PRACTICAL ECOLOGY
ecological restoration & consulting

FLORA AND FAUNA ASSESSMENT & IMPACT ANALYSIS

DAREBIN CREEK TRAIL: ALPHINGTON LINK

10 December 2021 – Final Version 2

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1. INTRODUCTION

Practical Ecology Pty Ltd was commissioned by the Department of Transport (DoT) to prepare a Flora and Fauna Assessment and Impact Analysis for the "Alphington Link" of the Darebin Creek Trail. The Alphington Link aims to provide the local community of Alphington with direct access to the Darebin Creek Trail, and subsequently the network of other trails through Melbourne's east.

This Report follows on from previous reporting completed by Practical Ecology in relation to the Darebin Creek Trail since 2008. Most recently, this has included the *Vegetation and Habitat Impact Assessment: Darebin Yarra Trail Link* prepared by Savona in 2015. This Report detailed the flora and fauna values and impacts associated with the now constructed Stages One (Sparks Reserve to the northern end of the La Trobe Golf Course) and Two (La Trobe Golf Course to the Main Yarra Trail in Kew) of the trail. This was followed in 2018 with work specific to the Alphington Link Project that was completed by Hamer (2018). This 2018 Report considered three preliminary design options for the proposed Alphington Link.

The third of the three options considered by Hamer (2018) is generally consistent with the currently proposed Alphington Link alignment, which extends from the eastern end of Farm Road in Alphington to the existing Darebin Creek Trail located north of the Latrobe Golf Club. The Alphington Link itself will be bridged from Farm Road to just west of the existing golf practice nets, with the overall project also including a realignment of the existing golf course access track between the Latrobe Golf Course driving range and clubhouse/carparks, as well as the installation of retaining walls.

1.1 Project Scope

The purpose of this Report is to detail the flora and fauna values present within the Study Area associated with the proposed Alphington Link, and complete an analysis of impacts, including a Native Vegetation Impact Assessment, based on any unavoidable impacts.

The information presented in this Report is based on the following scope of works:

- a desktop review of relevant information including relevant flora and fauna databases, relevant literature, including legislation and planning permit requirements
- a site assessment aimed at documenting the ecological values that are present, or are likely to be present within the Study Area
- consultation to discuss the findings of the site assessment, and discussion regarding the possibility of avoiding and minimising impacts on identified values
- reporting and mapping on existing conditions and expected unavoidable impacts associated with the Alphington Link, and
- discussion of relevant ecological policy and legislation in relation to the Alphington Link, based on the unavoidable extent of impacts.

1.2 Study Area

The Study Area that forms the focus of this *Flora and Fauna Assessment and Impact Analysis* is primarily based on the alignment of the proposed Alphington Link to be located between Farm Road and the Latrobe Golf Couse practice nets, as described above. As shown on Map 1 however, the Study Area also includes additional areas beyond the Alphington Link alignment itself, to consider the vegetation in the immediate surrounds that could be subject to direct disturbance or indirect impacts due to construction, and potential temporary disturbances associated with the movement of plant and machinery.

Overall, the Study Area is approximately 0.76 hectares in size. It generally supports established trees, shrubs and groundstorey vegetation on either side of Farm Road to the Latrobe Golf Couse entrance gates. Beyond these gates, to the north of Golf Course car park and clubhouse, sparse mature trees with areas containing mid-storey and groundstorey vegetation also occur. While such vegetation occurs primarily to the south of the Golf Course access track between the driving range and clubhouse/carpark within mulched garden beds, revegetation has also been established closer to the Darebin Creek Trail fence as part of drainage infrastructure, and for screening/amenity purposes. Remnant vegetation and revegetation also occur alongside the already constructed Darebin Trail.

1.2.1 Adjacent land

The Study Area is located in Alphington, at the northern end of the Latrobe Golf Course. The suburban areas of Alphington occur beyond the Latrobe Golf Couse to the west of the Study Area. This is also the case beyond the vegetated riparian strip associated with the Darebin Creek to the north-east of the Study Area, where a residential area of Ivanhoe occurs.

1.2.2 Landscape

Bioregions are a landscape-scale approach to classifying the environment using a range of attributes such as climate, geomorphology, geology, soils and vegetation. There are 28 bioregions identified within Victoria. The Study Area falls within the Victorian Volcanic Plains Bioregion (DELWP 2021a).

Under the Catchment and Land Protection Act 1994 (the CaLP Act), Victoria is divided into ten catchment regions with a Catchment Management Authority (CMA) established for each region (Victorian Water Industry Association Inc 2015). The Study Area occurs within the Port Philip and Westernport Catchment (DELWP 2021a).

The surrounding landscape is flat to hilly and contains fragmented patches and corridors of native vegetation, mostly along Darebin Creek and the Yarra River. The vegetation along the Darebin Creek provides an important ecological corridor, containing River Red Gums *Eucalyptus camaldulensis* and a diversity of native understorey species. There are also planted street trees with the surrounding landscape, mostly exotic species or species not indigenous to the local area that still however provide habitat value at least on a local level.

1.2.3 Zoning and Overlays

The Study Area is located within the Yarra Local Government Area and is zoned Neighbourhood Residential Zone -Schedule 2 (NRZ2, along Farm Road), Special Use Zone- Schedule 1 (SUZ1, two sections of Golf Course) and Urban Floodway Zone (UFZ, section of Golf Course north of car park).

The Study Area is also covered by the following overlays under the Yarra Planning Scheme, either in part or in its entirety:

- Environmental Significance Overlay – Schedule 3 (ESO3, partial coverage)
- Significant Landscape Overlay – Schedule 1 (SLO1, partial coverage)
- Design and Development Overlay – Schedule 1-A (DDO1-A, partial coverage)
- Land Subject to Inundation Overlay (LSIO, partial coverage)
- Development Contributions Plan Overlay (DCPO, full coverage)
- Public Acquisition Overlay 2 (PAO2, partial coverage)

The Study Area is also located in an area of Aboriginal Cultural Heritage Sensitivity.

2. METHODS

2.1 Field survey

Field surveys covering existing conditions across the Study Area were undertaken by Michelle Savona on 28th June 2021 and 24th August 2021. These aimed to:

- map and asses native vegetation patches and trees according to requirements of Clause 52.17 of the Yarra Planning Scheme and the associated *Guidelines for the removal, destruction and lopping of native vegetation* (DELWP 2017a)
- determine EVCs and capture data to facilitate determination of any threatened ecological communities
- compile a list of vascular plants observed across the Study Area
- consider vegetation and habitat potentially triggering planning permit requirements under the ecological related Yarra Planning Scheme overlays that cover the site
- consider of the site's habitat values, including habitat connectivity and available habitat for threatened fauna and flora.

Further detail regarding the field survey completed within the Study Area is provided below.

2.1.1 Vegetation Categorisation, Classification and Quality

Vegetation was assessed for its categorisation according to the *Guidelines for the removal, destruction and lopping of native vegetation* (DELWP 2017a), then it's Ecological Vegetation Class and finally, quality, as determined by a Habitat Hectare assessment.

2.1.1.1 Vegetation Categories

Vegetation in the Study Area was categorised in accordance with the *Guidelines for the removal, destruction and lopping of native vegetation* (DELWP 2017a) which defines native vegetation as :

- **Native Vegetation**
    - *Native Vegetation* as per the Victorian Planning Provisions (Clause 73.01): plants that are indigenous to Victoria, including trees shrubs, herbs and grasses.
    - *Native Vegetation* does not include exotic species or Australian native species that are not indigenous to Victoria. Note that species indigenous to Victoria that have been planted are deemed *Native Vegetation* even where they are planted outside of their natural range.

- **Native Vegetation Patch**
    - *A patch* of native vegetation is either:
        - an area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native
        - any area with three or more native canopy trees where the drip line of each tree touches the drip line of at least one other tree, forming a continuous canopy, or
        - any mapped wetland included in the current wetlands layer available in the Department of Environment, Land, Water and Planning's (DELWP) Native Vegetation Information Management tool and other DELWP systems.
    - A patch of native vegetation is also referred to in this Report as a Habitat Zone.
- **Native canopy tree**
    - A *native canopy tree* is a mature tree (i.e. that is able to flower) that is greater than 3m in height and is normally found in the upper layer of the relevant vegetation type.
    - Trees are measured by diameter at breast height (DBH) at 1.3 metres above ground level.
- **Large Tree**
    - A *Large Tree* is either: a live tree that is equal to or greater than the Large Tree benchmark for the species in the relevant EVC; or a standing dead tree has a DBH measurement of 40 centimetres or greater.
    - A *Large Tree* can be either a Large Tree within a Habitat Zone, or a Large Scattered Tree.
- **Scattered Tree:**
    - A *Scattered Tree* is a native canopy tree that does not form part of a patch.
    - *Scattered Trees* are measured by diameter at breast height (DBH) at 1.3 metres above ground level.
    - *Scattered Trees* have 2 size classes, Large Trees and Small Trees, i.e. those that have a DBH that is less than the large tree benchmark for the species in the relevant EVC.

2.1.1.2 Ecological Vegetation Classes

EVCs are a method of systematic organisation of plant communities into common types that occur in similar environmental conditions throughout Victoria. Each vegetation type is identified on the basis of its floristic composition (the plant species present), vegetation structure (woodland, grassland, saltmarsh), landform (gully, foothill, plain) and environmental characteristics (soil type, climate).

Modelled EVC distribution was accessed to assess the EVC likely to occur within the Study Area (DELWP 2021a). EVCs were then identified in the field according to observable attributes including dominant and characteristic species consistent with the benchmark descriptions (DELWP 2021b).

2.1.1.3 Habitat Hectare Assessment

A Habitat Hectare assessment is used to determine the condition of the vegetation and significance of a defined patch of native vegetation. This methodology used in undertaking a Habitat Hectare assessment is outlined in the *Vegetation Quality Assessment Manual-Guidelines for Applying the Habitat Hectares Scoring Method* (DSE 2004). The methodology involves making visual and quantitative assessments on various characteristics of native vegetation according to established criteria that are set against an optimum benchmark.

This process begins with the identification of the EVC. Each EVC has an optimal benchmark representing its mature, natural (pre-1750) state. The assessment area is measured based on 7 habitat/vegetation components and 3 landscape components as a percentage of the EVC benchmark.

Assessment areas are separated into different Habitat Zones where:

- their location is discrete within a Study Area (i.e. it is not continuous with another Habitat Zone),
- where adjoining Habitat Zones are representative of two different types of EVCs,
- the condition score varies by more than 15 points, or
- the extent of the continuous patch of vegetation is greater than 1 hectare (as per DEWLP 2017b).

2.1.1.4 Threatened Ecological Communities

As there was potential for EPBC Act and/or FFG Act listed communities to be present within the Study Area, patches of native vegetation identified within the Study Area were considered against published criteria and/or characteristics that define these threatened communities.

The EPBC Act listed communities deemed likely to occur within the Study Area or surrounds (five kilometre buffer search) was based on the list of MNES indicated as potentially occurring within a five kilometre radius in the report produced using the Protected Matters Search Tool (PMST). Under the EPBC Act, there are key diagnostic criteria and conditions thresholds as defined by Commonwealth Threatened Species Scientific Committee (TSSC) that assist in identifying EPBC listed communities. The Habitat Zones of a particular EVC identified on site were therefore assessed against these key diagnostic criteria, and where required, the relevant condition thresholds of the threatened communities identified by the EPBC Act PMST.

While there are no specific criteria which determine the presence of FFG Act communities, an informal method of comparing site characteristics and floristics with community descriptions in the document: *Characteristics of Threatened Communities – Flora and Fauna Guarantee Act 1988* (DELWP 2021c) was undertaken. This document summarises the characteristics of FFG Act threatened communities, to assist with field recognition. An evaluation of the Habitat Zones identified as part of this ecological assessment was made against the information in DELWP (2021c).

2.1.1.5 Tree Data

Information regarding trees within and surrounding the proposed Alphington Link and associated infrastructure as discussed within this Report is based on data and mapping in the *Arboricultural Impact Assessment for Department of Transport – Assessment of trees at Latrobe Golf Club, Alphington* that was prepared by Emma Barrett of Homewood Consulting in August 2021, and subsequently updated in December 2021 (Barrett 2021). Data used from Barrett (2021) within this Report in relation to trees within and surrounding the proposed Alphington Link and associated infrastructure, includes:

- tree number
- common name
- scientific name
- Diameter at Breast Height (DBH; at 1.3m above ground level)
- information associated with Tree Protection Zones (TPZs) and expected impacts on trees from proposed works.

2.1.1.6 Classification of Exotic and Planted Vegetation

The assessment of vegetation completed within the Study Area focussed on that which met the definition of a Native Vegetation Patch or Scattered Tree and is not exempt from planning permit requirements under Clause 52.17. Australian Native Trees, Victorian Native Trees, and other planted vegetation were however also considered and mapped where deemed necessary, particularly given their potential to trigger planning permit requirements under the range of Planning Scheme overlays that cover the site.

Areas with recent (<10 years) revegetation or planted trees were considered 'Planted Vegetation'. These areas are also not covered by a polygon (i.e. were not mapped/classified as native vegetation) on the Map 2 but some of these trees have however been mapped individually to show their location. This includes:

- Australian and Victorian native trees planted along Farm Road and to the east of the Golf Course gates (some of which is now naturally recruiting)
- plantings recently installed as part of drainage works associated with the existing Darebin Trail, and
- a number of River Red Gum trees of a similar age that appeared to have been previously planted along the bottom of the embankment along Farm Road.

Areas considered Exotic Vegetation included for example mown areas dominated by exotic species. These areas did not generally contain any trees or shrubs and are not covered by a polygon on Map 2 or Map 3.

Note that as the focus of the field surveys was on native vegetation triggering permit requirements under Clause 52.17 of the Yarra Planning Scheme, the definition of a native canopy tree within DELWP (2017a) was also taken into consideration when defining vegetation within the Study Area. A canopy tree is defined as one normally found in the upper layer of the relevant EVC.

2.1.2 Flora Survey

Existing flora records on the Victorian Biodiversity Atlas (VBA; DELWP 2020d) for a 5-kilometre radius around the Study Area were obtained on 9/07/2020.

During the field survey, the Study Area was inspected on foot. A species list (or defined area list) for indigenous or naturalised flora (i.e. not including planted species) over the entire Study Area was compiled

Species that could not be identified in the field were recorded to the nearest possible family or genera. These were then collected as per the protocols associated with Practical Ecology's Flora and Fauna Guarantee Act 1988 (FFG Act) permit (No. 10008906) for the collection of plant material. In order to assist in the identification of some flora, major features of the specimens were collected where possible, including leaves, parts of branches, fruit and/or flowers.

2.1.3 Fauna and Fauna Habitat Assessment

Existing fauna records on the Victorian Biodiversity Atlas (DELWP 2021d) for a 5-kilometre radius around the study area was obtained on 9/07/2020.

Only a brief incidental fauna survey was undertaken for this study. As it was undertaken in association with other tasks some species onsite are likely to have not been observed. The main focus in regard to fauna was to undertake a habitat assessment. The habitat assessment relies upon making judgements on the suitability of habitat present within the Study Area for any significant species recorded in the database search.

2.2 Field Survey Limitations

The following considerations should be made regarding the limitations of the flora survey:

- it was undertaken in winter which is not the optimal time for plant identification, as key identifying features including flowers and seeds are not usually present
- it is expected that some other species, particularly orchid, lily and other herbaceous species that can only be observed for a limited period of time may not have been recorded during the present assessment
- flora surveys were undertaken over a short period of time.

The field survey was considered an adequate representation of site condition and sufficient to determine potential impacts associated with the Alphington Link within the Study Area.

In regard to fauna, the likely presence of significant fauna species was determined primarily through habitat assessments. This is a more conservative approach likely to include species that are difficult to detect even if suitable habitat was observed in the Study Area, and if that species was known to occur regionally.

It should also be noted that fieldwork took place and after more recent investigative excavations associated with the Alphington Link took place, as shown in photographs within Barrett (2021).

The data within this Report is however based on that collected initially on 28th June 2021. While refinement of the boundaries of Habitat Zones 1a, 1b and 1c took place on 24th August 2021 although these excavation works had not affected these areas at that stage.

Determination of vegetation boundaries was undertaken using ground-truthing (directly observing conditions on-site) with aerial photography. Mapping should be considered approximate only (e.g. +/- 1-5m).

2.3 Potentially Occurring Rare or Threatened Species

All significant flora and fauna species identified on databases as previously recorded, or potentially occurring, within the vicinity of the Study Area were subject to a 'likelihood of occurrence' assessment. The species assessed were those identified within a five kilometre buffer search from the boundaries of the Study Area through searches of the VBA and the EPBC Act PMST.

The 'likelihood of occurrence' for each species was assessed as being Nil, Low, Moderate, High or Recorded, based on the criteria listed in Table 1.

In determining likelihood of occurrence and potential use of the Study Area by these national or state significant flora and fauna species, the following factors were considered:

- previous recordings of the species in the local area
- the date of the last record for the species
- the habitat requirements of the species
- the physical attributes of the site, such as topography, geology, soils, aspect and other habitat features such as trees with hollows, the presence of rocks or boulders, logs on the ground
- the history of land use at the Study Area, and
- the ecological landscape context; i.e. connectivity, modification and fragmentation.

A basic matrix that describes the justification for the likelihood of occurrence is presented below.

