ecology & heritage partners

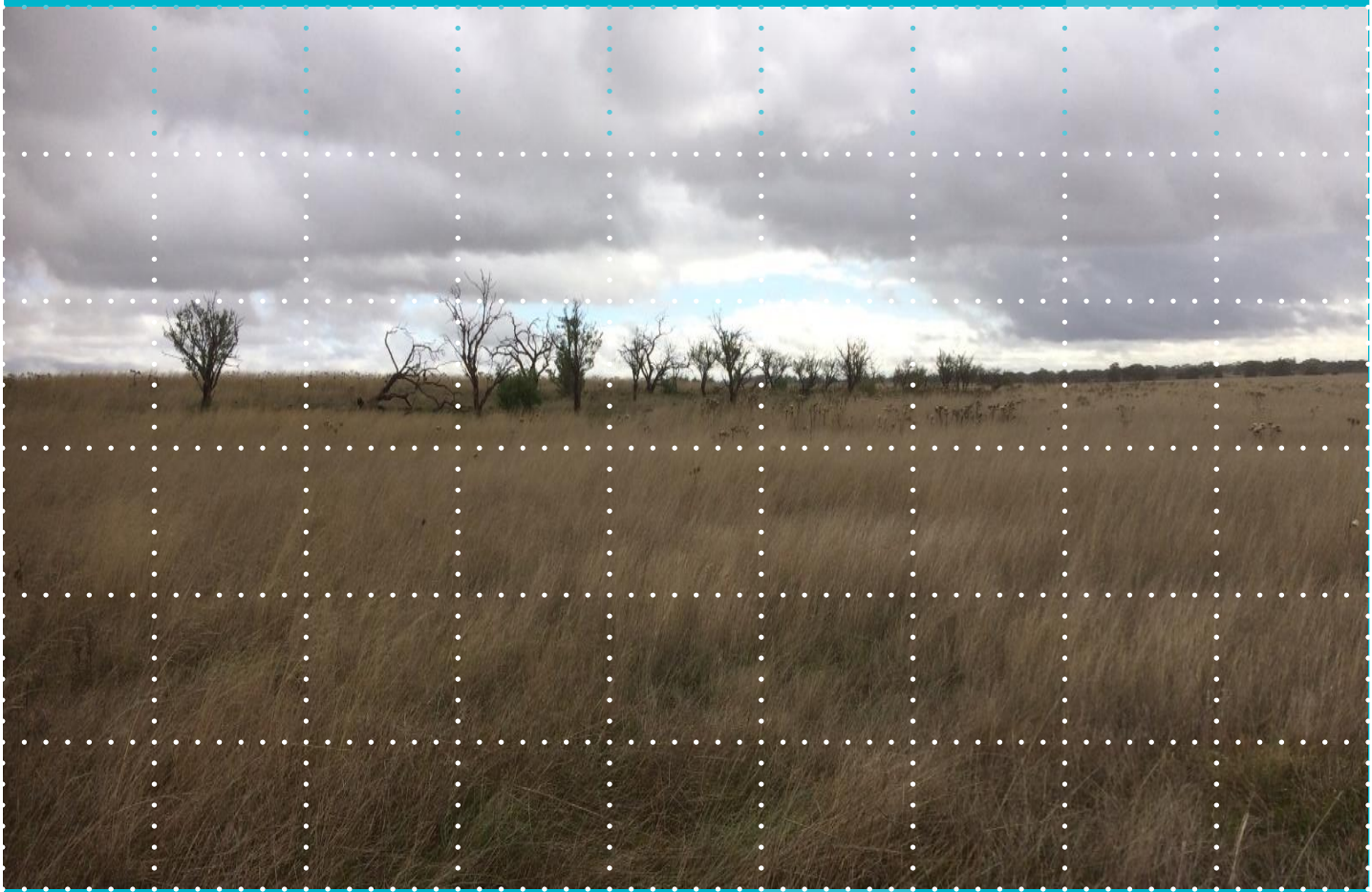
Final Report

Preliminary Ecological Assessment: Youth Justice Precinct Development, Cherry Creek

Prepared for

Department of Justice and Regulation

May 2017



Ecology and Heritage Partners Pty Ltd

MELBOURNE: 292 Mt Alexander Road, Ascot Vale VIC 3032 **GEELONG:** 230 Latrobe Terrace, Geelong West Vic 3218
BRISBANE: Level 22, 127 Creek Street, Brisbane QLD 4000 **ADELAIDE:** 22 Greenhill Road, Wayville SA 5034
CANBERRA: PO Box 6067, O'Connor ACT 2602 **SYDNEY:** Level 5, 616 Harris Street, Ultimo, NSW, 2007
www.ehpartners.com.au | (03) 9377 0100

DOCUMENT CONTROL

Assessment	Preliminary Ecological Assessment
Address	Youth Justice Precinct Development, Cherry Creek
Project number	9302
Project manager	Dr Thomas Wright (Senior Botanist)
Report reviewer	Aaron Organ (Director / Principal Ecologist)
Mapping	Monique Elsley (GIS Officer)
File name	EHP_9302_YJPD_NH_FINAL_30052017
Client	Department of Justice and Regulation
Bioregion	Victorian Volcanic Plain
CMA	Port Philip and Westernport
Council	Wyndham City Council

Report versions	Comments	Comments updated by	Date submitted
Draft 1	Submitted to client		19/05/2017
Final	Include recommendations in summary, provide definition of an offset, include a list of acronyms, change construction start dates.	TW	30/05/2017

ACRONYMS AND ABBREVIATIONS

BCS	Biodiversity Conservation Strategy
BEU	Biodiversity Equivalence Unit
BIM	Biodiversity Interactive Map
CaLP Act	*Catchment and Land Protection Act 1994*
CEMP	Construction Environmental Management Plan
CMA	Catchment Management Authority
DELWP	Victorian Department of Environment, Land, Water and Planning
DJR	Department of Justice and Regulation
DoEE	Commonwealth Department of the Environment and Energy
DSE	Dry Sheep Equivalent
EE Act	*Environment Effects Act 1978* (Victorian)
EES	Environmental Effects Statement
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EVC	Ecological Vegetation Class
FFG Act	*Flora and Fauna Guarantee Act 1988* (Victorian)
LGA	Local Government Area
MSA	Melbourne Strategic Assessment
NES	National Environmental Significance
NVIM	Native Vegetation Information Management
OMAR	Outer Metropolitan Arterial Road
OTC	Over-the-Counter
P&E Act	*Planning and Environment Act 1987* (Victorian)
PG	Plains Grassland
PMST	Protected Matters Search Tool
PUZ1	Public Use Zone – Schedule 1
SBS	Strategic Biodiversity Score
Study area	73 hectare site including proposed access road
WONS	Weed of National Significance
WTP	Western Treatment Plant
VBA	Victorian Biodiversity Atlas
YJDP	Youth Justice Precinct Development

SUMMARY

Ecology and Heritage Partners Pty Ltd was commissioned by the Victorian Department of Justice and Regulation (DJR) to conduct a preliminary ecological assessment for the proposed Youth Justice Precinct Development (YJDP), Cherry Creek, Victoria. The YJDP will involve a youth justice centre and construction of the facility is scheduled to commence in late 2018 and be completed early in 2021. The study area is located in the 'Northern Grasslands' area of Melbourne Water's Western Treatment Plant and is approximately 73 hectares of which approximately 31 hectares will be required for the project (i.e. 25 hectares for the YJPD and six hectares for an access road).

The purpose of the assessment was to identify presence or likely presence of significant ecological values that may be impacted by the project, including threatened species and ecological communities, migratory species, Wetlands of International Importance (Ramsar site) and remnant native vegetation. The assessment included a desktop and field study and consultation with key stakeholders. Results of the assessment have been discussed in the context of relevant environmental legislation and policy to identify which environmental approvals and permits are likely to be required for the project.

The study area is covered nearly entirely by Low-rainfall Plains Grassland (EVC 132_63) and the nationally threatened Natural Temperate Grassland of the Victorian Volcanic Plain. This community provides habitat for nationally threatened species that have been recorded in close proximity to the study area, including Button Wrinklewort *Rutidosis leptorhynchoides*, Clover Glycine *Glycine latrobeana*, Large-headed Fireweed *Senecio macrocarpa*, Matted Flax-lily *Dianella amoena*, Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens*, Golden Sun Moth *Synemon plana* and Striped Legless Lizard *Delma impar*. Targeted surveys are recommended to determine the presence of these species.

The study area forms part of a protected Ramsar site (Port Phillip Bay (Western Shoreline) and Bellarine Peninsula) due to being located within the Western Treatment Plant. However, the study area does not contain any of the values that support Ramsar-listing, namely wetlands and significant water-bodies that provide important habitat for migratory birds. As such, the project is unlikely to have a significant impact on the protected Ramsar site, provided that best-practice erosion, sediment and stormwater management procedures are in place.

The project is likely to require approval under the following environmental legislation and policy:

Table 1. Summary of legislative implications

Act	Implications	Recommendations
Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)	Study area is mostly covered by the listed ecological community - Natural Temperate Grassland of the Victorian, and has potential to support five listed flora species (Button Wrinklewort, Clover Glycine, Large-headed Fireweed, Matted Flax-lily and Spiny Rice-flower) and two-listed fauna species (Golden Sun Moth and Striped Legless).	Complete targeted surveys for listed flora and fauna. Submit a referral the Commonwealth Environment Minster for approval under the EPBC Act. Given that Natural Temperate Grassland of the Victorian Volcanic Plain will be impacted the proposed development is likely to be determined a controlled action and the assessment and approval process will take at least 6-9 months.
Victorian *Environment Effects*	The project is highly likely to exceed the following triggers for an Environment Effect	Consult DELWP about the requirement to

Act	Implications	Recommendations
Act 1978 (EE Act)	Statement (EES) referral under the EE Act: - loss of more than 10 hectares of an Endangered Ecological Vegetation Class (Plains Grassland); - loss of an FFG Act-listed ecological community (Western Basalt Plains Grassland Community); and, - potentially impact FFG Act-listed species.	submit an EES referral.
Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act)	The project is likely to impact the listed ecological community Western (Basalt) Plains Grassland Community, and may require the removal of listed threatened and protected species.	Submit an FFG Act-permit application for the loss of Western (Basalt) Plains Grassland Community, and any threatened or flora species that would be impacted.
Victorian *Planning and Environment Act 1987* (P&E Act)	The majority of the study area contains remnant native vegetation protected under the P&E Act. A permit would be required under the Act and offsets obtained to compensate for the loss of any remnant native vegetation.	Submit a permit to Wyndham City Council for the removal of remnant native vegetation. Offsets would need to be obtained as part of the permit conditions.
Victorian *Wildlife Act 1975*	Planted trees, grasslands and stony knolls provide suitable habitat for native fauna protected under the Act.	A suitably qualified zoologist, with authorisation under the Act, should be on site during habitat clearing to salvage and relocate any protected fauna.
Victorian *Catchment and Land Protection Act 1994*	The study area supports weeds and pest animals declared as noxious under the Act.	Prepare a Construction Environmental Management Plan (CEMP) or similar document that outlines control measures to prevent the introduction or spread of declared noxious species.

Should the EPBC Act referral be submitted prior to the completion of the recommended targeted surveys for listed flora and fauna species, and the project is determined a controlled action, further information on the presence or otherwise of listed flora and fauna species can be provided to DoEE as results of the targeted surveys become available (i.e. between October and early January). That is, additional information can be provided to DoEE's during the EPBC Act assessment process.

Early works such as geotechnical investigations are likely to require disturbance and possibly clearance of Natural Temperate Grassland of the Victorian Volcanic Plain and threatened species' habitat and it is recommended that DJR liaise with DoEE regarding whether these early works would need to be referred.

A possible location for the project has been identified in the south of the study area, and this location is likely to have the lowest impact on ecological values.

Based on our understanding of the project timeframe, there is a risk that environmental assessments and approvals could delay construction. As such, it is recommended that an environmental approvals strategy be prepared and DJR liaise with relevant referral authorities (i.e. Commonwealth Department of the Environment and Energy 'DoEE' and Victorian Department of the Environment, Land, Water and Planning 'DELWP') to ascertain the likely assessment requirements and conditions associated with environmental approvals.

A significant quantity of biodiversity offsets will be required for the project as part of Commonwealth and Victorian environmental approvals. Offsets are measures that compensate for the residual impacts of an action on the environment, and generally involve the protection and management of similar habitat at an alternate site.

The offset requirements in Victoria have been calculated for the recommended site location (Table 2). It has been identified via a review of the Native Vegetation Credit Register that there is a short-fall of offsets that can be purchased through Over-the-Counter offset schemes (e.g. Bushbroker) to meet the offset requirements in Table 2. As such, landowners who have suitable offsets would need to be approached. The offset requirements to address Commonwealth environmental approvals would be determined by DoEE after the project has been assessed under the EPBC Act, and would include any matter of National Environmental Significance that will be significantly impacted by the project (e.g. Natural Temperate Grassland of the Victorian Volcanic Plain and/or threatened species).

Table 2. Offset requirements under Victoria's *Permitted clearing of native vegetation: biodiversity assessment guidelines* (DEPI 2013) for the recommended site

General Offsets Required	4.536 General BEUs
Specific Offsets Required	Red-chested Button-quail (13.596 specific BEUs), Striped Legless Lizard (18.200 specific BEUs), Large-headed Fireweed (16.756 specific BEUs) and Pale Swamp Everlasting (17.522 specific BEUs) and Spiny Rice-flower (0.02 specific BEUs)
Vicinity (catchment / LGA)	Port Philip and Westernport CMA / Wyndham City Council
Minimum Strategic Biodiversity Score*	0.445

BEU = Biodiversity Equivalence Unit

Based on the findings of the assessment, and an understanding of the project timeframes, the following actions are recommended:

1. Complete targeted surveys for Button Wrinklewort, Clover Glycine, Large-headed Fireweed, Matted Flax-lily, Spiny Rice-flower, Golden Sun Moth and Striped Legless Lizard in accordance with Government minimum survey requirements/guidelines.

2. Liaise with DoEE to determine if approval under the EPBC Act would be required for pre-construction geotechnical surveys.

3. Prepare an offset strategy that estimates the total offset liability (Commonwealth and State offsets), potential sites that would be available, costs and consultation with DoEE to clarify the likely Commonwealth offsets required for the project.

4. Prepare an environmental approvals strategy that outlines the likely permits and approvals required for the project, and the likelihood of an EES being required for the project following consultation with DELWP.

5. Submit relevant referrals (e.g. EPBC Act and EES) and permits (e.g. planning, FFG Act and Wildlife Act) as soon as possible.

6. Liaise with DELWP and DoEE to determine if the project would be assessed via a bilateral agreement between the Commonwealth and Victorian Government (this is likely to be the case should an EES be required for the project).

CONTENTS

1 INTRODUCTION

1.1 Background

Ecology and Heritage Partners Pty Ltd was commissioned by the Victorian Department of Justice and Regulation to conduct a preliminary ecological assessment for the proposed Youth Justice Precinct Development, Cherry Creek, Victoria.

The Victorian Government has allocated funding to build a fit-for-purpose youth justice centre in Cherry Creek, Victoria, consisting of 224 beds for remand and sentenced clients, a 12 bed mental health unit and an intensive supervision unit of at least eight beds, with scope for further expansion within the allocated government owned site. Construction of the Youth Justice Precinct Development (YJPD) is scheduled to commence in late 2018 and completed early in 2021. The Department of Justice and Regulation (DJR) is responsible for the YJDP.

1.2 Objectives

The objectives of the Preliminary Ecological Assessment were to identify significant ecological values, or the likely presence thereof, where significant ecological values include threatened species and ecological communities listed under Commonwealth and State legislation, and protected remnant vegetation. The scope for the works included:

- Detailed review of existing desktop information including biodiversity databases and ecological reports;
- Consult with stakeholders from Melbourne Water and the Victorian Department of Environment, Land, Water and Planning (DELWP) to understand the management history of the site, known or potential biodiversity values present and discuss likely regulatory approvals;
- Undertake a field assessment to map the extent and quality of:
    - remnant native vegetation in accordance with Victoria's *Permitted clearing of native vegetation: biodiversity assessment guidelines* (DEPI 2013);
    - threatened ecological communities listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act)*;* and,
    - habitat for significant flora and fauna raised during the desktop and stakeholder review.
- Prepare a report detailing the results of the assessments, advising on any addition surveys and likely environmental approvals that would be required before construction can commence.

1.3 Study Area

The study area is located at Cherry Creek, Victoria, and forms part of the Melbourne Water's Western Treatment Plan. It is approximately 10 kilometres south-west of Werribee and 38 kilometres south-west of

the Melbourne Central Business District, and is bound by Princes Freeway to the south, and grazing paddocks to the north, east and west. The eastern boundary of the study area is the proposed route for the Outer Metropolitan Arterial Road (OMAR). The Melbourne-Geelong Railway-line is approximately one kilometre to the north (Figure 1a). Including the proposed access road from Princes Freeway, the study area covers approximately 73 hectares of which it is estimated approximately 31 hectares will be required for the project (i.e. 25 hectares for the YJPD and six hectares for an access road).

The study area lies within the Victorian Volcanic Plain bioregion, and falls under the jurisdiction of the Wyndham City Council and Port Phillip and Westernport Catchment Management Authority. It also falls within the boundary of the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site. The study area lies outside of the Melbourne Strategic Assessment (MSA) area, the adjoining OMAR representing the western boundary of the MSA.

The study area is referred to by Melbourne Water staff as the 'Almond Paddock' as it once contained Almond plantations the remnants of which can be seen in the east of the study area. The section of the WTP north and immediately south of the Princes Freeway, which includes the study area, is also referred to as the 'Northern Grasslands'. The study area has not been cropped but has had a long history of grazing. Up until 2006, the site was grazed intensively all year round at a rate estimated to be 7.5. Dry Sheep Equivalent (DSE) per hectare. Since then, crash grazing has been implemented, predominantly in spring and the grazing intensity has reduced to 2.5 DSE per hectare. In the last five years grazing intensity has reduced even further. The study area was not being grazed during the field assessment. In addition to altering grazing practices, Melbourne Water has invested significantly in weed control.

The study area is generally flat, with occasional stony knolls characteristic of the bioregion. There are no major water-bodies located in the study area. An ephemeral tributary of Lollypop Creek runs through the west of the study area. The closest major water body is Belfrages Swamp situated 500 metres south of the study area.

Other sites within the Northern Grasslands area were considered for the project; however, adjoining land-uses such as a landfill, quarries, proposed poultry farm and high pressure gas pipeline, would preclude the YJPD being located anywhere outside of the study area. The YJPD could also not be located on land designated for the OMAR.

2 METHODS

2.1 Desktop Assessment

A detailed review of online-resources, biodiversity databases, and ecological reports were reviewed to provide an assessment of the flora and fauna values associated with the study area, including:

- Native Vegetation Information Management (NVIM) tool, maintained by the Victorian Department of Environment, Land, Water and Planning (DELWP 2017a), to check for any obligations under the Victorian Biodiversity Conservation Strategy (BCS) (DEPI 2013a);
- Biodiversity Interactive Map (BIM) maintained by DELWP, for the modelled distribution of Ecological Vegetation Classes (EVCs) within the study area (DEWLP 2017b);
- EVC benchmarks (DELWP 2017c) for descriptions of EVCs within the relevant bioregion;
- Victorian Biodiversity Atlas (VBA), maintained by DELWP, for records of threatened species recorded within or in close proximity to the study area (DELWP 2017d);
- Planning Maps Online (DELWP 2017e) and Planning Schemes Online (DELWP 2017f) to ascertain current zoning and environmental overlays in the study area;
- Protected Matters Search Tool (PMST), maintained by the Commonwealth Department of the Environment and Energy (DoEE); for records or modelled presence of matters of National Environmental Significance (NES), protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- Previous ecological assessments of the study area or adjoining areas, specifically:
    - Fauna Survey of Dry Pasture Areas, Western Treatment Plant, Werribee, Victoria (Biosis Research 2003);
    - Grassland Mammal Investigation, T-section Grasslands and Dry Pasture Areas north of the Princes Highway, Western Treatment Plant, Victoria (Ecology Partners 2006);
    - A Flora Assessment of the Northern Grassland Area of the Western Treatment Plant (Botanicus Australia 2007);
    - Vegetation mapping of the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar Site (Sinclair 2010);
    - Biodiversity Conservation and Ramsar Management Plan for the Western Treatment Plant, Werribee (Ecology Australia 2010);
    - Melbourne Water Sites of Biodiversity Significance Habitat Hectare Assessments (Australian Ecosystems 2011);
    - Western (Basalt) Plains Grassland Fauna Surveys – Western Treatment Plant, Werribee (Ecology Australia 2012).

  - Index of Wetland Condition Assessments of Natural and Constructed Wetlands (Australian Ecosystems 2013); and,
  - Sites of Biodiversity Significance – Vegetation Assessments 2014 – 2015 Draft Report (Australian Ecosystems 2015).
- Publically available aerial imagery; and,
- Relevant legislation and policy.

A map showing the location of the past ecological assessments of the study area and adjoining areas is provided in Figure 1b.

2.2 Field Assessment

A field assessment was undertaken on 11 April 2017 to obtain information on flora and fauna values within the study area. The study area was walked, with all observed vascular flora and fauna species recorded, any significant records mapped and the overall condition of vegetation and habitats noted. An additional 25 metre buffer was surveyed either side of the proposed access road.

Remnant native vegetation was identified based on the definition provided in the Victorian *Permitted clearing of native vegetation: biodiversity assessment guidelines* (DEPI 2013), where native remnant vegetation is categorised as either a remnant path or scattered tree (Table 3). The condition of a remnant patch was assessed in accordance with the methodology described in the Vegetation Quality Assessment Manual (DSE 2004). Ecological Vegetation Classes (EVCs) were determined with reference to DELWP pre-1750 and extant EVC mapping and their published descriptions (DELWP 2017c).

Threatened ecological communities were also identified on the basis of relevant conservation statements, listing advice and condition thresholds.

Table 3. Determination of remnant native vegetation (DEPI 2013)

Category	Definition	Extent	Condition
Remnant patch of native vegetation	An area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native. OR An area with three or more native canopy trees where the canopy foliage cover is at least 20 per cent of the area.	Measured in hectares. Based on hectare area of the remnant patch.	Vegetation Quality Assessment Manual (DSE 2004).
Scattered tree	A native canopy tree that does not form part of a remnant patch.	Measured in hectares. Each scattered tree is assigned an extent of 0.071 hectares (30m diameter).	Scattered trees are assigned a default condition score of 0.2.

2.3 Stakeholder Consultation

A site visit with relevant stakeholders was undertaken on 12 May 2017 to discuss the environmental values of the project, past management history, site selection process and other components of the project.

A list of people who attended the site walk-over is provided below (Table 4).

Table 4. List of attendees at site walk-over

Heather Graham	Environmental Officer, Western Treatment Plant
Richard Boekel	DELWP
Tracey Taylor	DELWP
Matthew Joy	ISG Projects
Russell Collier	ISG Projects
Thomas Wright	Ecology and Heritage Partners

2.4 Assessment Qualifications and Limitations

Data and information held within the ecological databases and mapping programs reviewed in the desktop assessment (e.g. VBA, PMST, BIM 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.

Ecology and Heritage Partners cannot guarantee the accuracy of third-party data used in this project, such as past ecological surveys and biodiversity databases.

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 'snap shot' nature of a standard biodiversity assessment, meant that migratory, transitory or uncommon fauna species may have been absent from typically occupied habitats at the time of the field assessment. In addition, annual or cryptic flora species such as those that persist via underground tubers may also be absent. Targeted flora or fauna surveys were not undertaken, as this was beyond the preliminary scope of the project. Nevertheless, the terrestrial flora and fauna data collected during the field assessment and information obtained from relevant desktop sources is considered adequate to provide information on the additional detailed ecological investigations that are required to inform the project design and various ecological approvals.

3 RESULTS

3.1 Vegetation Condition

3.1.1 Remnant Patches

Remnant native vegetation in the study area is representative of one EVC: Low-rainfall Plains Grassland (EVC 132_63). The presence of this EVC is consistent with the modelled pre-1750s native vegetation mapping (DELWP 2017b). The remainder of the study area comprises introduced and planted vegetation, present as pasture, windrows and ornamental plantings. Specific details relating to observed EVCs are provided below.

A list of vascular flora recorded in the study area is provided in Appendix 2.1, while the results of the habitat hectare assessment are included in Appendix 2.3.

3.1.1.1 Low-rainfall Plains Grassland

Low-rainfall Plains Grassland covers almost the entire study area (Figure 2). Sixty-seven (67) hectares of Plains Grassland was recorded throughout the study area (including the 25 metre buffer around the access road). The presence of Plains Grassland is patchy along the proposed access road as a result of past disturbances, although the EVC does persist beneath the tree plantings including in the north of the study area. The EVC varies in quality across the site, and is dominated by native perennial tussock-grasses such as Kneed Spear-grass *Austrostipa bigeniculata,* Rough Spear-grass *Austrostipa scabra* subsp. *falcata,* Bristly Wallaby-grass *Rytidosperma setacea,* Brown-back Wallaby-grass *Rytidosperma duttoniana* and Copper Wallaby-grass *Rytidosperma fulva.* Other native perennial tussock-grasses such as Red-leg Grass *Bothriochloa macra,* Windmill Grass *Chloris truncata* and Kangaroo Grass *Themeda triandra* occur as subdominant species.

The herb component of the EVC consists mostly of native chenopod species. Berry Saltbush *Atriplex semibaccata* is the common native herb, while Ruby Saltbush *Enchylaena nutans,* Nodding Saltbush *Einadia nutans,* Seaberry Saltbush *Rhagodia candolleana* and Wingless Bluebush *Maireana enchylaenoides* are also present. Non-native chenopod species that are present, albeit at low frequencies, include Wood Sorrel *Oxalis perennans,* Slender Dock *Rumex brownii,* Blue Devil *Eryngium ovinum,* Black-anther Flax-lily *Dianella revoluta* and Bindweed *Convolvulus erubescens.*

Weed cover is less than 40% throughout most of the patches, and less than 5% in the highest quality patches (i.e. PG 1) which covers approximately 26 hectares across the study area (Figure 2). The most common weed species are Galenia *Galenia pubescens*, Phalaris *Phalaris aquatica,* Soft Brome *Bromus hordeaceus,* Rye-grass *Lolium rigidum,* Big Heron's-bill *Erodium botrys,* Barley Grass *Hordeum leporinum,* and the declared noxious weeds Spear Thistle *Cirsium vulgare* and Artichoke Thistle *Cynara cardunculus.* Serrated Tussock-grass *Nassella trichotoma* and Chilean Needle-grass *Nassella neesiana,* which are also declared noxious weeds as well as Weeds of National Significance (WONS), are also present although at very low cover.

Plate 1. High quality Plains Grassland (PG 1) within the east of the study area (Ecology and Heritage Partners Pty Ltd 11/04/2017).

Plate 2. Moderate quality Plains Grassland (PG 2) within the west of the study area with Phalaris and Serrated Tussock-grass (Ecology and Heritage Partners Pty Ltd 11/04/2017).

Plate 3 Moderate quality Plains Grassland (PG 3) along the proposed access road (Ecology and Heritage Partners Pty Ltd 11/04/2017).

Plate 4. Low quality Plains Grassland (PG 4) dominated by Galenia and Artichoke Thistle (Ecology and Heritage Partners Pty Ltd 11/04/2017).

3.1.2 Scattered Trees

No scattered remnant trees occur in the study area.

3.1.3 Introduced and Planted Vegetation

3.1.3.1 Introduced Vegetation

The small areas of the study area not supporting remnant native vegetation contain a high cover (>80%) of exotic species. These areas are mostly located on the more elevated parts of the study area where grazing intensity is likely to be higher, and along the windrows which are likely to have been significantly disturbed during tree planting. This includes underneath the windrows and Almond plantations. The most dominant species in areas of introduced vegetation is Galenia, Phalaris, Serrated Tussock-grass and Artichoke Thistle.

Plate 5. Stony knoll dominated by Galenia (Ecology and Heritage Partners Pty Ltd 11/04/2017).

Plate 6. Highly disturbed area alongside proposed access road (Ecology and Heritage Partners Pty Ltd 11/04/2017).

3.1.3.2 Planted Vegetation

The northern boundary fence-line, and the fence-line adjoining the proposed access road has been planted with indigenous and non-indigenous native trees, including River Red-gum *Eucalyptus camaldulensis,* Weeping Myall *Acacia pendula,* Cootamundra Wattle *Acacia baileyana,* Drooping Cassinia *Cassinia arcuata,* River Sheoak *Casuarina cunninghamiana* and Scented Paperbark *Melaleuca squarrosa.* There original stand of almond *Prunis dulcis* trees still remain in the east of the study area, although the trees are all dead. Several individual Sugar Gum *Eucalyptus cladocalyx* trees have been planted to the south of the study area.

Plate 7. Tree plantings alongside proposed access road (Ecology and Heritage Partners Pty Ltd 11/04/2017).

Plate 8. Old almond plantation (Ecology and Heritage Partners Pty Ltd 11/04/2017).

3.2 Fauna Habitat

3.2.1 Native and Introduced Grasslands

The majority of the study area consists of native grassland that provides habitat for a range of native fauna. . This habitat would be used by common bird and mammal species for foraging, such as Eastern Grey Kangaroo *Macropus giganteus,* Australian Magpie *Cracticus tibicen,* Common Bronzewing *Phaps chalcoptera,* Grey Falcon *Falco hypoleucos,* Little Raven *Corvus mellori* and Willie Wagtail *Rhipidura leucophrys,* which were all recorded during the field assessment (Appendix 3.1). Fat-tailed Dunnart *Sminthopsis crassicaudata,* which is considered Near Threatened in Victoria (DSE 2013), has previously been recorded throughout the study area on a number of occasions (Biosis Research 2003, Ecology Partners 2006).

The open tussock-structure and availability of rocks and soil cracks would make the study area suitable for a range of reptile species. This includes the nationally significant Striped Legless Lizard *Delma impar* (Section 3.4.2.5). In addition, the healthy sward of Spear and Wallaby grass tussocks, and the availability of bare ground would also provide suitable habitat for the nationally significant Golden Sun Moth *Synemon plana* (Section 3.4.2.1).

