were undertaken for all flora species considered likely to occur within the study area (Appendix 2.3). Based on the results of desktop- and habitat assessment, one of the following likelihood of presence rating was assigned to each threatened species raised by the VBA and PMST:

- Known Occurrence (=1). Recorded within the study area within the last ten years.
- High Likelihood (=2). Previous records of the species in the local vicinity; and/or the study area contains areas of high quality habitat.
- Moderate Likelihood (=3). Limited previous records of the species in the local vicinity; and/or the study area contains poor or limited habitat.
- Low Likelihood (=4). Poor or limited habitat for the species however other evidence (such as a lack of records of environmental factors) indicates there is a very low likelihood of presence.
- Unlikely (=5). No suitable habitat and/or outside the species range.

The purpose of the assessment was to identify which threatened species (if any) are likely to occur in the study area and guide the targeted flora survey effort.

Targeted surveys involved traversing the area on foot at five to ten metre intervals (often involving two botanists). Handheld GPS units were used to record the exact location of any significant species found. Where required, samples were taken for further identification using resources such as the Flora of Victoria and National Herbarium of Victoria.

Surveys were undertaken within the study area in areas considered suitable habitat (determined during general flora and vegetation assessments), including:

- Remnant grassland and woodland patches; and,
- Riparian vegetation associated with Toolern Creek and Bostock Reservoir.

Vegetation considered suitable habitat equates to that mapped as a remnant vegetation patch under the habitat hectare assessment. In addition, other areas (e.g. around the base of trees and along fence lines) were surveyed for significant flora species. The exact survey locations for the targeted surveys in Element 1c - 6 are provided in Table 2 and shown on Figure 2. Targeted flora survey results that are not relevant to approval processes were not included in the ecological features mapping (Figure 3), and these have instead been provided directly to MMRA.

#### ***Nationally significant species***

##### **Spiny Rice-flower**

A targeted survey was undertaken on 23, 24, 25 August 2016 by two qualified ecologists who are experienced in Spiny Rice-flower identification. The survey was undertaken during the flowering season for the species, which maximised the detectability of the species. In the suitable habitat identified in Element 1, each side of



the corridor was traversed on foot by two ecologists walking 5-10 metres apart. The location of each individual plant was recorded by GPS. Any additional rare and threatened flora species observed during the survey were also recorded.

### **Matted Flax-lily and Large-fruit Groundsel**

A targeted survey was undertaken on 17 and 21 November 2016, and the 15, 20, and 22 December 2016 by two qualified ecologists who are experienced in the identification of the species. The survey was undertaken during the flowering season for Matted Flax-lily and Large-fruit Groundsel, which maximised the detectability of the species. All Elements containing potentially suitable habitat were surveyed. This included all Elements except for Element 3. Each side of the corridor was traversed on foot by two ecologists walking 5-10 metres apart. The location of each individual plant was recorded by GPS. Any additional rare and threatened flora species observed during the survey were also recorded.

### **Assessment Qualifications and Limitations**

The assessment does not address variations made to the project area after March 2017.

Data and information held within the ecological databases and mapping programs reviewed in the desktop assessment (e.g. VBA, PMST, Biodiversity Interactive Maps etc.) are unlikely to represent all flora and fauna observations within, and surrounding, the study area. It is therefore important to acknowledge that a lack of documented records does not necessarily indicate that a species or community is absent.

Ecological values identified on site are recorded using a hand-held GPS or tablet with an accuracy of +/-5 metres. This level of accuracy is considered adequate to provide an accurate assessment of the ecological values present within the study area; however this data should not be used for detailed surveying purposes.

The field assessment was undertaken during the optimal season for the identification of the significant flora species (i.e. winter and spring). Although only a minor limitation, some areas of dense vegetation (i.e. under these areas of wattle) may have made identification difficult.

The terrestrial flora and fauna data collected during the field assessment and information obtained from relevant desktop sources is considered adequate to provide an accurate assessment of the ecological values present within the study area.

Notwithstanding the aforementioned, it is considered that the survey effort, timing and results presented meet the objectives of the survey and provide sufficient information to support the approvals processes.

Fauna surveys were conducted under the Ecology and Heritage Partners Pty Ltd Research Permit (#10006893) issued by DELWP under the *Wildlife Act 1975*.

### **Results**

The targeted flora results are presented in Section 3 of the main report. A total of 209 flora species (88 indigenous and 121 non-indigenous or introduced) were recorded within the complete study area during the field assessments.

The VBA contains records of 16 nationally significant and 90 State significant flora species previously recorded within 10 kilometres of the study area (DELWP 2016a) (Appendix 2.3). The PMST nominated an additional three nationally significant species which have not been previously recorded but have the potential to occur in the locality (DoEE 2017).

Desktop and site assessments identified potential habitat within the study area for species of national and State conservation significance. Significant flora documented within five kilometres of each Element located outside the Urban Growth Boundary is depicted in Figures 4-E1c, 4-E2, 4-E3, 4-E4, 4-E5, and 4-E6, contained in Appendix 2.3.

### **Nationally significant flora**

Targeted flora surveys recorded the presence of the nationally-listed Spiny Rice-flower, Matted Flax-lily, and Large-fruit Groundsel within the study area.

#### *Matted Flax-lily*

Matted Flax-lily has been recorded within one kilometre of the study area, and field survey confirmed the presence of suitable habitat for the species within the study area. Targeted surveys recorded three patches of this species in Element 4 – Ballan Loop. These patches are located outside of the proposed impact area and will therefore not be impacted by the BLU.

#### *Spiny Rice-flower and Large-fruit Groundsel*

Spiny Rice-flower and Large-fruit Groundsel have been recorded within one kilometre of the study area, and field survey confirmed the presence of suitable habitat for these species within the study area. Targeted surveys did not record the presence of either species in Elements 1c - 6.

A total of 194 Spiny Rice-flower and 33 Large-fruit Groundsel were recorded within Element 1a during the targeted surveys. Locations of these individuals are depicted on Figure 3 and the spatial data has been provided to BLU to inform avoidance, minimisation and mitigation measures in this area.

### **State significant and FFG-Act Protected flora**

There is suitable habitat within the study area for the State significant Black Roly-poly *Sclerolaena muricata* var. *muricata*, Slender Tick-trefoil *Desmodium varians*, Austral Crane's-bill *Geranium solanderi* var. *solanderi* s.s., Pale-flower Crane's-bill *Geranium* sp. 3 and Rye Beetle-grass *Tripogon loliiformis*. Suitable habitat is also present for Protected Flora under the FFG Act, including Slender Onion-orchid *Microtis parviflora* and Cotton Fireweed *Senecio quadridentatus*.

Five patches of approximately 20 Slender Onion-orchids were recorded in Element 5 – Spreadeagle loop. One patch of approximately 20 Cotton Fireweed plants was also recorded in Element 5 – Spreadeagle loop, and an additional individual was recorded in Element 6 – Warrenheip Duplication.