Table 1. Criteria for potential occurrence of significant species

Likelihood of occurrence	Criteria
Nil	Species known to be extinct in local area and/or absent from the site.
Low	Unsuitable habitat at Study Area; or habitat conditions intermediate and records very limited and dated; or if it were present, it is highly likely to have been observed on site.
Moderate	Habitat conditions are intermediate, and/or optimal habitat conditions for species but local records limited or dated and/or if it were present, it is not likely to have been observed on site.
High	Optimal habitat conditions for species or species recorded at site, or intermediate habitat conditions but extensive local records and/or if it were present, it is not likely to have been observed on site.

2.4 Taxonomy

Flora and fauna taxonomy used in this Report is in accordance with the Victorian Biodiversity Atlas Checklist dated 14/02/2020 (DELWP 2021e).

2.5 Permits

Practical Ecology Pty Ltd staff are covered under a *The Wildlife Act 1975* Permit and FFG Act permit (No. 10008906) to take/keep protected flora and Wildlife and Small Institutions Ethics Committee approval (16.18).

3. RESULTS

3.1 Vegetation Categorisation, Classification and Quality

3.1.1 Ecological Vegetation Classes

Pre-1750s EVC mapping by DELWP (DELWP 2021a) indicates that the Study Area was historically dominated by two EVCs. This includes EVC 55_61: Plains Grassy Woodland in areas upslope of the Darebin Creek riparian corridor, and EVC 56: Floodplain Riparian Woodland in the creek corridor and immediate surrounds.

The Study Area has however experienced significant disturbance over time through historical land clearance and soil excavation, including likely earthworks to establish the steep batters along Farm Road and within the La Trobe Golf Course to the north of the carpark and clubhouse. Planted vegetation has also been installed within the Study Area over time, including Australian, Victorian and indigenous planted trees along with the planting of ground layer vegetation.

Through consideration of those trees likely to be remnant within the Study Area and the distribution of modelled EVCs, for the purposes of this Report the EVCs associated with native vegetation observed on site has been mapped in a similar manner to that modelled and mapped by DELWP. Consequently, vegetation along Farm Road has been deemed EVC 55_61: Plains Grassy Woodland, while that close to the Darebin Creek and to the north of the Golf Course carpark and clubrooms has been deemed representative of EVC 56: Floodplain Riparian Woodland.

A brief description of the native vegetation representative of these EVCs as observed within the Study Area, is provided in Table 2 and depicted on Map 2. Further information pertaining to the quality of the patches of native vegetation identified within the Study Area is provided below in Section 3.1.2

Note that detail regarding trees within the Study Area, including Scattered Trees, is provided in Section 3.1.4.

Table 2. Ecological Vegetation Class within the Study Area

#, Name and BCS^	Description
EVC 55_61: Plains Grassy Woodland Endangered	Plains Grassy Woodland is described as an open, eucalypt woodland to 15 m tall that occupies poorly drained, fertile soils on flat or gently undulating plains at low elevations. The understorey consists of a few sparse shrubs over a species-rich grassy and herbaceous ground layer with this particular variant (EVC 55_61 as opposed to EVC 55_62 or EVC 55_63) occupying areas receiving approximately 500 – 700 mm annual rainfall. Three patches of native vegetation within the Study Area are documented in this Report as being representative of this EVC. This includes Habitat Zones 1a, 1b and 1c which occur in three disjunct areas along batter to the north of Farm Road. These three patches occur beneath planted Australian and Victorian native trees through this area, inclusive of Lemon-scented Gum *Corymbia citriodora* and Spotted Gum *Corymbia maculata* planted along Farm Road, some of which have now naturally regenerated. While four River Red Gum *Eucalyptus camaldulensis* trees, a canopy species typical of this EVC also occur in this area, the similar size of these trees (between 20cm and 40cm DBH) and their positioning in a line at the toe of the batter are highly indicative that these were historically planted in this location. This was confirmed by Scott Irving, Superintendent of the La Trobe Golf Course (Pers. Comm.). The ground layer associated with Habitat Zone 1a, 1b and 1c is largely dominated by Spiny-headed Mat-rush *Lomandra longifolia* (note that this species is not usually found in this EVC and as discussed below is likely the result of planting, however is still indigenous to the area and is therefore considered as part of the understorey) amongst which Black-anther Flax-lily *Dianella admixta* and Nodding Saltbush *Einadia nutans* were growing, with the cover of these species deemed overall above 25%, hence their documentation as Habitat Zones. Weed cover is high through these areas with species such as Panic Veldt-grass **Ehrharta erecta*, Annual Veldt-grass **Ehrharta longiflora*, Soursob **Oxalis pes-caprae* Rice Millet **Piptatherum miliaceum* and Kikuyu **Cenchrus clandestinus* having a high cover. While it is noted here that the native vegetation within these Habitat Zones, particularly the Spiny-headed Mat-rush and Black-anther Flax-lily though these areas would have originated from plantings completed between 16 to 20 years prior (Scott Irving, Pers. Comm.), it is likely that this revegetation has naturally regenerated over time from these planting and it not possible to discern between what may have been planted and what has recruited since. Using the precautionary principle, these areas have been deemed patches of native vegetation as defined by the *Guidelines for the removal, destruction and lopping of native vegetation* (DELWP 2017a). These Habitat Zones are therefore not exempt under Clause 52.17 based on their planted status. Beyond Habitat Zones 1z, 1b and 1c, Tree A as discussed in Section 3.1.4 is also located within the section of the Study Area where EVC 55_61: Plains Grassy Woodland would have previously dominated. With a DBH of 73cm, Tree A is a Small Scattered Tree based on the benchmark size for a Large Tree for this EVC.
EVC 56: Floodplain Riparian Woodland Endangered	Floodplain Riparian Woodland is an open eucalypt woodland to 20 m tall over a medium to tall shrub layer with a ground layer consisting of amphibious and aquatic herbs and sedges. This EVC occurs along the banks and floodplains of the larger meandering rivers and major creeks, often in conjunction with one or more floodplain wetland communities. Elevation and rainfall are relatively low and soils are fertile alluviums subject to periodic flooding and inundation. Two patches of native vegetation within the Study Area are documented in this Report as being representative of this EVC. This includes Habitat Zone 2, which occurs along the batter to the south of the Golf Course clubrooms, along with Habitat Zone 3 which straddles the existing Darebin Creek Trail.

#, Name and BCS^	Description
	Habitat Zone 2 is similar in composition to Habitat Zones 1a, 1b and 1c with previously planted Spiny-headed Mat-rush dominating the batter, along with some Tussock Grass *Poa* sp. Again, these plants would have originated from plantings completed in this area up to 16-17 years prior (Scott Irving, Pers. Comm.), it is likely however that this revegetation has naturally regenerated over time and they have this incorporated into a patch of native vegetation. Tree 12 as per Barrett (2021) is also located within this Habitat Zone. Habitat Zone 3 has been separated from Habitat Zone based on the disjunct canopy between trees across the Golf Course access track. Habitat Zone 3 straddles the existing Darebin Creek trail and captures both remnant and planted native vegetation through this area. The distribution and location of this Habitat Zone is largely synonymous with Habitat Zone 7c as documented in Savona (2015). Species throughout this Habitat Zone include River Red Gum, Spiny-headed Mat-rush, Tree Violet *Melicytus dentatus* s.l. and Sticky Hop-bush *Dodonaea viscosa.* Tree 13 as per Barett (2021) is located within this Habitat Zone and is a Large Tree. Beyond Habitat Zones 2 and 3, Tree 10 and Tree 11 as per Barett (2021) and discussed in Section 3.1.4 are also located within the section of the Study Area where EVC 56: Floodplain Riparian Woodland would have previously dominated. Tree 10 is a Large Scattered Tree; Tree 11 is a Small Scattered Tree.

^ BCS: Bioregional Conservation Status; * denotes exotic species

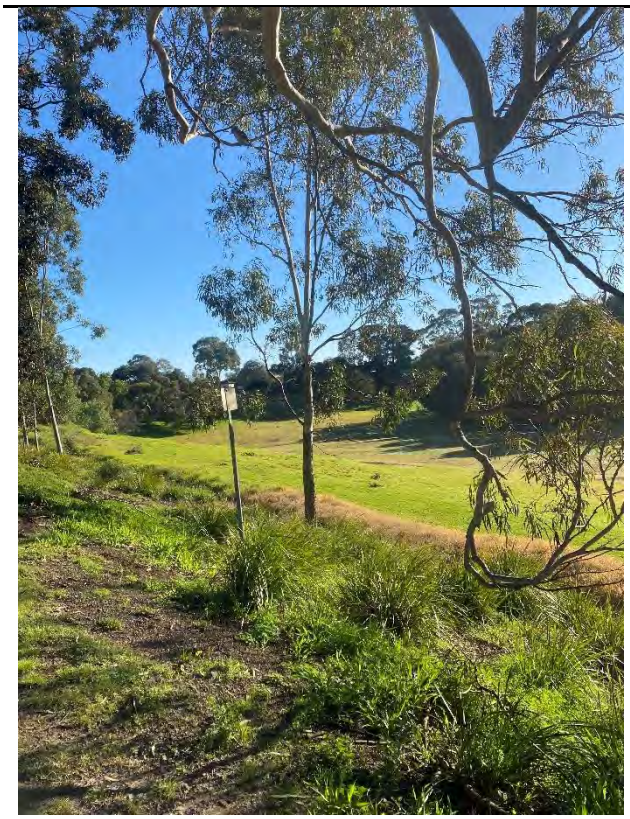


Figure 1. Plains Grassy Woodland ground storey

Figure 2. Plains Grassy Woodland ground storey

Figure 3. Habitat Zone 2

Figure 4. Tree 13 within Habitat Zone 3

3.1.2 Habitat Hectare Assessments

Patches of native vegetation (Habitat Zones) recorded within the Study Area were subject to a Habitat Hectare assessment. Results are presented in Table 3.

Table 3. Habitat hectare assessment results

Habitat Zone			1 (a, b, c)	2	3
Bioregion			VVP	VVP	VVP
EVC Name (initials)			PGW	FRW	FRW
EVC Number			55_61	56	56
EVC Conservation Status			E	E	E
Size of Zone (ha)			1a: 0.028 1b: 0.020 1c: 0.009	0.022	0.095
		Max Score	Score	Score	
Site Condition	Large Old Trees	10	0	0	9
	Canopy Cover	5	0	3	4
	Understorey	25	5	5	5
	Lack of Weeds	15	2	6	2
	Recruitment	10	0	0	0
	Organic Litter	5	4	5	5
	Logs	5	0	0	2
	EVC Standardiser	n/a	1	1	1
	Standardised Score	75	11	19	27
Landscape value	Patch Size	10	1	1	1
	Neighbourhood	10	0	0	0
	Distance to Core	5	3	3	4
Habitat points		100	15	23	32
Habitat Score (habitat points/100)		0.##	**0.15**	**0.23**	**0.32**
No. of Large Old Trees			**0**	**0**	**1 (Tree 13 in Barrett 2021)**

3.1.3 Threatened Ecological Communities

3.1.3.1 EPBC Act Communities

Table 4 below lists the Nationally threatened communities identified by the EPBC Act PMST as potentially occurring within five kilometres of the Study Area. As shown in Table 4, these communities are marked in the EPBC Act PMST as 'known to occur', 'likely to occur' or 'may occur'. As shown in Table 4, these EPBC Act threatened communities are not however deemed to be present within the Study Area.

Table 4. Details of threatened communities identified by the PMST and presence within Study Area

Community	Status	Summary of Community	EPBC Act PMST Report Status	Present within Study Area?
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Eucalypt woodland that is restricted to Quaternary basalt soils. Occurs on flat to gently undulating plains and associated stony knolls, generally at elevations up to 500 metres above sea level. The ecological community lies within a rainfall zone of 500–800 mm per annum and has a canopy typically dominated by River Red Gum *Eucalyptus camaldulensis*	Community known to occur within search area	**No** The Key Diagnostic Criteria for this listed Community are not met by any of the Habitat Zones on site Habitat Zones 1a, 1b and 1c do not have an understorey dominated by the native species that would typically dominate this community; Habitat Zone 2 and Habitat Zone – both deemed more akin to EVC 56: Floodplain Riparian Woodland – are also not deemed this community given their location and ground layer species composition.
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Generally corresponds to damp expressions of EVC 132: Plains Grassland within the Gippsland Plain bioregion. Key Diagnostic Characteristic includes a ground layer that must contain Kangaroo grass *Themeda triandra* and/or Common Tussock Grass Poa labillardierei.	Community may occur within search area	**No** No vegetation within Study Area meets the Key Diagnostic Criteria for this Community
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Dominated by a ground layer of native tussock-forming perennial grasses interspersed with a variety of herbs. Large shrubs and trees are absent to sparse. Limited to the basalt plain of Victoria that extends from Melbourne, west to about Hamilton.	Community may occur within search area	**No** No vegetation within Study Area meets the Key Diagnostic Criteria for this Community
White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Species rich understory of native tussock grass, herbs and scattered shrub and a canopy dominated by either White Box, Yellow Box, or Blakely's Red Gum. Tree cover is generally discontinuous and of medium height. Occurs on moderate to highly fertile soils where rainfall is between 400–1200 mm per year at altitudes of 170 m to 1200 m.	Community likely to occur within search area	**No** No vegetation within Study Area meets all Key Diagnostic Criteria for this Community

3.1.3.2 FFG Act Communities

Four FFG Act threatened communities are modelled by DELWP (DELWP 2021a) as present within the surrounding landscape. These FFG communities are the Western (Basalt) Plains Grasslands Community, Western Basalt Plains (River Red Gum) Grassy Woodland, Central Gippsland Plains Grassland and Forest Red Gum Grassy Woodland.

While not mapped by DELWP as occurring within the Study Area, the Habitat Zones identified on site contain species that are synonymous with the Western Basalt Plains (River Red Gum) Grassy Woodland community. This community has a clearly-recognizable structure made up of an open canopy of River Red Gum, a middle layer chiefly of scattered wattles and other species and a ground layer dominated by grasses. The original description of this community was based on its occurrences on the volcanic plains immediately north of Melbourne, however community also occurs across the Newer Basalt volcanic plains of Western Victoria as scattered remnants.

While the vegetation within the Study Area – in particular remnant River Red Gum trees – may be representative of the FFG listed community Western Basalt Plains (River Red Gum) Grassy Woodland, as outlined in Section 5.2 impacts to such trees will occur within the confines of 8 Farm Road which is effectively the La Trobe Golf Course and therefore private land. Consequently, as they are located on private land the provisions of the FFG Act would not apply.

3.1.4 Trees

There are two Small Scattered Trees (Tree A and Tree 11), one Large Scattered Tree (Tree 10) and one Large Tree within a Habitat Zone (Tree 13) within the Study Area.

Beyond the above, there are additional trees deemed indigenous to the local area. This includes Tree 12 which is a canopy tree located within Habitat Zone 2, but is not a Large Tree. It also includes four planted River Red Gum trees at the toe of the batter along Farm Road, two of which (Tree 3 and Tree 4) were documented in Barrett (2021). Additional indigenous trees – largely River Red Gums – of various sizes are also located across Habitat Zone 3.

Australian and Victorian native trees are also present within the Study Area. This includes large established Lemon-scented Gums and Spotted Gums planted along Farm Road. The location of such trees is presented on Map 2, with a number of these trees also recorded in Barrett (2021) where they are in close proximity to the proposed Alphington Link construction area.

Table 5 presents information of selected trees located across the Study Area with a particular emphasis on trees that meet the definition of a Scattered Tree or Large Tree within a Habitat Zone as per Clause 52.17 and the *Guidelines for the removal, destruction and lopping of native vegetation* (DELWP 2017a). It also includes however details on other trees within the Study Area that occur in proximity to the proposed Alphington Link construction area as documented by Barrett. Trees prefaced by a number were those recorded in Barrett (2021) with data regarding species, DBH and TPZ taken from this document; Tree A was recorded by Practical Ecology and is located within the Study Area but not within close proximity to the proposed Alphington Link construction area.

Figure 5 has been extracted from Barrett (2021) to show the location of all but one of the trees (Tree A) within Table 5. These tree numbers are also reflected on Map 2.