Due to the level of disturbance and fragmentation in the surrounding landscape, several exotic fauna species occur in the grassland areas, including Eurasian Skylark *Alauda arvensis,* Fox *Vulpes vulpes* and European Rabbit *Oryctolagus cuniculus.*

3.2.2 Planted Vegetation

The planted stands of native and non-native trees provided perching and nesting habitat for common bird species. Black-shouldered Kite, Black-faced Cuckoo-shrike *Coracina novaehollandiae,* Red Wattlebird *Anthochaera carunculata* and Yellow-rumped Thornbill *Acanthiza chrysorrhoa* were observed perching or foraging in this habitat during the field assessment (Appendix 3.1). Little Raven nests were also present in planted native trees alongside the proposed access road.

Despite the study area being located within a Ramsar site, the planted trees are unlikely to provide any habitat for migratory birds. There is no significant habitat features associated with Ramsar sites in the surrounding area (e.g. wetlands) and migratory birds are more likely to be found closer to the shoreline where more significant habitat occurs.

3.3 Permitted Clearing Assessment (the Guidelines)

3.3.1 Vegetation proposed to be removed

In accordance with Victoria's *Permitted clearing of native vegetation: biodiversity assessment guidelines* (DEPI 2013), impacts on biodiversity from native vegetation removal are assessed using a risk-based approach. Two factors – extent risk and location risk – are used to determine the risk associated with an application for a permit to remove native vegetation. The location risk (A, B or C) has been determined for all areas in Victoria and is available on DELWP's Native Vegetation Information Management (NVIM) Tool (DELWP 2017a). Determination of risk-based pathway is summarised in Table 5.

Table 5. Risk-based pathways for applications to remove native vegetation (DEPI 2013)

Extent		Location		
		A	B	C
Native Vegetation	< 0.5 hectares	Low	Low	High
	≥ 0.5 hectares and < 1 hectare	Low	Moderate	High
	≥ 1 hectare	Moderate	High	High
Scattered Trees	< 15 scattered trees	Low	Moderate	High
	≥ 15 scattered trees	Moderate	High	High

Table 6 lists the extent of remnant native vegetation recorded across the entire study area, as well as the extent of native vegetation mapped within a potential siting for the YJDP in the south of the study area that includes a 25 hectare footprint plus the proposed access road with a 25 metre buffer (Figure 2). Both proposals would result in an application to remove remnant native vegetation and this would be assessed under the High Risk-based Pathway. This information has been obtained from the Biodiversity Impact and Offset Requirements (BIOR) report prepared by DELWP (Appendix 4).

Table 6. Permitted Clearing Assessment (the Guidelines)

	Study Area	Recommended Site
Risk-based pathway	High	High
Total Extent	67.143	32.187
Remnant Patch (ha)	67.143	32.187
Scattered Trees (no.)	0	0
Location Risk	B	B
Strategic Biodiversity Score	0.679	0.715

3.3.2 Offset Targets

In accordance with Victoria's *Permitted clearing of native vegetation: biodiversity assessment guidelines* (DEPI 2013), any removal of native vegetation needs to be offset. The offset requirements for both removal scenarios (entire study area and recommended site) are provided below (Table 7). Both removal scenarios would require both General and Specific offsets. The offsets for removal of all native vegetation in the study area have been calculated to identify the range of specific offsets that may be required depending on the location of the project.

The offset requirements are calculated as Biodiversity Equivalence Units (BEUs), where General offsets are calculated based on the quantity of habitat hectares removed (Appendix 2.3) and modelled Strategic Biodiversity Score (SBS) as such:

General BEUs = habitat hectares x SBS

And Specific offsets are calculated using the modelled habitat importance score for each rare and threatened species modelled to occur on the site:

Specific BEUs = habitat hectares x habitat importance score.

General offsets need to be obtained within the same Catchment or Local Government Area as the clearing site. Specific offsets can be obtained anywhere in Victoria where the species habitat is modelled.

The area of an offset site that will generate the required BEUs for the project will depend upon the existing condition, the level of management commitment, and the number of species the offset site provides habitat for. Specific offsets for multiple species can be obtained from the same offset site. General and Specific offsets can be obtained from the same property but not the same location within the property.

The availability and cost implications of these offsets requirements are discussed further in Section 6. In addition to offset requirements under Victorian legislation, the project is also likely to require offsets under the Commonwealth EPBC Act (Section 6.1.1).

Table 7. Offset targets

	Study Area	Recommended Site
General Offsets Required	8.252 General BEUs	4.536 General BEUs
Specific Offsets Required	Red-chested Button-qual (38.899 specific BEUs), Brolga (37.756 specific BEUs), Striped Legless Lizard (39.712 specific BEUs), Tough Scurf-pea (4.686 specific BEUs), Large-headed Fireweed (34.487 specific BEUs), Rye Beetle-grass (8.024 specific BEUs) and Pale Swamp Everlasting (38.497 specific BEUs).	Red-chested Button-quail (13.596 specific BEUs), Striped Legless Lizard (18.200 specific BEUs), Large-headed Fireweed (16.756 specific BEUs), Pale Swamp Everlasting (17.522 specific BEUs) and Spiny Rice-flower (0.02 specific BEUs)
Vicinity (catchment / LGA)	Port Philip and Westernport CMA / Wyndham City Council	Port Philip and Westernport CMA / Wyndham City Council
Minimum Strategic Biodiversity Score	0.475	0.445

Note: BEU = Biodiversity Equivalence Units

3.4 Significance Assessment

3.4.1 Flora

The study area is considered to provide suitable habitat for a number of nationally and state-significant flora species. A likelihood of occurrence rating has been assigned to each significant flora species raised by the desktop assessment. Likelihood of occurrence ratings are 'Known', 'Likely', 'Moderate', 'Low', or 'Unlikely' Results of the likelihood of occurrence assessment and a description of the occurrence ratings is provided in Appendix 2.2.

Of the 40 nationally and state-significant flora species raised by the VBA, and two additional nationally-significant species identified via the PMST, sixteen are considered to have a reasonable possibility of occurrence (i.e. 'Likely' or 'Moderate') (Appendix 2.2). This includes five nationally significant flora species:

- Button Wrinklewort *Rutidosis leptorhynchoides;*
- Clover Glycine *Glycine latrobeana*;
- Large-headed Fireweed *Senecio macrocarpus*;
- Matted Flax-lily *Dianella amoena*; and,
- Spiny Rice-flower *Pimelea spinescens* subsp. *spinescens.*

Further information on each of these species is provided in the sub-sections below, including recommended survey techniques. Targeted surveys for these species are likely to detect most of the state-significant species which have a reasonable likelihood of occurring, if present.

3.4.1.1 Button Wrinklewort

Button Wrinklewort is considered to have a 'Moderate' likelihood of presence within the study area. The species is found in native grasslands in western Melbourne (OEH 2012), and has been recorded on 38 occasions within 10 kilometres of the study area (Appendix 2.2), but is yet to be recorded within the WTP. All but two of these records are from along the Melbourne-Geelong Railway-line with the closest records three kilometres west of the study area from 2001 (Figure 5-1).

Button Wrinklewort was not recorded in the study area during the flora assessment by Botanicus Australia (2007), although the purpose of that study was to assess the quality and species composition of native vegetation, not identify threatened flora. The study by Botanicus Australia (2007) included three 30 x 30 metre quadrats located within the study area, and thus did not involve a search of the entire study area.

Targeted surveys for Button Wrinklewort are recommended between October and February when the species is flowering (OEH 2012). Surveys should involve trained botanists walking transects 5 metres apart in all patches of native grassland recorded on site.

3.4.1.2 Clover Glycine

Clover Glycine is considered to have a 'Moderate' likelihood of occurrence within the study area. The species occurs to the west of Melbourne in grasslands dominated by Kangaroo Grass with varying richness of herbs

(Carter and Sutter 2010). The species has been recorded on six occasions within a ten kilometre radius of the study area (Appendix 2.2), these records from 2008 approximately 5-6 kilometres north of the study area (Figure 5-2).

Clover Glycine was not recorded by Botanicus Australia (2007) within the three 30 x 30 metre quadrats located in the study area.

Targeted surveys for Clover Glycine are recommended between September and November when the species is flowering (Carter and Sutter 2010). Surveys should involve trained botanists walking transects 5 metres apart in all patches of native grassland recorded on site.

3.4.1.3 Large-headed Fireweed

Large-headed Fireweed is considered to have a 'High' likelihood of presence within the study area. The species is found to the west of Melbourne in native grasslands on heavy basalt clays (Sinclair 2010b), and has been recorded in the adjoining property less than twelve months ago, and there are 72 records for the species within a 10 kilometre radius of the study area (Appendix 2.2) all of which are confined to the Melbourne-Geelong Railway-line (Figure 5-3). The closest record to the study area is approximately one kilometre north (Figure 5-3). There are also known populations of Large-headed Fireweed in the rail-reserve along Manor Road, Werribee and at a quarry site in Werribee (Sinclair 2010b).

Botanicus Australia (2007) did not record Large-headed Fireweed during their flora assessment, which was restricted to only a small portion of the study area.

Targeted surveys for Large-headed Fireweed are recommended between September and November when the species is flowering (Sinclair 2010b). Surveys should involve trained botanists walking transects 5 metres apart in all patches of native grassland recorded on site.

3.4.1.4 Matted Flax-lily

Matted Flax-lily is considered to have a 'High' likelihood of occurrence within the study area. There are twenty-two records for the species within a 10 kilometre radius of the study area (Appendix 2.2), which are concentrated between 8-10 kilometres to the south-west of the study area with most of these records from 2014 (Figure 5-4). Native grassland throughout the study area is suitable habitat for the species (Carter 2010), with the species most likely to occur amongst stony knolls where the species is better protected from cattle and rabbit grazing.

Botanicus Australia (2007) did not record Matted Flax-lily during their flora assessment, which was restricted to only a small portion of the study area.

Targeted surveys for Matted Flax-lily are recommended between October and April when the species is flowering (Carter 2010). Surveys should involve trained botanists walking transects 5 metres apart in all patches of native grassland recorded on site.

3.4.1.5 Spiny Rice-flower

Spiny Rice-flower is considered to have a 'High' likelihood of occurrence in the study area. There are 496 VBA records for Spiny Rice-flower within 10 kilometres of the study area, including recent records within the WTP near Lake Borrie. There are no VBA records for the species within the study area.

Spiny Rice-flower was not recorded as part of the study by Botanicus Australia (2007). However, their study not only covered a small proportion of the study area, but was conducted in November. The Commonwealth survey guidelines for Spiny Rice-flower recommend surveys for the species should be conducted when the species is in flower, which is typically between April and August (DEWHA 2009b), although in western Melbourne most populations commence flowering in May-June.

Targeted surveys for Spiny Rice-flower are recommended between June and August. Surveys should involve trained botanists walking transects 5 metres apart in all patches of native grassland recorded on site. The species is most likely to occur on the lower sections of the study area in high quality patches of native grasslands (i.e. PG 1).

3.4.2 Fauna

The study area is considered to provide suitable habitat for a number of nationally and state-significant fauna species. A likelihood of occurrence rating has been assigned to each significant fauna species raised by the desktop assessment. Likelihood of occurrence ratings are 'Likely', 'Moderate', 'Low', or 'Unlikely'. Results of the likelihood of occurrence assessment and a description of the occurrence ratings are provided in Appendix 3.2.

Of the 118 nationally and state-significant fauna species raised by the VBA and PMST, 13 are considered to have a reasonable possibility of occurrence (i.e. 'Likely' or 'Moderate') (Appendix 2.2). This includes two nationally significant flora species:

- Golden Sun Moth; and,
- Striped Legless Lizard.

Further information on each of these species is provided in the sub-sections below, including recommended survey techniques. While the recommended survey techniques would also detect several state-significant fauna species (such as Fat-tailed Dunnart if present), they are unlikely to detect all the likely state-significant species that have potential to occur in the study area (Appendix 3.2). However, targeted surveys for State-significant fauna species may not be a requirement for project approvals unless the project requires the preparation of an Environment Effects Statement (EES).

The sections below also describe the likelihood of occurrence for other nationally significant fauna species that occur or have previously occurred in the surround landscape, with justification as to why further surveys are not warranted. Specifically these species are:

- Grassland Earless Dragon *Tympanocryptis pinguicolla*
- Growling Grass Frog *Litoria raniformis;* and,
- Plains Wanderer *Pedionomus torquatus*.

3.4.2.1 Golden Sun Moth

Golden Sun Moth is considered to have a 'High' likelihood of occurrence in the study area. All patches of native vegetation recorded in the study area (Figure 2) are considered suitable habitat for Golden Sun Moth. In addition, there are 111 VBA records for Golden Sun Moth within a 10 kilometre radius of the study area

(Appendix 3.2), within close proximity to the study area, including as recently as 2015 and as close as two kilometres from the study area (Figure 5-6).

There are no past records for Golden Sun Moth within the WTP, or south of the Melbourne-Geelong railway line. Ecology Australia (2012) undertook targeted surveys for Golden Sun Moth between 2010 and 2012 in the southern part of the study area but did not record the species. However, it was noted by Ecology Australia (2012) that the surveys did not meet the Commonwealth requirements for Golden Sun Moth surveys (DEWHA 2009a), which include a minimum of four surveys within a flying season to determine presence (survey include two per season), and check of reference sites to confirm the species is flying and weather conditions are suitable for survey. Ecology Australia (2012) concluded that Golden Sun Moth is still likely to occur within the Northern Grasslands area and further surveys of Golden Sun Moth are recommended to determine the species' presence at the WTP.

Targeted surveys for Golden Sun Moth are recommended throughout the entire study area where native vegetation has been recorded, as well as areas dominated by Serrated Tussock and any areas of Chilean Needle-grass -grass (i.e. northern end of access road). Targeted surveys should be completed in accordance with Commonwealth survey requirements, which require:

- Surveys completed during the species' flying season (typically November to early January near the study area).
- Survey on days and at times when the species is most likely to be flying (i.e. ambient temperate > 20 °C at 1000hrs, surveys to be completed between 1000 and 1400 hrs on clear, still days, and at least two days since rain).
- Reference checks of a site nearby known to support Golden Sun Moth to confirm the species is flying that day.
- Four surveys to be completed at approximately weekly intervals. Once presence has been determined, survey effort should focus on determining species distribution across the site.

3.4.2.2 Grassland Earless Dragon

Grassland Earless Dragon has not been recorded for some time in vicinity of the study area, and is considered to have a 'Low' likelihood of presence within the study area despite the availability of suitable habitat. Grassland Earless Dragon is found in native grasslands dominated by Wallaby Grass and Spear Grass, and shelters beneath rocks. It prefers well-drained grasslands that are relatively undisturbed (Robertson and Evans 2009).

There are four VBA records for Grassland Earless Dragon within a 10 kilometre radius of the study area (Appendix 3.2), three of which are from 1990 and located approximately seven kilometres west of the study area near Little River-Ridley Road (see Figure 5-7). The remaining VBA record is from 1967, and is located approximately four kilometres west of the study area along the Melbourne-Geelong Railway-line (see Figure 5-7). The *National Recovery Plan for Grassland Earless Dragon* (Robertson and Evans 2009) notes that there were three sightings believed to be Grassland Earless Dragon in the Little River area between 1988 and 1990, which could refer to the VBA records described above. However, intense survey effort in this area from 1994 failed to detect the species and the Recovery Plan states that the last confirmed siting of the species around Melbourne is from the 1960s (Robertson and Evans 2009).

Targeted surveys for Grassland Earless Dragon are not recommended given the low likelihood of occurrence.

3.4.2.3 Growling Grass Frog

Growling Grass Frog is considered to have a 'Low' likelihood of occurrence within the study area due to the lack of the suitable habitat. The WTP supports a resident population of Growling Grass Frog. The species is mostly found in treatment ponds, wetlands and drainage lines in the south of the WTP. The closest WTP record for the species to the study area is from Ryans Swamp, which is located one kilometre south of the Princes Freeway (Figure 5-8).

The VBA contains 267 Growling Grass Frog records within a 10 kilometre radius of the study area (see Appendix 3.2). The majority of these records are from within the WTP, with the most recent record from 2015 (Figure 5-8).

Despite the large number of records for Growling Grass Frog close to the study area, there is no suitable habitat to support an important population of the species. The only water-way or drainage-line running through the creek is a tributary of Lollypop Creek, which is ephemeral and was dry at the time of the field assessment despite significant rainfall in the preceding days. The creek is also dominated by similar vegetation to the rest of the study area, with no semi-aquatic or aquatic vegetation observed. The species has previously been recorded using Lollypop Creek further south of the study area.

Given the low likelihood of occurrence, targeted surveys for Growling Grass Frog are not considered necessary.

3.4.2.4 Plains Wanderer

Despite the availability of suitable habitat, Plains Wanderer is considered to have a 'Low' likelihood of occurrence in the study area. Plains Wanderer is found in native grasslands with approximately 50% cover of bare ground and grass height less than five centimetres; whereas bare ground cover is less than 20% in the study area (Appendix 3.3) and grass height is at least 20 centimetres. The species has been recorded 15 times in a 10 kilometre radius of the study area (Appendix 3.2); however, only one of these records is from the last ten years with the remaining records from between 1906 and 1989 (Figure 5-9). The species is now considered a vagrant visitor to southern Victorian and individuals are rarely sighted in grasslands west of Melbourne (the stronghold for the species is in northern grasslands in the Victorian Riverina).

Given the low likelihood of occurrence, targeted surveys for Plains Wanderer are not considered necessary.

3.4.2.5 Striped Legless Lizard

Striped Legless Lizard is considered to have a 'Moderate' likelihood of occurrence. The study area supports the species' preferred habitat - native grassland habitat dominated by mature tussock species, interspersed by embedded and surface rock located on cracking clay soils. Non-native areas support lower quality habitat but also have potential to support the species, as they contain tussock grasses (e.g. Serrated Tussock-grass and Phalaris) and embedded rock.

There are five VBA records for Striped Legless Lizard within a 10 kilometre radius of the study area (Appendix 3.2) with the most recent record from 1990. The closest record to the study area is approximately two

kilometres to the west (Figure 5-10). Striped Legless Lizard has not been previously recorded in the study area, but was recorded in the Northern Grasslands south of the Princes Freeway in 1987 by Schulz (1987).

Ecology Australia (2012) undertook targeted surveys for Striped Legless Lizard in the study area between October 2010 and January 2011 using the tile grid method and did not record the species. However, it was noted that their methodology did not comply with Commonwealth survey guidelines (DSEWPaC 2011). In accordance with the recommended guidelines, Ecology Australia (2012) employed the tile grid method (tile grids consisting of 50 tiles laid out in 10 x 5 configuration), with two tile grids located within the study area and another ten tile grids located in the adjoining paddocks. Tile grids were checked three weeks after installation; however, the Victorian guidelines recommend at least three months before checking allowing fauna to become accustomed to the tiles as habitat (DSE 2009). In addition, the timing of the survey may have also influenced non-detection (Ecology Australia 2012). The species is more likely to be found in spring than summer (DSWEPaC 2011).

Targeted surveys are recommended for Striped Legless Lizard. To comply with Commonwealth and Victorian survey requirements for Striped Legless Lizard (DSEWPaC 2011), the following survey methods are recommended:

- Ten tile-grids to be set-up across the study area (including proposed access road) with each grid consisting a 50 tiles configured in a 10 x 5 arrangement at 5 metre spacings (i.e. 900 m^2), and positioned in vegetated areas with a northerly aspect;
- Tile-grids to be installed in June, allowing three months before checking for presence in September;
- Checks to occur no less than fortnightly throughout spring and possibly early summer; and
- Checks to occur on days when ambient temperature is ≥ 20 °C.

3.4.3 Communities

3.4.3.1 Environment Protection and Biodiversity Conservation Act 1999

The PMST identified the following six EPBC Act-listed ecological communities as occurring in the study area:

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain (listed as Critically Endangered);
- Natural Damp Grassland of the Victorian Coastal Plains (Critically Endangered);
- Natural Temperate Grassland of the Victorian Volcanic Plain (Critically Endangered);
- Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains (Critically Endangered);
- Subtropical and Temperate Coastal Saltmarsh (Vulnerable); and,
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Critically Endangered).

Natural Temperate Grassland of the Victorian Volcanic Plain was recorded across most of the study area. Of the 67 hectares of Plains Grassland (EVC 132_63) mapped, 66 hectares qualifies as the listed ecological community. There is approximately 32 hectares of Natural Temperate Grassland of the Victorian Volcanic Plain within the preferred site and proposed access road (Figure 2).

The EPBC Act – condition thresholds for Natural Temperate Grassland of the Victorian Volcanic Plain (DSEWPaC 2011) were applied to determine the community's presence. All patches that qualified as the threatened ecological community exceeded the following critical criteria:

- Larger than 500 m^2;
- Dominated by native grasses; and,
- The dominant native species represent at least 50% of the native species and perennial tussock cover.

Patches of Plains Grassland (EVC 132) that did not qualify as the listed ecological community were dominated by exotic perennial species, and therefore failed to exceed all of the criteria above.

3.4.3.2 Flora and Fauna Guarantee Act 1988

Plains Grassland (EVC 132_63) of the Victorian Volcanic Plain bioregion is synonymous with the listed ecological community Western (Basalt) Plains Grassland community. The study area supports 67.14 hectares of this community. There is approximately 32 hectares of the listed ecological community within the preferred site and proposed access road (see Figure 2).

4 LEGISLATIVE AND POLICY IMPLICATIONS

4.1 *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)

The EPBC Act establishes a Commonwealth process for the assessment of proposed actions likely to have a significant impact on any matters of National Environment Significance (NES), described in Table 9. Any action that is likely to have a significant impact of a matter of NES must be referred to the Commonwealth Minister of the Environment for assessment under the EPBC Act.

The Minister will make a decision on a referral as to whether the project is a 'Not controlled action', 'Controlled action', 'Not controlled action particular manner', 'Controlled action' or 'Action clearly unacceptable' (Table 8). The development of the YJPD is likely to result in the loss of a listed ecological community (Natural Temperate Grassland of the Victorian Volcanic Plain). As such the project should be referred under the EPBC Act, and is likely to be considered a 'controlled action', based on impacts to the threatened ecological communities.

Should the EPBC Act referral be submitted prior to the completion of the recommended targeted surveys for listed flora and fauna species, and the project is determined a controlled action, further information on the presence or otherwise of listed flora and fauna species can be provided to DoEE as results of the targeted surveys become available (i.e. between October and early January). That is, additional information can be provided to DoEE's during the EPBC Act assessment process.

Early works such as geotechnical investigations are likely to require disturbance and possibly clearance of Natural Temperate Grassland of the Victorian Volcanic Plain and threatened species' habitat and it is recommended that DJR liaise with DoEE regarding whether these early works would need to be referred..

Any significant impact to threatened species or ecological communities would need to be offset in accordance with the EPBC Act Offset Policy (DSEWPaC 2012) – see Section 6 for further information.

Table 8. EPBC Act-referral decisions

Not controlled action	Approval is not required under the EPBC Act if the action is taken in accordance with the referral.
Not controlled action 'particular manner'	Approval is not required if the action is taken in accordance with the manner specified.
Controlled action	Action is subject to the assessment and approval process under the EPBC Act.
Action is clearly unacceptable	Proponent may: - withdraw referral and take no actions; - withdraw and submit a modified proposal as a new referral; and, - may request the minister to reconsider the decision.

Table 9. Potential impacts to matters of National Environmental Significance (NES)

Matter of NES	Potential Impacts
World Heritage properties	The proposed action will not impact any properties listed for World Heritage.

Matter of NES	Potential Impacts
National heritage places	The proposed action will not impact any places listed for national heritage.
Ramsar wetlands of international significance	The study area is located in the northern extent of the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site. The study area does not contain any of the ecological values typically associated with the Ramsar site, i.e. wetlands, shorelines and migratory bird habitat. There are also no sensitive receptors in adjoining areas. Belfrages Swamp is an ephemeral wetland supporting Cane Grass Wetland (EVC 291) that provides habitat for native wader birds, but does not provide important habitat for migratory species. It is considered unlikely that the proposed development would have a significant impact on the Ramsar site, provide best-practice erosion and sediment control is adopted during construction.
Threatened species and ecological communities	The study area has potential to support five nationally significant flora species: - Button Wrinklewort; - Clover Glycine; - Large-headed Fireweed; - Matted Flax-lily; and, - Spiny Rice-flower. The study area has potential to support two nationally significant fauna species: - Golden Sun Moth; and, - Striped Legless Lizard. The study area supports approximately 67 hectares of Natural Temperate Grassland of the Victorian Volcanic Plain, of which 32 hectares is situated within the recommended site location.
Migratory species	The PMST raised 59 species as potentially occurring near the study area, while there are a large number of VBA records for migratory species in the south of the WTP along the shorelines of Port Phillip Bay. The study area does not contain any wetlands or significant water-bodies and is unlikely to provide important habitat for migratory species.
Commonwealth marine area	The study area is not a Commonwealth marine area.
Nuclear actions (including uranium mining)	The proposed action is not a nuclear action.
Great Barrier Reef Marine Park	The proposed action will not impact the Great Barrier Reef Marine Park.
Water resources impacted by coal seam gas or mining development	The proposed action is not a coal seam gas or mining development.

4.2 *Flora and Fauna Guarantee Act 1988* (Victoria)

The FFG Act is the primary legislation dealing with biodiversity conservation and sustainable use of native flora and fauna in Victoria. Proponents are required to apply for an FFG Act Permit to 'take' listed and/or protected flora species, listed vegetation communities and listed fish species in areas of public land (i.e. within road reserves, drainage lines and public reserves). An FFG Act permit is generally not required for removal of species or communities on private land, or for the removal of habitat for a listed terrestrial fauna species.

It is understood that the study area will be transferred to crown land and as such the FFG Act applies. The study area supports suitable habitat for a number of listed flora and fauna species. In addition, the study area supports 67.14 hectares of the listed ecological community Western (Basalt) Plains Grassland community. A permit would be required under the FFG Act before any removal of listed or protected species or ecological communities occur. It takes approximately six weeks for a FFG Act permit to be approved.

4.3 *Environment Effects Act 1978* (Victoria)

The *Environment Effects Act 1978* provides for assessment of proposed actions that are capable of having a significant effect on the environment via the preparation of an Environment Effects Statement (EES). A project with potential adverse environmental effects that, individually or in combination, could be significant in a regional or State context should be referred. An action may be referred for an EES decision where:

- one of the following occurs:
    - Potential clearing of 10 hectares or more of native vegetation from an area that:
        - is of an EVC identified as endangered by DELWP;
        - is, of Very High conservation significance; or,
        - is not authorised under an approved Forest Management Plan or Fire Protection Plan.
    - Potential long-term loss of a significant proportion (1-5% depending on conservation status of species) of known remaining habitat or population of a threatened species within Victoria.
- or where two or more of the following occur:
    - Potential clearing of 10 hectares or more of native vegetation, unless authorised under an approved Forest Management Act or Fire Protection Plan;
    - Matters listed under the FFG Act:
        - Potential loss of a significant area of a listed ecological community;
        - Potential loss of a genetically important population of an endangered or threatened species;
        - Potential loss of critical habitat; or,
        - Potential significant effects on habitat values of a wetland supporting migratory birds.

Given that the proposed development footprint for the project is approximately 25 hectares plus the access road, the development of the project would results in the loss of more than 10 hectares of Plains Grassland (EVC 132_63) which is an Endangered EVC. The extent of native vegetation removal would therefore trigger an EES referral. It is recommended that DJR liaise with DELWP to understand the likelihood that an EES would need to be prepared for the project, given that it could significantly delay the commencement of construction.

4.4 *Planning and Environment Act 1987* (Victoria)

The *Planning and Environment Act 1987* outlines the legislative framework for planning in Victoria and for the development and administration of planning schemes. All planning schemes contain native vegetation provisions at Clause 52.17 which require a planning permit from the relevant local Council to remove, destroy or lop native vegetation on a site of more than 0.4 hectares, unless an exemption under clause 52.17-7 of the Victorian Planning Schemes applies or a subdivision is proposed with lots less than 0.4 hectares[1]. Local planning schemes may contain other provisions in relation to the removal of native vegetation (Section 4.4.1).

4.4.1 Local Planning Schemes

The study area is located within the Wyndham City Council. It is zoned Public Use Schedule 1 (PUZ1). No relevant environmental planning overlays apply.

4.4.1.1 Relevant Exemptions

Under Clause 52.17-7 of the planning scheme, the following activities do not require a permit:

- Removal of 'Planted Vegetation', which includes the windrows of native trees along the boundary fence-line; and,
- Removal of native vegetation associated with 'Stone Exploration' that covers geotechnical investigation provided that the total extent of native vegetation removal is less than one hectare.

4.4.2 The Guidelines

The State Planning Policy Framework and the decision guidelines at Clause 52.17 (Native Vegetation) and Clause 12.01 require Planning and Responsible Authorities to have regard for *'Permitted clearing of native vegetation - Biodiversity assessment guidelines' (the Guidelines)* (DEPI 2013). Where the clearing of native vegetation is permitted, the quantity and type of vegetation to be offset is determined using methodology specified in the Guidelines. The primary objective of the regulations is "no net loss in the contribution made by native vegetation to Victoria's biodiversity".

A permit will be referred to DELWP as a 'recommending authority' if vegetation removal meets one or more of the below thresholds (Table 10).

The project may require the removal of up to 32 hectares of native vegetation. The loss of any remnant vegetation would need to be offset in accordance with the guidelines (see Section 3.3).

Table 10. Permit to remove native vegetation – application referral triggers (Clause 66, Referral and Notice Provisions)

Native Vegetation	• Remove, destroy or lop native vegetation where the area to be cleared is 0.5 hectares or more
	• Remove, destroy or lop native vegetation which is to be considered under the High Risk-based pathway

Other Circumstances	• Remove, destroy or lop native vegetation if a property vegetation plan applies to the site
	• Remove, destroy or lop native vegetation on Crown land which is occupied or managed by the responsible authority

4.5 *Wildlife Act 1975* and Wildlife Regulations 2013 (Victoria)

The *Wildlife Act 1975* (and associated Wildlife Regulations 2013) is the primary legislation in Victoria providing for protection and management of wildlife. Authorisation for habitat removal may be obtained under the *Wildlife Act 1975* through a licence granted under the *Forests Act 1958*, or under any other Act such as the *Planning and Environment Act 1987*. Any persons engaged to remove, salvage, hold or relocate native fauna during construction must hold a current Management Authorisation under the *Wildlife Act 1975*, issued by DELWP.