### **Scattered Remnant Trees**

Scattered trees within the study area and BLU impact area are summarised in Tables A2.1 and A2.2. The majority of these are Grey Box. These trees would once have been part of the Plains Grassy Woodland or Plains Woodland EVC, however the understorey vegetation now predominantly comprises introduced species (mainly exotic pasture grasses), and the trees no longer form a patch of native vegetation.

**Table A2.1. Scattered Remnant Tree Breakdown**

Element	Scattered Trees within Study Area	Scattered Trees within Impact Area
1a	Time-stamped BCS data / unknown	Time-stamped BCS data / unknown
1b	Time-stamped NVPP data = 9	Time-stamped NVPP data = 7 (marked as "to be retained")
1c	11	8
2	1	1
3	2	2
4	1	0
5	16	12
6	4	2
<b>TOTALS</b>	<b>MSA Area = 9</b> <b>Element 1c – 6 = 35</b> <b>TOTAL = 44</b>	<b>MSA Area = 7</b> <b>Element 1c – 6 = 25</b> <b>TOTAL = 32</b>

**Table A2.2.** Remnant scattered trees recorded within the study area (Elements 1c – 6).

Label (Figure Series 3)	Scientific Name	Common Name	DBH	EASTING	NORTHING	Element
1	<i>Eucalyptus ovata</i>	Swamp Gum	130	228564.2	5836423	6
2	<i>Eucalyptus ovata</i>	Swamp Gum	45	228516.2	5836458	6
3	<i>Eucalyptus ovata</i>	Swamp Gum	40	228539.5	5836349	6
4	<i>Eucalyptus polyanthemos</i>	Red Box	61	273918.9	5825730	3a
5	<i>Eucalyptus ovata</i>	Swamp Gum	48	273927.2	5825726	3a
20	<i>Eucalyptus microcarpa</i>	Grey Box	60	286488.8	5824264	1c
21	<i>Eucalyptus microcarpa</i>	Grey Box	45	286492.4	5824276	1c
22	<i>Eucalyptus microcarpa</i>	Grey Box	55	286462.3	5824271	1c
23	<i>Eucalyptus microcarpa</i>	Grey Box	42	286446.7	5824277	1c
24	<i>Eucalyptus microcarpa</i>	Grey Box	40	286407.5	5824290	1c
25	<i>Eucalyptus microcarpa</i>	Grey Box	18	286518.3	5824226	1c
26	<i>Eucalyptus melliodora</i>	Yellow Box	72	286178.8	5824239	1c
27	<i>Eucalyptus microcarpa</i>	Grey Box	25	286146.5	5824241	1c
28	<i>Eucalyptus microcarpa</i>	Grey Box	30	285539	5824373	2

Label (Figure Series 3)	Scientific Name	Common Name	DBH	EASTING	NORTHING	Element
29	<i>Eucalyptus microcarpa</i>	Grey Box	87	285685.1	5824408	1c
30	<i>Eucalyptus microcarpa</i>	Grey Box	50	285918.9	5824360	1c
31	<i>Eucalyptus microcarpa</i>	Grey Box	35	285925.5	5824358	1c
37	<i>Eucalyptus ovata</i>	Swamp Gum	55	251755.4	5835363	4
38	<i>Eucalyptus</i> sp.	Eucalypt	Not recorded	228597.4	5836165	6
39	<i>Eucalyptus ovata</i>	Swamp Gum	16	236254.1	5834962	5
40	<i>Eucalyptus ovata</i>	Swamp Gum	25	236202.4	5834967	5
41	<i>Eucalyptus ovata</i>	Swamp Gum	20	236206.1	5834969	5
42	<i>Eucalyptus ovata</i>	Swamp Gum	20	236060.3	5834946	5
43	<i>Eucalyptus ovata</i>	Swamp Gum	18	236043.4	5834955	5
44	<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	Manna Gum	34	238766.7	5834979	5
45	<i>Eucalyptus ovata</i>	Swamp Gum	15	238900	5835013	5
46	<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	Manna Gum	14	238986.3	5835034	5
47	<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	Manna Gum	25	239007	5835028	5
48	<i>Eucalyptus ovata</i>	Swamp Gum	100	239089	5835111	5 (TRZ impacts only)

Label (Figure Series 3)	Scientific Name	Common Name	DBH	EASTING	NORTHING	Element
49	<i>Eucalyptus ovata</i>	Swamp Gum	15	239106.3	5835068	5
50	<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	Manna Gum	16	239504.7	5835175	5
51	<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	Manna Gum	15	239519.6	5835181	5
52	<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	Manna Gum	30	239618.7	5835212	5
53	<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	Manna Gum	20	239640.3	5835217	5
54	<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	Manna Gum	30	239683.3	5835223	5

## Appendix 2.2 – Flora Results

**Table A2.2.** Flora recorded within the study area.

**CR/VU** Listed as Critically Endangered//Vulnerable under the EPBC Act;

**I** Protected under the FFG Act (DELWP 2016);

**L** Listed under the FFG Act (DELWP 2017d);

**v/r/p** Listed as vulnerable/rare/poorly known in Victoria under the Advisory List of Rare or Threatened Plants in Victoria (DEPI 2014);

**\*** Listed as a noxious weed under the CaLP Act;

**w** Weed of National Significance; and,

**#** Planted Victorian and non-Victorian species; and,

- Not applicable

Scientific Name	Common Name	Conservation Status/Notes
<b>INDIGENOUS SPECIES</b>		
<i>Acacia acinacea</i> s.l.	Gold-dust Wattle	I
<i>Acacia implexa</i>	Lightwood	-
<i>Acacia mearnsii</i>	Black Wattle	I
<i>Acacia melanoxylon</i>	Blackwood	-
<i>Acacia paradoxa</i>	Hedge Wattle	-
<i>Acacia pycnantha</i>	Golden Wattle	I
<i>Acaena echinata</i>	Sheep's Burr	-
<i>Acaena</i> sp.	Sheep's Burr	-
<i>Allocasuarina luehmannii</i>	Buloke	L
<i>Allocasuarina verticillata</i>	Drooping Sheoak	-
<i>Amyema pendula</i>	Drooping Mistletoe	-
<i>Anthosachne scabra</i> s.l.	Common Wheat-grass	-
<i>Arthropodium strictum</i> s.l.	Chocolate Lily	-
<i>Asperula conferta</i>	Common Woodruff	-
<i>Atriplex semibaccata</i>	Berry Saltbush	-
<i>Austrostipa bigeniculata</i>	Kneed Spear-grass	-
<i>Austrostipa densiflora</i>	Dense Spear-grass	-
<i>Austrostipa scabra</i> subsp. <i>falcata</i>	Rough Spear-grass	-
<i>Austrostipa semibarbata</i>	Fibrous Spear-grass	-
<i>Austrostipa</i> spp.	Spear Grass	-
<i>Bothriochloa macra</i>	Red-leg Grass	-
<i>Bulbine bulbosa</i>	Bulbine Lily	-
<i>Carex appressa</i>	Tall Sedge	-
<i>Carex</i> spp.	Sedge	-