Table 5. Details of selected trees within Study Area

ID	Scientific name	Common name	DBH (cm)	TPZ (m)	Origin
1	*Corymbia citriodora*	Lemon-scented Gum	59	7.08	Australian Native (Planted)
2	*Corymbia maculata*	Spotted Gum	68	6.84	Victorian Native (Planted)
3	*Eucalyptus camaldulensis*	Spotted Gum	29	3.48	Indigenous (Planted)
4	*Eucalyptus camaldulensis*	River Red Gum	35	4.20	Indigenous (planted)
5	*Corymbia citriodora*	Lemon-scented Gum	53	6.36	Australian Native (Planted)
6	*Eucalyptus globulus*	Blue Gum	54	6.48	Victorian Native (Planted)
7	*Eucalyptus globulus*	Blue Gum	101	12.12	Victorian Native (Planted)
8	*Eucalyptus globulus*	Blue Gum	88	10.56	Victorian Native (Planted)
9	*Eucalyptus globulus*	Blue Gum	23	2.76	Victorian Native (dead)
10	*Eucalyptus camaldulensis*	River Red Gum	92	11.04	Indigenous (deemed Large Scattered Tree)
11	*Eucalyptus camaldulensis*	River Red Gum	51	6.12	Indigenous (deemed Small Scattered Tree)
12	*Eucalyptus camaldulensis*	River Red Gum	74	8.88	Indigenous (Small canopy tree within Habitat Zone 2)
13	*Eucalyptus camaldulensis*	River Red Gum	109	13.08	Indigenous (Large Tree within Habitat Zone 3)
A	*Eucalyptus camaldulensis*	River Red Gum	73	8.76	Indigenous (Small Scattered Tree)

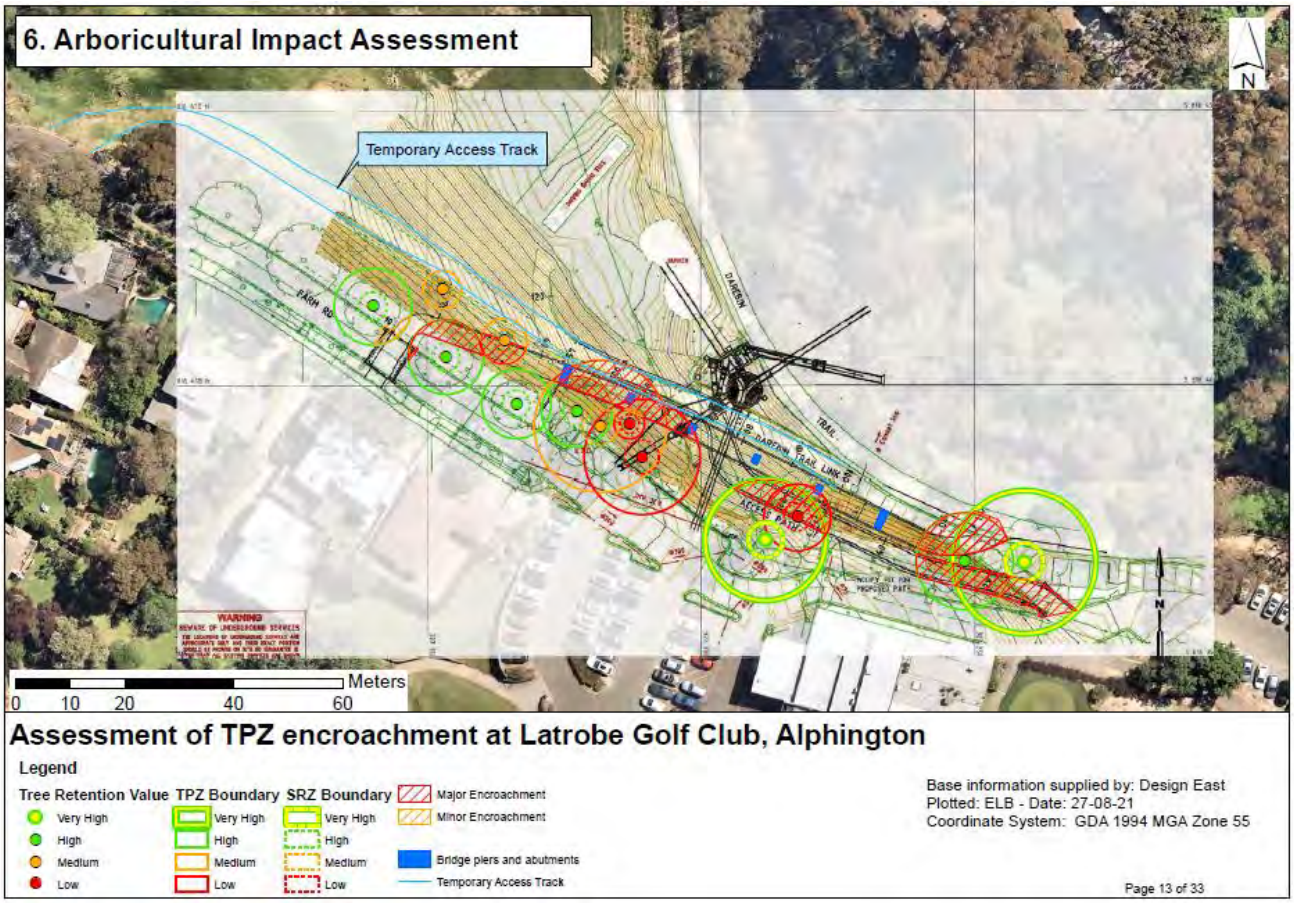


Figure 5. Arboricultural impact assessment showing tree locations (extracted from Barrett 2021)

3.1.5 Planted and Exotic Vegetation

As highlighted above, most of the trees located within the Study Area have been planted. This includes Australian Native, Victorian Native and Indigenous species as shown in Table 5, along with planted nature strip plantings along the southern side of Farm Road inclusive of Bottlebrush *Callistemon* spp. trees.

While some of these planted species, such Blue Gum and Spotted Gum occur naturally within Victoria, they are outside of their natural range and like other non-indigenous trees within the Study Area appears to have been planted within the Study Area for aesthetic and amenity purposes in association with Farm Road and the Golf Course.

It is also noted that in addition to the above there is additional planted vegetation located between the Study Area and the existing Darebin Trail fence. This vegetation appears to be less than 10 years old and installed as part of drainage infrastructure associated with the existing trail. Species present in this area include juvenile River Red Gums, Common Tussock-grass, Spiny-headed Mat-rush, Rush *Juncus* spp., Bidgee-widgee *Acaena novae-zelandiae*.

As discussed in Table 2 the ground layer vegetation located within Habitat Zones 1a, 1b and 1c, along with Habitat Zone 2 has also largely originated from planted individuals. Given the time since this planting however, it is difficult to discern if the individuals present are from original planted specimens or their progeny. As a precaution, these areas have been mapped as patches of native vegetation and subject to Clause 52.17 permit requirements.

In other locations within the Study Area outside of Habitat Zones as discussed above, a range of exotic species occur. This includes a range of species which are listed in Appendix 1 and dominate the ground layer in some areas, such as the grassed section between Habitat Zone 1c and Habitat Zone 2. This area is dominated by Couch **Cynodon dactylon*, Galenia **Aizoon pubescens* (previously known as *Galenia pubescens* var. *pubescens*), Prairie Grass **Bromus catharticus* and Soursob.

While there are scattered indigenous species present in areas outside of the patches of native vegetation (Habitat Zones) identified in Section 3.1.1, these are scattered in their extent with a cover below 25 per cent. This includes scattered occurrences of Spiny-headed Mat-rush and Nodding Saltbush under non-indigenous trees.

3.2 Flora

A total of 42 plant taxa were recorded in the Study Area during this survey of which 13 were indigenous (31%) and 29 (69%) were introduced or naturalised outside their natural range. Appendix 1 lists all flora recorded within the Study Area. Table 6 summarises plant taxa recorded in the Study Area during field surveys.

Table 6. Summary of plant species recorded

Flora Status	Number of Taxa
Indigenous vascular species	13
Exotic species	3
Native species outside of natural range	26
TOTAL	**42**

3.2.1 Rare or threatened flora

3.2.1.1 Field Survey

One species listed under the FFG Act was observed within the Study Area and is Spotted Gum.

Spotted Gum is listed as vulnerable in Victoria under the FFG Act. Spotted Gum is only naturally known to occur however in Victoria in Tara Range, south of Buchan (Royal Botanic Gardens Melbourne 2020). Notable for its erect form and completely smooth bark, Spotted Gum is widely planted as an ornamental tree. A number of Spotted Gum trees occur across the Study Area as observed during the field survey undertaken and documented in Barrett (2021).

3.2.1.2 Database Records

Searches undertaken of the VBA and the EPBC Act PMST identified 23 flora species of state and/or national significance. These have either been recorded within five kilometres from the Study Area boundaries or are predicted to occur within this search area by the EPBC Act PMST. All species identified on from the VBA and the EPBC Act PMST are listed in Appendix 2.

One of these species – Spotted Gum – was recorded as part of field surveys and in Barrett (2021) as discussed above. Individuals within the Study Area of this species have planted within the Study Area or have regenerated from other planted specimens.

While not detected during field surveys, there is a low-moderate likelihood that two additional flora species identified through database searches could also occur within the Study Area. These species are:

- Veiled Fringe-sedge *Fimbristylis velata*, which is listed as endangered under the FFG Act, and
- Floodplain Fireweed *Senecio campylocarpus*, also listed as endangered under the FFG Act.

Veiled Fringe-sedge occasionally occurs on drying mud beside lakes and rivers and in seasonally wet depressions (Wilson 1994). It mostly occurs in northern Victoria, but recent collections in the south from, for example, Bairnsdale and Healesville areas (Wilson 1994). There are three records for this species located north of the Study Area along the Yarra River providing some potential for the species to be present along the margins of the Darebin Creek if suitable local conditions are present. This species was not recorded during the field surveys undertaken as part of this ecological assessment however, which had a large focus on the areas where the proposed Alphington Link itself is proposed.

Floodplain Fireweed *Senecio campylocarpus* grows in forests and woodlands with loam to clay soils, often where seasonal inundation occurs. In Victoria, Floodplain Fireweed occurs mostly throughout central Victoria and in the north-east in loam to clay soils in forest and woodland, usually in seasonally inundated areas. There is one record for this species in the Yarra Flats Park north of the Study Area along the Yarra River. Again, there is some potential that the riparian area of the Darebin Creek could provide habitat for this species. This species is therefore deemed to have a low-moderate likelihood of occurrence within the Study Area.

For the remaining EPBC Act or FFG Act listed flora identified through database searches, the likelihood that they would occur within the Study Area is considered low given their habitat preferences, local records and the highly modified condition of the habitat available within the Study Area.

3.3 Fauna

3.3.1 Fauna Survey

Fauna observed within the investigation area during the field survey was limited to common fauna species. The results of the incidental fauna survey are presented in Table 7.

Table 7. Incidental fauna list recorded during site visit

Scientific Name	Common Name	Record type
Dacelo novaeguineae	Laughing Kookaburra	Heard
Trichoglossus haematodus	Rainbow Lorikeet	Heard
Cacatua galerita	Sulphur-crested Cockatoo	Heard
Corvus coronoides)	Australian Raven	Heard

3.3.2 Rare or Threatened Fauna

3.3.2.1 Field Survey

No rare or threatened fauna of state or national significance were recorded during the field survey.

3.3.2.2 Database Records

Searches undertaken of the VBA and the EPBC Act PMST identified 62 fauna species of state and/or national significance. This includes species listed as migratory under the EPBC Act. These fauna species have either been recorded within five kilometres from the Study Area boundaries or are predicted to occur within this search area. All species identified on from the VBA and the EPBC Act PMST species are listed in Appendix 3.

The majority of species identified via database searches are not expected to make significant use of the habitat available within the Study Area, if at all, with most likelihoods ranging between "Nil" to "Low-Moderate". This has taken into consideration the number of records on the VBA within the local landscape, if any, the urbanised nature of Study Area and the habitat available.

While not detected during field surveys, there is a moderate or higher likelihood that some of the fauna species identified through database searches could however utilise the habitat available within the Study Area. These species are presented in Table 8, along with information that highlights the rationale for this likelihood rating for the species within the Study Area.

Table 8. Threatened fauna species with moderate or higher likelihood of occurrence in Study Area

EPBC	FFG	Scientific Name	Common Name	Likelihood of occurrence	Rationale
CR	Cr	*Lathamus discolor*	Swift Parrot	Moderate	There is some potential that the species could visit the Study Area, occasionally foraging on Eucalypts including River Red Gums on passage between northern Victoria and Tasmania. Species is unlikely, however, to make significant use of the Study Area and would only be used on passage when during migration between Tasmania and the mainland.
EN	En	*Macquaria australasica*	Macquarie Perch	Moderate	May occasionally swim up Darebin Creek from the Yarra River; records for species on VBA from within Darebin Creek in 0.5km of Study Area
	Vu	*Ninox strenua*	Powerful Owl	Moderate	Suitable foraging and roosting habitat, possible to hunt possums in canopy vegetation; previously recorded within 0.5km of Study Area. Study Area is within normal foraging/territorial range of the species, from known roosting and breeding sites
	Vu	*Ornithorhynchus anatinus*	Platypus	Moderate	Records on VBA north of Study Area are quite dated; those to the east and west along the Yarra River more recent. Reports in 2017 that indicate species was observed in Darebin Creek near Northland Shopping Centre in Heidelberg although records not on VBA.
VU	En	*Prototroctes maraena*	Australian Grayling	Moderate	Records on the VBA are from the Yarra River with no records within the Darebin Creek; the species could however occasionally occur upstream of the confluence of the Darebin Creek and the Yarra River so within the Darebin Creek itself; high number of local records for this species
VU	Vu	*Pteropus poliocephalus*	Grey-headed Flying-fox	High	Known to frequently forage in canopy trees along Darebin Creek and surrounds, and likely to at least forage and occasionally roost within the Study Area; Grey-headed Flying Fox *Pteropus poliocephalus* camp in Yarra Bend Park approximately 2km away from Study Area.

^Status under the EPBC Act: EX: Extinct, CR: Critically endangered, EN: Endangered, VU: Vulnerable and CD: Conservation dependant, M: Migratory under the EPBC Act; Status under FFG Act: Cd: Conservation dependant, Cr: Critically endangered, En: Endangered, Ex: Extinct, Th: Threatened, Vu: Vulnerable En(ExV): Endangered (extinct in Vic)

3.3.3 Fauna Habitat and Connectivity

The main focus with regards to fauna during the assessment was the consideration of the site's potential to provide fauna habitat. This included habitat for fauna species listed under the EPBC Act and the FFG Act, as well as non-listed species.

The fauna habitat observed within the site included:

- leaf litter and grassy understorey vegetation
- tree canopies, including trees with fissured bark and crevices.

The trees within the Study Area provide habitat for a range of local fauna species, including roosting and nesting habitat for a range of bird species relatively common in urban landscapes. Bats could also utilise these trees.

They could provide roosting habitat for microbats within bark fissures and crevices for example, along with potential foraging resources for the Grey-headed Flying-fox. Areas with leaf litter are likely to provide habitat for smaller fauna species such as invertebrates and potentially lizards including the Garden Skink *Lampropholis guichenoti*. This is also the case of the grassed areas of the site. In general, mid-storey vegetation is sparse to non-existent limiting available habitat for woodland birds for example except for the riparian strip along the Darebin Creek.

The habitat within the Study Area is connected to the Darebin Creek, and further south to the Yarra River. Both the Darebin Creek and Yarra River within the vicinity of the Study Area offer a range of available habitat given the presence of remnant vegetation and revegetation inclusive of trees, mid and groundstorey.

4. DEVELOPMENT PROPOSAL AND ASSOCIATED IMPACTS

The proposed Alphington Link extends from the eastern end of Farm Road in Alphington to the existing Darebin Creek Trail located north of the Latrobe Golf Club. The extension of the Darebin Train that the Alphington Link represents will be bridged from Farm Road to just west of the existing golf practice nets, with the overall project also including a realignment of the existing golf access track between the Latrobe Golf Course driving range and clubhouse/carparks and the installation of retaining walls. A copy of proposed development plan is presented in Figure 6 below which shows proposed infrastructure along with an associated "site construction zone".

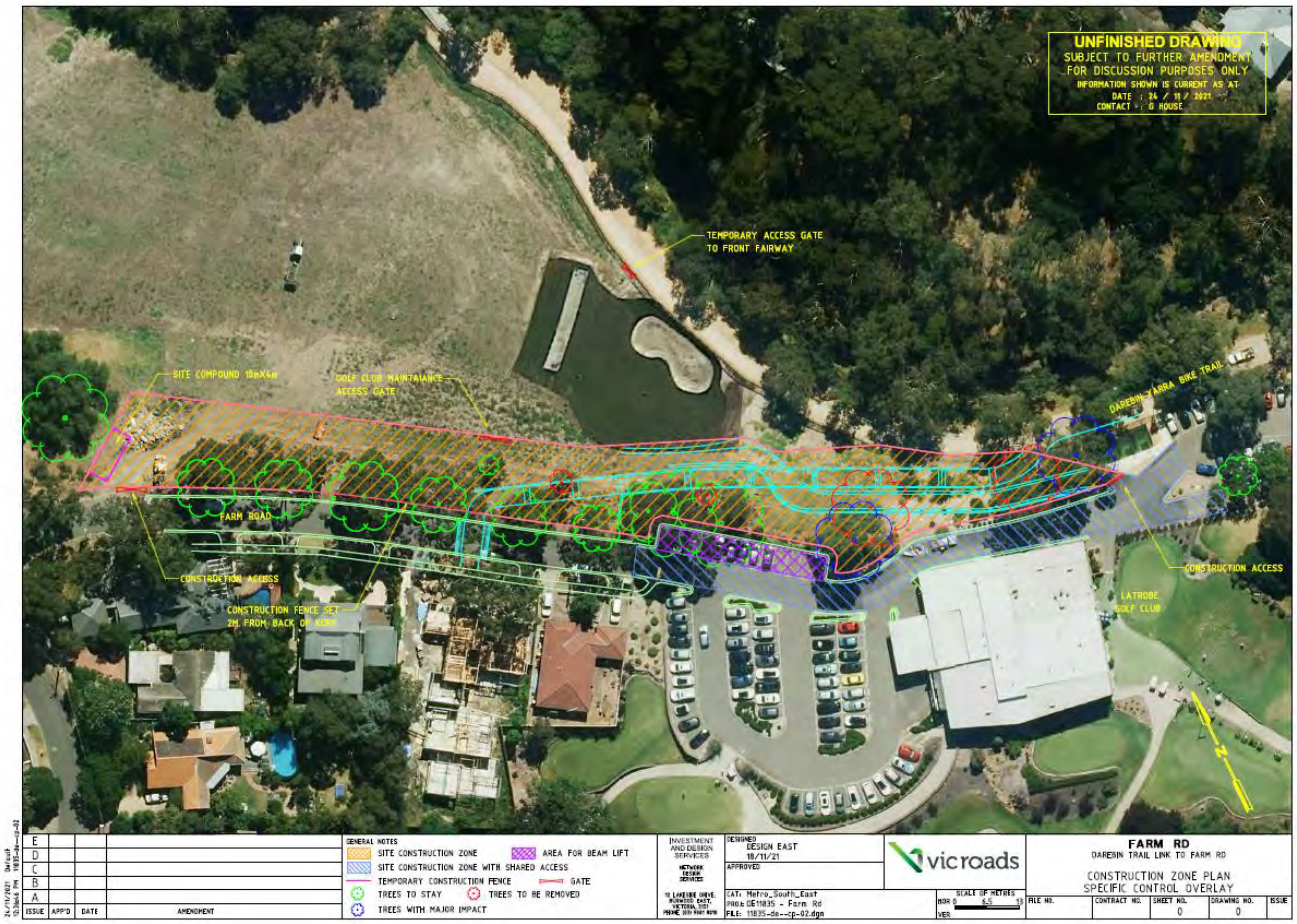


Figure 6. Development Plan with associated "site construction zone"

With regard to expected impacts from the proposed Alphington Link infrastructure and associated construction impacts, note the following in relation to expected impacts documented within this Report:

- Impacts to native vegetation documented in Section 6 below have incorporated a 10m buffer around proposed infrastructure to allow for "worst case scenario" impacts associated with construction and access

- A temporary access track will be located within the proposed "site construction zone" in line with the track presented on the arboricultural impact assessment map presented as Figure 5 above

    - As outlined in Barrett (2021), this track is proposed to be 3m width, will be located 2m from the semi-mature trees present at the toe of the embankment along Farm Road, and will not

encroach the TPZ of the larger trees located along Farm Road. Consequently trees are not expected to be impacted by this temporary access.