4.6 *Catchment and Land Protection Act 1994* (Victoria)

The *Catchment and Land Protection Act 1994* (CaLP Act) contains provisions relating to catchment planning, land management, noxious weeds and pest animals. Landowners are responsible for the control of any infestation of noxious weeds and pest fauna species to minimise their spread and impact on ecological values.

Weeds listed as noxious under the CaLP Act were recorded during the assessment (e.g. Artichoke Thistle, Spear Thistle, Serrated Tussock-grass and African Boxthorn). Similarly, the study area is currently occupied by several pest fauna species listed under the CaLP Act including Red Fox and European Rabbit. In accordance with the Act, actions should be taken during construction and occupation of the site to reduce the prevalence of declared noxious weeds and animals. Actions taken to achieve this end should be detailed in any Construction Environmental Management Plan (CEMP) or similar document prepared for the project

5 MITIGATION MEASURES

The following is a list of best-practice mitigation measures that reduce the impact of the project on biodiversity values:

- Locate the project within the section of the study area that is likely to require the least removal of remnant native vegetation, and/or lowest impact on high quality native vegetation and habitat (i.e. PG1). The recommended site, located in the south of the study area, achieves both of these goals. Locating the project site further north would require extending the access road and fragmenting existing patches of Plains Grassland.
- Further changes to the project site should be considered if any threatened species are identified following targeted surveys.
- Ensure any areas where remnant native vegetation is to be removed are clearly marked and that areas to be retained are fenced-off to avoid any unintended clearance.
- An ecologist should be on site during geotechnical investigations to assist with micro-siting drilling away from any sensitive ecological values such as threatened species.
- All contractors should be aware of ecologically sensitive areas to minimise the likelihood of inadvertent disturbance to areas marked for retention.
- Ensure that best practice sedimentation and pollution control measures are undertaken at all times, in accordance with Environment Protection Agency guidelines (EPA 1991; EPA 1996; Victorian Stormwater Committee 1999) to prevent offsite impacts to waterways and wetlands.
- As indigenous flora provides valuable habitat for indigenous fauna, it is recommended that any landscape plantings that are undertaken as part of the proposed works are conducted using indigenous species sourced from a local provenance. It is understood that Council have a preference to plant screening trees around the site. It's important to note that the study area and surrounding landscape is naturally treeless. Any tree plantings would not be keeping with the natural features of the landscape and should be located in degraded areas away from native grasslands as canopy shading is likely to results in loss of native grassland species and habitat.
- Prepare a Construction Environmental Management Plan (CEMP) that provides specific details on species/vegetation conservation strategies, daily monitoring, sedimentation management, site specific rehabilitation plans, weed and pathogen management measures, etc.

6 OFFSET IMPACTS

The project would require offsets under Victorian legislation (Section 6.1.2) and is also likely to require offsets under Commonwealth legislation. Further information on likely offset requirements is provided in the sections below. It is important to note that Commonwealth and State offsets have different criteria, and that to manage costs offset sites should be chosen that meet both Commonwealth and State offset criteria. Being proactive in understanding the likely offset requirements and availability of offsets is recommended to avoid any potential delays to construction timeframes.

Ecology and Heritage Partners has undertaken a preliminary review of adjoining land, and has identified that the required Victorian offsets, and possibly any Commonwealth offsets, could be achieved on other sections of the 'Northern Grasslands' area within the WTP.

6.1.1 Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

The Australian Government's EPBC Act Environmental Offsets Policy (SEWPaC 2012) outlines a framework for the use of environmental offsets under the EPBC Act including when they can be required, how they are determined and the framework under which they operate. Clear guidelines on what constitutes a suitable offset are provided and should be considered as part of any proposed offset strategy. Suitable offsets must include the following:

1. It delivers an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed development.
2. It is built around direct offsets but may include compensatory measures.
3. It is in proportion to the level of statutory protection that applies to the protected manner.
4. It is of a size and scale proportionate to the residual impacts on the protected manner.
5. It is additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs.
6. It effectively account for and manages the risks of the offset not succeeding.
7. It is efficient, effective, timely, transparent, scientifically robust and reasonable.
8. It has transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.

Offsets would be required for any significant impact to Natural Temperate Grassland of the Victorian Volcanic Plain and threatened species. The quantity of offsets required can be estimated using the EPBC Act offset calculator once the development footprint has occurred; however, the amount of offsets required under the EPBC Act would be determined by DoEE once the project has been assessed under the EPBC Act. It is recommended that DJR engage with DoEE to gain an accurate understanding of the likely Commonwealth offset requirements, which will expedite finding a suitable offset site for the project.

The Melbourne Urban Development policy (DoE 2014), allows for offset payments for Natural Temperate Grassland of the Victorian Volcanic Plain and Golden Sun Moth habitat for projects in the Wyndham City Council (and other municipalities) to be paid into the Western Grassland Reserve, under certain circumstances. The criteria include the type of project (projects associated with residential development are accepted) and the extent of habitat removed (less than 10 hectares of Natural Temperate Grassland of the Victorian Volcanic Plain and 10 hectares of Golden Sun Moth habitat). It is unlikely the YJDP would qualify under the MUD policy to make offset payments into the Western Grassland Reserve. It is recommended the DJR liaise with DoEE to confirm.

6.1.2 Permitted clearing of native vegetation: biodiversity assessment guidelines (Victoria)

The Guidelines (DEPI 2013) require offsetting as the final step in considering the impacts of development on native vegetation. Under the Moderate and High Risk-based pathway, emphasis is placed on minimising impacts, and only after these steps have been taken should offsets be considered.

Potential offsets may be sourced using the following mechanisms:

- BushBroker: BushBroker maintains a register of landowners who are willing to sell offset credits. Offsets secured by Bushbroker are done so via a Section 69 Agreement under the *Conservation, Forest and Lands Act 1987*.
- Trust for Nature: Trust for Nature holds a list of landowners who are willing to sell vegetation offsets. Offsets secured by Trust for Nature are done so under the Victorian *Conservation Trust Act 1972*.
- Local Councils: The proponent may contact local councils to seek availability of offsets.
- Over-the-Counter Offsets Scheme: The Guidelines include the expansion of the "Over-the-Counter" (OTC) Offsets Scheme, allowing non-government agencies to establish themselves as OTC Facilities. OTC Facilities will broker native vegetation offsets (credits) between landholders (with offset sites) and permit holders (with offset requirements).

The offset requirements for the project under the Guidelines (Section 3.3.2) are considered large in comparison to other projects. A review of the Native Vegetation Credit Register identified a short-fall based on the proposed site location (Section 3.3.2), in the amount of registered offset credits for Red-chested Button-quail, Striped-legless Lizard and Pale Swamp Everlasting. There are also no registered offset credits for Large-headed Fireweed. In addition the specific offsets that are available on the register are dispersed across multiple landowners. The costs of offsets per BUE would be higher if purchasing credits across multiple landowners due to overheads associated with registering and administering offset sites.

In order to obtain the offsets required for the project under Victoria's *Permitted clearing of native vegetation: biodiversity assessment guidelines,* DJR should contact landowners who are likely to have the required offsets for the project that are yet to be registered on the Native Vegetation Credit Register. To achieve the most cost-effective offset solution, landowners who have sites that provide all or at least the majority of offsets required for the project should be approached. Melbourne Water should be approached as they are likely to have many of the offsets required on other areas of the 'Northern Grasslands' that adjoin the study area.

7 CONCLUSION AND RECOMMENDATIONS

The study area provides habitat for several significant ecological values. It is dominated by Low Rainfall Plains Grassland (EVC 132_63) which is synonymous with the state-significant Western (Basalt) Plains Grassland Community. Most of the study area also supports the nationally significant Natural Temperate Grassland of the Victorian Volcanic Plain. Native grasslands in western Melbourne provide habitat for a range of significant flora and fauna species, many of which have been recorded in close proximity to the study area, and have a reasonable likelihood of occurring in the study area.

Development of the project is likely to require approval at the Commonwealth, State and Local level. Due to the extent of remnant native vegetation proposed to be removed, the project is likely to trigger an EES referral. If the Victorian Minister for Planning determines that an EES is required for the project, this could potentially delay the construction start date. An EPBC Act referral may also delay project timeframes, particularly if an approval is required for geotechnical investigations. As such, immediate consultation with DoEE and DELWP is advised.

It has been identified that the project is likely to generate a significant offset liability that cannot be addressed through purchasing offset credits via the over-the-counter bushbroker scheme due to current lack of availability of some of the specific offsets (i.e. Red-chested Button-quail, Striped Legless Lizard, Pale Swamp Everlasting and Large-headed Fireweed). As such, landowners who are likely to have the required offsets, but are yet to register their property as an offset with the Native Vegetation Credit Register, should be contacted to avoid potential delays to the project timeline.

The project is likely to require approval under the following environmental legislation and policy (Table 11):

Table 11. Summary of legislative implications

Act	Implications	Recommendations
Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)	Study area is mostly covered by the listed ecological community - Natural Temperate Grassland of the Victorian, and has potential to support five listed flora species (Button Wrinklewort, Clover Glycine, Large-headed Fireweed, Matted Flax-lily and Spiny Rice-flower) and two-listed fauna species (Golden Sun Moth and Striped Legless).	Complete targeted surveys for listed flora and fauna. Submit a referral the Commonwealth Environment Minster for approval under the EPBC Act. Given that NTGVVP will be impacted the proposed development is likely to be determined a controlled action and the assessment and approval process will take at least 6-9 months.
Victorian *Environment Effects Act 1978* (EE Act)	The project is highly likely to exceed the following triggers for an Environment Effect Statement (EES) referral under the EE Act: - loss of more than 10 hectares of an Endangered Ecological Vegetation Class (Plains Grassland); - loss of an FFG Act-listed ecological community (Western Basalt Plains Grassland Community); and, - potentially impact FFG Act-listed species.	Consult DELWP about the requirement to submit an EES referral.
Victorian *Flora and*	The project is likely to impact the listed ecological	Submit an FFG Act-permit application for the

Act	Implications	Recommendations
Fauna Guarantee Act 1988 (FFG Act)	community Western (Basalt) Plains Grassland Community, and may require the removal of listed threatened and protected species.	loss of Western (Basalt) Plains Grassland Community, and any threatened or flora species that would be impacted.
Victorian *Planning and Environment Act 1987* (P&E Act)	The majority of the study area contains remnant native vegetation protected under the P&E Act. A permit would be required under the Act and offsets obtained to compensate for the loss of any remnant native vegetation.	Submit a permit to Wyndham City Council for the removal of remnant native vegetation. Offsets would need to be obtained as part of the permit conditions.
Victorian *Wildlife Act 1975*	Planted trees, grasslands and stony knolls provide suitable habitat for native fauna protected under the Act.	A suitably qualified zoologist, with authorisation under the Act, should be on site during habitat clearing to salvage and relocate any protected fauna.
Victorian *Catchment and Land Protection Act 1994*	The study area supports weeds and pest animals declared as noxious under the Act.	Prepare a Construction Environmental Management Plan (CEMP) or similar document that outlines control measures to prevent the introduction or spread of declared noxious species.

Should the EPBC Act referral be submitted prior to the completion of the recommended targeted surveys for listed flora and fauna species, and the project is determined a controlled action, further information on the presence or otherwise of listed flora and fauna species can be provided to DoEE as results of the targeted surveys become available (i.e. between October and early January). That is, additional information can be provided to DoEE's during the EPBC Act assessment process.

Early works such as geotechnical investigations are likely to require disturbance and possibly clearance of Natural Temperate Grassland of the Victorian Volcanic Plain and threatened species' habitat and it is recommended that DJR liaise with DoEE regarding whether these early works would need to be referred.

Based on the findings of this assessment, and an understanding of the project timeframes, the following actions are recommended:

1. Complete targeted surveys for Button Wrinklewort, Clover Glycine, Large-headed Fireweed, Matted Flax-lily, Spiny Rice-flower, Golden Sun Moth and Striped Legless Lizard in accordance with Government minimum survey requirements / guidelines.

2. Liaise with DoEE to determine if approval under the EPBC Act would be required for geotechnical surveys.

3. Prepare an offset strategy that estimates the total offset liability (Commonwealth and State offsets), potential sites that would be available, costs and consultation with DoEE to clarify the likely Commonwealth offsets required for the project.

4. Prepare an environmental approvals strategy that outlines the likely permits and approvals required for the project, and the likelihood of an EES being required for the project following consultation with DELWP.

5. Submit relevant referrals (e.g. EPBC Act and EES) and permits (e.g. planning, FFG Act and Wildlife Act) as soon as possible.

6. Liaise with DELWP and DoEE to determine if the project would be assessed via a bilateral agreement between the Commonwealth and Victorian Government (this is likely to be the case should an EES be required for the project).

A possible location for the project has been identified in the south of the study area, and this location is likely to have the lowest impact on biodiversity values.

REFERENCES

Australian Ecosystems 2011. Melbourne Water Sites of Biodiversity Significance Habitat Hectare Assessments. Report for Melbourne Water Corporation.

Australian Ecosystems 2013. Index of Wetland Condition Assessments of Natural and Constructed. Report for Melbourne Water Corporation.

Australian Ecosystems 2015. Sites of Biodiversity Significance – Vegetation Assessments 2014-2015. Draft Report for Melbourne Water.

Botanicus 2007. A flora assessment of the Northern Grassland Area of the Western Treatment Plan. Report prepared by Botanicus Pty Ltd for Melbourne Water Corporation.

Biosis Research 2003. Fauna Survey of Dry Pasture Areas, Western Treatment Plant, Werribee, Victoria. Report for Melbourne Water Corporation.

Carter, O. 2010. National Recovery Plan for the Matted Flax-lily *Dianella amoena.* Department of Sustainability and Environment, Victoria.

Carter, O. and Sutter, G. 2010. National Recovery Plan for Clover Glycine *Glycine latrobeana*. Department of Sustainability and Environment, Melbourne.

DELWP 2015. Biodiversity assessment handbook, Permitted clearing of native vegetation – Version 1.0. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2017a. Native Vegetation Information Management Tool [www Document]. URL: <https://nvim.delwp.vic.gov.au/>. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2017b. Biodiversity Interactive Map [www Document]. URL: <http://www.depi.vic.gov.au/environment-and-wildlife/biodiversity/biodiversity-interactive-map>. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2017c. Ecological Vegetation Class (EVC) Benchmarks for each Bioregion [www Document]. URL: <http://www.depi.vic.gov.au/environment-and-wildlife/biodiversity/evc-benchmarks#bioregionname>. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2017d. Victorian Biodiversity Atlas. Sourced from GIS layers: "VBA_FLORA25", "VBA_FLORA100", "VBA_FAUNA25", "VBA_FAUNA100", February 2017. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2017e. Planning Maps Online [www Document]. URL: <http://services.land.vic.gov.au/maps/pmo.jsp>. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DELWP 2017f. Planning Schemes Online [www Document]. URL: http://planningschemes.dpcd.vic.gov.au. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

DEPI 2013. Permitted clearing of native vegetation - Biodiversity assessment guidelines (the Guidelines). Victorian Department of Environment and Primary Industries, Melbourne, Victoria.

DEPI 2014. Advisory List of Rare or Threatened Plants in Victoria. Victorian Department of Environment and Primary Industries, Melbourne, Victoria.

DEWHA 2009a. Significant impact guidelines for the critically endangered spiny rice-flower (*Pimelea spinescens* subsp. *spinescens*). Department of Environment, Water, Heritage and the Arts, Canberra.

DEWHA 2009b. Significant impact guidelines for the critically endangered golden sun moth (Synemon plana). Department of Environment, Water, Heritage and the Arts, Canberra.

DoE 2012. *Environment Protection and Biodiversity Conservation Act* Melbourne Urban Development policy. Department of the Environment, Canberra.

DSE 2004. Vegetation quality assessment manual: Guidelines for applying the habitat hectares scoring method. Version 1.3. Victorian Department of Sustainability and Environment, Melbourne Victoria

DSE 2009. Advisory list of Threatened Invertebrate Fauna in Victoria – 2009. Victorian Department of Sustainability and Environment, Melbourne, Victoria.

DSE 2013. Advisory List of Threatened Vertebrate Fauna in Victoria. Victorian Department of Sustainability and Environment, Melbourne, Victoria.

DSEWPaC 2012. EPBC Act Policy Statement Nationally Threatened Ecological Communities of the Victorian Volcanic Plain: Natural Temperate Grassland and Grassy Eucalypt Woodland. Department of Sustainability, Environment, Water, Populations and Communities, Canberra.

Ecology Australia 2010. Biodiversity Conservation and Ramsar Management Plan for the Western Treatment Plant, Werribee. Report for Melbourne Water Corporation.

Ecology Australia 2012. Western (Basalt) Plains Grassland Fauna Surveys – Western Treatment Plant, Werribee. Report for Melbourne Water.

Ecology Partners Pty Ltd 2006. Grassland Mammal Investigation, T-section Grasslands and Dry Pasture Areas north of the Princes Highway, Western Treatment Plant, Victoria. Report for Melbourne Water Corporation.

EPA 1991. Construction Techniques for Sediment Pollution Control. Published document prepared by the Victorian Environment Protection Authority, Melbourne, Victoria.

EPA 1996. Environmental Guidelines for Major Construction Sites. Published document prepared by the Victorian Environmental Protection Authority, Melbourne, Victoria.

Nelson, J. S. 1994. Fishes of the World, 3rd Edition. John Wiley & Sons, New York, USA.

OEH 2012. National Recovery Plan for Button Wrinklewort *Rutidosis leptorrhynchoides.* NSW Office of Environment and Heritage, Hurstville.

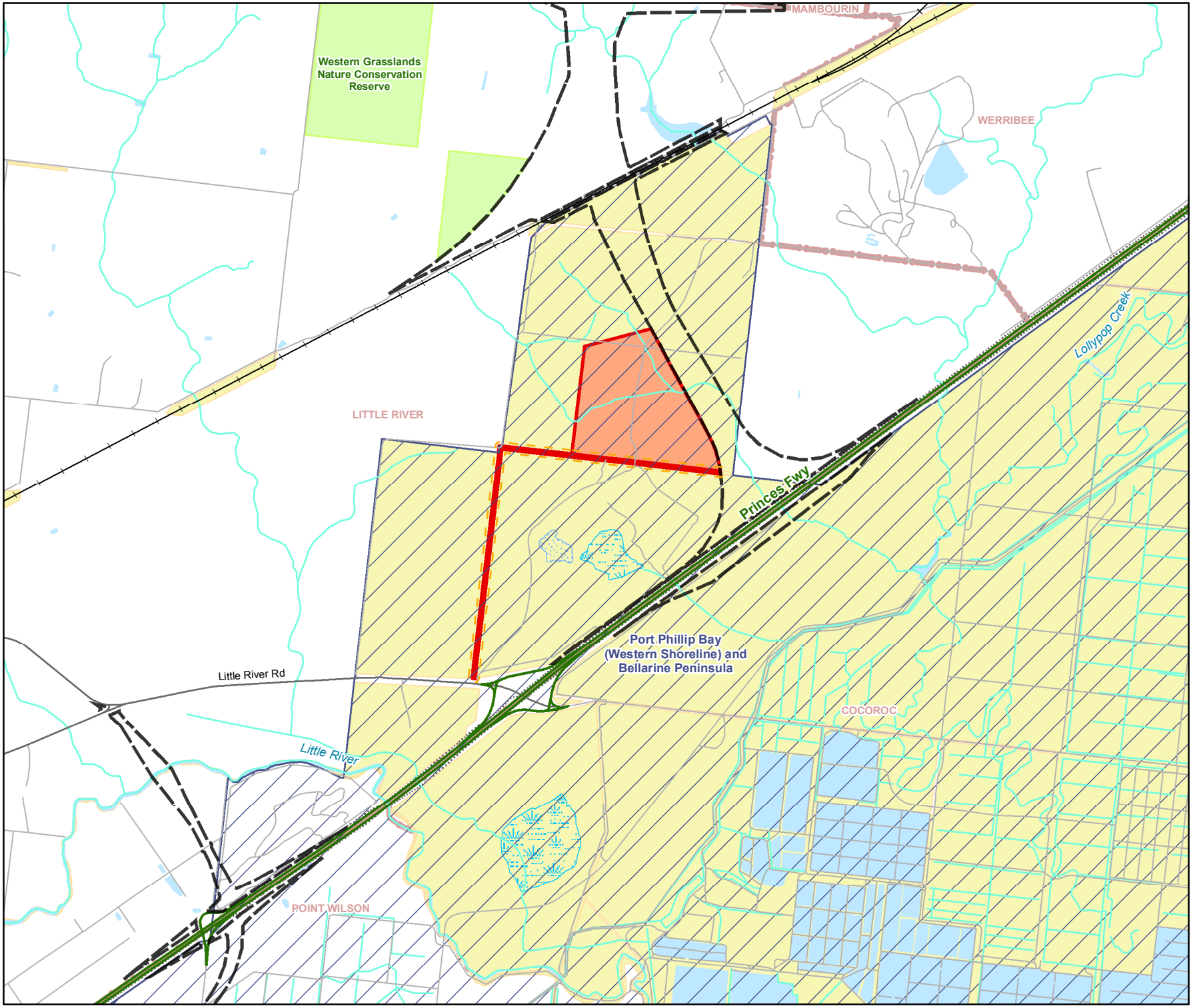
Sands, D.P.A. and New, T.R. 2002. The Action Plan for Australian Butterflies, Environment Australia, Canberra, ACT.

SEWPaC 2012. *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy. Commonwealth Department of Environment, Water, Population and Communities, Canberra, ACT.

Sinclair, SJ 2010. National Recovery Plan for the Large-fruit Groundsel *Senecio macrocarpus*, Department of Sustainability and Environment, Melbourne.

Victorian Urban Stormwater Committee 1999. Urban Stormwater: Best Practice Environmental Management Guidelines. CSIRO, Collingwood, Victoria.

FIGURES



Legend

- Study Area
- Outer Metropolitan Ring Road
- Railway
- Freeway
- Collector Road
- Minor Road
- Walking Track
- Minor Watercourse
- Permanent Waterbody
- Land Subject to Inundation
- Wetland/Swamp
- Ramsar wetland
- Parks and Reserves
- Crown Land
- Localities

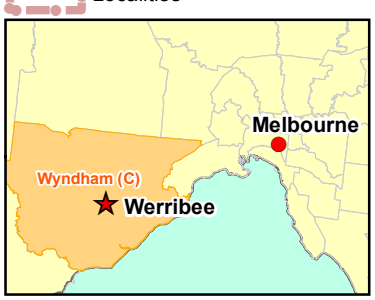


Figure 1a

Location of the study area

Ecological Assessment for the Proposed Youth Justice Precinct Development, Cherry Creek, Werribee

N

0 500 1,000

Metres

ecology & heritage partners

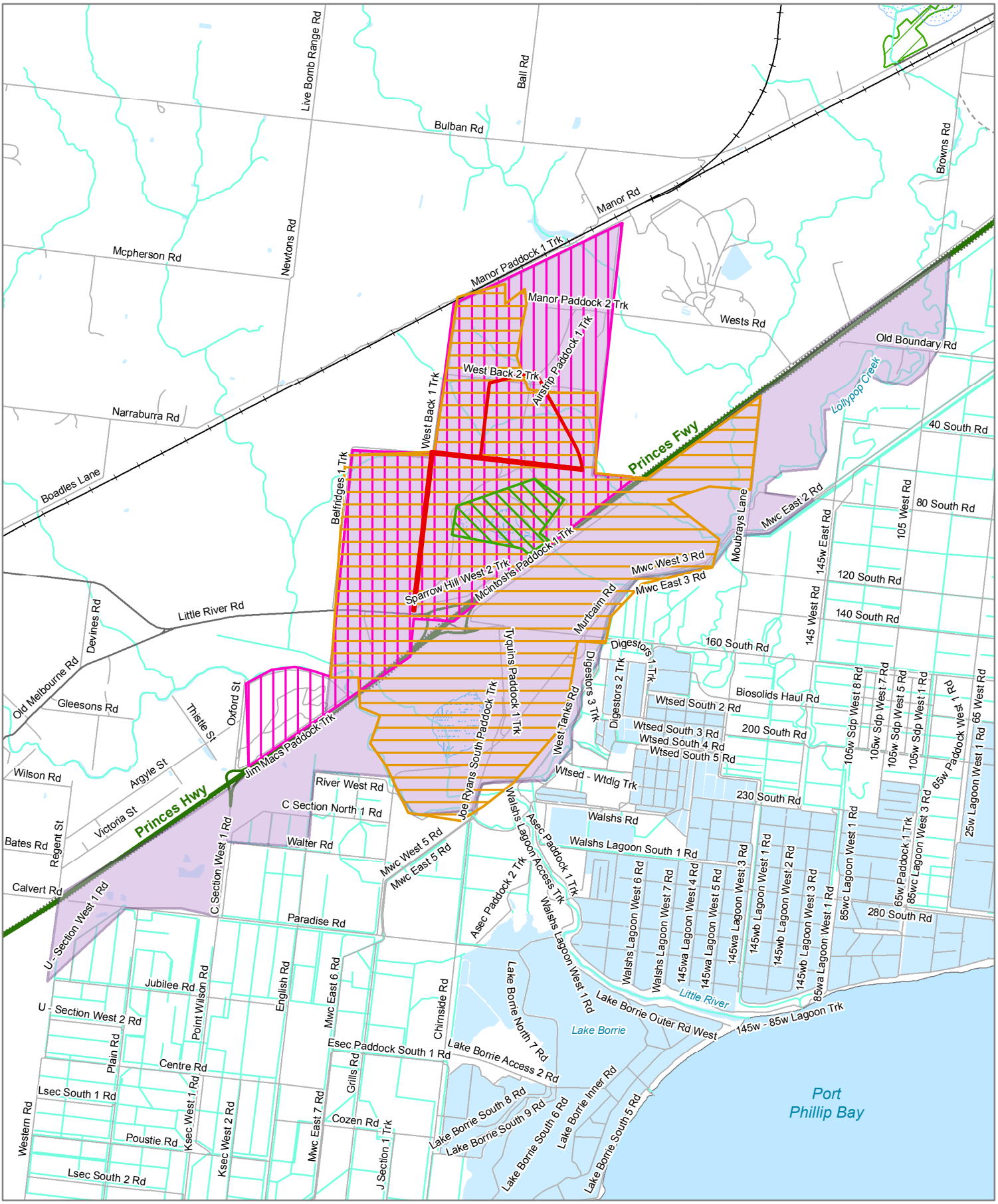


Figure 1b

Previous Studies

Ecological Assessment for the Proposed Youth Justice Precinct Development, Cherry Creek, Werribee

ecology & heritage partners

Legend

- Study Area

Previous Study Extent

- Australian Ecosystems 2016 - SoBS Vegetation Assessments; Australian Ecosystems 2013 - Index of Wetland Condition Assessments
- Botanicus 2007 - Flora assessment of the Northern Grassland Area
- Ecology Partners 2006 - Grassland Mammal Investigation, T-section Grasslands and Dry Pasture Areas
- Biosis 2003 - Fauna survey of Dry Pasture Areas; Ecology Australia 2010 - Western (Basalt) Plains Grassland Fauna Surveys

N

0 500 1,000
Metres

Figure 2

Ecological features

Ecological Assessment for the Proposed Youth Justice Precinct Development, Cherry Creek, Werribee

DRAFT

ecology & heritage partners

Legend

- Study Area
- Outer Metropolitan Ring Road
- Proposed road (25m buffer)
- Possible project site