Scientific Name	Common Name	Conservation Status/Notes
<i>Cassinia aculeata</i>	Common Cassinia	l
<i>Cassinia arcuata</i>	Drooping Cassinia	l
<i>Chamaesyce drummondii</i>	Flat Spurge	-
<i>Chrysocephalum apiculatum</i> s.l.	Common Everlasting	l
<i>Chrysocephalum semipapposum</i>	Clustered Everlasting	l
<i>Convolvulus angustissimus</i> subsp. <i>omnigracilis</i>	Slender Bindweed	p
<i>Cotula australis</i>	Common Cotula	l
<i>Crassula sieberiana</i> s.l.	Sieber Crassula	-
<i>Daviesia leptophylla</i>	Narrow-leaf Bitter-pea	-
<i>Dianella admixta</i>	Black-anther Flax-lily	-
<i>Dianella</i> sp. aff. <i>longifolia</i> (Benambra)	Arching Flax-lily	v
<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>	Silky Blue-grass	-
<i>Dichondra repens</i>	Kidney-weed	-
<i>Duma florulenta</i>	Tangled Lignum	-
<i>Einadia nutans</i> subsp. <i>nutans</i>	Nodding Saltbush	-
<i>Eleocharis acuta</i>	Common Spike-sedge	-
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	Ruby Saltbush	-
<i>Epilobium</i> sp.	Willow Herb	-
<i>Erodium crinitum</i>	Blue Heron's-bill	-
<i>Eryngium ovinum</i>	Blue Devil	-
<i>Eucalyptus camaldulensis</i>	River Red-gum	-
<i>Eucalyptus melliodora</i>	Yellow Box	-
<i>Eucalyptus microcarpa</i>	Grey Box	-
<i>Eucalyptus ovata</i>	Swamp Gum	-
<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	Manna Gum	-
<i>Euchiton involucratus</i> s.l.	Common Cudweed	l
<i>Geranium</i> sp.	Pale-flower Crane's-bill	-
<i>Gonocarpus tetragynus</i>	Common Raspwort	-
<i>Goodenia pinnatifida</i>	Cut-leaf Goodenia	-
<i>Hypericum gramineum</i> spp. agg.	Small St John's Wort	-
<i>Juncus</i> spp.	Rush	-
<i>Kennedia prostrata</i>	Running Postman	-
<i>Linum marginale</i>	Native Flax	-
<i>Lomandra filiformis</i>	Wattle Mat-rush	-
<i>Lomandra nana</i>	Dwarf Mat-rush	-
<i>Lomandra</i> spp.	Mat-rush	-
<i>Marsilea mutica</i>	Smooth Nardoo	-



Scientific Name	Common Name	Conservation Status/Notes
<i>Meliccytus dentatus</i> s.l.	Tree Violet	-
<i>Microtis parviflora</i>	Onion-orchid	l
<i>Oxalis perennans</i>	Grassland Wood-sorrel	-
<i>Pelargonium rodneyanum</i>	Magenta Stork's-bill	-
<i>Pimelea curviflora</i> s.l.	Curved Rice-flower	-
<i>Pimelea glauca</i>	Smooth Rice-flower	-
<i>Pimelea humilis</i>	Common Rice-flower	-
<i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	CR (only recorded within Element 1a).
<i>Plantago varia</i>	Variable Plantain	-
<i>Poa labillardierei</i>	Common Tussock-grass	-
<i>Poa sieberiana</i>	Grey Tussock-grass	-
<i>Pseudognaphalium luteoalbum</i>	Jersey Cudweed	l
<i>Ranunculus</i> spp.	Buttercup	-
<i>Rhagodia parabolica</i>	Fragrant Saltbush	r
<i>Rytidosperma caespitosum</i>	Common Wallaby-grass	-
<i>Rytidosperma duttonianum</i>	Brown-back Wallaby-grass	-
<i>Rytidosperma setaceum</i> var. <i>setaceum</i>	Bristly Wallaby-grass	-
<i>Rytidosperma</i> spp.	Wallaby Grass	-
<i>Senecio macrocarpus</i>	Large-fruit Fireweed	VU (only recorded within Element 1a).
<i>Senecio quadridentatus</i>	Cotton Fireweed	l
<i>Stackhousia monogyne</i>	Creamy Stackhousia	-
<i>Thelymitra</i> spp.	Sun Orchid	l
<i>Themeda triandra</i>	Kangaroo Grass	-
<i>Tricoryne elatior</i>	Yellow Rush-lily	-
<i>Typha</i> spp.	Cumbungi	-
<i>Vittadinia</i> spp.	New Holland Daisy	l
<i>Wahlenbergia</i> spp.	Bluebell	-
<i>Walwhalleya proluta</i>	Rigid Panic	-
<b>NON-INDIGENOUS OR INTRODUCED SPECIES</b>		
<i>Abies</i> sp.	Fir	-
<i>Acacia baileyana</i>	Cootamundra Wattle	-
<i>Acacia saligna</i>	Golden Wreath Wattle	-
<i>Acetosella vulgaris</i>	Sheep Sorrel	-
<i>Agapanthus praecox</i> subsp. <i>orientalis</i>	Agapanthus	-
<i>Agave americana</i>	Century Plant	-