- Additionally, this temporary access track will not impact ground layer species located within Habitat Zone 1a beyond what has already been accounted for as part of the Native Vegetation Impact Assessment in Section 6 of this report; those impacts marked to Habitat Zone 1a are associated with a buffer off proposed infrastructure of 10m as discussed above.

- At this stage it is expected that Tree 2 will incur at least some impacts through encroachment of fill within the TPZ, but is still expected to remain viable provided appropriate management techniques are employed as discussed in Barrett (2021)
    - For the purposes of approvals and permits in relation to Tree 2, discussion with DoT has indicated a preference for this "deemed lost" and that appropriate approvals/permits are obtained in relation to its removal. This is discussed in further detail below. Efforts will be made however to retain this tree in line with Barrett (2021).

- Similar to Tree 2, Tree 13 will incur a major TPZ encroachment, which will include proposed excavation within 5m of the trunk, however site works will take place with the intention of minimising long term impacts on this tree
    - While there is some risk that impacts to Tree 13 could impact it long term, this loss has not been accounted for within the Native Vegetation Impact Assessment Presented in this report. This approach takes into account the fact that this Tree 13 is synonymous with Tree 9, which was already "deemed lost" as part of offset requirements documented in the *Vegetation and Habitat Impact Assessment Darebin Yarra Trail Link* prepared in 2015 by Savona.

- No impacts are expected to the north of the existing Darebin Creek Trail however understorey within Habitat Zones 3 surrounding Tree 13 (south of existing trail) have been deemed lost for offset accounting purposes as a precautionary approach.

4.1 Vegetation and Flora

4.1.1 Trees

As outlined above, in Section 3.1.4 and shown on Map 2, there are indigenous trees (both planted and remnant) along with Australian and Victorian natives within the Study Area.

Table 9 presents information of selected trees located across the Study Area with a particular emphasis on trees that meet the definition of a Scattered Tree or Large Tree within a Habitat Zone as per Clause 52.17, and those documented in Barrett (2021) as located within and immediately surrounding works associated with the proposed Alphington Link. This table also presents the impacts to trees based on the current development plans as presented in Figure 6 above and as also detailed in Barrett (2021).

Table 9. Study Area Tree Impacts

ID	Scientific name	Common name	Origin	Impact?
1	*Corymbia citriodora*	Lemon-scented Gum	Australian Native (Planted)	Retained with establishment of TPZ during construction
2	*Corymbia maculata*	Spotted Gum	Victorian Native (Planted)	**Deemed lost due to TPZ encroachment and potential long-term impacts**
3	*Eucalyptus camaldulensis*	River Red Gum	Indigenous (Planted)	Retained with establishment of TPZ during construction
4	*Eucalyptus camaldulensis*	River Red Gum	Indigenous (planted)	**To be removed; direct impact**
5	*Corymbia citriodora*	Lemon-scented Gum	Australian Native (Planted)	Retained with establishment of TPZ during construction
6	*Eucalyptus globulus*	Blue Gum	Victorian Native (Planted)	Retained with establishment of TPZ during construction
7	*Eucalyptus globulus*	Blue Gum	Victorian Native (Planted)	Retained with establishment of TPZ during construction
8	*Eucalyptus globulus*	Blue Gum	Victorian Native (Planted)	Retained with establishment of TPZ during construction
9	*Eucalyptus globulus*	Blue Gum	Victorian Native (dead)	**To be removed; dead tree**
10	*Eucalyptus camaldulensis*	River Red Gum	Indigenous (deemed Large Scattered Tree)	**Deemed lost due to TPZ encroachment; Clause 52.17 trigger**
11	*Eucalyptus camaldulensis*	River Red Gum	Indigenous (deemed Small Scattered Tree)	**Direct impact; Clause 52.17 trigger**
12	*Eucalyptus camaldulensis*	River Red Gum	Indigenous (Small canopy tree within Habitat Zone 2)	**Direct impact; Clause 52.17 trigger**
13	*Eucalyptus camaldulensis*	River Red Gum	Indigenous (Large Tree within Habitat Zone 3)	Potential for impact but works proposed to retain tree; Clause 52.17 trigger however already deemed lost in Savona (2015)
A	*Eucalyptus camaldulensis*	River Red Gum	Indigenous (Small Scattered Tree)	Retained

4.1.2 Ground Layer Species

Native vegetation present within Habitat Zones 1b, 1c, 2 and 3 will be removed to accommodate the proposal and associated construction impacts. As detailed in Table 2 much of this vegetation, particularly within Habitat Zones 1b, 1c and 2 is most likely regeneration from previously planted specimens although for Nodding Saltbush this is less likely to be the case. While these areas are relatively species poor they do however have sufficient cover to be defined as a "patch" of native vegetation as per the DELWP (2017a) definition. The native species to be removed in the ground layer from these patches are predominantly Spiny-headed Mat-rush, Black-anther Flax-lily and Nodding Saltbush.

4.2 Fauna and Fauna Habitat

The Study Area is likely to support a range of local fauna species, and as outlined in Section 3.2.2.2, there is a moderate or higher likelihood that six species would make at least some use of the habitat available within the Study Area. Provided below in Table 10 is an indication of the likely potential impacts to these species and a determination of the likely nature and severity of impacts on each species.

Table 10. Threatened fauna species with moderate or higher likelihood of occurrence in Study Area

EPBC	FFG	Scientific Name	Common Name	Potential Impact
CR	Cr	*Lathamus discolor*	Swift Parrot	Trees 4, 10, 11 and 12 are all River Red Gum Trees to be removed that could present occasional foraging habitat for the Swift Parrot during migration between northern Victoria and Tasmania. A review against the *Matters of National Environmental Significance – Significant Impact Guidelines* (DoE 2013) does not indicate that the removal of these trees would however be deemed a significant impact on this species. The likelihood of a significant impact on this EPBC Act-listed species from the proposal is therefore considered low.
EN	En	*Macquaria australasica*	Macquarie Perch	There will be no direct impacts to the Darebin Creek with all works to occur to the south of the existing Darebin Trail. While impacts to this species if present within the Darebin Creek could occur through impacts associated with sedimentation and runoff this can be ameliorated through standard mitigation measures associated with working near a waterway as would be expected by relevant authorities including the EPA. The likelihood of a significant impact on this EPBC Act-listed species from the proposal is therefore considered very low.
	Vu	*Ninox strenua*	Powerful Owl	While direct impacts to potential foraging habitat is unlikely, there is potential for indirect impacts associated with noise during construction and operation that could change the behaviour of individuals utilising the habitat on site. It is expected that given the urban nature often Study Area and adjacent dwellings that construction will be restricted to daylight hours avoiding impacts on foraging potential; and impacts from ongoing use of the proposed Alphington Link are expected to be low given the already high traffic of both pedestrians and vehicles around the Study Area.
	Vu	*Ornithorhynchus anatinus*	Platypus	There will be no direct impacts to the Darebin Creek with all works to occur to the south of the existing Darebin Trail. While impacts to this species if present within the Darebin Creek could occur through impacts associated with sedimentation and runoff this can be ameliorated through standard mitigation measures associated with working near a waterway as would be expected by relevant authorities including the EPA. The likelihood of a impacts on this is therefore considered low.
VU	En	*Prototroctes maraena*	Australian Grayling	There will be no direct impacts to the Darebin Creek with all works to occur to the south of the existing Darebin Trail. While impacts to this species if present within the Darebin Creek could occur through impacts associated with sedimentation and runoff this can be ameliorated through standard mitigation measures associated with working near a waterway as would be expected by relevant authorities including the EPA. The likelihood of a significant impact on this EPBC Act listed species from the proposal is considered very low.

EPBC	FFG	Scientific Name	Common Name	Potential Impact
VU	Vu	*Pteropus poliocephalus*	Grey-headed Flying-fox	The trees proposed for removal, as outlined in Table 9, are likely to provide at least some potential habitat for this species given they would likely be occasionally used for foraging. While there also may be some indirect impacts to the potential for continued foraging by Grey-headed Flying-fox through noise and disturbance created during construction and operation of the Alphington Link, this species is highly mobile and readily persists within urban areas across Melbourne with high levels of background noise. A review of the *Matters of National Environmental Significance – Significant Impact Guidelines* (DoE 2013) does not indicate that impacts from the proposal would be deemed a significant impact on this species. The likelihood of a significant impact on this EPBC Act listed species from the proposal is therefore considered low.

5. RELEVANT POLICY AND LEGISLATION

The following section explores relevant policy and legislation pertaining to ecology from the national level through to the local level.

5.1 *Environment Protection and Biodiversity Conservation Act 1999*

The EPBC Act is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places defined in the Act as MNES. There are nine matters of national environmental significance to which the EPBC Act applies, these are:

- World heritage sites
- National heritage places
- Wetlands of international importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed)
- Nationally threatened species and ecological communities
- Migratory species
- Commonwealth marine areas
- Nuclear actions
- The Great Barrier Reef Marine Park
- A water resource, in relation to coal seam gas development and large coal mining development.

If a project is likely to have a significant impact on one of the nine matters of national environmental significance, the action or proposal must be referred to the Commonwealth DoEE. This 'referral' is then released to the public for comment. A '*significant impact is defined under the EPBC Act as an impact that is important, notable, or of consequence, having regard to its context or intensity'* (DoE 2013).

Under the EPBC Act, actions that are likely to have a significant impact upon MNES require approval from the Environment Minister to undertake those actions. An action includes any project, development, undertaking, activity or series of activities.

Relevance to proposal

Of the nine matters of national environmental significance to which the EPBC Act applies, one has direct relevance with relation to the Study Area and Alphington Link proposal – nationally threatened species. Threatened ecological communities listed under this Act were also however considered for their presence.

Threatened Ecological Communities

No EPBC Act listed ecological communities were deemed to be present within the Study Area as highlighted in Section 3.1.3.1 and Table 4. No referral is therefore recommended under the EPBC Act in relation to this threatened communities.

Nationally Threatened Species: Flora

No EPBC Act listed flora species were recorded during field surveys.

Database searches for significant flora species likely to occur within 5-kilometres of the Study Area produced a list of 12 EPBC Act listed species. Given the low likelihood of occurrence across the Study Area of all 12 EPBC Act flora species identified through database searches, direct losses are unlikely. The risk of a significant impacts as defined by the EPBC Act on these listed flora species is therefore also deemed to be low.

No referral is recommended under the EPBC Act in relation to significant flora species.

Nationally Threatened Species: Fauna

No EPBC Act listed fauna species were recorded during field surveys.

Database searches for significant fauna species likely to occur within a 5-kilometres of the Study Area produced a list of 19 EPBC Act listed fauna species. This includes species listed as Migratory under the EPBC Act and/or as threatened species.

Four EPBC Act listed fauna species are considered to have a moderate or higher likelihood of occurrence within the Study Area, inclusive of the Darebin Creek riparian area. This includes Swift Parrot *Lathamus discolor*, Macquarie Perch *Macquaria australasica*, Australian Grayling *Prototroctes maraena* and Grey-headed Flying-fox.

As outlined in Table 10 however, a review of the *Matters of National Environmental Significance – Significant Impact Guidelines* (DoE 2013) and consideration of construction and operational impacts of the Alphington Link, it is unlikely that it will have a significant impact on these species as defined by the EPBC Act.

No referral is recommended under the EPBC Act in relation to significant fauna species.

5.2 *Flora and Fauna Guarantee Act 1988*

The *Flora and Fauna Guarantee Act 1988* was legislated to ensure the continued survival of all Victorian species of flora and fauna and all Victorian communities of plants and animals. The FFG Act provides a number of ways to help achieve its objectives including:

- listing of threatened taxa, communities of flora or fauna and potentially threatening processes, and creation of Action Statements and Management Plans for all listed taxa communities of flora or fauna and processes
- declaration of a Critical Habitat if the habitat is critical for the survival of a species or a community of flora or fauna, if listed as Critical Habitat, the Minister for Environment may then make an Interim Conservation Order (ICO) to conserve the Critical Habitat (NB: no Critical Habitat has been declared in the State)

- protection of flora and fauna through listing offences such as penalties relating to not following an ICO and taking, trading in, keeping, moving or processing protected flora without a licence. (NB: this does not apply to taking protected flora from private land (other than land which is part of the critical habitat for the flora) except for taking tree-ferns, grasstrees or sphagnum moss for the purpose of sale.

The Department of Environment, Land, Water and Planning (DELWP) is the referral authority for matters under the FFG Act noting that this Act only applies to public land, not private land as is the La Trobe Golf Course.

Relevance to proposal

Threatened Communities

There are three River Red Gum trees (Tree 10, Tree 11 and Tree 12) within the Study Area that could be part of the FFG Act listed, Western Basalt Plains (River Red Gum) Grassy Woodland community, and will be impacted by the proposed Alphington Link and associated construction as shown in Table 9. As these trees will occur within the confines of 8 Farm Road which is effectively the La Trobe Golf Course and therefore private land, the provisions of the FFG Act do not apply.

Threatened Species

There are 19 flora species and 53 fauna species listed under the FFG Act 1988 recorded within a 5 km radius of the Study Area.

There is a low likelihood that the majority of these FFG Act listed flora species previously recorded, or predicted to occur, within 5-kilometres of the Study Area would occur on site. There is a low-moderate likelihood that two species could however occur: Floodplain Fireweed and Veiled Fringe-sedge. If present these species would more likely be within the riparian area associated with the Darebin Creek rather than the are proposed for construction of the Alphington Link.

Note that while the proposal will remove one Spotted Gum tree (Tree 2), this specimen would have been planted at this location and is outside the natural range for this species. This species is nonetheless listed as Vulnerable under the FFG Act.

Six FFG Act-listed fauna species are considered to have a moderate or higher likelihood of occurrence within the Study Ares as outlined in Section 3.3.2.2. While this is the case, construction and operational impacts of the Alphington Link are unlikely to impact on these species in a manner that would cause them to make significantly less use of the Study Area and immediate surrounds than they already do.

Protected Flora Species

The protected flora controls are set out in Division 2 of Part 5 of the FFG Act. It is an offence to take, trade in, keep, move or process protected flora without a permit, or unless authorised by Order of the Governor in Council published in the *Government Gazette* (GIC Order). The FFG Act defines "take" to mean to kill, injure, disturb or collect.

For all protected flora, the controls apply to flora "…in any form including the whole organism or any part or product, whether alive or dead or however processed" (Section 45 of the FFG Act). This does not apply to private land where permission is given by the owner and the flora is not taken for the purposes of selling.

The Protected Flora List includes plants from three sources:

- plant taxa which are not threatened but are declared to be protected under section 46 of the *Flora and Fauna Guarantee Act 1988*
- plant taxa which are listed as threatened under section 10 the *Flora and Fauna Guarantee Act 1988*
- plant taxa belonging to communities which are listed as threatened under section 10 of the *Flora and Fauna Guarantee Act 1988.*

As well as protecting threatened species, protected flora are listed as protected to regulate exploitation including removal from the wild for cultivation and the cut-flower industry. Among others the list includes all clubmosses, ferns and fern allies (excluding *Pteridium esculentum*), all members of the Asteraceae (daisies) family, all members of Epacridaceae (heaths), all members of Orchidaceae (orchids) and all Acacias (excluding Silver, Early Black, Lightwood, Blackwood and Hedge Wattles).

Spotted Gum is listed as vulnerable under the FFG Act with impacts to Tree 2 seeing a specimen of this species deemed lost given expected TPZ encroachment as outlined in Table 9. As this tree is Council owned and located along Farm Road, the provisions of the FFG Act apply and a "Permit to take protected flora" to remove this species may be required from DELWP despite its planted status within the Study Area.