Plains Grassland

- PG1
- PG2
- PG3
- PG4

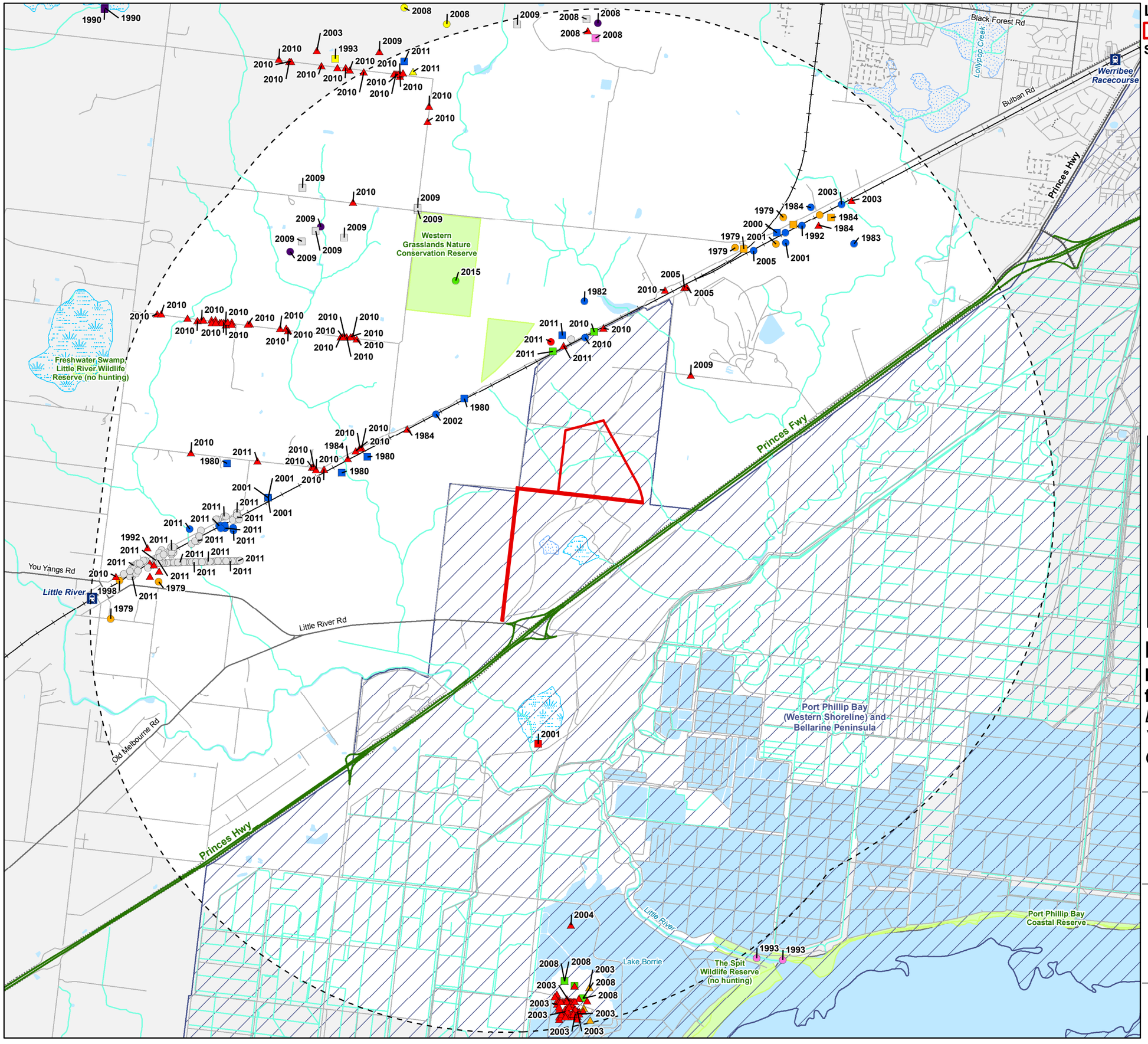
EPBC Act listed vegetation community

- Natural Temperate Grassland of the Victorian Volcanic Plain

N

0 125 250
Metres

9302_Fig02_EcolFeat_P 19/05/2017 melsley



Legend

- Study Area

Significant Flora

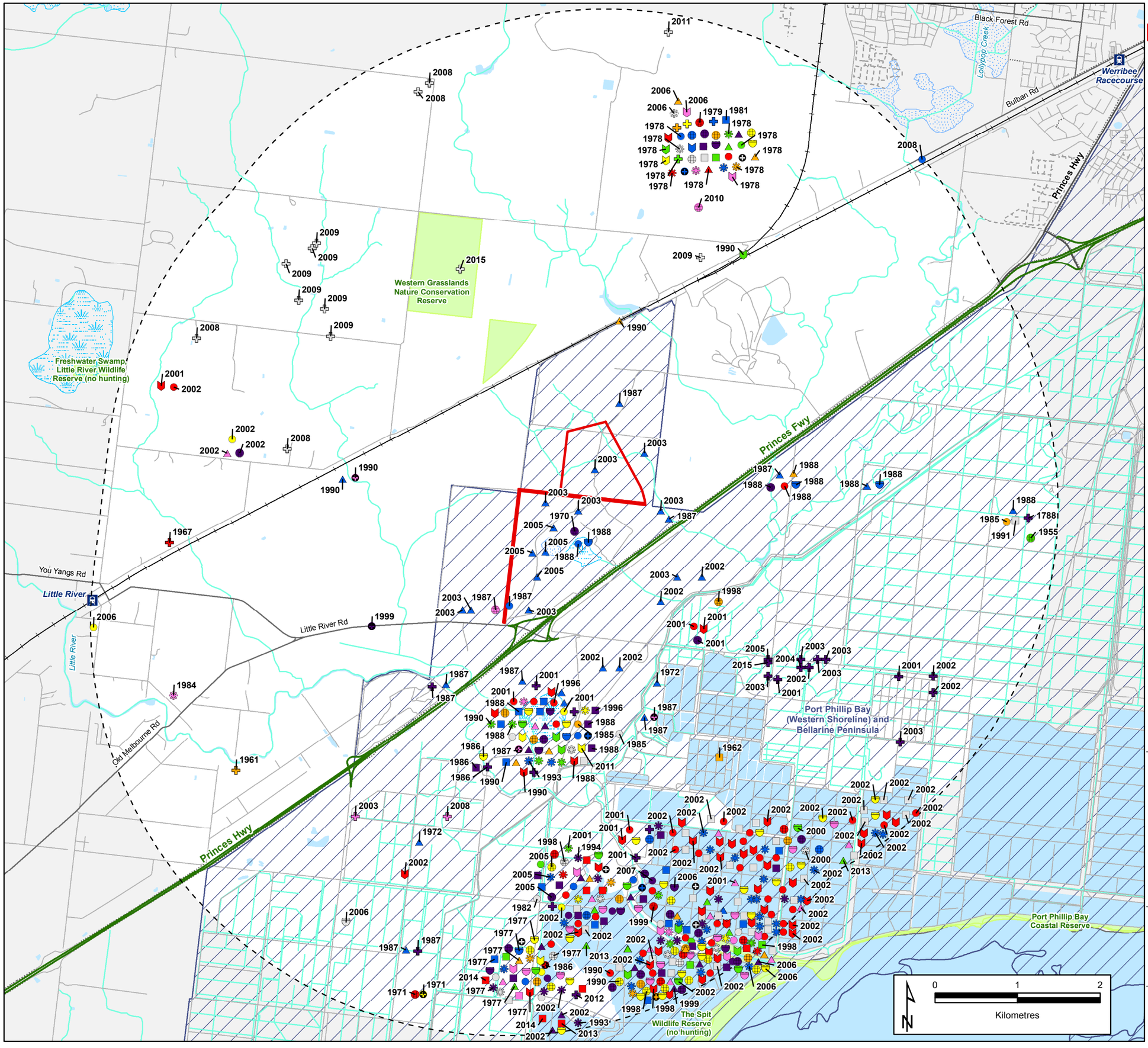
- Arching Flax-lily
- Basalt Podolepis
- Button Wrinklewort
- Clover Glycine
- Giant Honey-myrtle
- Large-headed Fireweed
- Marsh Saltbush
- Narrow Goodenia
- Plains Joyweed
- River Swamp Wallaby-grass
- Rough-grain Love-grass
- Rye Beetle-grass
- Slender Bindweed
- Small Milkwort
- Small Scurf-pea
- Smooth Nardoo
- Spiny Rice-flower
- Tough Scurf-pea
- Variable Goodenia

Figure 3

Previously documented significant flora within 5km of the study area

Ecological Assessment for the Proposed Youth Justice Precinct Development, Cherry Creek, Werribee

ecology & heritage partners



Legend

- Study Area

Significant Fauna

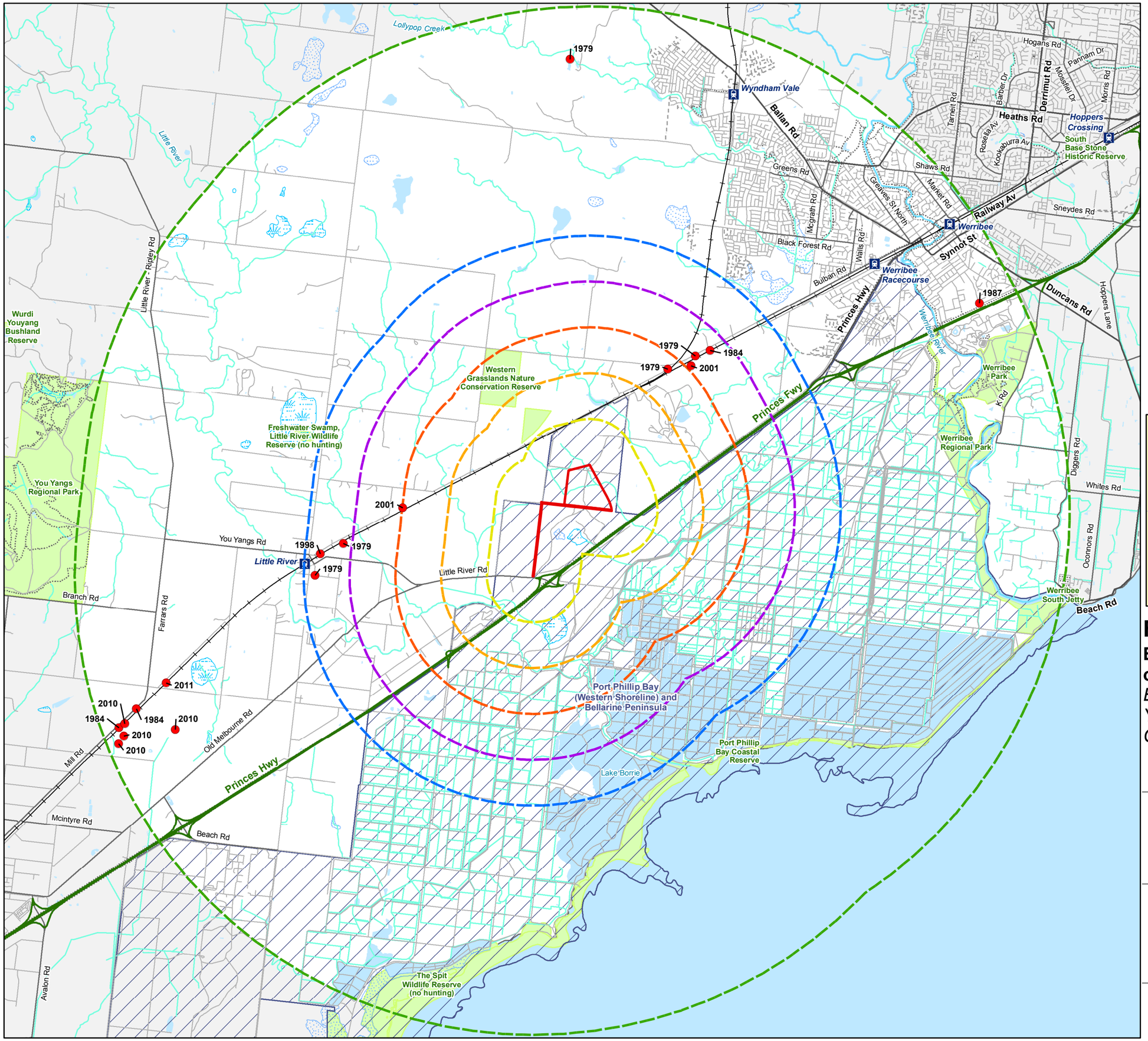
- Australasian Bittern
- Australasian Shoveler
- Australian Painted Snipe
- Baillon's Crake
- Bar-tailed Godwit
- Black Falcon
- Black-faced Cormorant
- Black-tailed Godwit
- Blue-billed Duck
- Brolga
- Brown Toadlet
- Caspian Tern
- Common Greenshank
- Common Sandpiper
- Curlew Sandpiper
- Eastern Curlew
- Eastern Great Egret
- Fairy Tern
- Fat-tailed Dunnart
- Freckled Duck
- Glossy Ibis
- Golden Sun Moth
- Grassland Earless Dragon
- Great Knot
- Greater Sand Plover
- Grey Goshawk
- Grey Plover
- Grey-headed Flying-fox
- Growling Grass Frog
- Hardhead
- Intermediate Egret
- Latham's Snipe
- Lesser Sand Plover
- Lewin's Rail
- Little Egret
- Little Tern
- Long-toed Stint
- Magpie Goose
- Marsh Sandpiper
- Musk Duck
- Nankeen Night Heron
- Orange-bellied Parrot
- Pacific Golden Plover
- Pacific Gull
- Pectoral Sandpiper
- Pied Cormorant
- Plains-wanderer
- Red Knot
- Red-chested Button-quail
- Royal Spoonbill
- Ruddy Turnstone
- Sanderling
- Sooty Oystercatcher
- Southern Giant-Petrel
- Spotted Harrier
- Striped Legless Lizard
- Superb Parrot
- Swift Parrot
- Whiskered Tern
- White-bellied Sea-Eagle
- White-throated Needletail
- White-winged Black Tern
- Wood Sandpiper

Figure 4

Previously documented significant fauna within 5km of the study area

Ecological Assessment for the Proposed Youth Justice Precinct Development, Cherry Creek, Werribee

ecology & heritage partners



Legend

Study Area

Search Buffer

- 1km
- 2km
- 3km
- 4km
- 5km
- 10km

EPBC Act-Listed Species

- Button Wrinklewort

Figure 5 - 1

EPBC Act-Listed Species Within 10km of the Study Area: Button Wrinklewort

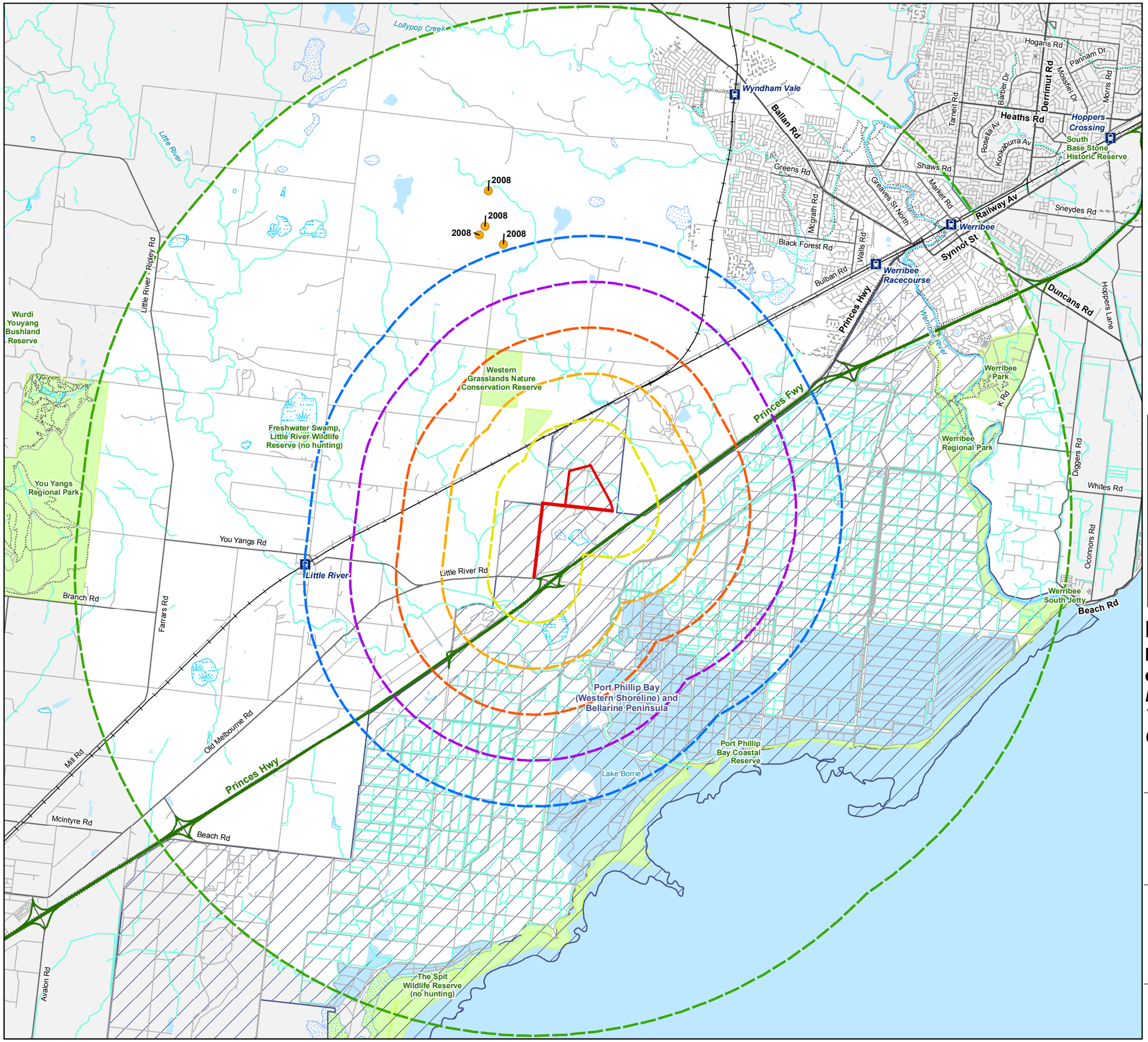
Ecological Assessment for the Proposed Youth Justice Precinct Development, Cherry Creek, Werribee

N

0 2 4

Kilometres

ecology & heritage partners



Legend

Study Area

Search Buffer

- 1km
- 2km
- 3km
- 4km
- 5km
- 10km

EPBC Act-Listed Species

- Clover Glycine

Figure 5 - 2

EPBC Act-Listed Species Within 10km of the Study Area: Clover Glycine

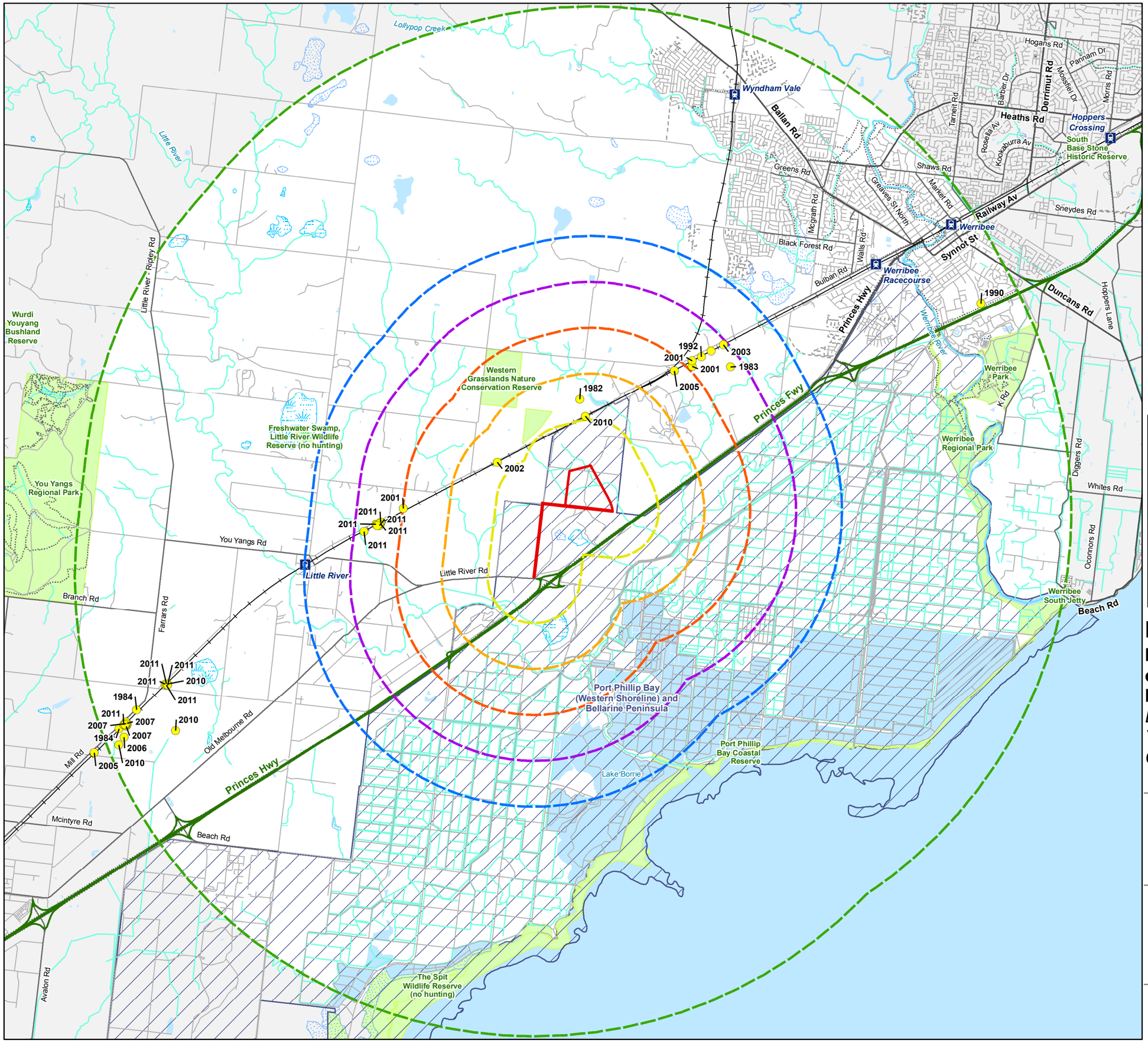
Ecological Assessment for the Proposed Youth Justice Precinct Development, Cherry Creek, Werribee

N

0 2 4

Kilometres

ecology & heritage partners



Legend

Study Area

Search Buffer

- 1km
- 2km
- 3km
- 4km
- 5km
- 10km

EPBC Act-Listed Species

- Large-headed Fireweed

Figure 5 - 3

EPBC Act-Listed Species Within 10km of the Study Area: Large-headed Fireweed

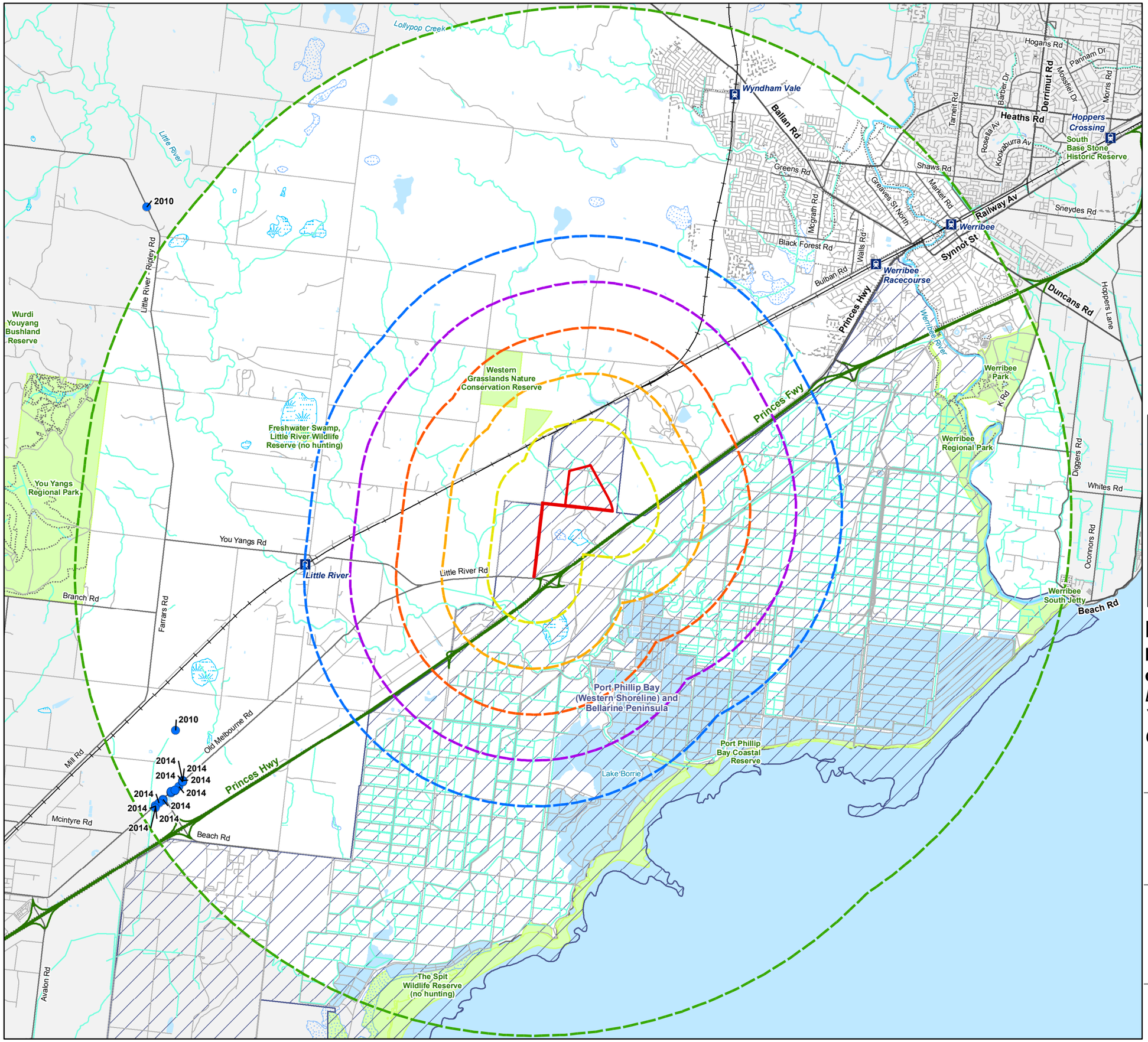
Ecological Assessment for the Proposed Youth Justice Precinct Development, Cherry Creek, Werribee

N

0 2 4

Kilometres

ecology & heritage partners



Legend

Study Area

Search Buffer

- 1km
- 2km
- 3km
- 4km
- 5km
- 10km

EPBC Act-Listed Species

- Matted Flax-lily

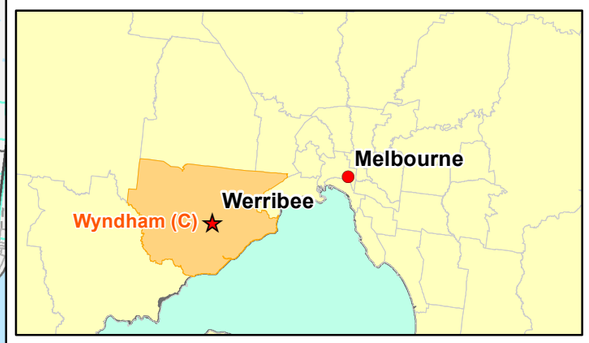


Figure 5 - 4

EPBC Act-Listed Species Within 10km of the Study Area: Matted Flax-lily

Ecological Assessment for the Proposed Youth Justice Precinct Development, Cherry Creek, Werribee

N

0 2 4

Kilometres

ecology & heritage partners

Legend

Study Area

Search Buffer

- 1km
- 2km
- 3km
- 4km
- 5km
- 10km

EPBC Act-Listed Species

- Spiny Rice-flower

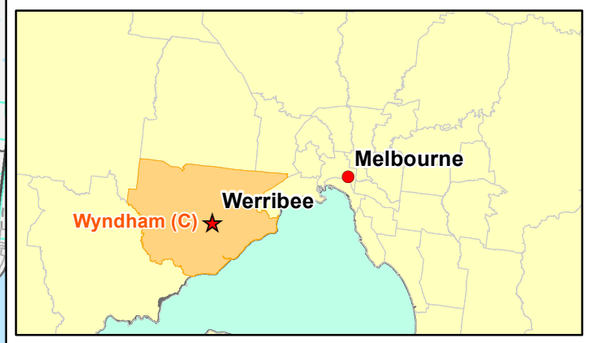


Figure 5 - 5

EPBC Act-Listed Species Within 10km of the Study Area: Spiny Rice-flower

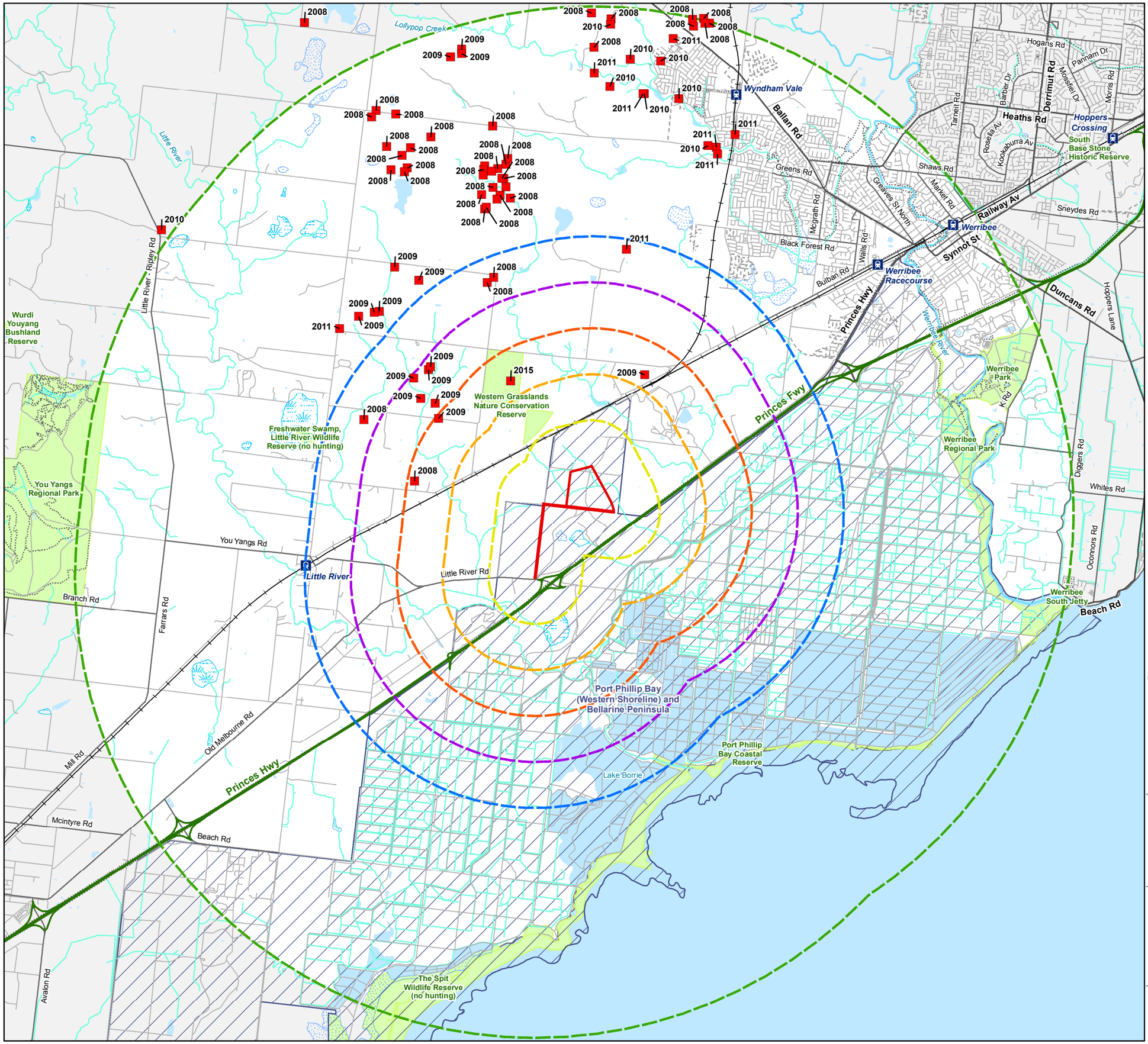
Ecological Assessment for the Proposed Youth Justice Precinct Development, Cherry Creek, Werribee