Scientific Name	Common Name	Conservation Status/Notes
<i>Agrostis capillaris</i> s.l.	Brown-top Bent	-
<i>Aira elegantissima</i>	Delicate Hair-grass	-
<i>Aira</i> spp.	Hair Grass	-
<i>Allium triquetrum</i>	Three-corner Garlic	-
<i>Alopecurus pratensis</i>	Meadow Fox-tail	-
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	-
<i>Arctotheca calendula</i>	Cape Weed	-
<i>Asphodelus fistulosus</i>	Onion Weed	-
<i>Avena</i> spp.	Oat	-
<i>Betula</i> spp.	Birch	-
<i>Billardiera heterophylla</i>	Bluebell Creeper	-
<i>Brassica fruticulosa</i>	Twiggy Turnip	-
<i>Brassicaceae</i> spp.	Crucifer	-
<i>Bromus catharticus</i>	Prairie Grass	-
<i>Bromus diandrus</i>	Great Brome	-
<i>Bromus hordeaceus</i> subsp. <i>hordeaceus</i>	Soft Brome	-
<i>Bromus madritensis</i>	Madrid Brome	-
<i>Bromus rubens</i>	Red Brome	-
<i>Cerastium glomeratum</i> s.l.	Common Mouse-ear Chickweed	-
<i>Chenopodium album</i>	Fat Hen	-
<i>Cirsium vulgare</i>	Spear Thistle	*
<i>Convolvulus arvensis</i>	Common Bindweed	*
<i>Conyza bonariensis</i>	Flaxleaf Fleabane	-
<i>Corymbia citriodora</i> subsp. <i>citriodora</i>	Lemon-scented Gum	#
<i>Corymbia maculata</i>	Spotted Gum	#
<i>Cotoneaster</i> spp.	Cotoneaster	-
<i>Crataegus monogyna</i>	Hawthorn	*
<i>Crocsmia X crocosmiiflora</i>	Montbretia	-
<i>Cupressus</i> spp.	Cypress	-
<i>Cynara cardunculus</i>	Spanish Artichoke	*
<i>Cynodon dactylon</i> var. <i>dactylon</i>	Couch	-
<i>Cyperus eragrostis</i>	Drain Flat-sedge	-
<i>Dactylis glomerata</i>	Cocksfoot	-
<i>Echium plantagineum</i>	Paterson's Curse	*
<i>Ehrharta calycina</i>	Perennial Veldt-grass	-
<i>Ehrharta erecta</i> var. <i>erecta</i>	Panic Veldt-grass	-
<i>Ehrharta longiflora</i>	Annual Veldt-grass	-

Scientific Name	Common Name	Conservation Status/Notes
<i>Erodium cicutarium</i>	Common Heron's-bill	-
<i>Eucalyptus cladocalyx</i>	Sugar Gum	#
<i>Eucalyptus globulus</i>	Southern Blue-gum	#
<i>Eucalyptus lehmannii</i>	Bushy Yate	#
<i>Eucalyptus leucoxylon</i> subsp. <i>megalocarpa</i>	Large-fruit Yellow-gum	#
<i>Eucalyptus sideroxylon</i> subsp. <i>sideroxylon</i>	Mugga	#
<i>Euphorbia peplus</i>	Petty Spurge	-
<i>Festuca arundinacea</i>	Tall Fescue	-
<i>Foeniculum vulgare</i>	Fennel	*
<i>Fraxinus angustifolia</i>	Desert Ash	-
<i>Freesia</i> spp.	Freesia	-
<i>Fumaria officinalis</i> spp. <i>agg.</i>	Fumitory	-
<i>Galenia pubescens</i> var. <i>pubescens</i>	Galenia	-
<i>Galium aparine</i>	Cleavers	-
<i>Gazania linearis</i>	Gazania	-
<i>Genista monspessulana</i>	Montpellier Broom	w *
<i>Geranium</i> spp.	Crane's Bill	-
<i>Hedera helix</i>	English Ivy	-
<i>Helminthotheca echioides</i>	Ox-tongue	-
<i>Holcus lanatus</i>	Yorkshire Fog	-
<i>Hordeum vulgare</i> s.l.	Barley	-
<i>Hypericum perforatum</i> subsp. <i>veronense</i>	St. John's Wort	*
<i>Hypochoeris glabra</i>	Smooth Cat's-ear	-
<i>Hypochoeris radicata</i>	Cat's Ear	-
<i>Iris</i> spp.	Iris	-
<i>Lactuca serriola</i>	Prickly Lettuce	-
<i>Lavandula dentata</i> var. <i>candicans</i>	Toothed Lavender	-
<i>Leontodon taraxacoides</i> subsp. <i>taraxacoides</i>	Hairy Hawkbit	-
<i>Lepidium africanum</i>	Common Peppergrass	-
<i>Lepidium draba</i>	Hoary Cress	-
<i>Lolium</i> spp.	Rye Grass	-
<i>Lycium ferocissimum</i>	African Box-thorn	w *
<i>Lysimachia arvensis</i>	Pimpernel	-
<i>Malva</i> spp.	Mallow	-
<i>Marrubium vulgare</i>	Horehound	*
<i>Medicago</i> spp.	Medic	-
<i>Melaleuca armillaris</i> subsp. <i>armillaris</i>	Giant Honey-myrtle	#

Scientific Name	Common Name	Conservation Status/Notes
<i>Modiola caroliniana</i>	Red-flower Mallow	-
<i>Myosotis</i> spp.	Forget-me-not	-
<i>Nassella neesiana</i>	Chilean Needle-grass	w *
<i>Nassella trichotoma</i>	Serrated Tussock	w *
<i>Opuntia</i> spp.	Prickly-pear,	w *
<i>Oxalis pes-caprae</i>	Soursob	w *
<i>Papaver</i> spp.	Poppy	-
<i>Paspalum dilatatum</i>	Paspalum	-
<i>Pennisetum clandestinum</i>	Kikuyu	-
<i>Petrorhagia nanteuillii</i>	Childling Pink	-
<i>Phalaris aquatica</i>	Toowoomba Canary-grass	-
<i>Physalis hederifolia</i>	Sticky Ground-cherry	-
<i>Pinus radiata</i>	Radiata Pine	-
<i>Plantago coronopus</i>	Buck's-horn Plantain	-
<i>Plantago lanceolata</i>	Ribwort	-
<i>Poa pratensis</i>	Kentucky Blue-grass	-
<i>Polygonum aviculare</i> s.l.	Prostrate Knotweed	-
<i>Prunus</i> spp.	Prunus	-
<i>Raphanus raphanistrum</i>	Wild Radish	-
<i>Romulea rosea</i>	Onion Grass	-
<i>Rosa rubiginosa</i>	Sweet Briar	*
<i>Rubus fruticosus</i> spp. agg.	Blackberry	w *
<i>Rumex crispus</i>	Curled Dock	-
<i>Salix</i> spp.	Willow	w *
<i>Salvia verbenaca</i>	Wild Sage	-
<i>Schinus molle</i>	Pepper Tree	-
<i>Silene gallica</i>	French Catchfly	-
<i>Silybum marianum</i>	Variegated Thistle	*
<i>Sonchus asper</i> s.l.	Rough Sow-thistle	-
<i>Sonchus oleraceus</i>	Common Sow-thistle	-
<i>Sporobolus africanus</i>	Rat-tail Grass	-
<i>Trifolium dubium</i>	Suckling Clover	-
<i>Trifolium repens</i> var. <i>repens</i>	White Clover	-
<i>Trifolium subterraneum</i>	Subterranean Clover	-
<i>Ulex europaeus</i>	Gorse	w *
<i>Ulmus</i> spp.	Elm	-
<i>Urtica urens</i>	Small Nettle	-

Scientific Name	Common Name	Conservation Status/Notes
<i>Verbascum thapsus</i> subsp. <i>thapsus</i>	Great Mullein	*
<i>Vicia disperma</i>	French Tiny Vetch	-
<i>Vicia sativa</i>	Common Vetch	-
<i>Vulpia</i> spp.	Fescue	-

## Appendix 2.3 – Significant Flora Species

**Table A2.3** Significant flora recorded within 10 kilometres of the study area

**Likelihood:** Habitat characteristics of significant flora species previously recorded within 10 kilometres of the study area, or that may potentially occur within the study area were assessed to determine their likelihood of occurrence. The likelihood of occurrence rankings are defined below.