While three River Red Gum trees (Tree 10, Tree 11 and Tree 12) are to be removed by the proposed Alphington Link and associated construction can be deemed part of an FFG Act listed community, as above these occur within the confines of the La Trove Golf Course which is private land for which the provisions of the FFG Act would not apply.

5.3 *Flora and Fauna Guarantee Amendment Act 2019*

The FFG Act has been amended to provide a modern and strengthened framework for the protection of Victoria's biodiversity. The *Flora and Fauna Guarantee Amendment Act 2019* (the Amendment Act) came into effect on June 1, 2020.

The Amendment Act:

- introduces principles to guide the implementation of the FFG Act, including consideration of the rights and interests of Traditional Owners and the impacts of climate change
- requires consideration of biodiversity across government to ensure decisions and policies are made with proper consideration of the potential impacts on biodiversity
- clarifies existing powers to determine critical habitat and improves their protection by encouraging cooperative management
- gives effect to a consistent national approach to assessing and listing threatened species using the Common Assessment Method (CAM), which will reduce duplication of effort between jurisdictions and facilitate the monitoring and reporting of species' conservation status
- modernises the FFG Act's enforcement framework including stronger penalties.

The Amended Act requires ministers and public authorities to consider the FFG Act when performing functions that might impact biodiversity when exercising their functions (set out in new section 4B).

The Act requires that in performing any of their functions that may reasonably be expected to impact on biodiversity, including a function under any Act, ministers and public authorities must consider the Act's objectives, so far as is consistent with the proper exercising of their functions.

Additional matters are also specified to be considered to clarify the objectives, including the Biodiversity Strategy, relevant action statements, management plans or critical habitat determinations. The types of potential impacts on biodiversity that should be considered are also specified, these include:

- long- and short-term impacts
- detrimental and beneficial impacts
- direct and indirect impacts
- cumulative impacts
- potentially threatening processes.

The act establishes tools to provide guidance to public authorities in considering biodiversity, these include:

- **Ministerial guidelines** to clarify the duty and support public authorities with further information.
- **Public authority management agreements** made with the Secretary to DELWP, which can provide certainty that biodiversity impacts are being sufficiently considered and being managed and can streamline approval requirements.

Relevance to proposal

The proposed Alphington Link is being built and administered by the DoT. As a public authority, the FFG Act must be considered when performing functions that might impact biodiversity. This Report and in the information contained within it has sought to consider and discuss potential impacts to FFG Act listed ecological (biodiversity) values, inclusive of long- and short-term impacts, direct and indirect impacts, and potentially threatening processes. The latter of these are addressed through the recommendations provided in Section 7.

5.4 *Planning and Environment Act 1987*

The *Planning and Environment Act 1987* establishes the framework for planning the use, development and protection of land in Victoria in the present and long-term interests of all Victorians. This includes providing the structure for and administering the implementation of Planning Schemes in each municipality through the Victorian Planning Provisions (VPPs). Planning Schemes are legal instruments outlining provisions for land use, development and protection. They are constructed and sourced from the VPPs.

The following section considers relevant sections of the Planning Scheme.

5.4.1 State Planning Policy Framework

Clause 12 Environmental and Landscape Values

Clause 12 of the planning scheme recognises that planning:

- should help to protect the health of ecological systems and the biodiversity they support (including ecosystems, habitats, species and genetic diversity) and conserve areas with identified environmental and landscape values.
- must implement environmental principles for ecologically sustainable development that have been established by international and national agreements.
- should protect sites and features of nature conservation, biodiversity, geological or landscape value.

Clauses of particular relevance include:

- Clause 12.01-1 Protection of biodiversity
- Clause 12.01-2 Native vegetation management

Relevance to proposal

The objectives of these clauses are considered in the body of this Report that relate to avoiding and minimising impacts to ecological values (biodiversity).

5.4.2 Zoning

The Study Area is zoned:

- Neighbourhood Residential Zone -Schedule 2 (NRZ2, along Farm Road)
- Special Use Zone- Schedules 1 (SUZ1, two sections of Golf Course)) and
- Urban Floodway Zone (UFZ, section of Golf Course north of car park).

Under NRZ2, a permit is required to construct a building or construct or carry out works for a use in Section 2 of Clause 32.09-2, which includes *any other use* not in Section 1 or 3 of Clause 32.09-2. As the proposed works to install a trail are not included in Section 1 or 3 it can be deduced that a permit to carry out works will be required for the Alphington Link under this zoning. There are no specific application requirements under this zoning relevant to flora and fauna (ecology, biodiversity).

For SUZ1, a permit is required for uses listed under Section 2 which refers to *any other use that is not within Section 1 or 3 of the Schedule to this Zone*. As above, it can be deduced that a permit may be required for the Alphington Link under this overlay. Application requirements in relation to this zoning include those related to the use and the types of activities which will be carried out; the likely effects, if any, on adjoining land including noise levels, traffic, the hours of delivery and dispatch of goods and materials, hours of operation and light spill, solar access and glare; and maintenance of areas not required for immediate use. There are no specific application requirements under this zoning relevant to flora and fauna (ecology, biodiversity) although light spill can have an influence on ecological values and in particular fauna and their behaviour.

Under UFZ, a permit is required to construct or carry out works, which includes *bicycle pathways and trails*. An application under this zoning may require the preparation of a flood risk report where a local floodplain development plan has not been incorporated into the Yarra Planning Scheme. This report must consider, amongst other items, "*The effects of the development on environmental values such as natural habitat, stream stability, erosion, water quality and sites of scientific significance.*" This Report aims to document the natural habitat within the Study Area and highlight the significance of the habitat that is present; other items regarding the effects of potential erosion and water quality issues are outside of the scope of this Report although are expected to be ameliorated through the adoption of control measures implemented during construction of the proposed Alphington link and associated infrastructure.

5.4.3 Overlays

The Study Area has full or partial coverage of the following overlays that have specific relevance to flora and fauna values:

- Environmental Significance Overlay – Schedule 3 (ESO3, partial coverage)
- Significant Landscape Overlay – Schedule 1 (SLO1, partial coverage)
- Design and Development Overlay – Schedule 1-A (DDO1-A, partial coverage)
- Land Subject to Inundation Overlay (LSIO, partial coverage)
- Public Acquisition Overlay 2 (PAO2, partial coverage)

Note that information regarding the Development Contributions Plan Overlay (DCPO) that cover the entire Study Area is not included below as the information presented relates predominantly to flora and fauna related issues.

5.4.3.1 Environmental Significance Overlay – Schedule 3

Environmental Significance Overlay – Schedule 3 *Darebin Creek and Environs* covers the majority of the Study Area aside from an area at the top of the batter close to the Golf Course club rooms. This overlay recognises the Darebin Creek Valley as a major conservation, ecological and recreational resource and as an important linear open space corridor providing habitat for flora and fauna, as well as recreational opportunities linked to the Yarra River Trail network.

The objectives of this overlay are:

- To ensure protection and enhancement of the creek side environment as a conservation, ecological and recreational resource including the protection and improvement of water quality (inclusive of runoff) in stream and streamside habitats, geological features and indigenous riparian vegetation
- To protect areas along the watercourse from development that may cause damage to the streamside environment as a conservation, ecological and recreation resource
- To conserve water quality and watercourse capacity to enable appropriate beneficial land use and water based activities to be undertaken

- To protect areas of identified local and regional habitat value in particular remnant River Red Gum species
- To encourage the retention, restoration and revegetation of a continuous corridor of indigenous vegetation along the Darebin Creek valley in order to provide for the movement of wildlife, to enhance water quality and to contribute to the natural aesthetic of the creek
- To coordinate and improve facilities on the river, its banks and environs to enable full enjoyment of the area by the public, whilst protecting the quality of the streamside environment
- To provide a linear open space link including the provision of a shared use path along one side of the waterway corridor
- To preserve the natural aesthetic and precent deterioration of the waterway and environs
- To coordinate development along the waterway, its bank and environs
- To protect areas and features of sensitivity for Aboriginal Heritage, and
- To encourage development consistent with any concept plan for the area.

A permit is required to construct a building or carry out works under this Overlay, inclusive of a fence and road works and associated street furniture. A permit is also required to remove, destroy or lop vegetation including dead and dying trees.

Relevance to proposal

There will be some impact to native vegetation to accommodate the establishment of the Alphington Link, it is largely however limited to relatively small areas of low-quality native vegetation and the removal of trees that are unlikely to cause significant changes to the value and significance to habitat that is present. Further information regarding the removal of this native vegetation is detailed on Section 4 and Section 6.

It is also noted here that one of the objectives of this overlay is to *"provide a linear open space link including the provision of a shared use path along one side of the waterway corridor"*. The proposed Alphington link will in effect form part of this shared path to be located on the southern side of the Darebin Creek at this location.

5.4.3.2 Significant Landscape Overlay – Schedule 1

Significant Landscape Overlay – Schedule 1 *Yarra (Birrarung) River Corridor Environs* covers remaining areas of the Study Area not covered by ESO3 outlined above. This includes areas close to the Golf Course clubhouse and incorporating area where Tree 10, Tree 11, Tree 12 and Tree 13 occur although the trunk of Tree 13 may be on the boundary of this overlay. This overlay recognises that the Yarra River has metropolitan significance as an environmental, aesthetic, cultural, recreation and tourism asset and that the river corridor links parklands and reserves into a near-continuous vegetated landscape experience that provides a highly valued, secluded natural environment, enjoyed by local and metropolitan communities.

The landscape character objectives of this overlay are:

- To retain vegetation that contributes to landscape character, heritage values or neighbourhood character.

- To maintain and protect linear public open space and provide for secluded areas of public open space with access to the river where appropriate.
- To encourage the co-location or clustering of buildings, jetties and mooring facilities on public land.
- To encourage bicycle and shared paths that are safe, well located and require minimal earthworks and vegetation removal.
- To ensure fencing within close proximity to the Yarra River is low in scale, visually permeable and does not contrast with the natural landscape character

A permit is required to remove, destroy or lop vegetation under this overlay and to construct or carry out works unless exemptions apply.

Relevance to proposal

Attempts have been made to retain vegetation in the context of establishing the Alphington link such that only selected trees will be removed though directed impacts or affected through tree protection zone encroachment. The ground storey vegetation to be removed is of relatively low quality and originally derived from planted specimens most likely. As the exemptions from a need to remove, destroy or lop vegetation largely apply to non-native species, including particularly trees, a permit is likely required for the removal of native vegetation under this overlay. Further information regarding the removal of this native vegetation is detailed on Section 4 and Section 6.

Note that similar to ESO3, while this overlay aims to retain vegetation that contributes to landscape and neighbourhood character, it also aims to "*encourage bicycle and shared paths that are safe, well located and require minimal earthworks and vegetation removal*". The proposed Alphington link has been designed in a manner to be between the trees present within the Study Area as far as practicable to ensure as many tree as possible are retained. While some ground storey vegetation will be removed, as above, this is of relatively low-quality.

5.4.3.3 Design and Development Overlay – Schedule 1-A

Design and Development Overlay – Schedule 1-A (DDO1-A, partial coverage) covers the majority of the Study Area. The objectives of this overlay are:

- To ensure new buildings, tennis courts, swimming pools and other structures are appropriately set back from the banks of the Yarra River and adjacent public open space.
- To ensure buildings are presented at a variety of heights, avoid visual bulk, are stepped back from the frontage of the Yarra River and adjacent public open space and use colours and finishes which do not contrast with the natural landscape setting
- To avoid additional light spill and overshadowing from buildings on the banks and water of the Yarra River, its adjacent public open space, pedestrian and bicycle paths
- To ensure sufficient space is provided between buildings to maintain views to the Yarra River and allow for the planting and growth of vegetation, including large canopy trees

- To minimise impervious surfaces to allow for the filtration of water and retention and establishment of vegetation and canopy trees.

Relevance to proposal

Permit requirements specifically in relation to DDO1–A refer to fencing and the construction of swimming pools and tennis courts associated with a dwelling, although Clause 43.02 states that a permit is required to construct or carry out works only where a schedule specifically states a permit is not required. While the provisions of this overlay relate to the Yarra River, should a permit under DDO1–A be required, application requirements under DDO1–A include but are not limited to a landscaping plan. It is understood that a landscaping plan in relation to the Alphington link is being prepared by the DoT.

5.4.3.4 Land Subject to Inundation Overlay

A Land Subject to Inundation Overlay (LSIO) covers the majority of the Study Area. The purpose of this overlay is to:

- To implement the Municipal Planning Strategy and the Planning Policy Framework.
- To identify flood prone land in a riverine or coastal area affected by the 1 in 100 (1 per cent Annual Exceedance Probability) year flood or any other area determined by the floodplain management authority.
- To ensure that development maintains the free passage and temporary storage of floodwaters, minimises flood damage, responds to the flood hazard and local drainage conditions and will not cause any significant rise in flood level or flow velocity.
- To minimise the potential flood risk to life, health and safety associated with development.
- To reflect a declaration under Division 4 of Part 10 of the *Water Act, 1989*.
- To protect water quality and waterways as natural resources by managing urban stormwater, protecting water supply catchment areas, and managing saline discharges to minimise the risks to the environmental quality of water and groundwater.
- To ensure that development maintains or improves river, marine, coastal and wetland health, waterway protection and floodplain health.

A permit is required to construct a building or to construct or carry out works, including *bicycle pathways and trails*.

Relevance to proposal

There are no specific applications requirements for an application under the schedule to LSIO. Before deciding on an application however the responsible authority must consider a range of items including "*The effect of the development on river, marine and coastal health values including wetlands, natural habitat, stream stability, erosion, environmental flows, water quality, estuaries and sites of scientific significance*."

This Report aims to document the natural habitat within the Study Area and highlight the significance of the habitat that is present; other items regarding the effects of potential erosion and water quality issues are outside of the scope of this Report although are expected to be ameliorated through the adoption of control measures implemented during construction of the proposed Alphington link and associated infrastructure.

5.4.3.5 Public Acquisition Overlay – Schedule 2

Public Acquisition Overlay – Schedule 2 refers to the "creation of a continuous linear park/trail system adjacent to waterways" and has partial coverage over the Study Area particularly in the area north of the Golf Course club rooms. This purpose of this overlay is:

- To implement the Municipal Planning Strategy and the Planning Policy Framework
- To identify land which is proposed to be acquired by a Minister, public authority or municipal council
- To reserve land for a public purpose and to ensure that changes to the use or development of the land do not prejudice the purpose for which the land is to be acquired
- To designate a Minister, public authority or municipal council as an acquiring authority for land reserved for a public purpose.

A permit is required to remove, destroy or lop any vegetation under this overlay unless exemptions apply. The vegetation for which a permit is not required includes:

- vegetation has been planted for pasture, timber production or any other crop
- any action which is necessary to keep the whole or any part of a tree clear of an electric line provided the action is carried out in accordance with a code of practice prepared under Section 86 of the Electricity Safety Act 1998
- If the vegetation presents an immediate risk of personal injury or damage to property.

Relevance to proposal

Unless permit requirements do not apply in relation to the establishment of the Alphington link, given that the purpose of this overlay is to provide land for the establishment of a trail system adjacent to a waterway, a permit will likely be required under this overlay for the removal of the vegetation that is present.

5.4.4 Clause 52.17

Under Clause 52.17 a permit is required to remove, destroy or lop native vegetation on sites greater than 0.4 hectares. Clause 52.17 requires a planning permit for the removal of native vegetation (exemptions apply). The purpose of the clause (amongst others) is to minimise impacts on Victoria's biodiversity from the removal of native vegetation and to manage native vegetation to minimise land and water degradation.

Application requirements and decision guidelines are listed within the Clause. Applications may fall into a Basic, Intermediate or Detailed risk pathway depending on the location and extent of vegetation removed. The application requirements and decisions depend on the relevant risk pathway.

Referral to DELWP under Clause 66.02 may be required for an application to remove native vegetation; e.g. if clearing is greater than 0.5 ha or the application follows the detailed pathway.

For the Alphington link project, a planning permit is required for the removal of Native Vegetation under this Clause. This Report, and in particular, Section 6, seeks to respond to this Clause.

5.5 *Wildlife Act 1975 and Wildlife Regulations 2013*

The *Wildlife Act 1975* provides for the protection and conservation of native wildlife (fauna) within Victoria. It also provides the basis for the majority of wildlife permit/licensing requirements within the state. Under the Act a person must not hunt, take or destroy endangered, notable or protected wildlife; this includes all native vertebrate animals, all kinds of deer, non-indigenous quail, pheasants, and partridges, and all terrestrial invertebrate animals listed under the *Flora and Fauna Guarantee Act 2019.*

The *Wildlife Regulations 2013* provide further detail relating to the act, including that a person not to damage, disturb or destroy any wildlife habitat (s42), although this does not apply if the person is authorised to do so under any other Act such as the *Planning and Environment Act 1987.*

Relevance to proposal

It is unlikely a separate permit is required under this Act as damage should only be to wildlife habitat and not wildlife. However, if any wildlife is located within the habitat proposed for clearing, which is possible as there were hollows observed on site, salvage and translocation of such wildlife may be required as part of the planning permit. This should also ensure wildlife is not damaged during construction works.

5.6 *Catchment and Land Protection Act 1994*

The *Catchment and Land Protection Act 1994* (CaLP Act) intends to manage land degradation including detrimental environmental or economic impacts of declared noxious weeds and pest animals.