N

0 2 4

Kilometres

ecology & heritage partners



Legend

- Study Area

Search Buffer

- 1km
- 2km
- 3km
- 4km
- 5km
- 10km

EPBC Act-Listed Species

- Golden Sun Moth

Figure 5 - 6

EPBC Act-Listed Species Within 10km of the Study Area: Golden Sun Moth

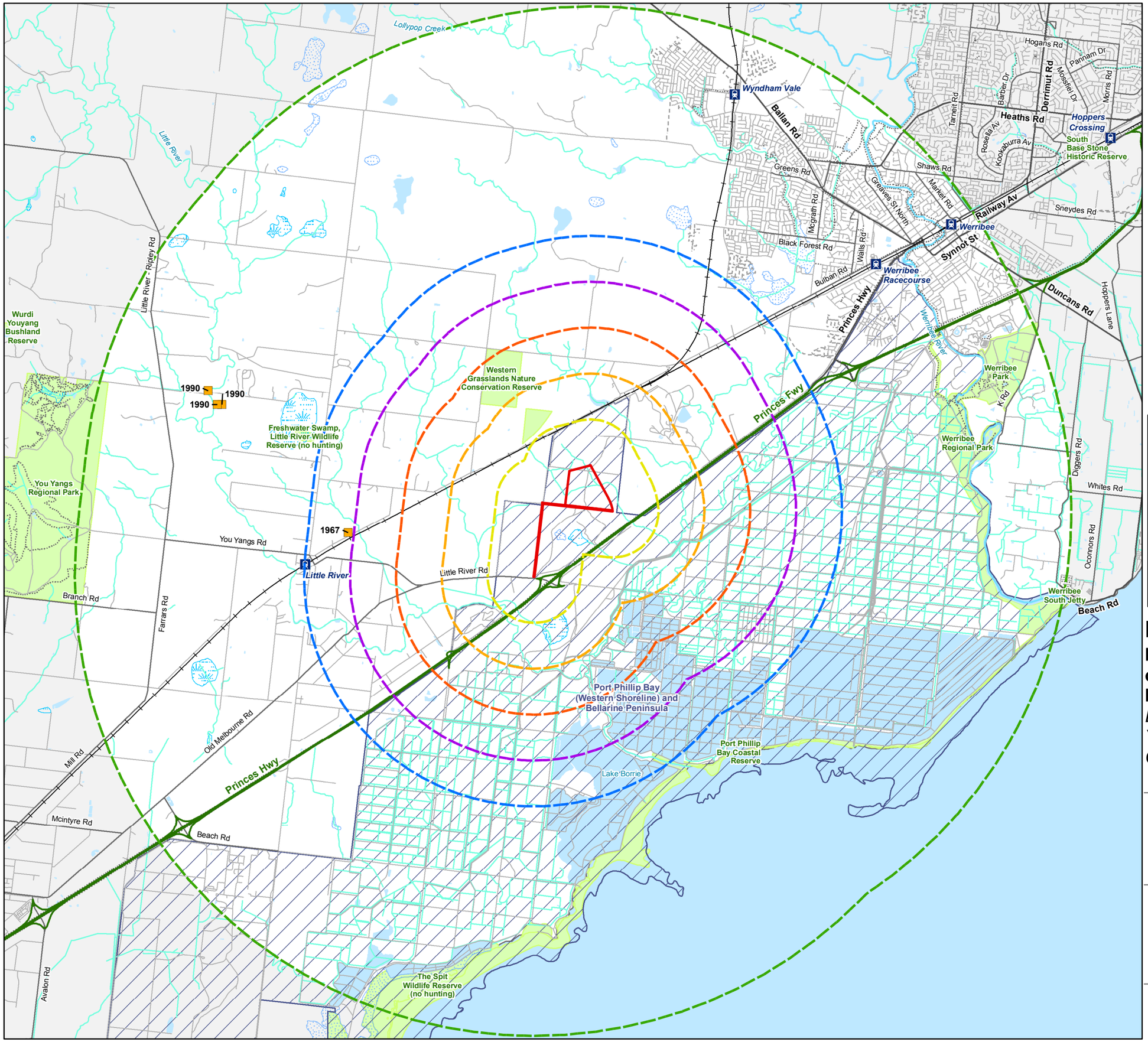
Ecological Assessment for the Proposed Youth Justice Precinct Development, Cherry Creek, Werribee

N

0 2 4

Kilometres

ecology & heritage partners



Legend

- Study Area

Search Buffer

- 1km
- 2km
- 3km
- 4km
- 5km
- 10km

EPBC Act-Listed Species

- Grassland Earless Dragon

Figure 5 - 7

EPBC Act-Listed Species Within 10km of the Study Area: Grassland Earless Dragon

Ecological Assessment for the Proposed Youth Justice Precinct Development, Cherry Creek, Werribee

N

0 2 4

Kilometres

ecology & heritage partners

Legend

- Study Area

Search Buffer

- 1km
- 2km
- 3km
- 4km
- 5km
- 10km

EPBC Act-Listed Species

- Growling Grass Frog

Figure 5 - 8

EPBC Act-Listed Species Within 10km of the Study Area: Growling Grass Frog

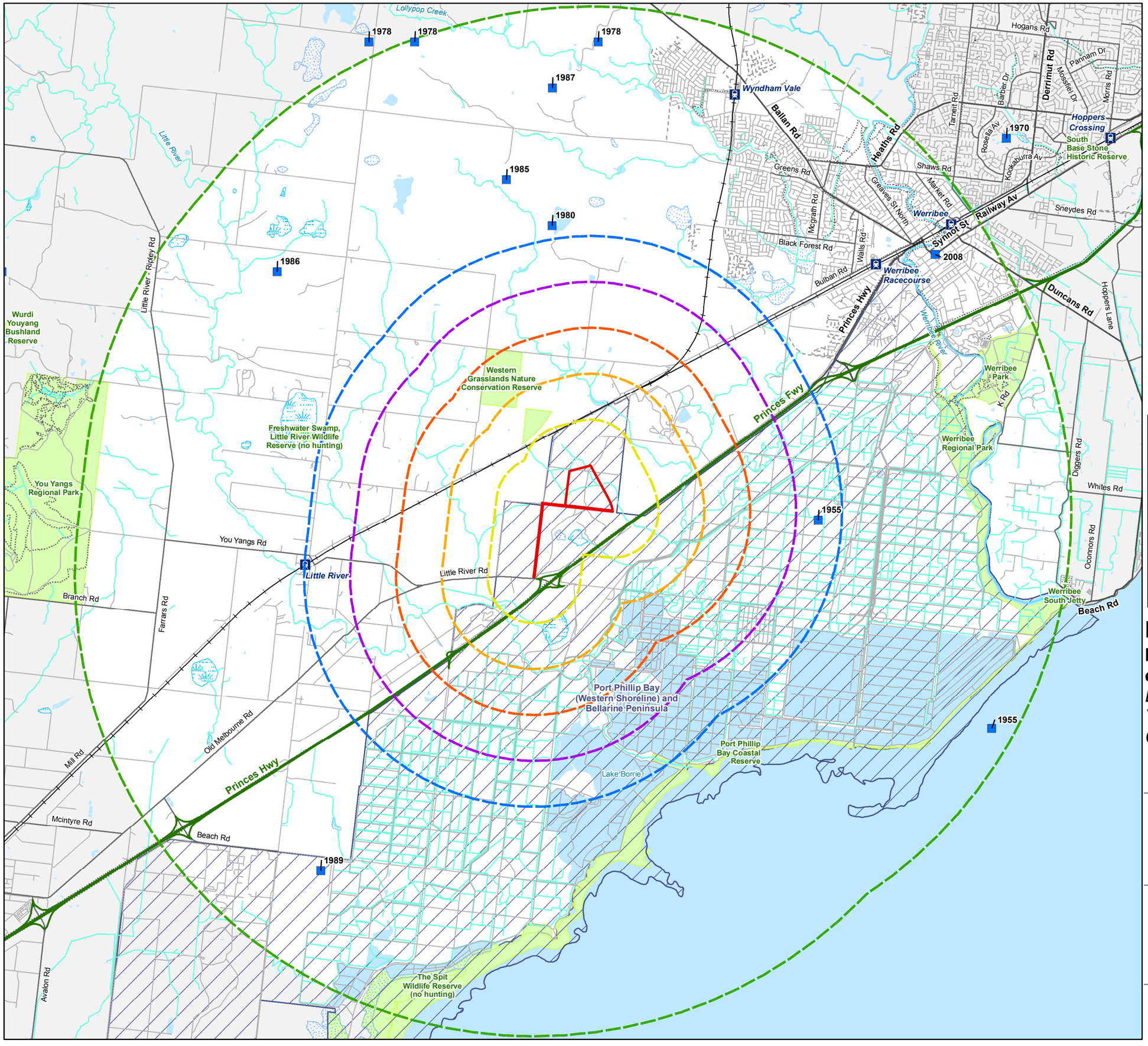
Ecological Assessment for the Proposed Youth Justice Precinct Development, Cherry Creek, Werribee

N

0 2 4

Kilometres

ecology & heritage partners



Legend

- Study Area

Search Buffer

- 1km
- 2km
- 3km
- 4km
- 5km
- 10km

EPBC Act-Listed Species

- Plains-wanderer

Figure 5 - 9

EPBC Act-Listed Species Within 10km of the Study Area: Plains-wanderer

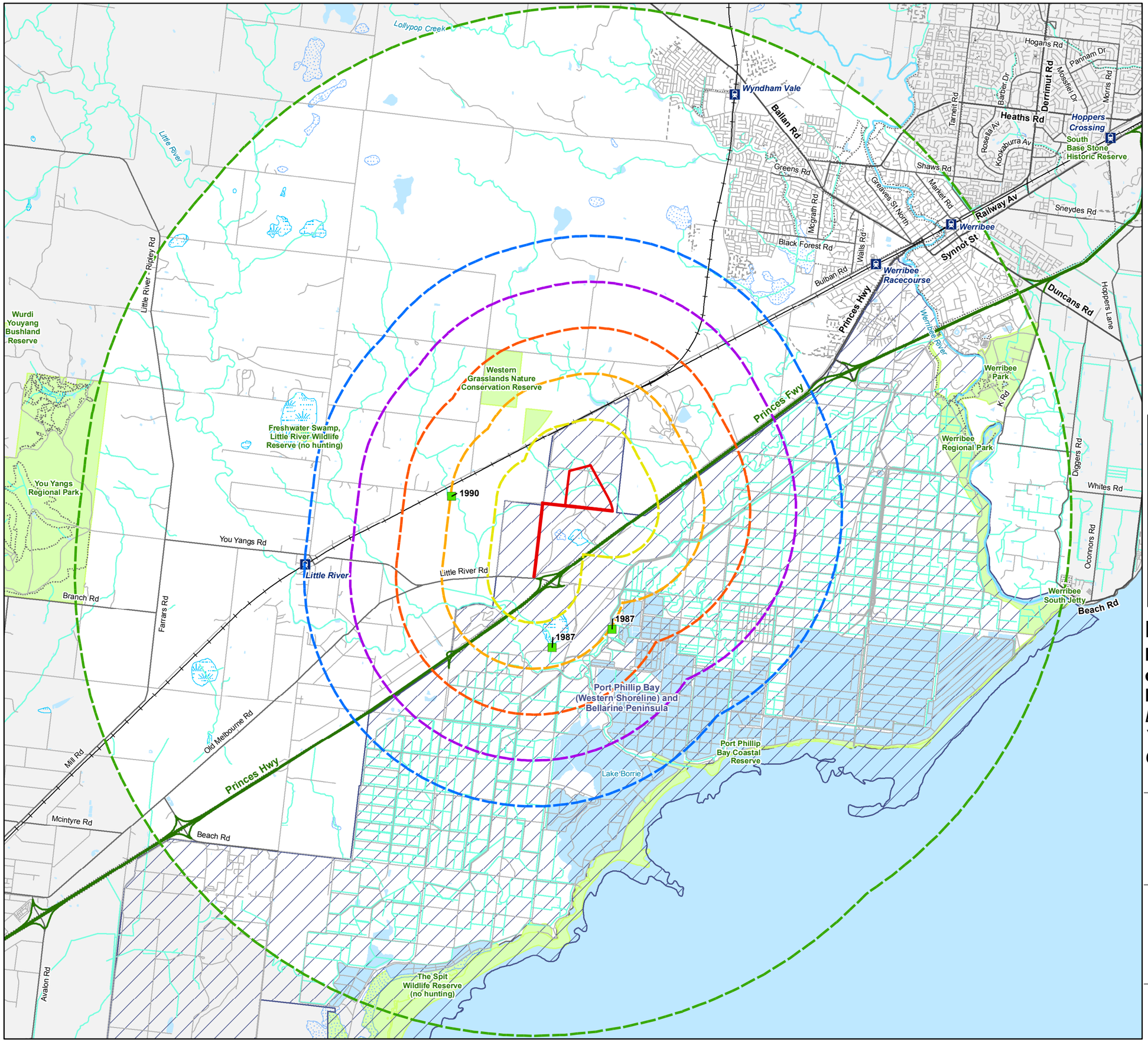
Ecological Assessment for the Proposed Youth Justice Precinct Development, Cherry Creek, Werribee

N

0 2 4

Kilometres

ecology & heritage partners



Legend

- Study Area

Search Buffer

- 1km
- 2km
- 3km
- 4km
- 5km
- 10km

EPBC Act-Listed Species

- Striped Legless Lizard

Figure 5 - 10

EPBC Act-Listed Species Within 10km of the Study Area: Striped Legless Lizard

Ecological Assessment for the Proposed Youth Justice Precinct Development, Cherry Creek, Werribee

N

0 2 4

Kilometres

ecology & heritage partners

APPENDICES

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
Conservation Status in Australia (Based on the EPBC Act 1999)
EX - Extinct: Extinct is when there is no reasonable doubt that the last individual of the species has died.
CR - Critically Endangered: A species is critically endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.
EN - 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.
VU - 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.
R* - Rare: A species is rare but overall is not currently considered critically endangered, endangered or vulnerable.
K* - Poorly Known: A species is suspected, but not definitely known, to belong to any of the categories extinct, critically endangered, endangered, vulnerable or rare.
Conservation Status in Victoria (Based on DEPI 2014, DSE 2009 or2013)
x - 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.
e - Endangered in Victoria: at risk of disappearing from the wild state if present land use and other causal factors continue to operate.
v - 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.
r - 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.
k - 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 – Offsets and Exemptions

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

Pathway	Biodiversity Assessment Tools	Information Source
Low Risk-based pathway	Condition Score	Modelled data, NVIM Tool (DELWP 2017a)
	Habitat Hectares	= Condition Score x Extent (ha)
	Strategic Biodiversity Score	Modelled data, NVIM Tool (DELWP 2017a)
	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 **(A)**	= Habitat Hectares x Habitat Importance Score
	Sum of Specific Biodiversity Equivalence Scores of remaining habitat **(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 **(C)**	
	General/Specific Threshold Test: If **A ÷ B > C** a **Specific** offset is required If **A ÷ B < C** a **General** offset required	

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

Risk –based Pathway	Offset Type	Offset Amount (Risk adjusted biodiversity equivalence score)	Offset Attributes		
			Habitat for Species	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 1.3 – *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. 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 wWallaby-grasses *Rytidosperma* spp. are protected in degraded areas previously supporting the listed Western [Basalt] Plains Grassland Community.

Table A1.6 provides a list of plant groups protected under the FFG Act.

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 *Pteridium esculentum*
Asteraceae	Daisies	N/A
Ericaceae (formerly Epacridaceae)	Heaths	N/A
Orchidaceae	Orchids	N/A
Acacia	Wattles	*Acacia dealbata, Acacia decurrens, Acacia implexa, Acacia melanoxylon and Acacia paradoxa*
Baeckea	Baeckeas	N/A
Boronia	Boronias	N/A
Calytrix	Fringe-myrtles	N/A
Correa -	Correas	N/A
Darwinia	Darwinias	N/A
Eremophila	Emu-bushes	N/A
Eriostemon	Wax-flowers	N/A
Gompholobium	Wedge-peas	N/A
Grevillea	Grevilleas	N/A
Prostanthera	Mint-bushes	N/A
Sphagnum	Sphagnum mosses	N/A
Stylidium	Trigger-plants	N/A
Thryptomene	Thryptomenes	N/A
Thysanotus	Fringe-lilies	N/A
Xanthorrhoea	Grass-trees	N/A

APPENDIX 2 - FLORA

Appendix 2.1 – Flora Results

Legend:

I Protected under the FFG Act (DELWP 2016);

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

w Weed of National Significance;

Planted Victorian and non-Victorian species;

+ Planted indigenous species that also occur in remnant native vegetation in the study area;

****** Planted indigenous species in the study area; and,

Table A2.1. Flora recorded within the study area.

Scientific Name	Common Name	Conservation Status/Notes
INDIGENOUS SPECIES		
Acacia baileyana	Cootamundra Wattle	#
Acacia pendula	Weeping Myall	#
Atriplex semibaccata	Berry Saltbush	
Austrostipa bigeniculata	Kneed Spear-grass	
Austrostipa scabra subsp. falcata	Rough Spear-grass	
Austrostipa sp.	Spear Grass	
Bothriochloa macra	Red-leg Grass	
Cassinia arcuata	Drooping Cassinia	I
Casuarina cunninghamiana	River Sheoak	#
Chamaesyce drummondii	Caustic Weed	
Chloris truncata	Windmill Grass	
Convolvulus erubescens	Bindweed	
Dianella revoluta	Black-anther Flax-lily	
Einadia nutans	Nodding Saltbush	
Enchylaena tomentosa	Ruby Saltbush	
Eryngium ovinum	Blue Devil	
Eucalyptus camaldulensis	Red Gum	**
Eucalytpus cladocalyx	Sugar Gum	#

Scientific Name	Common Name	Conservation Status/Notes
Juncus sp.	Rush	
Juncus subsecundus	Finger Rush	
Maireana enchylaenoides	Wingless Bluebush	
Melaleuca squarrosa	Scented Paperbark	#
Oxalis perennans	Wood Sorrel	
Rhagodia candolleana	Seaberry Saltbush	
Rumex brownii	Slender Dock	
Rytidosperma duttoniana	Brown-back Wallaby-grass	
Rytidosperma fulva	Copper Wallaby-grass	
Rytidosperma racemosa	Stiped Wallaby-grass	
Rytidosperma setacea	Bristly Wallaby-grass	
Rytidosperma sp.	Wallaby Grass	
Salsola targus	Common Saltwort	
Themeda triandra	Kangaroo Grass	
NON-INDIGENOUS OR INTRODUCED SPECIES		
Arcthotheca calendula	Capeweed	
Avena fatua	Wildoat	
Bromus driandrus	Great Brome	
Bromus hordaceus	Soft Brome	
Carthamus lanatus	Safron Thistle	*
Chenopodium murale	Goosefoot	
Cirsium vulgare	Spear Thistle	*
Conyza sp.	Fleabane	
Cucubit myriocarpus	Paddy Melon	
Cynara cardunculus	Artichoke Thistle	*
Cynodon dactylon	Couch	
Dactylis glomerata	Cocksfoot	
Diplotaxis tenuifolia	Perennial Wall-rocket	
Erodium botrys	Big Heron's-bill	
Erodium cicutarium	Common Stork's-bill	
Galenia pubescens	Galenia	
Helminthotheca echiodes	Bristly Ox-tongue	
Hordeum leporinum	Barley Grass	
Hypochoeris radicata	Cat's Ear	
Lactuca serriola	Prickly Lettuce	

Scientific Name	Common Name	Conservation Status/Notes
Lepidium africanum	Common Peppercress	
Lolium rigidum	Wimmera Rye-grass	
Lycium ferocissimum	African Boxthorn	*, W
Malva parviflora	Small-flower Mallow	
Marrubium vulgare	Horehound	*
Nassella neesiana	Chilean Needle-grass	*, W
Nassella trichotoma	Serrated Tussock	*, W
Phalaris aquatica	Toowoomba Canary-grass	
Phalaris minor	Lesser Canary-grass	
Phleum pratense	Timothy grass	
Physalis viscosa	Sticky Ground-cherry	
Polygonum aviculare	Wireweed	
Portulaca oleracea	Pigweed	
Prunis dulcis	Almond	
Romulea rosea	Onion Grass	
Salvia verbenaca	Wild Sage	
Silybum marianum	Variegated Thistle	*
Solanum linnaenum	Apple of Sodom	*
Solanum nigrum	Nightshade	
Sonchus asper	Rough Sow-thistle	
Sonchus oleraceus	Common Sow-thistle	
Trifolium glomeratum	Cluster Clover	
Vulpia bromoides	Squirrel-tail Fescue	
Xanthium spinosum	Batthurst Burr	*

Appendix 2.2 – Significant Flora Species

Table A2.2 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.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG Act	DELWP	Likely occurrence in study area
NATIONAL SIGNIFICANCE							
Amphibromus fluitans	River Swamp Wallaby-grass	1	2001	VU	X		4 – no suitable habitat within the study area.
Dianella amoena	Matted Flax-lily	22	2014	EN	L	e	2 – suitable habitat and records in close proximity to study area
Glycine latrobeana	Clover Glycine	6	2008	VU	L	v	3 – reasonable quality habitat and records in close proximity
Leucochrysum albicans var. tricolor	Hoary Sunray	#	#	EN	L	e	4 – no records close to study area although suitable habitat available.
Pimelea spinescens subsp. spinescens	Spiny Rice-flower	496	2014	CR	L	e	2 – large number of records and suitable habitat
Prasophyllum suaveolens	Fragrant Leek-orchid	1	1899	EN	L	e	4 – marginal habitat and no recent records
Pterostylis cucullata	Leafy Greenhood	#	#	VU	L	e	4 – No records close to study area
Rutidosis leptorhynchoides	Button Wrinklewort	38	2011	EN	L	e	3 – suitable habitat and recent records in close proximity
Senecio macrocarpus	Large-headed Fireweed	72	2011	VU	L	e	2 – large number of records in close proximity to study area,

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG Act	DELWP	Likely occurrence in study area
							as well as suitable habitat
STATE SIGNIFICANCE							
Acacia boormanii	Snowy River Wattle	1	2002			r	4 – no suitable habitat
Allocasuarina luehmannii	Buloke	12	2011		L	e	4 – would have been observed during field assessment
Alternanthera sp. 1 (Plains)	Plains Joyweed	10	2009			k	3 – suitable grassland habitat
Althenia marina	Sea Water-mat	2	2009		L	v	5 – no suitable habitat
Asperula charophyton	Elongate Woodruff	1	1770			k	5 – no recent record for species
Atriplex paludosa subsp. paludosa	Marsh Saltbush	4	1993			r	3 – suitable habitat in grassland areas
Avicennia marina subsp. australasica	Grey Mangrove	1	1961			r	5 – no suitable habitat
Comesperma polygaloides	Small Milkwort	29	2011		L	v	3 – suitable grassland habitat and recent records
Convolvulus angustissimus subsp. omnigracilis	Slender Bindweed	15	2011			k	2 – suitable habitat and recent records
Cullen parvum	Small Scurf-pea	13	2011		L	e	3 – suitable habitat and recent records
Cullen tenax	Tough Scurf-pea	4	2003		L	e	3 – suitable habitat and recent records
Dianella sp. aff. longifolia (Benambra)	Arching Flax-lily	121	2011			v	3 – suitable habitat and recent records
Diuris palustris	Swamp Diuris	1	1971		L	v	4 – no suitable habitat
Eleocharis pallens	Pale Spike-sedge	1	2012			k	4 – no suitable habitat
Eragrostis trachycarpa	Rough-grain Love-grass	3	1984		D	r	4 – few recent records
Eucalyptus leucoxylon subsp. connata	Melbourne Yellow-gum	3	2010		X	v	4 – would have been observed during field assessment if present
Eucalyptus sideroxylon subsp. sideroxylon	Mugga	1	2007			r	4 - would have been observed during field assessment if present
Goodenia heterophylla subsp. heterophylla	Variable Goodenia	1	2011			r	3 – suitable habitat although few recent records

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG Act	DELWP	Likely occurrence in study area
Goodenia macbarronii	Narrow Goodenia	7	2009		L	v	3 – suitable habitat and recent records
Grevillea rosmarinifolia	Rosemary Grevillea	1	1974			P	4 - would have been observed during field assessment if present
Grevillea rosmarinifolia subsp. rosmarinifolia	Rosemary Grevillea	1	2002			r	4 - would have been observed during field assessment if present
Heterozostera nigricaulis	Australian Grass-wrack	2	2009			r	4 – preferred habitat not available
Lawrencia spicata	Salt Lawrencia	4	2009			r	4 – preferred habitat not available
Marsilea mutica	Smooth Nardoo	3	1994			k	4 – preferred habitat not available
Melaleuca armillaris subsp. armillaris	Giant Honey-myrtle	3	2015			r	4 – would have been observed during field assessment if present
Nicotiana suaveolens	Austral Tobacco	1	1770			r	4 – preferred habitat not available and no recent records
Pellaea calidirupium	Inland Sickle-fern	1	1866			k	4 – preferred habitat not available and no recent records
Pleurosorus subglandulosus	Glandular Blanket-fern	1	2010			k	4 – preferred habitat not available
Podolepis linearifolia	Basalt Podolepis	13	2011			e	3 – suitable habitat and recent records
Pterostylis truncata	Brittle Greenhood	115	2006		L	e	4 – many recent records but no suitable habitat available
Salsola tragus subsp. pontica	Coast Saltwort	1	1982			r	5 – no suitable habitat
Swainsona behriana	Southern Swainson-pea	2	1894			r	4 – suitable habitat but no recent records
Tripogon loliiformis	Rye Beetle-grass	26	2010			r	2 – preferred habitat available and recent records in close proximity

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 2017d); Protected Matters Search Tool (DoEE 2017). Order: Alphabetical. .

Appendix 2.3 – Habitat Hectares

Table A2.3. Habitat Hectares results for remnant vegetation recorded within the study area.

HZ	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
EVC	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63	132_63
Understorey (/15)	15	10	15	15	15	15	10	10	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Lack of Weeds (/15)	9	2	6	9	6	6	2	2	6	6	6	13	6	6	13	9	13	9	9	13	9	6	9	6	6	6
Recruitment (/10	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Litter (/5)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Logs (/5)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Standardiser	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36	x 1.36
Site Condition (/75)	43.52	27.2	39.44	43.52	39.44	39.44	27.2	27.2	39.44	39.44	39.44	48.96	39.44	39.44	48.96	43.52	48.96	43.52	43.52	48.96	43.52	39.44	43.52	39.44	39.44	39.44
Patch Size (/10)	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Distance to Core Area (/5)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Neighbourhood (/10)	5	5	5	5	5	5	2	2	2	3	5	3	5	5	5	5	3	3	5	5	3	5	5	5	2	2
Landscape Context (/25)	17	17	17	17	17	17	14	14	14	15	17	15	17	17	17	17	15	15	17	17	15	17	17	17	14	14
Habitat Score (/100)	60.52	44.2	56.44	60.52	56.44	56.44	41.2	41.2	53.44	54.44	56.44	63.96	56.44	56.44	65.96	60.52	63.96	58.52	60.52	65.96	58.52	56.44	60.52	56.44	53.44	53.44
Habitat Points (/1)	0.61	0.44	0.56	0.61	0.56	0.56	0.41	0.41	0.53	0.54	0.56	0.64	0.56	0.56	0.66	0.61	0.64	0.59	0.61	0.66	0.59	0.56	0.61	0.56	0.53	0.53

APPENDIX 3 - FAUNA

Appendix 3.1 – Fauna Results

Table A3.1. Fauna recorded within the study area during the preliminary ecological assessment.

Common Name	Species Name	Status
Australasian Pipit	*Anthus novaesselandiae*	
Australian Magpie	*Cracticus tibicen*	
Australian White Ibis	*Threskiornis molucca*	
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	
Black-shouldered Kite	*Elanus axillaris*	
Common Bronzewing	*Phaps chalccoptera*	
Common Froglet	*Crinia signifera*	
Eastern Grey Kangaroo	*Macropus giganteus*	
Eurasian Skylark	*Alauda arvensis*	*
European Rabbit	*Oryctolagus cuniculus*	*
Fox	*Vulpes vulpes*	*
Grey Falcon	*Falco hypoleucos*	
Little Raven	*Corvus mellori*	
Red Wattlebird	*Anthochaera carunculata*	
Willie Wagtail	*Rhipidura leucophrys*	
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	

Notes: * = Introduced Species. This is by no means an exhaustive list of fauna that are likely to use habitat resources within the study area.

.

Appendix 3.2 – Significant Fauna Species

Table A3.2. Significant fauna within 10 kilometres of the study area.

Likelihood: Habitat characteristics of significant fauna 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	High Likelihood	• Known resident in the study area based on site observations, database records, or expert advice; and/or, • Recent records (i.e. within five years) of the species in the local area (DELWP 2017d); and/or, • The study area contains the species' preferred habitat.
2	Moderate Likelihood	• The species is likely to visit the study area regularly (i.e. at least seasonally); and/or, • Previous records of the species in the local area (DELWP 2017d); and/or, • The study area contains some characteristics of the species' preferred habitat.
3	Low Likelihood	• The species is likely to visit the study area occasionally or opportunistically whilst en route to more suitable sites; and/or, • There are only limited or historical records of the species in the local area (i.e. more than 20 years old); and/or, • The study area contains few or no characteristics of the species' preferred habitat.
4	Unlikely	• No previous records of the species in the local area; and/or, • The species may fly over the study area when moving between areas of more suitable habitat; and/or, • Out of the species' range; and/or, • No suitable habitat present.