### 1 - Known occurrence

- Recorded within the study area recently (i.e. within ten years)

### 2 - High Likelihood

- Previous records of the species in the local vicinity; and/or,
- The study area contains areas of high quality habitat.

### 3 - Moderate Likelihood

- Limited previous records of the species in the local vicinity; and/or,
- The study area contains poor or limited habitat.

### 4 - Low Likelihood

- Poor or limited habitat for the species however other evidence (such as a lack of records or environmental factors) indicates there is a very low likelihood of presence.

### 5 – Unlikely

- No suitable habitat and/or outside the species range.

Key:

EPBC *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)  
 FFG *Flora and Fauna Guarantee Act 1988* (FFG Act)  
 DEPI Advisory List of Threatened Flora in Victoria (DEPI 2014)

EX	Extinct	X	Extinct
CR	Critically endangered	e	Endangered
EN	Endangered	v	Vulnerable
VU	Vulnerable	r	Rare
K	Poorly Known (Briggs and Leigh 1996)	k	Poorly Known
#	Records identified from EPBC Act Protected Matters Search Tool.	L	Listed
*	Records identified from the FIS		

Scientific Name	Common Name	Last Documented Record (No. VBA Records)						EPBC Act	FFG ACT	VICADV	Likelihood
		Element 1	Element 2	Element 3	Element 4	Element 5	Element 6				
<b>NATIONAL SIGNIFICANCE</b>											
<i>Amphibromus fluitans</i>	River Swamp Wallaby-grass	2008 (3)	-	-	-	2006 (1)	VU	-	-	4	
<i>Dianella amoena</i>	Matted Flax-lily	2011 (47)	2008 (2)	PMST	PMST	1770 (1)	EN	L	e	1 (recorded within Element 4)	
<i>Diuris basaltica</i>	Small Golden Moths	2012 (26)	2012 (6)	2006 (4)	-	-	EN	L	e	1 (recorded within the study area ~100 metres west of Ferris Road – Figure 4-E1c)	
<i>Diuris fragrantissima</i>	Sunshine Diuris	2009 (14)	-	1770 (1)	-	-	EN	L	e	5	
<i>Dodonaea procumbens</i>	Trailing Hop-bush	-	-	2000 (1)	PMST	-	VU	-	v	5	
<i>Eucalyptus aggregata</i>	Black Gum	-	-	-	PMST	PMST	VU	L	e	5	
<i>Glycine latrobeana</i>	Clover Glycine	2006 (4)	2006 (3)	1992 (1)	PMST	2004 (1)	VU	L	v	4	
<i>Lachnagrostis adamsonii</i>	Adamson's Blown-grass	PMST	PMST	-	1997 (1)	1997 (1)	EN	L	v	5	
<i>Lepidium hyssopifolium</i>	Basalt Peppergrass	-	-	-	PMST	2013 (13)	EN	L	e	5	
<i>Leucochrysum albicans</i> var. <i>tricolor</i>	Hoary Sunray	PMST	PMST	PMST	PMST	PMST	EN	-	e	5	
<i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	2015 (790)	2012 (53)	2003 (5)	PMST	2010 (3)	CR	L	e	1 (recorded in Element 1a and 1b)	

Scientific Name	Common Name	Last Documented Record (No. VBA Records)						EPBC Act	FFG ACT	VICADV	Likelihood
		Element 1	Element 2	Element 3	Element 4	Element 5	Element 6				
<i>Prasophyllum frenchii</i>	Maroon Leek-orchid	PMST	PMST	PMST	PMST	1992 (1)	PMST	EN	L	e	5
<i>Prasophyllum suaveolens</i>	Fragrant Leek-orchid	1962 (12)	-	-	-	-	-	EN	L	e	5
<i>Pterostylis cucullata</i>	Leafy Greenhood	PMST	PMST	-	-	-	-	VU	L	v	5
<i>Rutidosia leptorhynchooides</i>	Button Wrinklewort	2015 (38)	-	-	-	-	-	EN	L	e	5
<i>Senecio macrocarpus</i>	Large-fruit Groundsel	2015 (24)	1984 (1)	PMST	-	-	-	VU	L	e	1 (recorded in Element 1a)
<i>Senecio psilocarpus</i>	Swamp Fireweed	-	-	-	1996 (1)	2012 (8)	1996 (1)	VU	-	v	5
<i>Thesium austral</i>	Austral Toad-flax	1904 (1)	-	-	PMST	PMST	PMST	VU	L	v	5
<i>Xerochrysum palustre</i>	Swamp Everlasting	PMST	PMST	-	PMST	2008 (9)	PMST	VU	L	v	5
<b>STATE SIGNIFICANT</b>											
<i>Acacia aspera</i> subsp. <i>Parviceps</i>	Rough Wattle	-	-	2011 (33)	1998 (1)	-	-	-	-	r	3
<i>Acacia howittii</i>	Sticky Wattle	-	-	-	2007 (1)	2007 (1)	-	-	-	r	3
<i>Acacia rostriformis</i>	Bacchus Marsh Wattle	2015 (140)	2015 (144)	2015 (280)	-	-	-	-	L	v	4
<i>Allocauarina luehmannii</i>	Buloke	2010 (206)	2010 (127)	2010 (18)	-	-	-	-	L	e	4
<i>Alternanthera</i> sp. 1 (Plains)	Plains Joyweed	2011 (38)	2010 (6)	2010 (1)	-	-	-	-	-	k	4
<i>Amphibromus pithogastrus</i>	Plump Swamp Wallaby-	2004 (3)	-	-	-	-	-	-	L	e	3