Under section 20 of the (Catchment and Land Protection Act 1994) CaLP Act, all land owners, including the Crown, public authorities and licensees of Crown lands, must, in relation to their land, take all reasonable steps to:

- avoid causing or contributing to land degradation which causes or may cause damage to land of another land owner;
- eradicate regionally prohibited weeds;
- prevent the growth and spread of regionally controlled weeds on their land;
- prevent the spread of, and as far as possible, eradicate established pest animals.

These are also provisions within the Act to prevent the spread of declared noxious weeds, through regulating the purchase, sale, possession for the purposes of sale, display, propagation or transport of these species into or within Victoria. Furthermore, under the Act it is prohibited to bring into Victoria, keep, sell or release declared pest animals without an authority (permit).

Declared noxious weeds are categorised into four groups depending on their known and potential impact and specific circumstances for each region. These categories are:

State Prohibited Weeds (S) are either currently absent in Victoria or are restricted enough to be eradicated. The Victorian Government is responsible for their control.

- Regionally Prohibited Weeds (P) in the Port Phillip Catchment Management Authority (CMA) area these weeds are not necessarily widespread but have the potential to become widespread. It is expected that weeds that meet this criteria can be eradicated from the region. For weeds considered to be Regionally Prohibited it is the responsibility of the land owner to control these weeds on their land but not on adjacent roadside reserves.

- Regionally Controlled Weeds (C) are usually widespread but it is important to prevent further spread. It is the responsibility of the landowner to control these weeds on their property and on adjacent roadside reserves.

- Restricted Weeds (R) include plants that pose unacceptable risk of spreading in the State or other Australian states and are considered to be a serious threat to primary production, Crown land, the environment and/or community health if they were traded in Victoria. Trade in these weeds and there propagules, either as plants, seeds or contaminants in other material is prohibited.

Relevance to proposal

There was one weed declared noxious under the *Catchment and Land Protection (CaLP) Act 1994* within the Study Area – Soursob – although others are likely to occur particularly during construction and associated soil disturbance. Hygiene procedures listed in a Construction Environmental Management Plan (CEMP) are recommended during construction.

6. NATIVE VEGETATION IMPACT ASSESSMENT

This section addresses the proposed native vegetation impacts associated with this permit application. A permit is required to remove native vegetation on the site as outlined in the Native Vegetation Clause 52.17 of the planning scheme and detailed in the *Guidelines for the removal, destruction and lopping of native vegetation* (DELWP 2017a).

The purpose of clause 52.17 and 'the Guidelines' is to ensure a no net loss to biodiversity as a result of removal or loss of native vegetation. This is achieved in three steps:

1. Avoid the removal, destruction or lopping of native vegetation
2. Minimise impacts from the removal where native vegetation cannot be avoided and,
3. Provide an offset to compensate for the biodiversity impact if a permit is granted

6.1 Assessment Pathway

An application to remove, destroy or lop native vegetation must be classified as one of the following assessment pathways:

- basic
- intermediate
- detailed

The application requirements and decision guidelines in Clause 52.17 must be applied in accordance with the relevant assessment pathway.

To determine the assessment pathway, two factors are considered in relation to the native vegetation proposed to be removed:

- the location category (shown in the location map as location 1, 2 or 3)
- the extent of proposed native vegetation removal

Table 11. Determining the Assessment Pathway

Extent of native vegetation	Location Category		
	Location 1	Location 2	Location 3
Less than 0.5 ha and not including any Large Trees	Basic	Intermediate	Detailed
Less than 0.5 ha and including one or more Large Trees	Intermediate	Intermediate	Detailed
0.5 ha or more	Detailed	Detailed	Detailed

Adapted from Table 3, *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017a)

6.1.1 Location category

The location category has been determined for all of Victoria. Native vegetation will be in either Location 1, 2 or 3 as outlined below

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

The vegetation to be removed is in Location 1 and Location 2. Figure 7 below shows the location category.

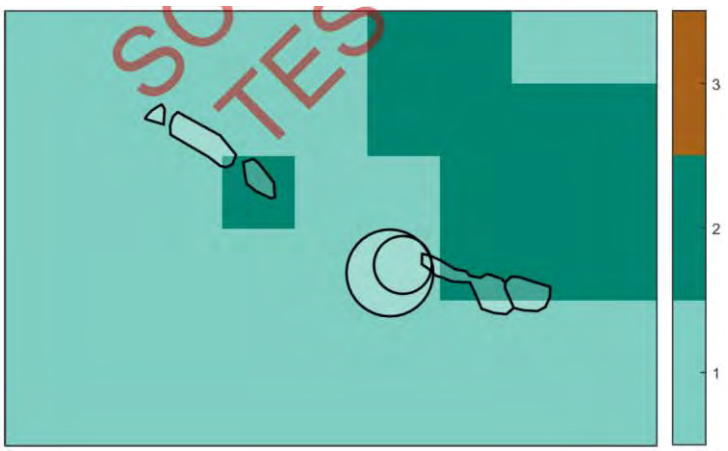


Figure 7. Location category for vegetation to be removed

6.1.2 Extent of impact from proposed development

As outlined in 'The Guidelines', an application must consider:

- the proposal and all buildings and works that could impact on existing native vegetation, including mapped wetlands.
- consider any ancillary uses, utilities, access and earthworks associated with the use or development and any defendable space requirements.
- the full extent of native vegetation removal must be considered.
- assumed losses account for indirect loss of native vegetation for example, encroachment into tree protection zones, loss from changed water flows and shading.

A construction buffer has been applied to the proposed Alphington Link inclusive of the proposed bridge from Farm Road to just west of the existing golf practice nets, along with the realignment of the existing golf access track between the Latrobe Golf Course driving range and clubhouse/carparks and the installation of retaining walls.

The construction buffer applied in order to determine native vegetation impacts was 10m, noting that it is not anticipated that works and construction will occur to the north of the existing Darebin Trail the Alphington Link seeks to connect to.

Further detail on anticipated impacts is provided in Section 4 above. This includes detail on the proposed outcome for individual trees form the development proposal which has been determined in line with Barrett (2021) as identified in Section 4.1.1and Table 9.

As discussed above in Section 4, a "a site construction zone" will also be established as part of the Alphington Link project to facilitate construction. This "site construction zone" along with the proposed temporary access track to be established within its confines, is not expected to have impacts on native vegetation beyond those considered in the 10m construction buffer applied to proposed infrastructure as discussed above.

Details of the loss of native vegetation from the Study Area from Habitat Zone 1a, Habitat Zone 1b, Habitat Zone 1c, Habitat Zone 2 and Habitat Zone 3 is provided in Table 12; Scattered Trees to be removed or deemed lost is provided in Table 13. All losses are visually presented on Map 3.

Table 12. Areas of Habitat Zones impacted by development

Habitat Zone	EVC	Score	Area (ha) lost	Comments
HZ1a	EVC 55_61: Plains Grassy Woodland	0.15	0.003	Ground storey vegetation present across these Habitat Zones will be directly lost to accommodate the Alphington link and associated infrastructure inclusive of a construction buffer and temporary access works.
HZ1b	EVC 55_61: Plains Grassy Woodland	0.15	0.020	
HZ1c	EVC 55_61: Plains Grassy Woodland	0.15	0.009	
HZ2	EVC 56: Floodplain Riparian Woodland	0.23	0.022	Ground storey will be removed as above, along with Tree 12 which is a small canopy tree
HZ3	EVC 56: Floodplain Riparian Woodland	0.32	0.014	Losses of ground storey vegetation from this Habitat Zone are based on a worst case scenario basis; this vegetation occurs to the north of the existing access track and should not be affected but has been included in current losses; Tree 13 – a Large tree within this Habitat Zone – is proposed for retention.

Table 13. Scattered Trees to be removed or deemed lost

Tree ID	Common name	Scientific name	DBH (cm)	Size	Tree to be removed/ deemed lost
10	River Red Gum	*Eucalyptus camaldulensis*	92	Large Tree	Deemed lost
11	River Red Gum	*Eucalyptus camaldulensis*	51	Small Tree	To be removed

6.2 Assessment pathway

The proposed clearing within the site follows the Intermediate assessment pathway.

Table 14 presents the application requirements to remove native vegetation under Clause 52.17 as provided in *the Guidelines for the removal, destruction and lopping of native vegetation* (DELWP 2017a) and details whether these have been met.

Table 14. Application requirements for applications for a permit to remove native vegetation

No.	Application requirements	Assessment Pathway	Provided/response
		Basic and Intermediate	
1	Information about the native vegetation to be removed, including: • the assessment pathway and reason for the assessment pathway. This includes the location category of the native vegetation to be removed • a description of the native vegetation to be removed • maps showing the native vegetation and property in context • the offset requirement, determined that will apply if the native vegetation is approved to be removed.	Native Vegetation Removal (NVR) Report And Section 6.1.2	Yes ☒ No ☐ N/a ☐
2	Topographic and land information relating to the native vegetation to be removed, showing ridges, crests and hilltops, wetlands and waterways, slopes of more than 20 percent, drainage lines, low lying areas, saline discharge areas, and areas of existing erosion, as appropriate.	Shown in Map 1-3	Yes ☒ No ☐ N/a ☐
3	Recent photographs (dated) of the native vegetation to be removed.	Section 4	Yes ☒ No ☐ N/a ☐
4	Details of any other native vegetation approved to be removed, or that was removed without the required approvals, on the same property or on contiguous land in the same ownership as the applicant, in the five year period before the application for a permit is lodged.	Discussion with DELWP in April 2021 indicated past removal associated with Darebin Trail would be deemed separate to current removal	Yes ☐ No ☐ N/a ☒
5	An avoid and minimise statement. The statement describes any efforts to avoid the removal of, and minimise the impacts on the biodiversity and other values of native vegetation, and how these efforts focussed on areas of native vegetation that have the most value.	Section 6.3	Yes ☒ No ☐ N/a ☐
6	A copy of any property vegetation plan that applies to the site.	N/A	Yes ☐ No ☐ N/a ☒
7	Where the removal of native vegetation is to create defendable space, a written statement explaining why the removal of native vegetation is necessary. This is not required when the creation of defendable space is in conjunction with an application under the Bushfire Management Overlay.	N/A	Yes ☐ No ☐ N/a ☒

No.	Application requirements	Assessment Pathway	Provided/response
		Basic and Intermediate	
8	If the application is under Clause 52.16, a statement that explains how the proposal responds to the Native Vegetation Precinct Plan	N/A	Yes ☐ No ☐ N/a ☒
9	An offset statement explaining that an offset that meets the offset requirements for the native vegetation to be removed has been identified and how it will be secured.	Section 6.5	Yes ☒ No ☐ N/a ☐

6.3 Avoid and Minimising impacts to biodiversity

Table 15 details the steps that have been applied to avoid and minimise biodiversity impacts of the proposed development.

Table 15. Steps taken to avoid and minimise biodiversity impacts

Steps taken to avoid and minimise biodiversity impacts
• Detailed advice obtained from Arborist with recommendations for tree retention • Includes provisions to avoid impact to Large Tree within Habitat Zone 3 and retain habitat connectivity and canopy connection with within the broader habitat corridor • Minimises impact by locating proposed infrastructure between existing trees to minimise impacts as far as practicable • Utilises existing infrastructure and incorporates into design to minimise impacts • Ensures that "site construction zone" inclusive of temporary access track and site compound are predominantly located in areas where native vegetation does not occur

6.4 Native vegetation removal requirements

The Native Vegetation Removal report has been prepared for this project. A summary of the report is given in Table 16 and the full report is provide in Appendix 4.

Table 16. Summary of native vegetation to be removed

Summary Item	Result
Assessment pathway	Intermediate
Total extent	0.136 ha
No. Large trees proposed to be removed	1 tree
Location category	2

Offset targets

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

Table 17. Offsets required if a permit is granted

Offset type	Offset requirements	
	Offset amount	Offset attributes
General	0.026 general habitat units	• Offset must be within Port Phillip and Westernport Catchment Management Authority CMA or Yarra City Council • Offset must have a minimum strategic biodiversity value of 0.208 • 1 large tree

6.5 Offset Strategy

All applications that require a permit to remove native vegetation must include an offset strategy as a part of the application.

Offsets can be either:

- First party – located on land owned by the landholder who is proposing to remove the native vegetation
- Third party – located on land owned by a third party

The offsets that are required to account for vegetation loss on site are to be achieved by creating third party offsets off-site. The required offsets are available from multiple brokers and an offset report is provided in Appendix 5

7. RECOMMENDATIONS

7.1 Fauna

Effort should be made to ensure any wildlife located within any area proposed for clearing is carefully salvaged and relocated from the works areas. This should ensure minimal impacts to wildlife during the works.

Prior to the removal of larger trees, including Tree 10, Tree 11 and Tree 12 in particular, it is recommended that a zoologist inspects these trees for the presence of fauna. If there is potential hollows then a zoologist should be onsite during removal to undertake fauna salvage.

7.2 Native Vegetation

Native vegetation has been identified and mapped across the site. The works area should be clearly flagged out to avoid impacts to adjacent areas of native vegetation that are outside of the proposed "occupation area".

7.3 Weeds and Pathogens

To minimise the risk of introducing weeds onto the site, machinery should be cleaned prior to use and all effort should be made to ensure any materials utilised on the site is clean and free of weed seeds and pathogens.

7.4 Management of Construction site

The construction site should be clearly marked and managed so that only areas permitted to be disturbed are impacted. This will include keeping construction works to the areas identified as works zone, access, vehicle movement and storage of materials.

To ensure the flora and fauna values identified on site are managed appropriately:

- construction works to be confined to designated 'Go-Zones', where construction activities and access will take place;
- temporary fencing, to be installed around the 'Go-Zones' to limit the movement of vehicles and machinery; where there is the potential for subsurface harm to root zones the use of above ground footings should be considered
- erosion and sediment control measures to be implemented, including;
    - drainage management and soil stabilisation measures;
    - protocols around management and location of stockpiles, along with restrictions on vehicle movement through fencing;
    - sediment barriers to be erected where necessary to prevent sediment laden runoff

- waste management and chemical management to be undertaken to reduce risk of contamination of areas containing flora and fauna values;
- areas of native vegetation that may be excavated should have the soil managed appropriately to ensure that the seed bank is utilised in remediation.

8. REFERENCES

Savona M (2015) *Vegetation and Habitat Impact Assessment Darebin Yarra Trail Link*. Practical Ecology Pty Ltd, Preston.

Hamer A (2018) *Flora and Fauna Assessment and Native Vegetation Impact Assessment Alphington Link to the Darebin Trail, Alphington*. Practical Ecology Pty Ltd, Preston.

Barrett E (2021) *Arboricultural Impact Assessment for Department of Transport – Assessment of trees at Latrobe Golf Club, Alphington – Version Dated 8 December 2021*. Homewood Consulting, Thomastown.

DELWP (2021a) *NatureKit*. Department of Environment, Land, Water and Planning, Government of Victoria. Accessed via: http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit

DELWP (2021c) *Characteristics of Threatened Communities – Flora and Fauna Guarantee Act 1988*. Accessed via: https://www.environment.vic.gov.au/__data/assets/pdf_file/0018/50418/04072019-Flora-and-Fauna-Guarantee-Characteristics-of-Threatened-Communities-3.pdf

DoE (2013) *Matters of National Environmental Significance. Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999*. Commonwealth of Australia, Department of the Environment, Australian Capital Territory.

DELWP (2017a) *Guidelines for the removal, destruction and lopping of native vegetation*. Department of Environment, Land, Water and Planning, Government of Victoria, Melbourne.

DELWP (2017b) *Assessor's Handbook – Applications to remove, destroy or lop native vegetation*. Department of Environment, Land, Water and Planning, Government of Victoria, Melbourne.

DELWP (2021b) *Ecological Vegetation Class (EVC) Benchmarks*. Department of Environment, Land, Water and Planning, Government of Victoria. Accessed via: https://www.environment.vic.gov.au/biodiversity/bioregions-and-evc-benchmarks

DELWP (2021e) *Victorian Biodiversity Atlas Taxa List*. Dataset version date 14/02/2020 ed. Department of Environment, Land, Water and Planning, Government of Victoria.

DELWP (2021d) *Victorian Biodiversity Atlas*. Department of Environment, Land, Water and Planning, Government of Victoria. Accessed via: https://vba.dse.vic.gov.au

DSE (2004) Veget*ation Quality Assessment Manual – Guidelines for applying the habitat hectares scoring method, Version 1.3*. Department of Sustainability and Environment, East Melbourne, Victoria.

Victorian Water Industry Association Inc (2015) *Catchment Management Authorities*. Accessed via: https://vicwater.org.au/victorian-water-sector/catchment-management-authorities

Appendix 1. Flora recorded at Study Area

The following table provides a list of flora recorded in the Study Area during fieldwork.