-

EPBC	*Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
FFG	*Flora and Fauna Guarantee Act 1988* (FFG Act)
DSE	Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2013); Advisory List of Threatened Invertebrate Fauna in Victoria (DSE 2009)
NAP	National Action Plan (Cogger *et al.* 1993; Duncan *et al.* 1999; Garnet *et al.* 2011; Woinarski *et al.* 2014; Sands and New 2002; Tyler 1997)

EX	Extinct	DD	Data deficient (insufficiently or poorly known
RX	Regionally extinct	L	Listed as threatened under FFG Act
CR	Critically endangered	EN	Endangered
#	Listed on the Protected Matters Search Tool	NT	Near threatened
VU	Vulnerable	CD	Conservation dependent
LC	least concern	RA	Rare

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	National Action Plan	Likelihood
NATIONAL SIGNIFICANCE								
Swamp Antechinus	*Antechinus minimus maritimus*	#	1	VU	L	NT	VU	4 – no suitable habitat or recent records
Greater Glider	*Petauroides volans*	#	1	VU	-	VU	VU	4 – no suitable habitat or recent records
Grey-headed Flying-fox	*Pteropus poliocephalus*	2014	6	VU	L	VU	VU	4 – no suitable habitat
Southern Right Whale	*Eubalaena australis*	2006	2	EN	L	CR	-	4 – no suitable habitat
Humpback Whale	*Megaptera novaeangliae*	#	1	VU	L	VU	-	4 – no suitable habitat
Wandering Albatross	*Diomedea exulans*	#	1	VU	L	EN	VU	4 – no suitable habitat
Black-browed Albatross	*Thalassarche melanophris melanophris*	#	1	VU	-	VU	NT	4 – no suitable habitat
Shy Albatross	*Thalassarche cauta*	#	1	VU	L	VU	VU	4 – no suitable habitat
Grey-headed Albatross	*Thalassarche chrysostoma*	#	1	EN	L	VU	VU	4 – no suitable habitat
Antipodean Albatross	*Diomedea exulans antipodensis*	#	1	VU	-	-	VU	4 – no suitable habitat
Campbell Albatross	*Thalassarche melanophris impavida*	#	1	VU	-	-	VU	4 – no suitable habitat
White-capped Albatross	*Thalassarche cauta steadi*	#	1	VU	-	-	VU	4 – no suitable habitat
Salvin's Albatross	*Thalassarche salvini*	#	1	VU	-	-	VU	4 – no suitable habitat
Buller's Albatross	*Thalassarche bulleri*	#	1	VU	L	-	VU	4 – no suitable habitat
Northern Buller's Albatross	*Thalassarche bulleri platei*	#	1	VU	-	-	VU	4 – no suitable habitat
Southern Royal Albatross	*Diomedea epomophora epomophora*	#	1	VU	-	-	VU	4 – no suitable habitat
Northern Royal Albatross	*Diomedea epomophora sanfordi*	#	1	EN	-	-	VU	4 – no suitable habitat
Sooty Albatross	*Phoebetria fusca*	#	1	VU	L	-	VU	4 – no suitable habitat
Southern Giant-Petrel	*Macronectes giganteus*	1985	4	EN	L	VU	VU	4 – no suitable habitat
Northern Giant-Petrel	*Macronectes halli*	#	1	VU	L	NT	-	4 – no suitable habitat
Fairy Prion	*Pachyptila turtur*	#	1	VU	-	VU	-	4 – no suitable habitat
Gould's Petrel	*Pterodroma leucoptera*	#	1	EN	-	-	VU	4 – no suitable habitat
Australasian Bittern	*Botaurus poiciloptilus*	2008	42	EN	L	EN	VU	4 – no suitable habitat
Lesser Sand Plover	*Charadrius mongolus*	1991	12	EN	-	CR	-	4 – no suitable habitat
Greater Sand Plover	*Charadrius leschenaultii*	1987	8	VU	-	CR	-	4 – no suitable habitat
Plains-wanderer	*Pedionomus torquatus*	2008	31	CR	L	CR	EN	3 – few recent records, low quality

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	National Action Plan	Likelihood
								habitat
Australian Painted Snipe	*Rostratula australis*	2011	8	VU	L	CR	VU	4 – no suitable habitat
Northern Siberian Bar-tailed Godwit	*Limosa lapponica menzbieri*	#	1	EN	-	-	VU	4 – no suitable habitat
Eastern Curlew	*Numenius madagascariensis*	2008	19	CR	-	VU	-	4 – no suitable habitat
Great Knot	*Calidris tenuirostris*	2007	20	CR	L	EN	-	4 – no suitable habitat
Red Knot	*Calidris canutus*	2007	39	EN	-	EN	-	4 – no suitable habitat
Curlew Sandpiper	*Calidris ferruginea*	2013	155	CR	-	EN	-	4 – no suitable habitat
Fairy Tern	*Sternula nereis nereis*	2015	122	VU	L	EN	-	4 – no suitable habitat
Superb Parrot	*Polytelis swainsonii*	1999	1	VU	L	EN	VU	4 – no suitable habitat
Swift Parrot	*Lathamus discolor*	2006	11	CR	L	EN	EN	4 – no suitable habitat
Orange-bellied Parrot	*Neophema chrysogaster*	2008	278	CR	L	CR	CR	4 – no suitable habitat
Regent Honeyeater	*Anthochaera phrygia*	1960	2	CR	L	CR	EN	4 – no suitable habitat
Painted Honeyeater	*Grantiella picta*	#	1	VU	L	VU	NT	4 – no suitable habitat
Loggerhead Turtle	*Caretta caretta*	#	1	EN	-	-	VU	4 – no suitable habitat
Green Turtle	*Chelonia mydas*	#	1	VU	-	-	VU	4 – no suitable habitat
Leathery Turtle	*Dermochelys coriacea*	#	1	EN	L	CR	VU	4 – no suitable habitat
Striped Legless Lizard	*Delma impar*	1990	6	VU	L	EN	VU	2 – suitable rocky and grassland habitat and number of recent records
Grassland Earless Dragon	*Tympanocryptis pinguicolla*	1990	5	EN	L	CR	VU	3 – suitable grassland and rocky habitat but no recent records
Growling Grass Frog	*Litoria raniformis*	2015	268	VU	L	EN	VU	3
Great White Shark	*Carcharodon carcharias*	#	1	VU	L	VU	-	4 – no suitable habitat
Pilchard	*Sardinops sagax*	1995	1	-	-	-	EN	4 – no suitable habitat
Dwarf Galaxias	*Galaxiella pusilla*	#	1	VU	L	EN	VU	4 – no suitable habitat
Australian Grayling	*Prototroctes maraena*	#	1	VU	L	VU	VU	4 – no suitable habitat
Bluenose Cod (Trout Cod)	*Maccullochella macquariensis*	1877	1	EN	L	CR	EN	4 – no suitable habitat
Golden Sun Moth	*Synemon plana*	2015	111	CR	L	CR	-	1 – many records close by and health dense swards of native grassland
STATE SIGNIFICANCE								
Southern Myotis	*Myotis macropus*	1989	1	-	-	NT	NT	2 – suitable habitat (flyover)
Magpie Goose	*Anseranas semipalmata*	2008	22	-	L	NT	-	4 – no suitable habitat

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	National Action Plan	Likelihood
Musk Duck	*Biziura lobata*	2008	1177	-	-	VU	-	4 – no suitable habitat
Freckled Duck	*Stictonetta naevosa*	2008	206	-	L	EN	-	4 – no suitable habitat
Australasian Shoveler	*Anas rhynchotis*	2008	1131	-	-	VU	-	4 – no suitable habitat
Hardhead	*Aythya australis*	2008	1324	-	-	VU	-	4 – no suitable habitat
Blue-billed Duck	*Oxyura australis*	2008	1390	-	L	EN	-	4 – no suitable habitat
White-throated Needletail	*Hirundapus caudacutus*	1988	13	-	-	VU	-	3 – no suitable habitat
White-faced Storm-Petrel	*Pelagodroma marina*	1978	2	-	-	VU	-	4 – no suitable habitat
Little Bittern	*Ixobrychus minutus dubius*	2006	3	-	L	EN	-	4 – no suitable habitat
Eastern Great Egret	*Ardea modesta*	2008	79	-	L	VU	-	4 – no suitable habitat
Intermediate Egret	*Ardea intermedia*	2011	12	-	L	EN	-	4 – no suitable habitat
Little Egret	*Egretta garzetta nigripes*	2007	64	-	L	EN	-	4 – no suitable habitat
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	2008	34	-	L	VU	-	3 – no suitable habitat (flyover)
Grey Goshawk	*Accipiter novaehollandiae novaehollandiae*	2008	10	-	L	VU	-	1 – suitable habitat (flyover)
Black Falcon	*Falco subniger*	2011	40	-	-	VU	-	1 – suitable habitat (flyover)
Brolga	*Grus rubicunda*	2015	113	-	L	VU	-	1 – suitable foraging habitat
Lewin's Rail	*Lewinia pectoralis pectoralis*	2011	27	-	L	VU	NT	4 – no suitable habitat
Baillon's Crake	*Porzana pusilla palustris*	2006	18	-	L	VU	-	4 – no suitable habitat
Major Mitchell's Cockatoo	*Lophocroa leadbeateri*	1958	2	-	L	VU	-	4 – no recent records
Bush Stone-curlew	*Burhinus grallarius*	1960	3	-	L	EN	NT	4 – suitable habitat but no recent records
Pacific Golden Plover	*Pluvialis fulva*	2008	36	-	-	VU	-	4 – no suitable habitat
Grey Plover	*Pluvialis squatarola*	2008	15	-	-	EN	-	4 – no suitable habitat
Black-tailed Godwit	*Limosa limosa*	2008	49	-	-	VU	-	4 – no suitable habitat
Whimbrel	*Numenius phaeopus*	1978	2	-	-	VU	-	4 – no suitable habitat
Terek Sandpiper	*Xenus cinereus*	2008	17	-	L	EN	-	4 – no suitable habitat
Common Sandpiper	*Actitis hypoleucos*	2007	17	-	-	VU	-	4 – no suitable habitat
Grey-tailed Tattler	*Tringa brevipes*	1978	2	-	L	CR	-	4 – no suitable habitat
Common Greenshank	*Tringa nebularia*	2008	132	-	-	VU	-	4 – no suitable habitat
Marsh Sandpiper	*Tringa stagnatilis*	2008	75	-	-	VU	-	4 – no suitable habitat
Wood Sandpiper	*Tringa glareola*	2008	41	-	-	VU	-	4 – no suitable habitat

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	National Action Plan	Likelihood
Ruddy Turnstone	*Arenaria interpres*	2008	39	-	-	VU	-	4 – no suitable habitat
Red-chested Button-quail	*Turnix pyrrhothorax*	2010	5	-	L	VU	-	2 – suitable habitat and recent records
Little Tern	*Sternula albifrons sinensis*	2008	13	-	L	VU	-	4 – no suitable habitat
Gull-billed Tern	*Gelochelidon nilotica macrotarsa*	2008	12	-	L	EN	-	4 – no suitable habitat
Caspian Tern	*Hydroprogne caspia*	2008	18	-	L	NT	-	4 – no suitable habitat
Elegant Parrot	*Neophema elegans*	1993	5	-	-	VU	-	4– no suitable habitat
Barking Owl	*Ninox connivens connivens*	1931	2	-	L	EN	NT	4 – no suitable habitat
Masked Owl	*Tyto novaehollandiae novaehollandiae*	1884	1	-	L	EN	NT	4 – no suitable habitat
Brown Treecreeper (south-eastern ssp.)	*Climacteris picumnus victoriae*	2008	12	-	-	NT	NT	4 – no suitable habitat
Chestnut-rumped Heathwren	*Calamanthus pyrrhopygius*	1999	2	-	L	VU	-	4 – no suitable habitat
Speckled Warbler	*Chthonicola sagittatus*	1993	7	-	L	VU	NT	4 – no suitable habitat
Grey-crowned Babbler	*Pomatostomus temporalis temporalis*	1958	3	-	L	EN	NT	4 – no suitable habitat
Hooded Robin	*Melanodryas cucullata cucullata*	1987	10	-	L	NT	NT	4 – no suitable habitat
Diamond Firetail	*Stagonopleura guttata*	2005	44	-	L	NT	NT	2 – suitable habitat
Murray Short-necked Turtle	*Emydura macquarii*	2006	1	-	-	VU	-	4 – no suitable habitat
Brown Toadlet	*Pseudophryne bibronii*	1962	1	-	L	EN	DD	4 – no recent records
Freshwater Catfish	*Tandanus tandanus*	2013	2	-	L	EN	-	4 – no suitable habitat
REGIONAL SIGNIFICANCE								
Pied Cormorant	*Phalacrocorax varius*	2011	192	-	-	NT	-	3 – no suitable habitat (flyover)
Black-faced Cormorant	*Phalacrocorax fuscescens*	2008	8	-	-	NT	-	3 – no suitable habitat (flyover)
Nankeen Night Heron	*Nycticorax caledonicus hillii*	2007	24	-	-	NT	-	3 – no suitable habitat (flyover)
Glossy Ibis	*Plegadis falcinellus*	2008	77	-	-	NT	-	2 – suitable habitat in grasslands (flyover)
Royal Spoonbill	*Platalea regia*	2013	162	-	-	NT	-	4 – no suitable habitat
Spotted Harrier	*Circus assimilis*	2008	24	-	-	NT	-	1 – suitable habitat (flyover)
Sooty Oystercatcher	*Haematopus fuliginosus*	2008	8	-	-	NT	-	4 – no suitable habitat
Latham's Snipe	*Gallinago hardwickii*	2009	33	-	-	NT	-	2 – suitable habitat
Sanderling	*Calidris alba*	1986	7	-	-	NT	-	4- no suitable habitat

Common Name	Scientific Name	Last Documented Record (VBA)	# Records (VBA)	EPBC Act	FFG ACT	DSE (2013)	National Action Plan	Likelihood
Long-toed Stint	*Calidris subminuta*	2008	24	-	-	NT	-	4 – no suitable habitat
Pectoral Sandpiper	*Calidris melanotos*	2008	49	-	-	NT	-	4 – no suitable habitat
Australian Pratincole	*Stiltia isabella*	1985	4	-	-	NT	-	4 – no suitable habitat
Whiskered Tern	*Chlidonias hybridus javanicus*	2013	278	-	-	NT	-	4 – no suitable habitat
White-winged Black Tern	*Chlidonias leucopterus*	2013	119	-	-	NT	-	4 – no suitable habitat
White-fronted Tern	*Sterna striata*	2007	1	-	-	NT	-	4 – no suitable habitat
Pacific Gull	*Larus pacificus pacificus*	2009	101	-	-	NT	-	4 – no suitable habitat (flyover)
Black-eared Cuckoo	*Chrysococcyx osculans*	1946	3	-	-	NT	-	3 – no recent records
Red-backed Kingfisher	*Todiramphus pyrropygia pyrropygia*	1990	1	-	-	NT	-	2 – suitable habitat although few recent records
Spotted Quail-thrush	*Cinclosoma punctatum*	1932	1	-	-	NT	-	4 – no recent records

APPENDIX 4

Appendix 4.1 – Biodiversity Impact and Offset Requirements (BIOR) report for entire study area, DELWP

Biodiversity impact and offset requirements report

This report **does not represent an assessment by DELWP** of the proposed native vegetation removal. It provides additional biodiversity information to support moderate and high risk-based pathway applications for permits to remove native vegetation under clause 52.16 or 52.17 of planning schemes in Victoria.

Date of issue: **17/05/2017** **DELWP ref: EHP_0668**
Time of issue: **1:40 pm**

Project ID	EHP_9302_HHa

Summary of marked native vegetation

Risk-based pathway	**High**
Total extent	67.143 ha
Remnant patches	67.143 ha
Scattered trees	0 trees
Location risk	B

Strategic biodiversity score of all marked native vegetation	0.679

Offset requirements if a permit is granted

If a permit is granted to remove the marked native vegetation, a requirement to obtain a native vegetation offset will be included in the permit conditions. The offset must meet the following requirements:

Offset type	**General offset**
General offset amount (general biodiversity equivalence units)	8.252 general units
General offset attributes	
Vicinity	Port Phillip and Westernport Catchment Management Authority (CMA) **or** Wyndham City Council
Minimum strategic biodiversity score	0.475[1]
Offset type	**Specific offset(s)**
Specific offset amount (specific biodiversity equivalence units) and attributes	33.899 specific units of habitat for Red-chested Button-quail 37.756 specific units of habitat for Brolga 39.712 specific units of habitat for Striped Legless Lizard 4.686 specific units of habitat for Tough Scurf-pea 34.487 specific units of habitat for Large-headed Fireweed 8.024 specific units of habitat for Rye Beetle-grass 38.497 specific units of habitat for Pale Swamp Everlasting

See Appendices 1 and 2 for details in how offset requirements were determined.

NB: values presented in tables throughout this document may not add to totals due to rounding

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

Next steps

Any proposal to remove native vegetation must meet the application requirements of the high risk-based pathway and it will be assessed under the high risk-based pathway.

If you wish to remove the marked native vegetation you are required to apply for a permit from your local council. Council will then refer your application to DELWP for assessment, as required. **This report is not a referral assessment by DELWP.**

The biodiversity assessment report from NVIM and this biodiversity impact and offset report should be submitted with your application for a permit to remove native vegetation you plan to remove, lop or destroy.

The Biodiversity assessment report generated by the tool within NVIM provides the following information:

- The location of the site where native vegetation is to be removed.
- The area of the patch of native vegetation and/or the number of any scattered trees to be removed.
- Maps or plans containing information set out in the *Permitted clearing of native vegetation – Biodiversity assessment guidelines*
- The risk-based pathway of the application for a permit to remove native vegetation

This report provides the following information to meet application requirements for a permit to remove native vegetation:

- Confirmation of the risk-based pathway of the application for a permit to remove native vegetation
- The strategic biodiversity score of the native vegetation to be removed
- Information to inform the assessment of whether the proposed removal of native vegetation will have a significant impact on Victoria's biodiversity, with specific regard to the proportional impact on habitat for any rare or threatened species.
- The offset requirements should a permit be granted to remove native vegetation.

Additional application requirements must be provided with an application for a permit to remove native vegetation in the moderate or high risk-based pathways. These include:

- A habitat hectare assessment report of the native vegetation that is to be removed
- A statement outlining what steps have been taken to ensure that impacts on biodiversity from the removal of native vegetation have been minimised
- An offset strategy that details how a compliant offset will be secured to offset the biodiversity impacts of the removal of native vegetation.

Refer to the *Permitted clearing of native vegetation – Biodiversity assessment guidelines* and for a full list and details of application requirements.

Authorised by the Victorian Government, 8 Nicholson Street, East Melbourne.

For more information contact the DELWP Customer Service Centre 136 186

Appendix 1 – Biodiversity impact of removal of native vegetation

Habitat hectares

Habitat hectares are calculated for each habitat zone within your proposal using the extent and condition scores in the GIS data you provided.

Habitat zone	Site assessed condition score	Extent (ha)	Habitat hectares
1-1-a	0.610	0.055	0.033
2-2-a	0.440	0.025	0.011
3-3-a	0.560	0.106	0.060
4-4-a	0.610	0.078	0.048
5-5-a	0.560	2.055	1.151
6-5-b	0.560	8.562	4.795
7-6-a	0.560	2.074	1.161
8-7-a	0.410	0.113	0.046
9-8-a	0.410	0.826	0.339
10-9-a	0.530	0.305	0.162
11-10-a	0.540	3.039	1.641
12-11-a	0.560	0.560	0.314
13-12-a	0.640	18.875	12.080
14-13-a	0.560	1.911	1.070
15-14-a	0.560	2.747	1.538
16-15-a	0.660	1.101	0.727
17-16-a	0.610	3.917	2.389
18-17-a	0.640	5.774	3.695
19-18-a	0.590	6.799	4.011
20-19-a	0.610	0.534	0.326
21-20-a	0.660	0.522	0.345
22-21-a	0.590	1.869	1.103
23-22-a	0.560	2.895	1.621
24-23-a	0.610	0.376	0.229
25-24-a	0.560	0.739	0.414
26-25-a	0.530	0.705	0.373
27-26-a	0.530	0.580	0.307
TOTAL			**39.990**

Impacts on rare or threatened species habitat above specific offset threshold

The specific-general offset test was applied to your proposal. The test determines if the proposed removal of native vegetation has a proportional impact on any rare or threatened species habitats above the specific offset threshold. The threshold is set at 0.005 per cent of the total habitat for a species. When the proportional impact is above the specific offset threshold a specific offset for that species' habitat is required.

The specific-general offset test found your proposal has a proportional impact above the specific offset threshold for the following rare or threatened species' habitats

Species number	Species common name	Species scientific name	Species type	Area of mapped habitat (ha)	Proportional impact (%)
10019	Red-chested Button-quail	Turnix pyrrhothorax	Dispersed	44.603	0.040 %
10177	Brolga	Grus rubicunda	Dispersed	50.508	0.007 %
12159	Striped Legless Lizard	Delma impar	Dispersed	51.571	0.017 %
502776	Tough Scurf-pea	Cullen tenax	Dispersed	6.305	0.008 %
503116	Large-headed Fireweed	Senecio macrocarpus	Dispersed	41.152	0.247 %
503455	Rye Beetle-grass	Tripogon loliiformis	Dispersed	10.893	0.005 %
504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	Dispersed	51.658	0.017 %

Clearing site biodiversity equivalence score(s)

Where a habitat zone requires specific offset(s), the specific biodiversity equivalence score(s) for each species in that habitat zone is calculated by multiplying the habitat hectares of the habitat zone by the habitat importance score for each species impacted in the habitat zone.

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
1-1-a	0.033	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.750	0.025
1-1-a	0.033	100.000 %	10177	Brolga	Grus rubicunda	0.750	0.025
1-1-a	0.033	100.000 %	12159	Striped Legless Lizard	Delma impar	0.810	0.027
1-1-a	0.033	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.870	0.029
1-1-a	0.033	100.000 %	503455	Rye Beetle-grass	Tripogon loliiformis	0.750	0.025
1-1-a	0.033	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.770	0.026
2-2-a	0.011	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.781	0.009
2-2-a	0.011	100.000 %	10177	Brolga	Grus rubicunda	0.750	0.008

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
2-2-a	0.011	100.000 %	12159	Striped Legless Lizard	Delma impar	0.804	0.009
2-2-a	0.011	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.864	0.010
2-2-a	0.011	37.669 %	503455	Rye Beetle-grass	Tripogon loliiformis	0.750	0.003
2-2-a	0.011	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.758	0.008
3-3-a	0.060	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.800	0.048
3-3-a	0.060	100.000 %	10177	Brolga	Grus rubicunda	0.750	0.045
3-3-a	0.060	100.000 %	12159	Striped Legless Lizard	Delma impar	0.800	0.048
3-3-a	0.060	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.860	0.051
3-3-a	0.060	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.750	0.045
4-4-a	0.048	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.721	0.034
4-4-a	0.048	100.000 %	10177	Brolga	Grus rubicunda	0.721	0.034
4-4-a	0.048	100.000 %	12159	Striped Legless Lizard	Delma impar	0.741	0.035
4-4-a	0.048	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.711	0.034
5-5-a	1.151	97.744 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.686	0.772
5-5-a	1.151	100.000 %	10177	Brolga	Grus rubicunda	0.714	0.822
5-5-a	1.151	100.000 %	12159	Striped Legless Lizard	Delma impar	0.705	0.811
5-5-a	1.151	38.198 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.736	0.324

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
5-5-a	1.151	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.685	0.789
6-5-b	4.795	20.514 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.674	0.663
6-5-b	4.795	76.495 %	10177	Brolga	Grus rubicunda	0.590	2.164
6-5-b	4.795	75.484 %	12159	Striped Legless Lizard	Delma impar	0.603	2.183
6-5-b	4.795	76.493 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.651	2.388
6-5-b	4.795	8.494 %	503455	Rye Beetle-grass	Tripogon loliiformis	0.633	0.258
6-5-b	4.795	76.495 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.578	2.121
7-6-a	1.161	25.950 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.552	0.166
7-6-a	1.161	25.950 %	10177	Brolga	Grus rubicunda	0.553	0.167
7-6-a	1.161	25.950 %	12159	Striped Legless Lizard	Delma impar	0.585	0.176
7-6-a	1.161	25.950 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.638	0.192
7-6-a	1.161	25.950 %	503455	Rye Beetle-grass	Tripogon loliiformis	0.550	0.166
7-6-a	1.161	25.950 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.572	0.172
9-8-a	0.339	1.511 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.660	0.003
9-8-a	0.339	1.511 %	10177	Brolga	Grus rubicunda	0.660	0.003
9-8-a	0.339	1.511 %	12159	Striped Legless Lizard	Delma impar	0.710	0.004
9-8-a	0.339	1.511 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.760	0.004

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
9-8-a	0.339	1.511 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.660	0.003
10-9-a	0.162	44.055 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.637	0.045
10-9-a	0.162	44.055 %	10177	Brolga	Grus rubicunda	0.642	0.046
10-9-a	0.162	44.055 %	12159	Striped Legless Lizard	Delma impar	0.652	0.046
10-9-a	0.162	44.055 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.708	0.050
10-9-a	0.162	44.055 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.623	0.044
11-10-a	1.641	96.125 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.677	1.068
11-10-a	1.641	96.125 %	10177	Brolga	Grus rubicunda	0.679	1.072
11-10-a	1.641	96.125 %	12159	Striped Legless Lizard	Delma impar	0.718	1.133
11-10-a	1.641	96.125 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.774	1.221
11-10-a	1.641	96.125 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.670	1.058
12-11-a	0.314	85.190 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.712	0.190
12-11-a	0.314	85.190 %	10177	Brolga	Grus rubicunda	0.706	0.189
12-11-a	0.314	85.190 %	12159	Striped Legless Lizard	Delma impar	0.712	0.190
12-11-a	0.314	85.190 %	502776	Tough Scurf-pea	Cullen tenax	0.715	0.191
12-11-a	0.314	85.190 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.786	0.210

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
12-11-a	0.314	85.190 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.714	0.191
13-12-a	12.080	77.886 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.584	5.495
13-12-a	12.080	83.507 %	10177	Brolga	Grus rubicunda	0.592	5.974
13-12-a	12.080	83.507 %	12159	Striped Legless Lizard	Delma impar	0.594	5.989
13-12-a	12.080	14.833 %	502776	Tough Scurf-pea	Cullen tenax	0.499	0.894
13-12-a	12.080	41.377 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.658	3.287
13-12-a	12.080	3.054 %	503455	Rye Beetle-grass	Tripogon loliiformis	0.717	0.264
13-12-a	12.080	83.507 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.582	5.869
14-13-a	1.070	82.511 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.644	0.569
14-13-a	1.070	82.511 %	10177	Brolga	Grus rubicunda	0.644	0.569
14-13-a	1.070	82.511 %	12159	Striped Legless Lizard	Delma impar	0.676	0.597
14-13-a	1.070	13.503 %	502776	Tough Scurf-pea	Cullen tenax	0.660	0.095
14-13-a	1.070	66.683 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.747	0.533
14-13-a	1.070	82.511 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.640	0.566
15-14-a	1.538	69.361 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.597	0.637
15-14-a	1.538	69.361 %	10177	Brolga	Grus rubicunda	0.584	0.623
15-14-a	1.538	69.361 %	12159	Striped Legless Lizard	Delma impar	0.607	0.648

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
15-14-a	1.538	8.565 %	502776	Tough Scurf-pea	Cullen tenax	0.660	0.087
15-14-a	1.538	69.361 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.664	0.708
15-14-a	1.538	33.065 %	503455	Rye Beetle-grass	Tripogon loliiformis	0.533	0.271
15-14-a	1.538	69.361 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.598	0.639
16-15-a	0.727	76.401 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.429	0.238
16-15-a	0.727	76.401 %	10177	Brolga	Grus rubicunda	0.453	0.251
16-15-a	0.727	76.401 %	12159	Striped Legless Lizard	Delma impar	0.465	0.258
16-15-a	0.727	76.401 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.497	0.276
16-15-a	0.727	4.481 %	503455	Rye Beetle-grass	Tripogon loliiformis	0.490	0.016
16-15-a	0.727	76.401 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.446	0.248
17-16-a	2.389	43.465 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.476	0.494
17-16-a	2.389	43.465 %	10177	Brolga	Grus rubicunda	0.488	0.507
17-16-a	2.389	43.465 %	12159	Striped Legless Lizard	Delma impar	0.500	0.520
17-16-a	2.389	43.465 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.542	0.563
17-16-a	2.389	43.465 %	503455	Rye Beetle-grass	Tripogon loliiformis	0.467	0.485
17-16-a	2.389	43.465 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.488	0.507
18-17-a	3.695	36.693 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.611	0.829

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
18-17-a	3.695	36.693 %	10177	Brolga	Grus rubicunda	0.610	0.827
18-17-a	3.695	36.693 %	12159	Striped Legless Lizard	Delma impar	0.629	0.853
18-17-a	3.695	11.469 %	502776	Tough Scurf-pea	Cullen tenax	0.669	0.284
18-17-a	3.695	30.187 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.701	0.782
18-17-a	3.695	36.693 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.606	0.822
19-18-a	4.011	96.747 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.693	2.690
19-18-a	4.011	96.747 %	10177	Brolga	Grus rubicunda	0.687	2.667
19-18-a	4.011	96.747 %	12159	Striped Legless Lizard	Delma impar	0.712	2.763
19-18-a	4.011	21.228 %	502776	Tough Scurf-pea	Cullen tenax	0.717	0.611
19-18-a	4.011	96.747 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.775	3.007
19-18-a	4.011	96.747 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.687	2.666
20-19-a	0.326	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.706	0.230
20-19-a	0.326	100.000 %	10177	Brolga	Grus rubicunda	0.706	0.230
20-19-a	0.326	100.000 %	12159	Striped Legless Lizard	Delma impar	0.752	0.245
20-19-a	0.326	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.812	0.265
20-19-a	0.326	100.000 %	503455	Rye Beetle-grass	Tripogon loliiformis	0.696	0.227
20-19-a	0.326	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.726	0.236

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
21-20-a	0.345	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.750	0.258
21-20-a	0.345	100.000 %	10177	Brolga	Grus rubicunda	0.748	0.258
21-20-a	0.345	100.000 %	12159	Striped Legless Lizard	Delma impar	0.805	0.278
21-20-a	0.345	99.442 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.865	0.296
21-20-a	0.345	95.328 %	503455	Rye Beetle-grass	Tripogon loliiformis	0.746	0.245
21-20-a	0.345	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.765	0.264
22-21-a	1.103	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.779	0.860
22-21-a	1.103	100.000 %	10177	Brolga	Grus rubicunda	0.748	0.825
22-21-a	1.103	100.000 %	12159	Striped Legless Lizard	Delma impar	0.785	0.866
22-21-a	1.103	71.964 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.849	0.674
22-21-a	1.103	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.760	0.838
23-22-a	1.621	85.659 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.676	0.938
23-22-a	1.621	85.659 %	10177	Brolga	Grus rubicunda	0.645	0.896
23-22-a	1.621	100.000 %	12159	Striped Legless Lizard	Delma impar	0.683	1.107
23-22-a	1.621	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.750	1.216
23-22-a	1.621	100.000 %	503455	Rye Beetle-grass	Tripogon loliiformis	0.646	1.047
23-22-a	1.621	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.665	1.079

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
24-23-a	0.229	4.908 %	10177	Brolga	Grus rubicunda	0.750	0.008
24-23-a	0.229	100.000 %	12159	Striped Legless Lizard	Delma impar	0.752	0.172
24-23-a	0.229	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.831	0.191
24-23-a	0.229	100.000 %	503455	Rye Beetle-grass	Tripogon loliiformis	0.720	0.165
24-23-a	0.229	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.728	0.167
25-24-a	0.414	50.914 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.770	0.162
25-24-a	0.414	49.086 %	10177	Brolga	Grus rubicunda	0.747	0.152
25-24-a	0.414	100.000 %	12159	Striped Legless Lizard	Delma impar	0.821	0.340
25-24-a	0.414	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.886	0.367
25-24-a	0.414	100.000 %	503455	Rye Beetle-grass	Tripogon loliiformis	0.764	0.316
25-24-a	0.414	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.774	0.320
26-25-a	0.373	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.775	0.289
26-25-a	0.373	100.000 %	10177	Brolga	Grus rubicunda	0.762	0.285
26-25-a	0.373	100.000 %	12159	Striped Legless Lizard	Delma impar	0.824	0.308
26-25-a	0.373	27.075 %	502776	Tough Scurf-pea	Cullen tenax	0.800	0.081
26-25-a	0.373	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.887	0.331
26-25-a	0.373	100.000 %	503455	Rye Beetle-grass	Tripogon loliiformis	0.773	0.289

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
26-25-a	0.373	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.792	0.296
27-26-a	0.307	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.771	0.237
27-26-a	0.307	100.000 %	10177	Brolga	Grus rubicunda	0.756	0.232
27-26-a	0.307	100.000 %	12159	Striped Legless Lizard	Delma impar	0.814	0.250
27-26-a	0.307	41.121 %	502776	Tough Scurf-pea	Cullen tenax	0.795	0.100
27-26-a	0.307	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.877	0.269
27-26-a	0.307	100.000 %	503455	Rye Beetle-grass	Tripogon loliiformis	0.762	0.234
27-26-a	0.307	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.786	0.241

There are habitat zones in your proposal which are not habitat for the species above. A general offset is required for the(se) habitat zone(s).