Scientific Name	Common Name	Last Documented Record (No. VBA Records)						EPBC Act	FEG ACT	VICADV	Likelihood
		Element 1	Element 2	Element 3	Element 4	Element 5	Element 6				
	grass										
<i>Amphibromus sinuatus</i>	Wavy Swamp Wallaby-grass	-	-	-	-	2008 (1)	-	-	v	3	
<i>Amyema linophylla</i> subsp. <i>Orientalis</i>	Buloke Mistletoe	2010 (14)	2010 (14)	2010 (2)	-	-	-	-	v	5	
<i>Austrostipa breviglumis</i>	Cane Spear-grass	2014 (12)	2014 (12)	2014 (15)	-	-	-	-	r	4	
<i>Austrostipa exilis</i>	Heath Spear-grass	2006 (18)	2006 (17)	2008 (13)	-	-	-	-	r	3	
<i>Austrostipa hemipogon</i>	Half-bearded Spear-grass	2006 (2)	2006 (2)	-	-	-	-	-	r	3	
<i>Bolboschoenus fluviatilis</i>	Tall Club-sedge	-	-	1982 (1)	-	1982 (1)	1982 (1)	-	k	5	
<i>Boronia anemonifolia</i> subsp. <i>Aurifodina</i>	Goldfield Boronia	-	-	1917 (1)	-	-	-	-	r	5	
<i>Bossiaea cardigera</i>	Wiry Bossiaea	-	-	-	-	2012 (3)	1998 (2)	-	r	4	
<i>Bromus arenarius</i>	Sand Brome	1984 (1)	-	-	-	-	-	-	r	5	
<i>Callitriche palustris</i> var. <i>palustris</i>	Swamp Water-starwort	1945 (1)	-	-	-	-	-	-	k	5	
<i>Calotis lappulacea</i>	Yellow Burr-daisy	-	-	2001 (6)	-	-	-	-	r	4	
<i>Cardamine tenuifolia</i>	Slender Bitter-cress	-	-	-	-	1964 (2)	-	-	P	4	
<i>Carex chlorantha</i>	Green-top Sedge	-	-	-	1853 (1)	-	1905 (3)	-	k	5	

Scientific Name	Common Name	Last Documented Record (No. VBA Records)						EPBC Act	FFG ACT	VICADV	Likelihood
		Element 1	Element 2	Element 3	Element 4	Element 5	Element 6				
<i>Cornesperma polygaloides</i>	Small Milkwort	2015 (30)	-	-	-	-	-	-	L	v	4
<i>Convolvulus angustissimus</i> <i>subsp. omnigracilis</i>	Slender Bindweed	2014 (78)	2013 (9)	2012 (5)	-	-	-	-	-	k	2
<i>Coronidium gunnianum</i>	Pale Swamp Everlasting	2015 (20)	-	-	-	1996 (2)	1996 (1)	-	-	v	5
<i>Corymbia maculata</i>	Spotted Gum	1996 (1)	-	-	-	-	-	-	-	v	4
<i>Cullen parvum</i>	Small Scurf-pea	2012 (68)	2012 (19)	-	-	-	-	-	L	e	3
<i>Cullen tenax</i>	Tough Scurf-pea	2014 (54)	2010 (2)	1853 (1)	-	-	-	-	L	e	3
<i>Cynodon dactylon</i> var. <i>pulchellus</i>	Native Couch	2010 (1)	2010 (1)	-	-	-	-	-	-	k	4
<i>Desmodium varians</i>	Slender Tick-trefoil	2014 (42)	2011 (13)	2010 (2)	2007 (1)	1992 (2)	1992 (1)	-	-	k	2
<i>Dianella</i> sp. aff. <i>longifolia</i> (Benambra)	Arching Flax-lily	2014 (356)	2012 (75)	2011 (5)	-	-	-	-	-	v	2
<i>Dichondra</i> sp. 1	Silky Kidney-weed	2011 (1)	2011 (1)	-	-	-	-	-	-	r	5
<i>Discaria pubescens</i>	Australian Anchor Plant	-	-	-	-	2003 (15)	2001 (8)	-	L	r	5
<i>Distichium capillaceum</i>	Fine Fringe-moss	-	-	-	-	-	1898 (3)	-	-	v	5
<i>Diuris gregaria</i>	Clumping Golden Moths	2012 (1)	2012 (1)	-	-	-	-	-	L	e	5
<i>Diuris palustris</i>	Swamp Diuris	1934 (7)	-	-	-	-	-	-	L	v	5

Scientific Name	Common Name	Last Documented Record (No. VBA Records)						EPBC Act	FFG ACT	VICADV	Likelihood
		Element 1	Element 2	Element 3	Element 4	Element 5	Element 6				
<i>Eleocharis macharronii</i>	Grey Spike-sedge	2014 (5)	-	-	-	-	-	-	-	k	5
<i>Eleocharis pallens</i>	Pale Spike-sedge	2013 (25)	2010 (7)	-	-	-	-	-	-	k	5
<i>Eleocharis plana</i>	Flat Spike-sedge	2011 (2)	-	-	-	-	-	-	-	v	5
<i>Encalypta vulgaris</i>	Common Extinguisher-moss	-	-	-	-	1996 (1)	-	-	-	r	5
<i>Eucalyptus baueriana</i> subsp. <i>Thalassina</i>	Werribee Blue-box	2011 (320)	2011 (307)	2011 (304)	-	-	-	-	-	e	3
<i>Eucalyptus brookeriana</i>	Brooker's Gum	-	-	-	-	2013 (6)	2013 (6)	-	-	r	4
<i>Eucalyptus goniocalyx</i> subsp. <i>Laxa</i>	Gum-barked Bundy	-	-	2011 (27)	-	-	-	-	-	v	3
<i>Eucalyptus leucoxydon</i> subsp. <i>Connate</i>	Melbourne Yellow-gum	2013 (48)	2013 (49)	2013 (66)	-	-	-	-	-	v	3
<i>Eucalyptus leucoxydon</i> subsp. <i>Megalocarpa</i>	Large-fruit Yellow-gum	1996 (1)	-	-	-	-	-	-	L	e	5
<i>Eucalyptus yarraensis</i>	Yarra Gum	-	-	-	2000 (9)	2007 (28)	2011 (51)	-	-	r	3
<i>Euphrasia collina</i> subsp. <i>Speciose</i>	Purple Eyebright	-	-	-	-	-	1770 (1)	-	-	x	5
<i>Euphrasia scabra</i>	Rough Eyebright	-	-	-	-	-	1770 (1)	-	L	e	5
<i>Geranium solanderi</i> var.	Austral Crane's-bill	2009 (8)	-	-	-	-	-	-	-	v	5