Conservation status under EPBC Act 1999:
EX: Extinct, CR: Critically endangered, EN: Endangered, VU: Vulnerable and CD: Conservation dependant

FFG Act 1998 (2020 status)
Cd: Conservation dependant, Cr: Critically endangered, En: Endangered, Ex: Extinct, Th: Threatened, Vu: Vulnerable
En(ExV): Endangered (extinct in Vic)

Origin
*: exotic species; #: Victorian native species extended beyond natural range; Empty: Indigenous species

Family	Origin	Scientific Name	Common Name	EPBC	FFG
MONOCOTYLEDONS					
Poaceae	*	*Bromus catharticus*	Prairie Grass		
Poaceae	*	*Cenchrus clandestinus*	Kikuyu		
Poaceae	*	*Cynodon spp.*	Couch		
Poaceae	*	*Dactylis glomerata*	Cocksfoot		
Hemerocallidaceae		*Dianella admixta*	Black-anther Flax-lily		
Hemerocallidaceae		*Dianella spp.*	Flax Lily		
Poaceae	*	*Ehrharta erecta*	Panic Veldt-grass		
Poaceae	*	*Ehrharta longiflora*	Annual Veldt-grass		
Juncaceae		*Juncus spp.*	Rush		
Xanthorrhoeaceae		*Lomandra longifolia*	Spiny-headed Mat-rush		
Arecaceae	*	*Phoenix canariensis*	Canary Island Date-palm		
Poaceae	*	*Piptatherum miliaceum*	Rice Millet		
Poaceae	*	*Poa annua s.l.*	Annual Meadow-grass		
Poaceae		*Poa labillardierei*	Common Tussock-grass		
DICOTYLEDONS					
Mimosaceae		*Acacia melanoxylon*	Blackwood		
Rosaceae		*Acaena novae-zelandiae*	Bidgee-widgee		
Apocynaceae	*	*Araujia sericifera*	White Bladder-flower		
Asteraceae	*	*Arctotheca calendula*	Cape Weed		
Brassicaceae	*	*Brassica spp.*	Turnip		
Rutaceae		*Correa spp.*	Correa		
Myrtaceae	*	*Corymbia citriodora subsp. citriodora*	Lemon-scented Gum		
Myrtaceae	#	*Corymbia maculata*	Spotted Gum		Vu
Sapindaceae	#	*Dodonaea viscosa*	Sticky Hop-bush		
Chenopodiaceae		*Einadia nutans*	Nodding Saltbush		
Asteraceae	*	*Erigeron bonariensis*	Flaxleaf Fleabane		
Myrtaceae	#	*Eucalyptus botryoides*	Southern Mahogany		
Myrtaceae		*Eucalyptus camaldulensis*	River Red-gum		
Euphorbiaceae	*	*Euphorbia peplus*	Petty Spurge		
Fumariaceae	*	*Fumaria bastardii*	Bastard's Fumitory		
Aizoaceae	*	*Galenia pubescens var. pubescens*	Galenia		
Goodeniaceae		*Goodenia ovata*	Hop Goodenia		
Brassicaceae	*	*Lepidium campestre*	Field Peppercress		
Malvaceae	*	*Malva parviflora*	Small-flower Mallow		
Myrtaceae	*	*Melaleuca styphelioides*	Prickly Paperbark		
Violaceae		*Melicytus dentatus s.l.*	Tree Violet		
Cactaceae	*	*Opuntia spp.*	Prickly Pear		
Oxalidaceae	*	*Oxalis pes-caprae*	Soursob		

Family	Origin	Scientific Name	Common Name	EPBC	FFG
Polygonaceae	*	*Polygonum arenastrum*	Wireweed		
Polygonaceae	*	*Rumex spp.*	Dock		
Solanaceae	*	*Solanum nigrum s.l.*	Black Nightshade		
Asteraceae	*	*Sonchus oleraceus*	Common Sow-thistle		
Caryophyllaceae	*	*Stellaria media*	Chickweed		
Asteraceae	*	*Taraxacum officinale spp. agg.*	Garden Dandelion		

Appendix 2. Potentially occurring rare or threatened flora species

Conservation status under EPBC Act 1999: EX: Extinct, CR: Critically endangered, EN: Endangered, VU: Vulnerable and CD: Conservation dependant	**FFG Act 1998 (2020 status)** Cd: Conservation dependant, Cr: Critically endangered, En: Endangered, Ex: Extinct, Th: Threatened, Vu: Vulnerable En(ExV): Endangered (extinct in Vic)

Source	EPBC	FFG	Origin	Scientific name	Common name	No. Records	Last record	Habitat and species notes	Likelihood occurrence	Likelihood Reasoning	Likelihood of Potential Impact
VBA			#	*Adiantum capillus-veneris*	Venus-hair Fern	3	1999	Rare in Australia, in Victoria found in three locations; near Cape Shank, outside Bendigo and in the Plenty River Gorge near Greensborough. Often growing on calcareous soils. Possibly a garden escape in Victoria.	Low	Previous records now largely built up; records dated and site highly modified with no suitable habitat.	Negligible
VBA PMST	VU			*Amphibromus fluitans*	River Swamp Wallaby-grass	8	2011	Moist soils, usually confined to permanent swamps, and tolerates inundation. Mainly distributed along Murray River, it is rarer in southern Victoria. Largely restricted in greater Melbourne to seasonal wetlands and mudflats of River Red Gum swamps of the Lower Yarra and Plenty/Merri volcanic plains north of Melbourne (Cam Beardsell pers. comm.)	Low	Records from further north along Yarra Flats park in Bulleen. Study Area largely disturbed and unlikely to support this species.	Negligible
VBA		Vu	#	*Corymbia maculata*	Spotted Gum	8	2019	Native distribution only in Tara Range, south of Buchan, Vic. Otherwise, widely planted in urban environment as an ornamental species.	**Present**	Present on site as planted trees; some natural regeneration on northern side of Farm Road however outside of impact area.	Tree 2 deemed lost due to TPZ encroachment
VBA PMST	EN	Cr		*Dianella amoena*	Matted Flax-lily	1	2002	This plant is known to occur in lowland grasslands, grassy woodlands and grassy wetlands. It ranges from well drained to seasonally wet soils.	Low	Only one record in 5km from further north along Darebin Creek. Study Area disturbed	Negligible

Source	EPBC	FFG	Origin	Scientific name	Common name	No. Records	Last record	Habitat and species notes	Likelihood occurrence	Likelihood Reasoning	Likelihood of Potential Impact
										and unlikely to support this species,	
PMST	EN	Cr		*Diuris fragrantissima*	Sunshine Diuris	-	-	Restricted to the basalt plains immediately to the north and west of Melbourne, growing in native grassland. One of Victoria's most endangered orchids, now confined to a single site where only three plants have been seen in the last 5 years.	Low	Species only known from selected localities in Melbourne; no records within 5km of Study Area.	Negligible
VBA		En	#	*Eucalyptus globulus subsp. globulus*	Southern Blue-gum	1	2014	This subspecies of E. globulus is thought to only occur south of the Strzelecki Ranges, e.g. Port Franklin/Wilsons Promontory, and possibly intergraded spp. in Otway's and elsewhere in S. Gippsland.	Low	Blue Gum recorded within Study Area; Barrett (2021) does not indicate if this sub-species but all specimens likely planted regardless at this location.	Barrett (2021) does not indicate if this sub-species but all specimens likely planted regardless at this location.
VBA		En		*Eucalyptus leucoxylon subsp. connata*	Melbourne Yellow-gum	24	2018	Generally found in well-watered areas with deep soil, or on stony hills	Low	Numerous records within 5km radius with clustering to east of Study Area within Yarra Bend Park; not observed as part of this study or recorded in Barett (2021)	Negligible
VBA		Cr	#	*Eucalyptus leucoxylon subsp. megalocarpa*	Large-fruit Yellow-gum	2	2019	The Victorian occurrence, near Nelson, is the easternmost part of the mainly South Australian coastal distribution, south of Mt Gambier. Flowers spring to summer. The largest-fruited form of the species. It has been widely planted for its pink to red flowers.	Low	Records from north of site along Darebin Creek and Yarra River. Individuals at this location would be planted.	Negligible

Source	EPBC	FFG	Origin	Scientific name	Common name	No. Records	Last record	Habitat and species notes	Likelihood occurrence	Likelihood Reasoning	Likelihood of Potential Impact
VBA		Cr		*Eucalyptus X studleyensis*	Studley Park Gum	15	2006	A naturally occurring hybrid (E. ovata × E. camaldulensis) found in Studley Park/Yarra Bend and along the Yarra Valley.	Low	Numerous records for this species within 5km radius however this study and Barett (2021) did not record this species on site.	Negligible
VBA		En		*Fimbristylis velata*	Veiled Fringe-sedge	3	2011	Occasional on drying mud beside lakes and rivers and in seasonally wet depressions; mostly in northern Victoria, but recent collections in the south from, for example, Bairnsdale and Healesville areas.	Low-Moderate	Could occur along margin of Darebin Creek although this area is largely disturbed, less likely to be in areas proposed for Alphington Link and associated infrastructure.	Negligible
PMST	VU	Vu		*Glycine latrobeana*	Clover Glycine	-	-	Widespread, infrequent populations in southern Victoria. It occurs mainly in grassland and grassy woodland habitats, less often in dry forests, and only rarely in heathland. Populations occur from sea level to c. 1,200 m altitude (900 m in Tasmania). In Victoria, plants grow in a range of soil types including alluvial soils, and those derived from sandstones, mudstones, granite and basalt. Soils are usually clay, but may also have high loam content.	Low	No local records on the VBA and habitat within Study Area highly disturbed.	Negligible
VBA PMST	EN	En		*Lepidium hyssopifolium s.s.*	Basalt Peppercress	1	1978	Grows on basalt plains; rarely reported in western Victoria and only present at two known locations north and north-east of Melbourne; in total seven Victorian locations and now considered extinct in Greater Melbourne.	Low	Only one older record within 5km and habitat within Study Area highly disturbed.	Negligible

Source	EPBC	FFG	Origin	Scientific name	Common name	No. Records	Last record	Habitat and species notes	Likelihood occurrence	Likelihood Reasoning	Likelihood of Potential Impact
VBA		En	#	*Melaleuca armillaris subsp. armillaris*	Giant Honey-myrtle	7	2019	Mostly confined to near-coastal sandy heath, scrub on slightly raised saltmarsh, riparian scrub, foothill outcrops, and rocky coastlines. Mainly distributed (native) east of Marlo, Vic., but regularly naturalizes in areas where planted.	Low	Species not observed within Study Area by this study and Barett (2021); any specimens would be planted.	Negligible
VBA		En		*Nicotiana suaveolens*	Austral Tobacco	12	2017	Widespread, particularly in drier inland areas, often in rocky places.	Low	Numerous records within 5km radius with clustering to east of Study Area within Yarra Bend Park; species not observed and site highly disturbed.	Negligible
PMST	CR	Cr		*Pimelea spinescens subsp. spinescens*	Spiny Rice-flower	-	-	Grows in grassland or open shrubland on basalt derived soils west of Melbourne, but rare.	Low	No local records on the VBA and habitat within Study Area highly disturbed and not generally suitable.	Negligible
PMST	EN	En		*Prasophyllum frenchii*	Maroon Leek-orchid	-	-	Infrequent, widespread populations in south western Victoria. Grasslands heathlands and grassy woodlands on moist well drained soils, including roadsides or rail reserves.	Low	No local records on the VBA and habitat within Study Area highly disturbed and not generally suitable.	Negligible
PMST	VU	En		*Pterostylis chlorogramma*	Green-striped Greenhood	-	-	Apparently localized in Victoria, but exact range uncertain due to confusion with closely allied species. Grows in moist areas of heathy and shrubby forest, on well-drained soils. Flowers Jul.-Sep.	Low	No local records on the VBA and habitat within Study Area highly disturbed and not generally suitable.	Negligible

Source	EPBC	FFG	Origin	Scientific name	Common name	No. Records	Last record	Habitat and species notes	Likelihood occurrence	Likelihood Reasoning	Likelihood of Potential Impact
PMST	VU			*Pterostylis cucullata*	Leafy Greenhood	-	-	Widespread but sporadic across southern Victoria, mostly near the coast, with several occurrences in Montane areas in the east. In coastal locations it grows in scrubs on sand dunes, while in Montane areas it grows in moist foothill and Montane forest on slopes and river flats. Once abundant along the coast but now rare, with many populations lost to development.	Low	No local records on the VBA and habitat within Study Area highly disturbed and not generally suitable.	Negligible
VBA		Vu	#	*Rhagodia parabolica*	Fragrant Saltbush	3	2010	In Victoria confined to few steep rocky slopes and broad ridges between Sunbury and Geelong (e.g. Jacksons creek, Long Forest, Werribee Gorge, Steiglitz, Buckley's Falls on the Barwon River).	Low	Records are located along Merri Creek and within Yarra Bend Park; at these locations and within the Study Area any specimens would most likely be planted.	Negligible
VBA		En		*Senecio campylocarpus*	Floodplain Fireweed	1	2011	Grows in forests and woodlands with loam to clay soils, often where seasonal inundation occurs; distribution in Victoria ranges from central regions along the Murray River, down to Port Welshpool.	Low-Moderate	Record is from Yarra Flats Park north along Yarra River; likelihood within Study Area reduced due to site disturbance and habitat characteristics but could occur. If present not likely to be within area to be used for Alphington Link and associated infrastructure as highly disturbed.	Negligible
PMST	VU	Cr		*Senecio macrocarpus*	Large-headed Fireweed	-	-	Distribution within Victoria largely limited to Themeda grasslands on loamy clay soils derived from basalt, ranging from near	Low	No local records on the VBA and habitat within Study Area highly	Negligible

Source	EPBC	FFG	Origin	Scientific name	Common name	No. Records	Last record	Habitat and species notes	Likelihood occurrence	Likelihood Reasoning	Likelihood of Potential Impact
								Melbourne to Skipton in the west. Also found in auriferous soils near Stawell.		disturbed and not generally suitable.	
PMST	VU			*Senecio psilocarpus*	Swamp Fireweed	-	-	Rare, restricted in Victoria to a few herb-rich winter-wet swamps south and west from Ballarat, growing on Volcanic clays or peaty soils. Flowers Nov-Mar.	Low	No local records on the VBA and habitat within Study Area highly disturbed and not generally suitable.	Negligible
PMST	VU	Cr		*Xerochrysum palustre*	Swamp Everlasting	-	-	Found in the Midlands, Wannon, Volcanic Plains and Gippsland Plains regions and in SA and Tas. Occurs in lowland swamps usually on black cracking clay soils, scattered from near the south Australia border northwest of Portland to Bairnsdale district, but rare due to habitat depletion. Flowers November to March.	Low	No local records on the VBA and habitat within Study Area highly disturbed and not generally suitable.	Negligible

Appendix 3. Potentially occurring rare or threatened fauna species

International Treaty
B: Bonn Convention; C: CAMBA; J: JAMBA; R: ROKAMBA.
EPBC Act 1999 conservation status
EX: Extinct, CR: Critically endangered, EN: Endangered, VU: Vulnerable and CD: Conservation dependant.

FFG Act 1988 (2020 status)
Cd: Conservation dependant, Cr: Critically endangered, En: Endangered, Ex: Extinct, Th: Threatened, Vu: Vulnerable, En(ExV): Endangered (extinct in Vic)

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
PMST	B			*Monarcha melanopsis*	Black-faced Monarch	-	-	Inhabits rainforests, eucalypt woodlands; coastal scrubs; damp gullies in rainforest, eucalypt forest; when migrating more open woodland (Pizzey and Knight 2007). Occurs along the eastern-Australian coast (Simpson and Day 2000/2001).	Low	Habitat on site is largely disturbed; no records on VBA for this species.	Negligible
PMST	B			*Rhipidura rufifrons*	Rufous Fantail	-	-	In Victoria, the Rufous Fantail mainly inhabits the undergrowth of temperate rainforests, and wetter eucalypt forests and gullies, but also occur in paperbark thickets, sub-inland/coastal scrub, along watercourses and within parks/gardens. On migration it is seen at a wide range of locations from farmland to built up streets (Pizzey and Knight 2007).	Low	Species may rarely occur while on passage but would not make significant use of the Study Area; no records on VBA	Negligible

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
PMST	B			*Myiagra cyanoleuca*	Satin Flycatcher	-	-	The Satin Flycatcher migrates to southern parts of Victoria during the spring/summer months. It is generally found in many habitat types including wet sclerophyll and woodland particularly along watercourses (Higgins, Peter and Cowling 2006).	Nil-Low	Habitat for species includes watercourses however there are no records for this species on the VBA in the local area	Negligible
PMST	B R J			*Calidris melanotos*	Pectoral Sandpiper	-	-	Summer migrant (Aug-April) (Pizzey and Knight 2007). Mainly shallow fresh to saline wetlands; usually coastal but are occasionally found inland. Habitat includes coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. Forage in shallow water or soft mud at the edges of wetlands and often close to low fringing or emergent vegetation (Higgins and Davies 1996).	Nil	No suitable habitat present; no records on VBA	Negligible

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
VBA PMST	B R J C			*Gallinago hardwickii*	Latham's Snipe	7	1991	Latham's Snipe is a migratory species. The species migrates to Victoria from breeding grounds in Japan. In Victoria this species is widely distributed in a range of habits including heavily vegetated freshwater swamps, and pools or ditches in heaths or subalpine herblands (Pizzey and Knight 2007). Also occurs in small ephemeral wetlands such as wet depressions after floods recede. Generally roosts in thick vegetation during the day, sometimes under shrubs away from wetlands, and will feed in swamps at night. They are occasionally seen feeding during the day. This species feeds by probing in soft mud and rarely moves far from concealing vegetation (Higgins and Davies 1996).	Low	Species likely occasionally forages within well-vegetated wetland and riparian areas along the Yarra/Darebin Creek River; local records on VBA relatively old.	Unlikely. If present would likely be within undergrowth associated with the Darebin Creek; not likely to occur within area subject to development impacts and mitigation measures will need to be implemented for any indirect impacts such as sediment that could impact on habitat for this species
PMST	B R J C			*Calidris acuminata*	Sharp-tailed Sandpiper	-	-	Tidal mudflats, saltmarshes, mangroves, shallow fresh, brackish or saline inland wetlands, floodwaters, irrigated pastures and crops, sewage ponds, minefields. Breeds Arctic Siberia, migrates to s and se. Asia, widespread summer migrant to coastal and inland Aust and tas (Aug – April), mostly se. Aust, Murray Darling Basin and W. Vic, coastal and inland (Pizzey & Knight 2007).	Nil	No suitable habitat present; no records on VBA	None.