The general biodiversity equivalence score for the habitat zone(s) is calculated by multiplying the habitat hectares by the strategic biodiversity score.

Habitat zone	Habitat hectares	Proportion of habitat zone with general offset	Strategic biodiversity score	General biodiversity equivalence score (GBES)
6-5-b	4.795	23.505 %	0.749	0.844
7-6-a	1.161	74.050 %	0.234	0.201
8-7-a	0.046	100.000 %	0.414	0.019
9-8-a	0.339	98.489 %	0.482	0.161
10-9-a	0.162	55.945 %	0.420	0.038
11-10-a	1.641	3.875 %	0.514	0.033
12-11-a	0.314	14.810 %	0.837	0.039
13-12-a	12.080	16.493 %	0.696	1.386
14-13-a	1.070	17.489 %	0.496	0.093
15-14-a	1.538	30.639 %	0.845	0.398

Habitat zone	Habitat hectares	Proportion of habitat zone with general offset	Strategic biodiversity score	General biodiversity equivalence score (GBES)
16-15-a	0.727	23.599 %	0.690	0.118
17-16-a	2.389	56.535 %	0.562	0.759
18-17-a	3.695	63.307 %	0.582	1.362
19-18-a	4.011	3.253 %	0.389	0.051

Mapped rare or threatened species' habitats on site

This table sets out the list of rare or threatened species' habitats mapped at the site beyond those species for which the impact is above the specific offset threshold. These species habitats do not require a specific offset according to the specific-general offset test.

Species number	Species common name	Species scientific name
10050	Baillon's Crake	Porzana pusilla palustris
10111	Gull-billed Tern	Gelochelidon nilotica macrotarsa
10154	Wood Sandpiper	Tringa glareola
10170	Australian Painted Snipe	Rostratula benghalensis australis
10174	Bush Stone-curlew	Burhinus grallarius
10186	Intermediate Egret	Ardea intermedia
10187	Eastern Great Egret	Ardea modesta
10195	Australian Little Bittern	Ixobrychus minutus dubius
10197	Australasian Bittern	Botaurus poiciloptilus
10212	Australasian Shoveler	Anas rhynchotis
10214	Freckled Duck	Stictonetta naevosa
10215	Hardhead	Aythya australis
10217	Musk Duck	Biziura lobata
10238	Black Falcon	Falco subniger
13207	Growling Grass Frog	Litoria raniformis
500217	Buloke Mistletoe	Amyema linophylla subsp. orientale
500798	Small Milkwort	Comesperma polygaloides
504643	Grey Billy-buttons	Craspedia canens

Appendix 2 – Offset requirements detail

If a permit is granted to remove the marked native vegetation the permit condition will include the requirement to obtain a native vegetation offset.

To calculate the required offset amount required the biodiversity equivalence scores are aggregated to the proposal level and multiplied by the relevant risk multiplier.

Offsets also have required attributes:

- General offsets must be located in the same Catchment Management Authority (CMA) boundary or Local Municipal District (local council) as the clearing and must have a minimum strategic biodiversity score of 80 per cent of the clearing.[2]
- Specific offsets must be located in the same species habitat as that being removed, as determined by the habitat importance map for that species.

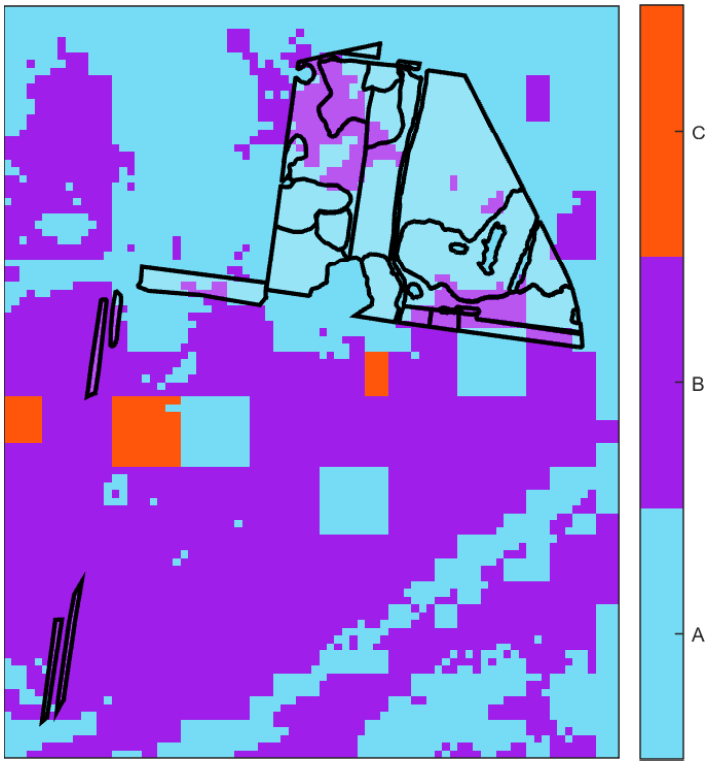
The offset requirements for your proposal are as follows:

Offset type	Clearing site biodiversity equivalence score	Risk multiplier	Offset requirements	
			Offset amount (biodiversity equivalence units)	Offset attributes
Specific	16.950 SBES	2	33.899 specific units	Offset must provide habitat for 10019, Red-chested Button-quail, Turnix pyrrhothorax
Specific	18.878 SBES	2	37.756 specific units	Offset must provide habitat for 10177, Brolga, Grus rubicunda
Specific	19.856 SBES	2	39.712 specific units	Offset must provide habitat for 12159, Striped Legless Lizard, Delma impar
Specific	2.343 SBES	2	4.686 specific units	Offset must provide habitat for 502776, Tough Scurf-pea, Cullen tenax
Specific	17.243 SBES	2	34.487 specific units	Offset must provide habitat for 503116, Large-headed Fireweed, Senecio macrocarpus
Specific	4.012 SBES	2	8.024 specific units	Offset must provide habitat for 503455, Rye Beetle-grass, Tripogon loliiformis
Specific	19.248 SBES	2	38.497 specific units	Offset must provide habitat for 504655, Pale Swamp Everlasting, Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant
General	5.502 GBES	1.5	8.252 general units	Offset must be within Port Phillip And Westernport CMA or Wyndham City Council Offset must have a minimum strategic biodiversity score of 0.475

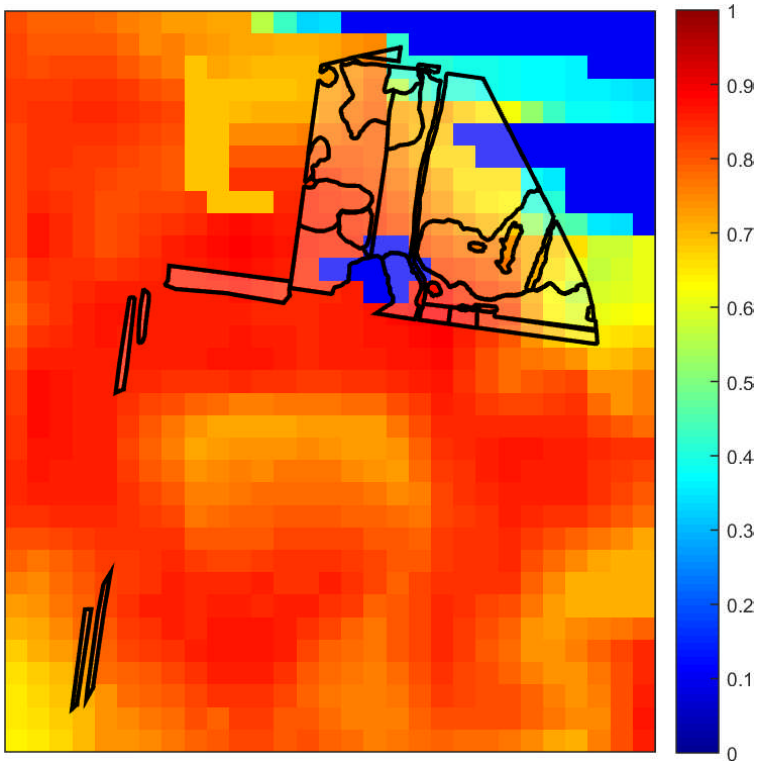
[2] Strategic biodiversity score is a weighted average across habitat zones where a general offset is required

Appendix 3 – Images of marked native vegetation

1. Native vegetation location risk map



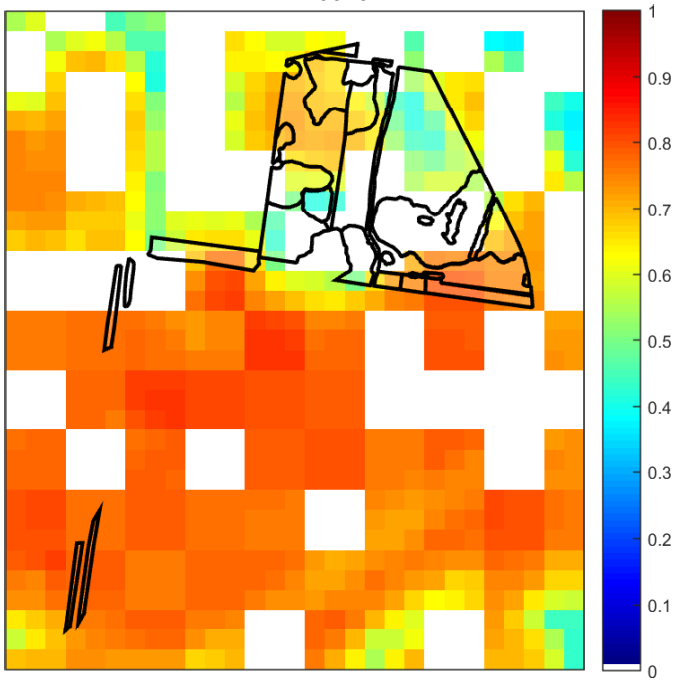
2. Strategic biodiversity score map



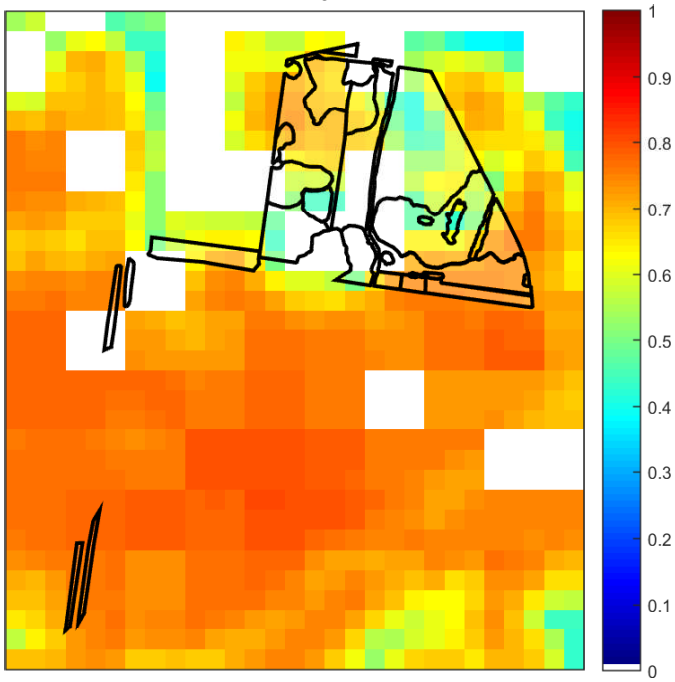
3. Aerial photograph showing marked native vegetation

4. Habitat importance maps

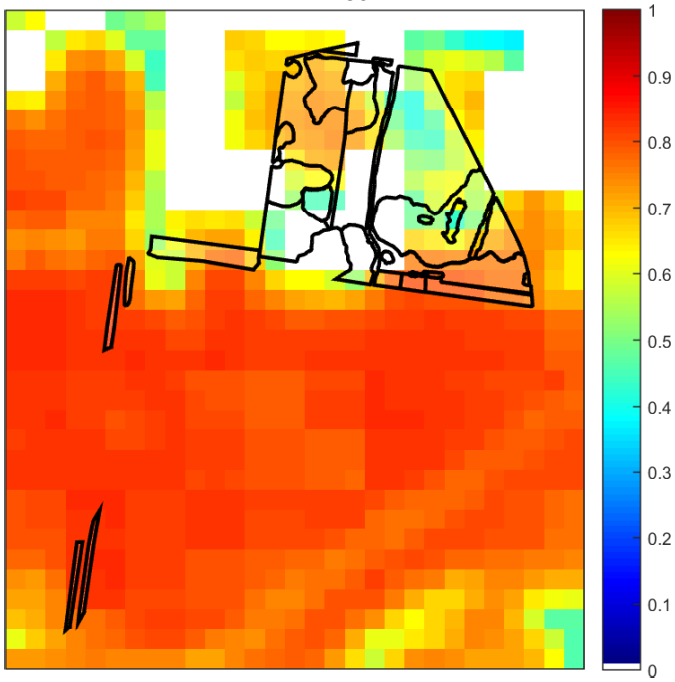
Red-chested Button-quail
Turnix pyrrhothorax
10019



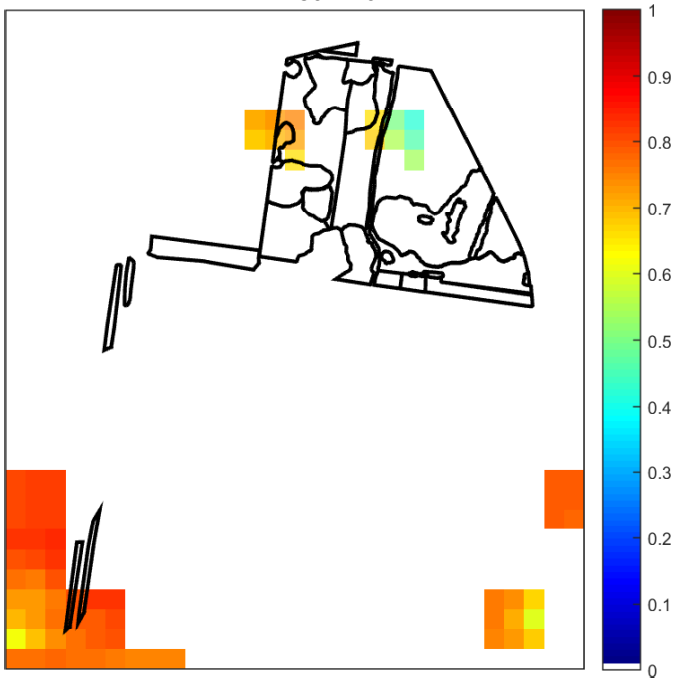
Brolga
Grus rubicunda
10177



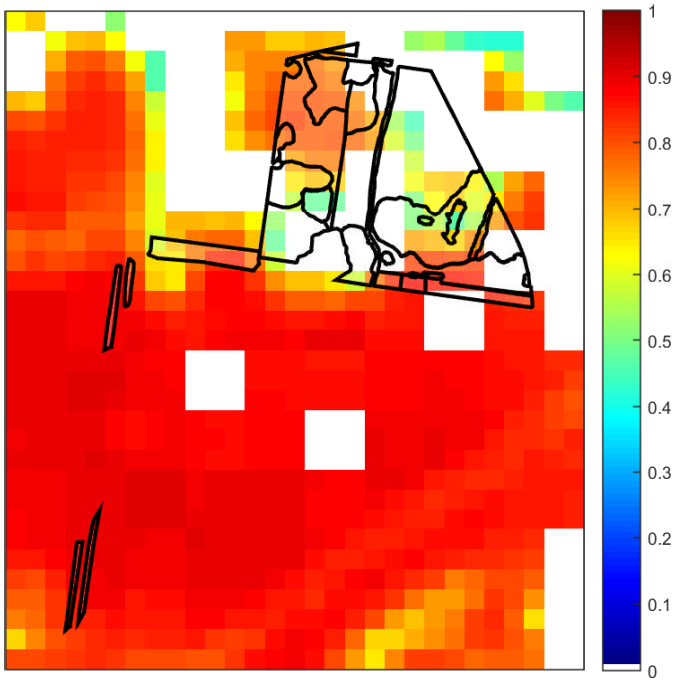
Striped Legless Lizard
Delma impar
12159



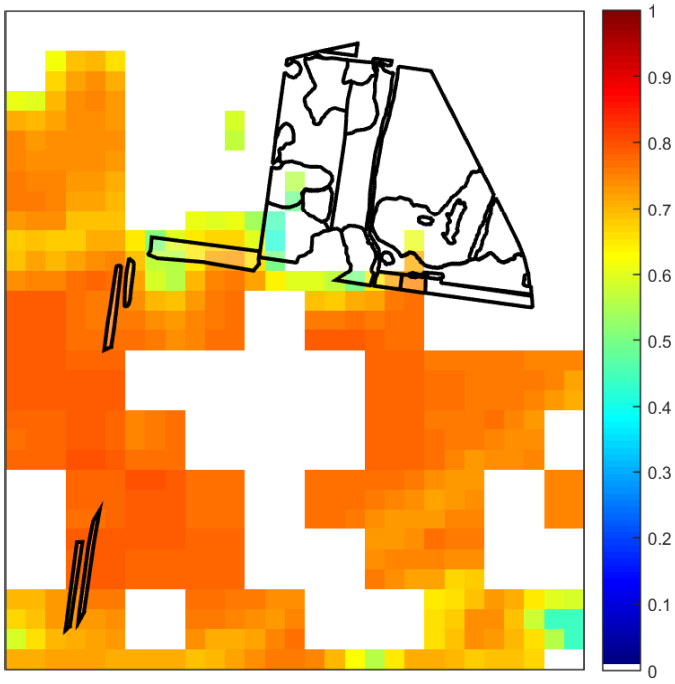
Tough Scurf-pea
Cullen tenax
502776



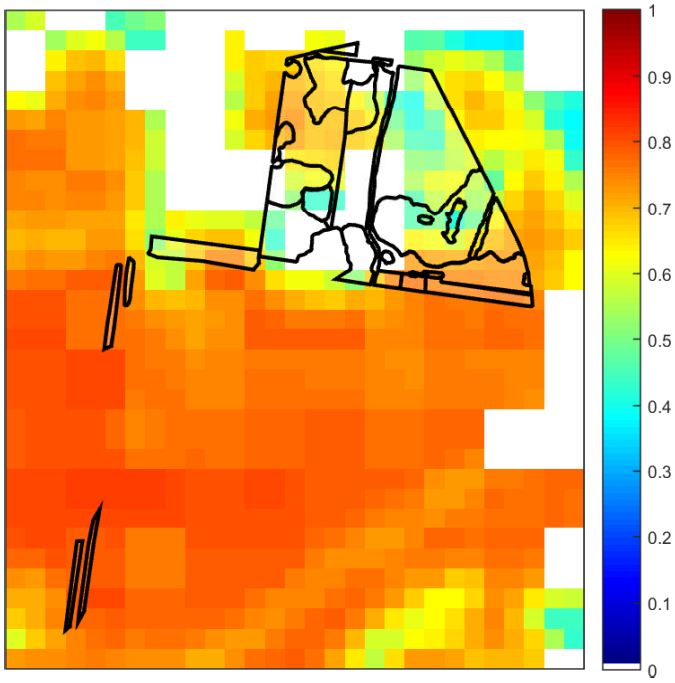
Large-headed Fireweed
Senecio macrocarpus
503116



Rye Beetle-grass
Tripogon loliiformis
503455



Pale Swamp Everlasting
Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant
504655



Glossary

Condition score

This is the site-assessed condition score for the native vegetation. Each habitat zone in the clearing proposal is assigned a condition score according to the habitat hectare assessment method. This information has been provided by or on behalf of the applicant in the GIS file.

Dispersed habitat

A dispersed species habitat is a habitat for a rare or threatened species whose habitat is spread over a relatively broad geographic area greater than 2,000 hectares.

General biodiversity equivalence score

The general biodiversity equivalence score quantifies the relative overall contribution that the native vegetation to be removed makes to Victoria's biodiversity. The general biodiversity equivalence score is calculated as follows:

$$\begin{aligned} &\textit{General biodiversity equivalence score} \\ &= \textit{habitat hectares} \times \textit{strategic biodiversity score} \end{aligned}$$

General offset amount

This is calculated by multiplying the general biodiversity equivalence score of the native vegetation to be removed by the risk factor for general offsets. This number is expressed in general biodiversity equivalence units and is the amount of offset that is required to be provided should the application be approved. This offset requirement will be a condition to the permit for the removal of native vegetation.

$$\begin{aligned} &\textit{Risk adjusted general biodiversity equivalence score} \\ &= \textit{general biodiversity equivalence score clearing} \times 1.5 \end{aligned}$$

General offset attributes

General offset must be located in the same Catchment Management Authority boundary or Municipal District (local council) as the clearing site. They must also have a strategic biodiversity score that is at least 80 per cent of the score of the clearing site.

Habitat hectares

Habitat hectares is a site-based measure that combines extent and condition of native vegetation. The habitat hectares of native vegetation is equal to the current condition of the vegetation (condition score) multiplied by the extent of native vegetation. Habitat hectares can be calculated for a remnant patch or for scattered trees or a combination of these two vegetation types. This value is calculated for each habitat zone using the following formula:

$$\textit{Habitat hectares} = \textit{total extent (hectares)} \times \textit{condition score}$$

Habitat importance score

The habitat importance score is a measure of the importance of the habitat located on a site for a particular rare or threatened species. The habitat importance score for a species is a weighted average value calculated from the habitat importance map for that species. The habitat importance score is calculated for each habitat zone where the habitat importace map indicates that species habitat occurs.

Habitat zone

Habitat zone is a discrete contiguous area of native vegetation that:

- is of a single Ecological Vegetation Class
- has the same measured condition.

Highly localised habitat

A highly localised habitat is habitat for a rare or threatened species that is spread across a very restricted area (less than 2,000 hectares). This can also be applied to a similarly limited sub-habitat that is disproportionately important for a wide-ranging rare or threatened species. Highly localised habitats have the highest habitat importance score (1) for all locations where they are present.

Minimum strategic biodiversity score

The minimum strategic biodiversity score is an attribute for a general offset.

The strategic biodiversity score of the offset site must be at least 80 per cent of the strategic biodiversity score of the native vegetation to be removed. This is to ensure offsets are located in areas with a strategic value that is comparable to, or better than, the native vegetation to be removed. Where a specific and general offset is required, the minimum strategic biodiversity score relates only to the habitat zones that require the general offset.

Offset risk factor

There is a risk that the gain from undertaking the offset will not adequately compensate for the loss from the removal of native vegetation. If this were to occur, despite obtaining an offset, the overall impact from removing native vegetation would result in a loss in the contribution that native vegetation makes to Victoria's biodiversity.

To address the risk of offsets failing, an offset risk factor is applied to the calculated loss to biodiversity value from removing native vegetation.

$$Risk\ factor\ for\ general\ offsets = 1.5$$

$$Risk\ factor\ for\ specific\ offset = 2$$

Offset type

The specific-general offset test determines the offset type required.

When the specific-general offset test determines that the native vegetation removal will have an impact on one or more rare or threatened species habitat above the set threshold of 0.005 per cent, a specific offset is required. This test is done at the permit application level.

A general offset is required when a proposal to remove native vegetation is not deemed, by application of the specific-general offset test, to have an impact on any habitat for any rare or threatened species above the set threshold of 0.005 per cent. All habitat zones that do not require a specific offset will require a general offset.

Proportional impact on species

This is the outcome of the specific-general offset test. The specific-general offset test is calculated across the entire proposal for each species on the native vegetation permitted clearing species list. If the proportional impact on a species is above the set threshold of 0.005 per cent then a specific offset is required for that species.

Specific offset amount

The specific offset amount is calculated by multiplying the specific biodiversity equivalence score of the native vegetation to be removed by the risk factor for specific offsets. This number is expressed in specific biodiversity equivalence units and is the amount of offset that is required to be provided should the application be approved. This offset requirement will be a condition to the permit for the removal of native vegetation.

$$Risk\ adjusted\ specific\ biodiversity\ equivalence\ score = specific\ biodiversity\ equivalence\ score\ clearing \times 2$$

Specific offset attributes

Specific offsets must be located in the modelled habitat for the species that has triggered the specific offset requirement.

Specific biodiversity equivalence score

The specific biodiversity equivalence score quantifies the relative overall contribution that the native vegetation to be removed makes to the habitat of the relevant rare or threatened species. It is calculated for each habitat zone where one or more species habitats require a specific offset as a result of the specific-general offset test as follows:

$$\textit{Specific biodiversity equivalence score} = \textit{habitat hectares} \times \textit{habitat importance score}$$

Strategic biodiversity score

This is the weighted average strategic biodiversity score of the marked native vegetation. The strategic biodiversity score has been calculated from the *Strategic biodiversity map* for each habitat zone.

The strategic biodiversity score of native vegetation is a measure of the native vegetation's importance for Victoria's biodiversity, relative to other locations across the landscape. The *Strategic biodiversity map* is a modelled layer that prioritises locations on the basis of rarity and level of depletion of the types of vegetation, species habitats, and condition and connectivity of native vegetation.

Total extent (hectares) for calculating habitat hectares

This is the total area of the marked native vegetation in hectares.

The total extent of native vegetation is an input to calculating the habitat hectares of a site and in calculating the general biodiversity equivalence score. Where the marked native vegetation includes scattered trees, each tree is converted to hectares using a standard area calculation of 0.071 hectares per tree. This information has been provided by or on behalf of the applicant in the GIS file.

Vicinity

The vicinity is an attribute for a general offset.

The offset site must be located within the same Catchment Management Authority boundary or Local Municipal District as the native vegetation to be removed.

Appendix 4.2 – Biodiversity Impact and Offset Requirements (BIOR) report for recommended site, DELWP

Biodiversity impact and offset requirements report

This report **does not represent an assessment by DELWP** of the proposed native vegetation removal. It provides additional biodiversity information to support moderate and high risk-based pathway applications for permits to remove native vegetation under clause 52.16 or 52.17 of planning schemes in Victoria.

Date of issue: **17/05/2017** **DELWP ref: EHP_0669**
Time of issue: **1:44 pm**

Project ID	EHP_9302_HHa

Summary of marked native vegetation

Risk-based pathway	**High**
Total extent	32.187 ha
Remnant patches	32.187 ha
Scattered trees	0 trees
Location risk	B

Strategic biodiversity score of all marked native vegetation	0.715

Offset requirements if a permit is granted

If a permit is granted to remove the marked native vegetation, a requirement to obtain a native vegetation offset will be included in the permit conditions. The offset must meet the following requirements:

Offset type	**General offset**
General offset amount (general biodiversity equivalence units)	4.536 general units
General offset attributes	
Vicinity	Port Phillip and Westernport Catchment Management Authority (CMA) **or** Wyndham City Council
Minimum strategic biodiversity score	0.445[1]
Offset type	**Specific offset(s)**
Specific offset amount (specific biodiversity equivalence units) and attributes	13.596 specific units of habitat for Red-chested Button-quail 18.200 specific units of habitat for Striped Legless Lizard 16.756 specific units of habitat for Large-headed Fireweed 17.522 specific units of habitat for Pale Swamp Everlasting

See Appendices 1 and 2 for details in how offset requirements were determined.
NB: values presented in tables throughout this document may not add to totals due to rounding

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

Next steps

Any proposal to remove native vegetation must meet the application requirements of the high risk-based pathway and it will be assessed under the high risk-based pathway.