Scientific Name	Common Name	Last Documented Record (No. VBA Records)						EPBC Act	FFG ACT	VICADV	Likelihood
		Element 1	Element 2	Element 3	Element 4	Element 5	Element 6				
<i>solanderi</i> s.s.											
<i>Geranium</i> sp. 1	Large-flower Crane's-bill	2009 (1)	-	-	-	-	-	-	L	e	5
<i>Geranium</i> sp. 3	Pale-flower Crane's-bill	2014 (19)	2011 (1)	-	-	-	-	-	-	r	5
<i>Goodenia lineata</i>	Grampians Goodenia	-	-	-	-	-	2006 (1)	-	-	r	5
<i>Goodia medicaginea</i>	Western Golden-tip	1993 (2)	1993 (2)	1993 (2)	-	-	-	-	-	r	5
<i>Grevillea rosmarinifolia</i>	Rosemary Grevillea	2014 (4)	1959 (1)	1850 (1)	1998 (2)	-	2011 (10)	-	-	P	5
<i>Grevillea steiglitziana</i>	Brisbane Range Grevillea	-	-	2011 (213)	-	-	-	-	-	r	4
<i>Hypoxis vaginata</i> var. <i>brevistigmata</i>	Yellow Star	-	-	-	1978 (1)	1882 (1)	-	-	-	k	5
<i>Lasiopetalum ferrugineum</i>	Rusty Velvet-bush	2010 (1)	2010 (1)	-	-	-	-	-	-	P	5
<i>Leiocarpa leptolepis</i>	Pale Plover-daisy	1912 (1)	-	-	-	-	-	-	L	e	5
<i>Leionema lamprophyllum</i> subsp. <i>obovatum</i>	Shiny Leionema	-	-	2011 (7)	-	-	-	-	-	r	5
<i>Lemna trisulca</i>	Ivy-leaf Duckweed	-	-	-	-	-	1993 (3)	-	-	k	5
<i>Lepidium pseudohyssopifolium</i>	Native Peppercress	2011 (3)	2011 (1)	2008 (2)	-	-	1993 (1)	-	-	k	5
<i>Lotus australis</i> var. <i>australis</i>	Austral Trefoil	2010 (1)	-	-	-	-	-	-	-	k	5

Scientific Name	Common Name	Last Documented Record (No. VBA Records)						EPBC Act	FEG ACT	VICADV	Likelihood
		Element 1	Element 2	Element 3	Element 4	Element 5	Element 6				
<i>Maireana aphylla</i>	Leafless Bluebush	2002 (3)	-	2006 (7)	-	-	-	-	k	5	
<i>Marsilea mutica</i>	Smooth Nardoo	2000 (1)	2000 (1)	2000 (1)	-	-	-	-	k	5	
<i>Melaleuca armillaris</i> subsp. <i>armillaris</i>	Giant Honey-myrtle	2011 (5)	2009 (1)	-	-	-	2011 (3)	-	r	4	
<i>Myoporum montanum</i>	Waterbush	-	-	1853 (1)	-	-	-	-	r	5	
<i>Nicotiana suaveolens</i>	Austral Tobacco	2014 (33)	2011 (27)	2013 (61)	2002 (1)	-	-	-	r	4	
<i>Olearia minor</i>	Satin Daisy-bush	-	-	2011 (12)	-	-	-	-	r	4	
<i>Philothea angustifolia</i> subsp. <i>montana</i>	Narrow-leaf Wax-flower	1987 (1)	1987 (1)	1987 (1)	-	-	-	-	v	5	
<i>Pimelea curviflora</i> var. <i>aff. Subglabrata</i>	Curved Rice-flower	1994 (1)	1994 (1)	2001 (3)	-	-	-	-	k	5	
<i>Pimelea hewardiana</i>	Forked Rice-flower	2011 (10)	2011 (10)	2011 (14)	-	-	-	-	r	4	
<i>Poa amplexicaulis</i>	Red-sheath Tussock-grass	-	-	2011 (8)	-	-	-	-	r	5	
<i>Poa labillardierei</i> var. (Volcanic Plains)	Basalt Tussock-grass	2010 (1)	-	-	-	-	-	-	k	5	
<i>Podolepis linearifolia</i>	Basalt Podolepis	2014 (15)	-	-	-	-	-	-	e	5	
<i>Poranthera corymbosa</i>	Clustered Poranthera	-	-	2011 (2)	-	-	-	-	r	5	
<i>Prostanthera decussata</i>	Dense Mint-bush	-	-	2011 (14)	-	-	-	-	r	5	

Scientific Name	Common Name	Last Documented Record (No. VBA Records)						EPBC Act	FFG ACT	VICADV	Likelihood
		Element 1	Element 2	Element 3	Element 4	Element 5	Element 6				
<i>Prostanthera nivea</i> var. <i>nivea</i>	Snowy Mint-bush	2011 (4)	2011 (4)	2011 (5)	-	-	-	-	r	5	
<i>Pseudanthus orbicularis</i>	Tangled Pseudanthus	-	-	2011 (36)	-	-	-	-	r	5	
<i>Pseudanthus ovalifolius</i>	Oval-leaf Pseudanthus	-	-	2007 (1)	-	-	-	-	r	5	
<i>Pterostylis bicolor</i>	Black-tip Greenhood	1996 (1)	1996 (1)	1996 (1)	-	-	-	-	k	5	
<i>Pterostylis truncate</i>	Brittle Greenhood	2013 (74)	2013 (74)	2013 (78)	-	-	-	L	e	5	
<i>Ptilotus erubescens</i>	Hairy Tails	-	-	1984 (1)	-	-	-	L	v	5	
<i>Ptychomitrium muelleri</i>	Pincushion	-	-	-	-	-	1898 (3)	-	k	5	
<i>Pultenaea gunnii</i> subsp. <i>tuberculata</i>	Golden Bush-pea	-	-	1992 (4)	-	-	-	-	r	5	
<i>Pultenaea reflexifolia</i>	Wombat Bush-pea	-	-	-	-	1770 (1)	1770 (1)	-	r	5	
<i>Ranunculus diminutus</i>	Brackish Plains Buttercup	1990 (1)	1990 (1)	-	-	-	-	-	r	5	
<i>Rhagodia parabolica</i>	Fragrant Saltbush	2015 (516)	2015 (500)	2015 (655)	2011 (3)	-	-	-	r	3	
<i>Sclerolaena muricata</i> var. <i>muricata</i>	Black Roly-poly	2010 (7)	1987 (4)	1998 (10)	-	-	-	-	k	3	
<i>Senecio cunninghamii</i> var. <i>cunninghamii</i>	Branching Groundsel	1994 (3)	1994 (2)	2008 (6)	-	-	-	-	r	5	
<i>Thelymitra gregaria</i>	Basalt Sun-orchid	1929 (1)	-	-	-	-	-	L	e	5	

Scientific Name	Common Name	Last Documented Record (No. VBA Records)						EPBC Act	FFG ACT	VICADV	Likelihood
		Element 1	Element 2	Element 3	Element 4	Element 5	Element 6				
<i>Tortula rubella</i>	Screw Moss	-	-	-	1998 (1)	-	-	-	-	k	5
<i>Tripogon liliiformis</i>	Rye Beetle-grass	2012 (56)	2010 (11)	2008 (2)	-	-	-	-	-	r	4
<i>Westringia glabra</i>	Violet Westringia	-	-	1980 (3)	-	1996 (3)	1989 (1)	-	-	r	5

**Notes:** EPBC = *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), FFG = *Flora and Fauna Guarantee Act 1988* (FFG Act), DEPI = Advisory List of Rare or Threatened Plants in Victoria (DEPI 2014), L = Listed, # = Records identified from EPBC Act Protected Matters Search Tool, Data source: Victorian Biodiversity Atlas (DELWP 2016); Protected Matters Search Tool (DoE 2016). Order: Alphabetical.

## Appendix 2.4 – Habitat Hectares

**Table A2.3.** Habitat Hectares results for remnant vegetation recorded within the study area located outside of the Urban Growth Area.

Vegetation Zone	CGW1	CGW2	PG1	PG2	PG5	PWood4	PWood5	PGW2b	PGW3	PGW5
Bioregion	VWP	VWP	VWP	VWP	VWP	VWP	VWP	VWP	VWP	VWP
EVC / Tree	CGW	CGW	PG(HS)	PG(HS)	PG(HS)	PW	PW	PGW	PGW	PGW
EVC Number	68	68	132_61	132_61	132_61	803	803	55_61	55_61	55_61
EVC Conservation Status	Vu	Vu	En	En	En	En	En	En	En	En
Large Old Trees /10	0	10	0	0	0	0	0	0	0	0
Canopy Cover /5	5	5	0	0	0	5	5	0	3	0
Understorey /25	5	5	5	5	5	5	5	5	5	5
Lack of Weeds /15	2	2	2	2	0	2	2	6	2	2
Recruitment /10	3	3	3	6	3	3	0	3	3	3

Condition	Organic Matter /5	5	5	5	5	5	5	5	5	5	5	5	5
	Logs /5	0	0	0	0	0	0	0	0	0	0	0	0
	Treeless EVC Multiplier	1.00	1.00	1.36	1.36	1.36	1.36	1.00	1.00	1.00	1.00	1.00	1.00
	Subtotal =	20.00	30.00	20.40	24.48	14.96	20.00	17.00	20.00	20.00	20.00	15.00	15.00
Landscape Value /25		4	4	4	4	4	4	4	4	6	4	4	4
Habitat Points /100		24	34	24	28	19	24	21	26	24	19	19	19
<b>Habitat Score</b>		<b>0.24</b>	<b>0.34</b>	<b>0.24</b>	<b>0.28</b>	<b>0.19</b>	<b>0.24</b>	<b>0.21</b>	<b>0.26</b>	<b>0.24</b>	<b>0.24</b>	<b>0.19</b>	<b>0.19</b>

\*Note that Landscape Values were modified from the BIM tool where patches were assigned the higher value throughout that Element; except in Element 5 where there was a clear distinction in landscape value scores between vegetation in the eastern section and lower values in the western section.

VVP = Victorian Volcanic Plain Bioregion; CGW = Creekline Grassy Woodland; PG(HS) = Plains Grassland – Heavier Soils; PW = Plains Woodland; PGW = Plains Grassy Woodland;; En = Endangered; Vu = Vulnerable. \* = No Conservation Status is available for this EVC within the VVP Bioregion.

**Table A2.3 (cont).** Habitat Hectares results for remnant vegetation recorded within the study area located outside of the Urban Growth Area.

Vegetation Zone	PGW6a	PGW6b	PGW6c	PGW8	PGWg	PGW10	PGW11a	PGW11b	PGW12	TM1
Bioregion	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP	VVP
EVC / Tree	PGW	PGW	PGW	PGW	PGW	PGW	PGW	PGW	PGW	TM
EVC Number	55_61	55_61	55_61	55_61	55_61	55_61	55_61	55_61	55_61	821
EVC Conservation Status	En	En	En	En	En	En	En	En	En	*
Large Old Trees /10	0	0	0	0	10	0	0	0	0	0
Canopy Cover /5	0	0	0	0	5	5	3	3	0	0
Under storey /25	5	5	5	5	5	5	5	5	5	5
Lack of Weeds /15	2	2	2	2	2	2	2	2	0	6
Recruitment /10	5	5	5	0	3	3	3	3	5	6



Condition	Organic Matter /5	3	3	3	3	3	3	3	3	3	3	3
	Logs /5	0	0	0	0	0	0	0	0	0	0	0
	Treeless EVC Multiplier	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.36
	Subtotal =	15.00	15.00	15.00	10.00	30.00	20.00	18.00	18.00	18.00	13.00	27.20
	Landscape Value /25	4	6	1	4	4	4	4	6	6	4	6
	Habitat Points /100	19	21	16	14	34	24	22	24	17	17	33
	<b>Habitat Score</b>	<b>0.19</b>	<b>0.21</b>	<b>0.16</b>	<b>0.14</b>	<b>0.34</b>	<b>0.24</b>	<b>0.22</b>	<b>0.24</b>	<b>0.17</b>	<b>0.33</b>	

\*Note that Landscape Values were modified from the BIM tool where patches were assigned the higher value throughout that Element; except in Element 5 where there was a clear distinction in landscape value scores between vegetation in the eastern section and lower values in the western section.

VVP = Victorian Volcanic Plain Bioregion; CGW = Creekline Grassy Woodland; PG(HS) = Plains Grassland – Heavier Soils; PW = Plains Woodland; PGW = Plains Grassy Woodland; TM = Tall Marsh; En = Endangered; Vu = Vulnerable. \* = No Conservation Status is available for this EVC within the VVP Bioregion

## APPENDIX 3 - FAUNA

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### Appendix 3.1 – Targeted Fauna Surveys

#### Introduction

Targeted surveys were conducted within the study area for the EPBC-Act listed Striped Legless Lizard *Delma impar*, Golden Sun Moth *Synemon plana*, Growling Grass Frog *Litoria raniformis*, and Dwarf Galaxias *Galaxias pusilla*.

The objective of the targeted surveys was to determine the presence or otherwise of the target species, and if present, collect information regarding the species' abundance and distribution across the study area. This information was then intended to inform the potential for the BLU to impact on the species, and identify whether avoidance and minimisation measures are required as part of the future project activities. The following has been outlined in this report:

- A description of target species habitat within the study area;
- A description of the target species;
- Methods used to survey for the target species;
- Results of the surveys;
- Information regarding any potential impacts on the species and legislative implications associated with the proposed activity; and,
- Recommendations to avoid or minimise impacts to the species.

#### ***Striped Legless Lizard Delma impar***

The Striped Legless Lizard is listed as Vulnerable under the EPBC Act, listed as threatened under the FFG Act and is considered to be endangered in Victoria (DSE 2013a).

#### **Description**

The Striped Legless Lizard is a member of the family Pygopodidae, the legless or flap-footed lizards (Cogger 1996). As with other members of the legless lizard family, Striped Legless Lizards lack forelimbs and have only vestigial hind limbs, in the form of scale 'flaps' either side of their vent.

Superficially, these animals resemble snakes, but can be readily distinguished from the latter by the presence of external ear openings, a fleshy undivided tongue and a tail which is longer than the body (Cogger 1996). Striped Legless Lizards are readily distinguished from other legless lizards by body colouration, body size and head scalation.



**Plate 8 Striped Legless Lizard (Ecology and Heritage Partners Pty Ltd)**