If you wish to remove the marked native vegetation you are required to apply for a permit from your local council. Council will then refer your application to DELWP for assessment, as required. **This report is not a referral assessment by DELWP.**

The biodiversity assessment report from NVIM and this biodiversity impact and offset report should be submitted with your application for a permit to remove native vegetation you plan to remove, lop or destroy.

The Biodiversity assessment report generated by the tool within NVIM provides the following information:

- The location of the site where native vegetation is to be removed.
- The area of the patch of native vegetation and/or the number of any scattered trees to be removed.
- Maps or plans containing information set out in the *Permitted clearing of native vegetation – Biodiversity assessment guidelines*
- The risk-based pathway of the application for a permit to remove native vegetation

This report provides the following information to meet application requirements for a permit to remove native vegetation:

- Confirmation of the risk-based pathway of the application for a permit to remove native vegetation
- The strategic biodiversity score of the native vegetation to be removed
- Information to inform the assessment of whether the proposed removal of native vegetation will have a significant impact on Victoria's biodiversity, with specific regard to the proportional impact on habitat for any rare or threatened species.
- The offset requirements should a permit be granted to remove native vegetation.

Additional application requirements must be provided with an application for a permit to remove native vegetation in the moderate or high risk-based pathways. These include:

- A habitat hectare assessment report of the native vegetation that is to be removed
- A statement outlining what steps have been taken to ensure that impacts on biodiversity from the removal of native vegetation have been minimised
- An offset strategy that details how a compliant offset will be secured to offset the biodiversity impacts of the removal of native vegetation.

Refer to the *Permitted clearing of native vegetation – Biodiversity assessment guidelines* and for a full list and details of application requirements.

Authorised by the Victorian Government, 8 Nicholson Street, East Melbourne.

For more information contact the DELWP Customer Service Centre 136 186

Appendix 1 – Biodiversity impact of removal of native vegetation

Habitat hectares

Habitat hectares are calculated for each habitat zone within your proposal using the extent and condition scores in the GIS data you provided.

Habitat zone	Site assessed condition score	Extent (ha)	Habitat hectares
1-1-a	0.610	0.055	0.033
2-2-a	0.440	0.017	0.007
3-3-a	0.560	0.063	0.035
4-6-a	0.560	0.697	0.390
5-12-a	0.640	0.788	0.504
6-12-b	0.640	0.181	0.116
7-16-a	0.610	0.323	0.197
8-19-a	0.610	0.534	0.326
9-20-a	0.660	0.521	0.344
10-21-a	0.590	1.869	1.103
11-22-a	0.560	2.831	1.586
12-23-a	0.610	0.371	0.226
13-24-a	0.560	0.739	0.414
14-25-a	0.530	0.705	0.373
15-26-a	0.530	0.580	0.307
16-5-a	0.560	1.697	0.951
17-5-b	0.560	7.407	4.148
18-6-b	0.560	1.250	0.700
19-12-c	0.640	3.850	2.464
20-14-a	0.560	1.217	0.682
21-15-a	0.660	1.101	0.727
22-16-b	0.610	3.156	1.925
23-17-a	0.640	1.933	1.237
24-18-a	0.590	0.302	0.178
TOTAL			**18.973**

Impacts on rare or threatened species habitat above specific offset threshold

The specific-general offset test was applied to your proposal. The test determines if the proposed removal of native vegetation has a proportional impact on any rare or threatened species habitats above the specific offset threshold. The threshold is set at 0.005 per cent of the total habitat for a species. When the proportional impact is above the specific offset threshold a specific offset for that species' habitat is required.

The specific-general offset test found your proposal has a proportional impact above the specific offset threshold for the following rare or threatened species' habitats

Species number	Species common name	Species scientific name	Species type	Area of mapped habitat (ha)	Proportional impact (%)
10019	Red-chested Button-quail	Turnix pyrrhothorax	Dispersed	17.057	0.016 %
12159	Striped Legless Lizard	Delma impar	Dispersed	23.099	0.008 %
503116	Large-headed Fireweed	Senecio macrocarpus	Dispersed	20.113	0.120 %
504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	Dispersed	23.099	0.008 %

Clearing site biodiversity equivalence score(s)

Where a habitat zone requires specific offset(s), the specific biodiversity equivalence score(s) for each species in that habitat zone is calculated by multiplying the habitat hectares of the habitat zone by the habitat importance score for each species impacted in the habitat zone.

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
1-1-a	0.033	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.750	0.025
1-1-a	0.033	100.000 %	12159	Striped Legless Lizard	Delma impar	0.810	0.027
1-1-a	0.033	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.870	0.029
1-1-a	0.033	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.770	0.026
2-2-a	0.007	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.778	0.006
2-2-a	0.007	100.000 %	12159	Striped Legless Lizard	Delma impar	0.804	0.006
2-2-a	0.007	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.864	0.006
2-2-a	0.007	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.759	0.006

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
3-3-a	0.035	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.800	0.028
3-3-a	0.035	100.000 %	12159	Striped Legless Lizard	Delma impar	0.800	0.028
3-3-a	0.035	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.860	0.030
3-3-a	0.035	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.750	0.027
4-6-a	0.390	77.240 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.552	0.166
4-6-a	0.390	77.240 %	12159	Striped Legless Lizard	Delma impar	0.585	0.176
4-6-a	0.390	77.240 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.638	0.192
4-6-a	0.390	77.240 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.572	0.172
5-12-a	0.504	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.771	0.389
5-12-a	0.504	100.000 %	12159	Striped Legless Lizard	Delma impar	0.781	0.394
5-12-a	0.504	58.299 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.852	0.251
5-12-a	0.504	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.746	0.376
6-12-b	0.116	73.846 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.731	0.063
6-12-b	0.116	73.846 %	12159	Striped Legless Lizard	Delma impar	0.783	0.067
6-12-b	0.116	73.846 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.843	0.072
6-12-b	0.116	73.846 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.751	0.064

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
7-16-a	0.197	65.947 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.533	0.069
7-16-a	0.197	65.947 %	12159	Striped Legless Lizard	Delma impar	0.553	0.072
7-16-a	0.197	65.947 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.617	0.080
7-16-a	0.197	65.947 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.553	0.072
8-19-a	0.326	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.706	0.230
8-19-a	0.326	100.000 %	12159	Striped Legless Lizard	Delma impar	0.752	0.245
8-19-a	0.326	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.812	0.265
8-19-a	0.326	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.726	0.236
9-20-a	0.344	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.750	0.258
9-20-a	0.344	100.000 %	12159	Striped Legless Lizard	Delma impar	0.805	0.277
9-20-a	0.344	99.471 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.865	0.296
9-20-a	0.344	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.765	0.263
10-21-a	1.103	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.779	0.859
10-21-a	1.103	100.000 %	12159	Striped Legless Lizard	Delma impar	0.785	0.866
10-21-a	1.103	71.960 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.849	0.674
10-21-a	1.103	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.760	0.838

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
11-22-a	1.586	86.633 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.675	0.928
11-22-a	1.586	100.000 %	12159	Striped Legless Lizard	Delma impar	0.684	1.084
11-22-a	1.586	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.751	1.191
11-22-a	1.586	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.666	1.056
12-23-a	0.226	100.000 %	12159	Striped Legless Lizard	Delma impar	0.751	0.170
12-23-a	0.226	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.831	0.188
12-23-a	0.226	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.728	0.165
13-24-a	0.414	50.914 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.770	0.162
13-24-a	0.414	100.000 %	12159	Striped Legless Lizard	Delma impar	0.821	0.340
13-24-a	0.414	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.886	0.367
13-24-a	0.414	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.774	0.320
14-25-a	0.373	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.775	0.289
14-25-a	0.373	100.000 %	12159	Striped Legless Lizard	Delma impar	0.824	0.308
14-25-a	0.373	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.887	0.331
14-25-a	0.373	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.792	0.296
15-26-a	0.307	100.000 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.771	0.237

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
15-26-a	0.307	100.000 %	12159	Striped Legless Lizard	Delma impar	0.814	0.250
15-26-a	0.307	100.000 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.877	0.269
15-26-a	0.307	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.786	0.241
16-5-a	0.951	97.268 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.690	0.638
16-5-a	0.951	100.000 %	12159	Striped Legless Lizard	Delma impar	0.708	0.673
16-5-a	0.951	34.717 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.740	0.244
16-5-a	0.951	100.000 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.687	0.653
17-5-b	4.148	15.303 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.740	0.470
17-5-b	4.148	72.833 %	12159	Striped Legless Lizard	Delma impar	0.609	1.840
17-5-b	4.148	72.833 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.656	1.981
17-5-b	4.148	72.833 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.582	1.758
19-12-c	2.464	57.557 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.749	1.062
19-12-c	2.464	73.723 %	12159	Striped Legless Lizard	Delma impar	0.718	1.305
19-12-c	2.464	47.160 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.744	0.865
19-12-c	2.464	73.723 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.687	1.248
20-14-a	0.682	59.931 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.554	0.226

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
20-14-a	0.682	59.931 %	12159	Striped Legless Lizard	Delma impar	0.569	0.233
20-14-a	0.682	59.931 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.620	0.253
20-14-a	0.682	59.931 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.562	0.230
21-15-a	0.727	76.401 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.429	0.238
21-15-a	0.727	76.401 %	12159	Striped Legless Lizard	Delma impar	0.465	0.258
21-15-a	0.727	76.401 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.497	0.276
21-15-a	0.727	76.401 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.446	0.248
22-16-b	1.925	37.221 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.452	0.324
22-16-b	1.925	37.221 %	12159	Striped Legless Lizard	Delma impar	0.478	0.342
22-16-b	1.925	37.221 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.513	0.368
22-16-b	1.925	37.221 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.463	0.332
23-17-a	1.237	15.447 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.443	0.085
23-17-a	1.237	15.447 %	12159	Striped Legless Lizard	Delma impar	0.473	0.090
23-17-a	1.237	15.447 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.505	0.097
23-17-a	1.237	15.447 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.453	0.086
24-18-a	0.178	55.286 %	10019	Red-chested Button-quail	Turnix pyrrhothorax	0.469	0.046

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
24-18-a	0.178	55.286 %	12159	Striped Legless Lizard	Delma impar	0.499	0.049
24-18-a	0.178	55.286 %	503116	Large-headed Fireweed	Senecio macrocarpus	0.535	0.053
24-18-a	0.178	55.286 %	504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant	0.479	0.047

There are habitat zones in your proposal which are not habitat for the species above. A general offset is required for the(se) habitat zone(s).

The general biodiversity equivalence score for the habitat zone(s) is calculated by multiplying the habitat hectares by the strategic biodiversity score.

Habitat zone	Habitat hectares	Proportion of habitat zone with general offset	Strategic biodiversity score	General biodiversity equivalence score (GBES)
4-6-a	0.390	22.760 %	0.310	0.028
6-12-b	0.116	26.154 %	0.862	0.026
7-16-a	0.197	34.053 %	0.851	0.057
17-5-b	4.148	27.167 %	0.749	0.844
18-6-b	0.700	100.000 %	0.212	0.148
19-12-c	2.464	26.277 %	0.688	0.445
20-14-a	0.682	40.069 %	0.847	0.231
21-15-a	0.727	23.599 %	0.690	0.118
22-16-b	1.925	62.779 %	0.528	0.638
23-17-a	1.237	84.553 %	0.460	0.481
24-18-a	0.178	44.714 %	0.102	0.008

Mapped rare or threatened species' habitats on site

This table sets out the list of rare or threatened species' habitats mapped at the site beyond those species for which the impact is above the specific offset threshold. These species habitats do not require a specific offset according to the specific-general offset test.

Species number	Species common name	Species scientific name
10050	Baillon's Crake	Porzana pusilla palustris
10111	Gull-billed Tern	Gelochelidon nilotica macrotarsa
10154	Wood Sandpiper	Tringa glareola
10170	Australian Painted Snipe	Rostratula benghalensis australis
10174	Bush Stone-curlew	Burhinus grallarius
10177	Brolga	Grus rubicunda
10186	Intermediate Egret	Ardea intermedia
10187	Eastern Great Egret	Ardea modesta
10195	Australian Little Bittern	Ixobrychus minutus dubius
10197	Australasian Bittern	Botaurus poiciloptilus
10212	Australasian Shoveler	Anas rhynchotis
10215	Hardhead	Aythya australis
10238	Black Falcon	Falco subniger
13207	Growling Grass Frog	Litoria raniformis
500217	Buloke Mistletoe	Amyema linophylla subsp. orientale
500798	Small Milkwort	Comesperma polygaloides
502776	Tough Scurf-pea	Cullen tenax
503455	Rye Beetle-grass	Tripogon loliiformis

Appendix 2 – Offset requirements detail

If a permit is granted to remove the marked native vegetation the permit condition will include the requirement to obtain a native vegetation offset.

To calculate the required offset amount required the biodiversity equivalence scores are aggregated to the proposal level and multiplied by the relevant risk multiplier.

Offsets also have required attributes:

- General offsets must be located in the same Catchment Management Authority (CMA) boundary or Local Municipal District (local council) as the clearing and must have a minimum strategic biodiversity score of 80 per cent of the clearing.[2]
- Specific offsets must be located in the same species habitat as that being removed, as determined by the habitat importance map for that species.

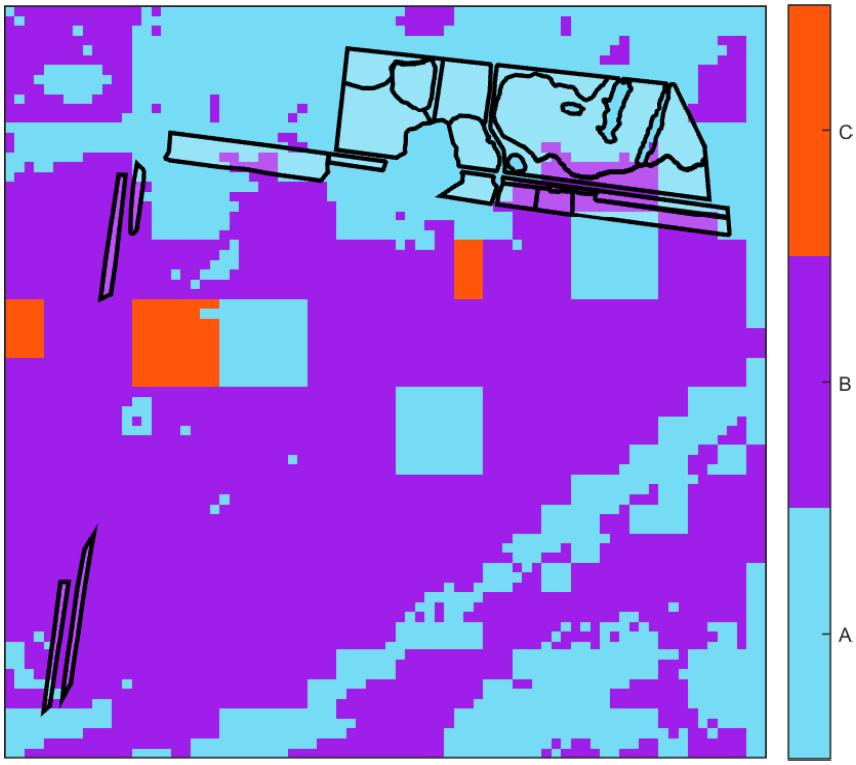
The offset requirements for your proposal are as follows:

Offset type	Clearing site biodiversity equivalence score	Risk multiplier	Offset requirements	
			Offset amount (biodiversity equivalence units)	Offset attributes
Specific	6.798 SBES	2	13.596 specific units	Offset must provide habitat for 10019, Red-chested Button-quail, Turnix pyrrhothorax
Specific	9.100 SBES	2	18.200 specific units	Offset must provide habitat for 12159, Striped Legless Lizard, Delma impar
Specific	8.378 SBES	2	16.756 specific units	Offset must provide habitat for 503116, Large-headed Fireweed, Senecio macrocarpus
Specific	8.761 SBES	2	17.522 specific units	Offset must provide habitat for 504655, Pale Swamp Everlasting, Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant
General	3.024 GBES	1.5	4.536 general units	Offset must be within Port Phillip And Westernport CMA or Wyndham City Council Offset must have a minimum strategic biodiversity score of 0.445

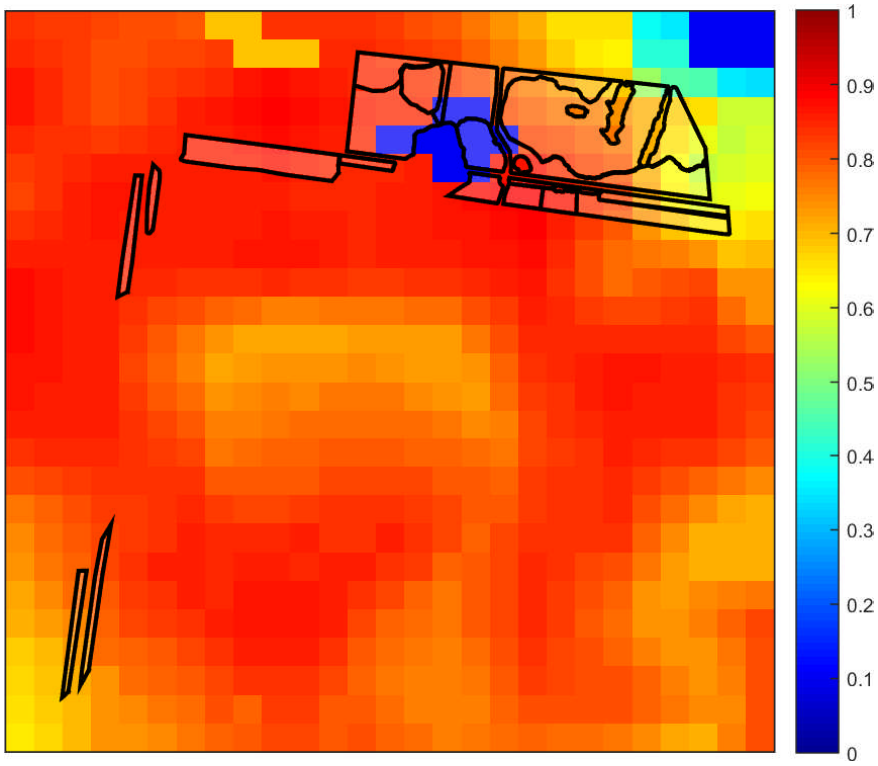
[2] Strategic biodiversity score is a weighted average across habitat zones where a general offset is required

Appendix 3 – Images of marked native vegetation

1. Native vegetation location risk map



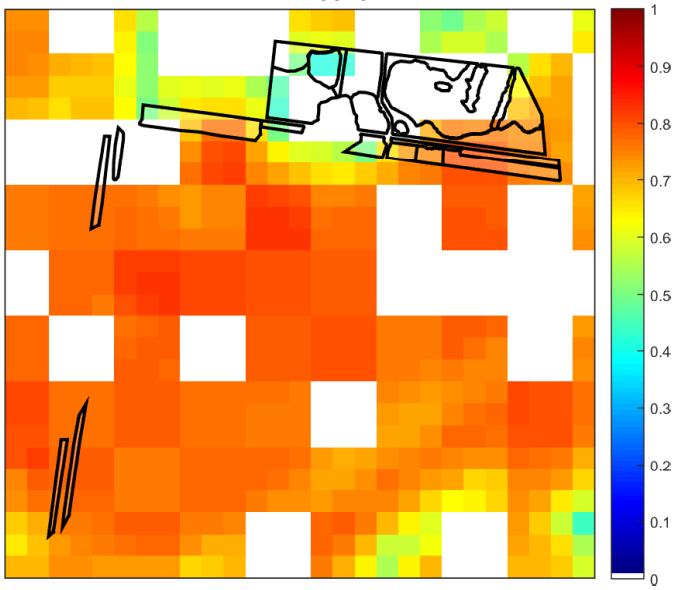
2. Strategic biodiversity score map



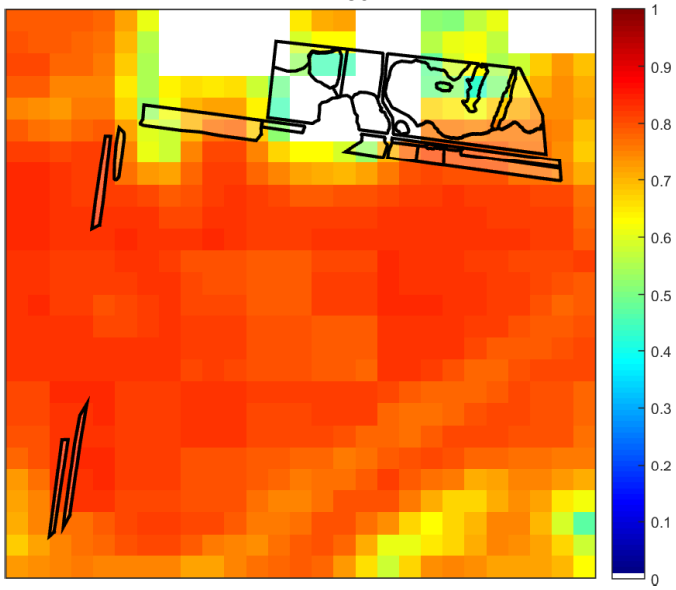
3. Aerial photograph showing marked native vegetation

4. Habitat importance maps

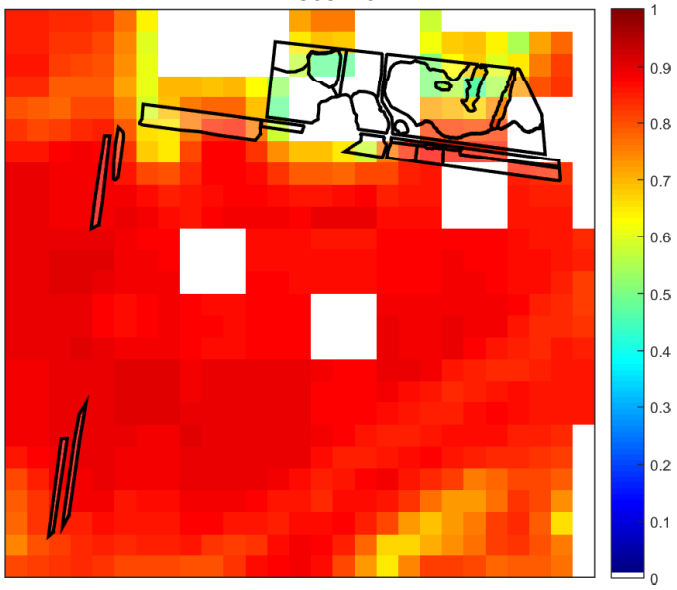
Red-chested Button-quail
Turnix pyrrhothorax
10019



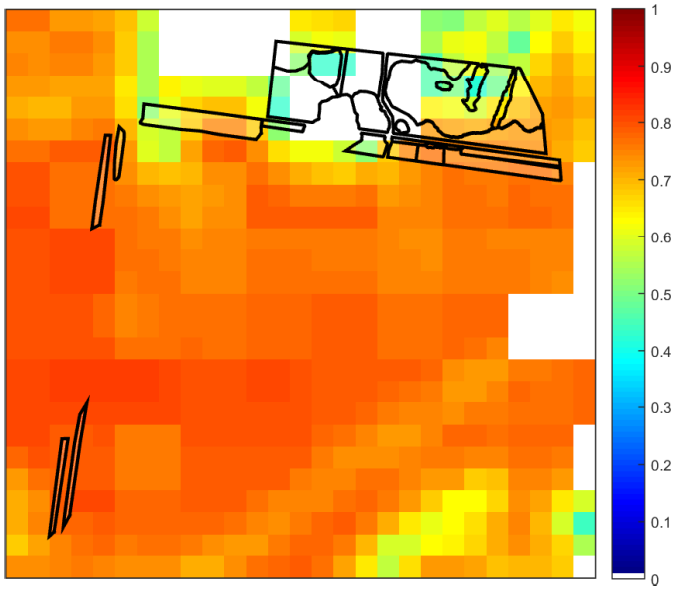
Striped Legless Lizard
Delma impar
12159



Large-headed Fireweed
Senecio macrocarpus
503116



Pale Swamp Everlasting
Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant
504655



Glossary

Condition score

This is the site-assessed condition score for the native vegetation. Each habitat zone in the clearing proposal is assigned a condition score according to the habitat hectare assessment method. This information has been provided by or on behalf of the applicant in the GIS file.

Dispersed habitat

A dispersed species habitat is a habitat for a rare or threatened species whose habitat is spread over a relatively broad geographic area greater than 2,000 hectares.

General biodiversity equivalence score

The general biodiversity equivalence score quantifies the relative overall contribution that the native vegetation to be removed makes to Victoria's biodiversity. The general biodiversity equivalence score is calculated as follows:

$$\begin{aligned} &\textit{General biodiversity equivalence score} \\ &= \textit{habitat hectares} \times \textit{strategic biodiversity score} \end{aligned}$$

General offset amount

This is calculated by multiplying the general biodiversity equivalence score of the native vegetation to be removed by the risk factor for general offsets. This number is expressed in general biodiversity equivalence units and is the amount of offset that is required to be provided should the application be approved. This offset requirement will be a condition to the permit for the removal of native vegetation.

$$\begin{aligned} &\textit{Risk adjusted general biodiversity equivalence score} \\ &= \textit{general biodiversity equivalence score clearing} \times 1.5 \end{aligned}$$

General offset attributes

General offset must be located in the same Catchment Management Authority boundary or Municipal District (local council) as the clearing site. They must also have a strategic biodiversity score that is at least 80 per cent of the score of the clearing site.

Habitat hectares

Habitat hectares is a site-based measure that combines extent and condition of native vegetation. The habitat hectares of native vegetation is equal to the current condition of the vegetation (condition score) multiplied by the extent of native vegetation. Habitat hectares can be calculated for a remnant patch or for scattered trees or a combination of these two vegetation types. This value is calculated for each habitat zone using the following formula:

$$\textit{Habitat hectares} = \textit{total extent (hectares)} \times \textit{condition score}$$

Habitat importance score

The habitat importance score is a measure of the importance of the habitat located on a site for a particular rare or threatened species. The habitat importance score for a species is a weighted average value calculated from the habitat importance map for that species. The habitat importance score is calculated for each habitat zone where the habitat importace map indicates that species habitat occurs.

Habitat zone

Habitat zone is a discrete contiguous area of native vegetation that:

- is of a single Ecological Vegetation Class
- has the same measured condition.

Highly localised habitat

A highly localised habitat is habitat for a rare or threatened species that is spread across a very restricted area (less than 2,000 hectares). This can also be applied to a similarly limited sub-habitat that is disproportionately important for a wide-ranging rare or threatened species. Highly localised habitats have the highest habitat importance score (1) for all locations where they are present.

Minimum strategic biodiversity score

The minimum strategic biodiversity score is an attribute for a general offset.

The strategic biodiversity score of the offset site must be at least 80 per cent of the strategic biodiversity score of the native vegetation to be removed. This is to ensure offsets are located in areas with a strategic value that is comparable to, or better than, the native vegetation to be removed. Where a specific and general offset is required, the minimum strategic biodiversity score relates only to the habitat zones that require the general offset.

Offset risk factor

There is a risk that the gain from undertaking the offset will not adequately compensate for the loss from the removal of native vegetation. If this were to occur, despite obtaining an offset, the overall impact from removing native vegetation would result in a loss in the contribution that native vegetation makes to Victoria's biodiversity.

To address the risk of offsets failing, an offset risk factor is applied to the calculated loss to biodiversity value from removing native vegetation.

$$Risk\ factor\ for\ general\ offsets = 1.5$$

$$Risk\ factor\ for\ specific\ offset = 2$$

Offset type

The specific-general offset test determines the offset type required.

When the specific-general offset test determines that the native vegetation removal will have an impact on one or more rare or threatened species habitat above the set threshold of 0.005 per cent, a specific offset is required. This test is done at the permit application level.

A general offset is required when a proposal to remove native vegetation is not deemed, by application of the specific-general offset test, to have an impact on any habitat for any rare or threatened species above the set threshold of 0.005 per cent. All habitat zones that do not require a specific offset will require a general offset.

Proportional impact on species

This is the outcome of the specific-general offset test. The specific-general offset test is calculated across the entire proposal for each species on the native vegetation permitted clearing species list. If the proportional impact on a species is above the set threshold of 0.005 per cent then a specific offset is required for that species.

Specific offset amount

The specific offset amount is calculated by multiplying the specific biodiversity equivalence score of the native vegetation to be removed by the risk factor for specific offsets. This number is expressed in specific biodiversity equivalence units and is the amount of offset that is required to be provided should the application be approved. This offset requirement will be a condition to the permit for the removal of native vegetation.

$$Risk\ adjusted\ specific\ biodiversity\ equivalence\ score = specific\ biodiversity\ equivalence\ score\ clearing \times 2$$

Specific offset attributes

Specific offsets must be located in the modelled habitat for the species that has triggered the specific offset requirement.

Specific biodiversity equivalence score

The specific biodiversity equivalence score quantifies the relative overall contribution that the native vegetation to be removed makes to the habitat of the relevant rare or threatened species. It is calculated for each habitat zone where one or more species habitats require a specific offset as a result of the specific-general offset test as follows:

$$\textit{Specific biodiversity equivalence score} = \textit{habitat hectares} \times \textit{habitat importance score}$$

Strategic biodiversity score

This is the weighted average strategic biodiversity score of the marked native vegetation. The strategic biodiversity score has been calculated from the *Strategic biodiversity map* for each habitat zone.

The strategic biodiversity score of native vegetation is a measure of the native vegetation's importance for Victoria's biodiversity, relative to other locations across the landscape. The *Strategic biodiversity map* is a modelled layer that prioritises locations on the basis of rarity and level of depletion of the types of vegetation, species habitats, and condition and connectivity of native vegetation.

Total extent (hectares) for calculating habitat hectares

This is the total area of the marked native vegetation in hectares.

The total extent of native vegetation is an input to calculating the habitat hectares of a site and in calculating the general biodiversity equivalence score. Where the marked native vegetation includes scattered trees, each tree is converted to hectares using a standard area calculation of 0.071 hectares per tree. This information has been provided by or on behalf of the applicant in the GIS file.

Vicinity

The vicinity is an attribute for a general offset.

The offset site must be located within the same Catchment Management Authority boundary or Local Municipal District as the native vegetation to be removed.