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
PMST	C R J			*Apus pacificus*	Fork-tailed Swift	-	-	The Fork-tailed Swift is a migratory species occurring throughout Australia between October-April. This insectivorous species is almost entirely aerial. Occur over inland plains, often over cliffs or beaches, also over settled areas. Feed aerially, and probably also roost aerially, although rarely seen to land (Higgins 1999; Pizzey and Knight 2007).	Low	Some potential species could forage aerially over trees however no local records for species on VBA.	Negligible
VBA			Cr	*Ardea intermedia plumifera*	Plumed Egret	4	2008	Occurs in the shallows of mainly grassy inland wetlands, flooded pastures or grasslands. They only occasionally visit coastal wetlands and are generally rare in Victoria. They are sometimes seen foraging in pastures with grazing cattle. This species builds platform nests which are built in trees in riverine forest, swamp woodland and mangroves (Pizzey and Knight 2007).	Low	Has potential to occur along Darebin Creek and nearby wetlands, where it has been recorded adjacent to the Study Area; could also forage upon grassed golf driving range when wet. Species is however uncommon in Victoria and would only occur within proximity of the Study Area as a vagrant or while on passage.	Unlikely. Development proposal is not likely to impact on ongoing use of the Study Area by the species were it to occur there; while a minor amount of habitat will be removed this will not have a significant impact on this species or its overall use of the Study Area and surrounds.

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
VBA			Cr	*Falco subniger*	Black Falcon	7	2017	The Black Falcon has a stronghold in inland Australia. Most Victorian records come from the lowlands and only occasionally from the foothills. It occurs mainly over croplands, grasslands and wooded farmlands. To catch flushed prey, they sweep low over croplands and grasslands and are often attracted by smoke from grassfires and late-summer burning off. This species nests in trees in old stick-nests of other birds (Marchant and Higgins 1993; Pizzey and Knight 2007).	Low	Could occasionally hunt over site but unlikely to make significant use.	Unlikely. While species could utilise habitat within the Study Area, at least occasionally, development proposal unlikely to have direct or indirect impact on species use of available habitat.
VBA			Cr	*Ninox connivens*	Barking Owl	2	1990	Occurs in dry woodlands, wooded farmlands and dry forests in the 500-800mm annual rainfall zone and extend into semi-arid areas in River Red Gum forests along the Murray River. Hollow dependent species (Higgins 1999; Pizzey and Knight 2007).	Low	May occasionally hunt over site; recorded in 1990 in close proximity to Study Area on north side of Darebin Creek near Naper Waller Reserve	Unlikely. While species could utilise habitat within the Study Area, at least occasionally, development proposal unlikely to have direct or indirect impact on species use of available habitat.

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
VBA			Cr	*Lophochroa leadbeateri*	Major Mitchell's Cockatoo	5	2008	Occurs in arid to semi-arid interior Aust. Widespread but much less abundant than other white Cockatoos, and are usually sedentary or locally nomadic. Nests can be on decayed debris, bark fragments, pebbles, or in tree hollows. Prefer areas near water on timbered watercourses, surrounding grasslands, gibber, saltbush, mulga and other acacias, as well as stands of native cypress and casuarina; or larger mallee eucalypts with suitable nest hollows: mallee associated with riverine woodlands e.g. of black box, coolabahs and river red gums.	Nil	VBA indicates records were escaped bird; unlikely to occur naturally at Study Area	Negligible
VBA PMST		CR	Cr	*Anthochaera phrygia*	Regent Honeyeater	6	2018	Occurs mainly in box-ironbark forests and woodlands north of the Great Divide. There are historical and recent isolated records from drier parts of south-eastern Victoria. Highly nomadic, their movements are determined by the flowering of eucalypts (DSE 2003a).	Low	No preferred Eucalyptus feed trees present within Study Area. Species considered to be extinct south of the Great Dividing Range	Negligible

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
VBA PMST		CR	Cr	*Lathamus discolor*	Swift Parrot	16	2018	The Swift Parrot is a winter migrant to Victoria (Swift Parrot Recovery Team 2001). Arriving from their breeding areas in Tasmania, however small numbers of non-breeding birds may remain here during summer (Higgins 1999; Swift Parrot Recovery Team 2001). They are nomadic, and follow the flowering of trees and psyllid infestations. In Victoria their distribution is centred on box-ironbark forests, but they are often seen in town parks and occur sporadically elsewhere in dry forests, dry woodlands and wooded farmlands but are seldom seen in treeless areas, rainforests or wet forests (Higgins 1999; Pizzey and Knight 2007). Feed mainly in winter-flowering plants, especially Red Ironbarks and ornamental trees and shrubs (Higgins 1999; Swift Parrot Recovery Team 2001).	Moderate	There is some potential that the species could visit the Study Area, occasionally foraging on Eucalypts including River Red Gums on passage between northern Victoria and Tasmania. Species is unlikely, however, to make significant use of the Study Area and would only be used on passage when during migration between Tasmania and the mainland.	Tree 4, 10, 11 and 12 are all River Red Gum Trees to be removed that could present occasional foraging habitat for the Swift Parrot during migration between northern Victoria and Tasmania. A review against the *Matters of National Environmental Significance – Significant Impact Guidelines* (DoE 2013) does not indicate that the removal of these trees would however be deemed a significant impact on this species. The likelihood of a significant impact on this EPBC Act listed species is therefore considered low.

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
PMST		CR	Cr	*Pedionomus torquatus*	Plains-wanderer	-	-	Main distribution is within the Riverina of NSW, patchy elsewhere, and only occurring in small numbers in northern Victoria. Inhabits open grasslands with preference towards Danthonia and Stipa species. However, vegetation structure is more important than floristic composition. Does not occur in dense grasslands and woodlands (Marchant and Higgins 1993; Pizzey and Knight 2007).	Nil	No suitable habitat present. Species is unlikely to occur within Study Area, as well outside the normal distribution range; no records on VBA	None
VBA PMST		EN	Cr	*Botaurus poiciloptilus*	Australasian Bittern	2	2007	This species is part nocturnal and forages over water in dense cover, sometimes from platforms in wetland vegetation. Habitat is usually tall reedbeds, sedges, rushes, cumbungi or lignum. Also occurs on rice fields, drains in tussocky paddocks and occasionally on saltmarshes and brackish wetlands. Nests are shallow saucers on trampled water plants (Pizzey and Knight 2007).	Low	No suitable habitat present including dense aquatic emergent/fringing vegetation; if present would be within confines of creek	Negligible
VBA		EN	Cr	*Craterocephalus fluviatilis*	Murray Hardyhead	2	1989	Endemic to inland parts of south-eastern Australia. The fish is an omnivore, feeding on small crustaceans, aquatic insects and algae. Inhabits lakes and billabongs, most frequently around aquatic plant thickets.	Nil	While older records on VBA, Study Area is outside species range,	Negligible

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
PMST		EN	Cr	*Paralucia pyrodiscus lucida*	Eltham Copper	-	-	This subspecies of the Dull Copper P. pyrodiscus is endemic to Victoria, with a very sparse, scattered distribution north (Eltham–Greensborough), and north–west of Melbourne (Wimmera and Castlemaine regions). In the Eltham area, it has an obligatory relationship with Notoncus spp. ants and the dwarfed form of Sweet Bursaria Bursaria spinosa. These discrete populations are found within sparse, dry woodland on well–drained gentle slopes with north to west aspects, particularly with Red Stringybark Eucalyptus macrorhyncha, Red Box E. polyanthemos, Long–leaved Box E. goniocalyx, and Late Black Wattle Acacia mearnsii and an understorey including Cherry Ballart Exocarpos cupressiformis, Hedge Wattle A. paradoxa, Drooping Cassinia Cassinia arcuata Shiny Cassinia C. longifolia, and Sweet Bursaria, and a groundcover including Small–leaf Clematis Clematis microphylla, Purple Coral–pea Hardenbergia violacea, and Common Flat–pea Platylobium obtusangulum amongst native grasses, mosses and leaf litter (DSE 2003e).	Nil	Species is unlikely to occur within Study Area due to highly specific habitat requirements (presence of dwarf form of *Bursaria spinosa* and specific attendant ant species) and location of known populations being too far away – the species has limited mobility across the wider landscape; no records on VBA	None

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
PMST		VU	Cr	*Sternula nereis*	Fairy Tern	-	-	Mostly sheltered coastal embayments, including harbours, lagoons, inlets, bays, estuaries and on ocean beaches. Also fresh or saline near-coastal terrestrial wetlands, including lakes and salt-ponds. Nests above high-water mark on sheltered beaches, spits, bars, banks and ridges, usually of sand but also of shell-grit or coral; either on mainland or on inshore islands (Higgins and Davies 1996).	Nil	No suitable habitat present. Species is unlikely to occur within Study Area due to habitat preferance; no records on VBA	None
PMST	B R J C	CR	Cr	*Calidris ferruginea*	Curlew Sandpiper	-	-	Summer migrants to Victoria from Arctic breeding grounds (Aug-April). This species is found in a range of wetland habitats; tidal mudflats, saltmarsh, saltfields, fresh to saline wetlands, both coastal (most) and inland. Also visits sewage ponds (Pizzey & Knight 2007).	Nil	No suitable habitat present. Species is unlikely to occur within Study Area due to habitat preference; no records on VBA	None
PMST	B R J C	CR	Cr	*Numenius madagascariensis*	Eastern Curlew	-	-	Common summer migrant to Australia (Aug-May) (Pizzey and Knight 2007). Sheltered coasts, especially estuaries, embayments, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats. Mainly forages on soft sheltered intertidal sandflats or mudflats, open and without vegetation; also on saltflats and in saltmarsh (Higgins and Davies 1996).	Nil	No suitable habitat present. Species is unlikely to occur within Study Area due to habitat preference; no records on VBA	Negligible

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
VBA PMST	C	EN	Cr	*Rostratula australis*	Australian Painted Snipe	1	1970	Generally uncommon in Australia and scattered records in Victoria. Uses terrestrial shallow freshwater (occasionally brackish) wetlands; ephemeral and permanent: lakes, swamps, claypans, inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps lignum, canegrass or tea-tree (Marchant and Higgins 1993).	Nil	No suitable habitat present. Species is unlikely to occur within Study Area; only one dated record on the VBA.	Negligible
VBA			En	*Accipiter novaehollandiae*	Grey Goshawk	6	2018	The Grey Goshawk has a stronghold in Victoria, particularly the white form, in the Otway Ranges, where wet forests and gullies containing Mountain Grey Gum adjoin partly cleared farmlands. They occur in lower densities in similar habitats in the Strzelecki Ranges, Gippsland Plains and Otway Plains. Elsewhere in the State they are occasionally seen in woodlands, dry forests, suburban parks and wooded farmlands (Marchant and Higgins 1993).	Low	Could occasionally hunt over site but unlikely to make significant use.	Unlikely. While species could utilise habitat within the Study Area, at least occasionally, development proposal unlikely to have direct or indirect impact on species use of available habitat.

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
VBA			En	*Egretta garzetta*	Little Egret	2	2000	Inhabits terrestrial wetlands and shallow margins of tidal estuaries and inland lakes and rivers. Feed in shallow water and nest colonially, often with other waterbirds. Stick-nests are usually built in trees over water, although occasionally in reedbeds (Marchant and Higgins 1990).	Low	Some potential that the species could occur along the Darebin Creek however few local records.	Negligible
VBA			En	*Tandanus tandanus*	Freshwater Catfish	2	2000	Found in slow-moving streams lakes and ponds with fringing vegetation. More abundant in lakes than in flowing water. Widely distributed throughout the Murray-Darling River system, but numbers are now declining possibly due to introductions of carp (which have similar feeding habits) and/or degradation of suitable breeding habitat (Allen, Midgley and Allen 2002, p. 88).	Low	May occasionally swim up Darebin Creek from the Yarra River	Negligible

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
VBA			En	*Antigone rubicunda*	Brolga	1	1991	The Brolga is a large light grey crane with males reaching over and females up to 1 meter tall. It is generally found in tropical, subtropical and temperate freshwater terrestrial wetlands. It is an omnivorous bird eating tubers, grains, insects and molluscs. Numbers in Victoria have reduced due to draining of freshwater wetlands for agriculture (Marchant and Higgins 1993). Occur in the Northern Plains and along adjacent parts of the Murray river as well as on the plains and adjacent foothills of w. Vic. Uses shallow wetlands, farm dams, flooded areas, margins of large lakes, pastures, grasslands, crops and stubbles. Obtains food from the surface of the ground or by digging in moist areas. Nests are usually made on the ground on islands or as isolated mounds within wetlands. Drainage and grazing of wetlands and other human activities have contributed to reductions in numbers.	Nil	No suitable habitat present; site highly disturbed and has high pedestrian and vehicle traffic.	None
VBA			En	*Pseudemoia rawlinsoni*	Glossy Grass Skink	1	1991	Inhabits swamp and lake edges, salt-marshes and boggy creeks with dense vegetation (Wilson and Swan 2008).	Nil	No suitable swampy habitat	None

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
VBA			En	*Neochanna cleaveri*	Australian Mudfish	2	1991	Prefers thickly vegetated muddy marshes and swamps. Also found in small ponds, billabongs, subterranean streams or man-made drains in and around swampy areas. A rare species, particularly in Victoria where large areas of suitable habitat have been destroyed (Allen, Midgley and Allen 2002).	Nil-Low	No suitable swampy areas are present; only two older records on VBA	Negligible
VBA			En	*Pseudophryne bibronii*	Brown Toadlet	1	2005	Frequent dry forest, woodland, shrubland and grassland; sheltering under leaf-litter and other debris in moist soaks and depressions. Eggs are spawned in shallow burrows (or nets) under litter, in low areas, near water, that will later be flooded. Tadpoles are aquatic in ponds, flooded grassland and roadside ditches (Hero, Littlejohn and Marantelli 1991).	Nil-Low	Marginal habitat with no suitable breeding habitat	Negligible
VBA		CR	En	*Bidyanus bidyanus*	Silver Perch	1	1981	Rivers, lakes and reservoirs, preferring areas of rapid flow. Swims near the surface and tolerates a wide temperature range (2°-37°C). Often seen below rapids and weirs (Allen, Midgley and Allen 2002, p. 217).	Nil	No suitable aquatic habitat and single old record	Negligible

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
VBA		EN	En	*Macquaria australasica*	Macquarie Perch	44	2020	The Macquarie Perch is found in the Murray River and its tributaries and is also found in parts of the Yarra River. It is most often found as a solitary individual, however can forms schools during breeding season. The Macquarie Perch is more commonly found in slow moving rivers, reservoirs and lakes (Allen, Midgley and Allen 2002).	Moderate	May occasionally swim up Darebin Creek from the Yarra River; records for species on VBA from within Darebin Creek in 0.5km of Study Area	There will be no direct impacts to the Darebin Creek with all works to occur to the south of the existing Darebin Trail. While impacts to this species if present within the Darebin Creek could occur through impacts associated with sedimentation and runoff this can be ameliorated through standard mitigation measures associated with working near a waterway as would be expected by relevant authorities including the EPA. The likelihood of a significant impact on this EPBC Act listed species is therefore considered very low.
PMST		EN	En	*Dasyurus maculatus maculatus*	Spot-tailed Quoll	-	-	The species is recorded in a range of treed habitats including tropical, subtropical and temperate rainforests, vine thickets, wet and dry sclerophyll forest, woodland and coastal scrub. In Tasmania it also occurs in heathland (Van Dyck and Strahan 2008a).	Nil	Species not likely to occur at the Study Area; no records on the VBA. Species is locally extinct	None

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
		EN	En	*Isoodon obesulus obesulus*	Southern Brown Bandicoot	-	-	The Southern Brown Bandicoot is both active during the day and night. It is found in forest, heath and shrub communities. It shelters in a nest of vegetation beneath dense cover, it eats fungi, tubers and arthropods (Menkhorst and Knight 2001; Paull 2008).	Nil	No suitable heathy vegetation; no records on the VBA from last 40 years.	None
VBA PMST		VU	En	*Maccullochella peelii*	Murray Cod	14	2020	The Murray Cod lives in a wide variety of habitats from silty slow moving rivers to clear rivers with pools and riffles. This fish prefers instream habitat of rocks and logs with over-hanging vegetation (Allen, Midgley and Allen 2002).	Low-Moderate	May inhabit Darebin Creek on occasions however records on VBA all located along Yarra River	There will be no direct impacts to the Darebin Creek with all works to occur to the south of the existing Darebin Trail. While impacts to this species if present within the Darebin Creek could occur through impacts associated with sedimentation and runoff this can be ameliorated through standard mitigation measures associated with working near a waterway as would be expected by relevant authorities including the EPA. The likelihood of a significant impact on this EPBC Act listed species is therefore considered very low.

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
VBA PMST		VU	En	*Prototroctes maraena*	Australian Grayling	95	2014	This species only spends part of its life in freshwater streams, Australian Graylings migrate between freshwater streams and the ocean. Streams where this species occur tend to be clear with gravel bottoms and a variety of instream habitat such as pools and riffles. The upstream migration of this species has been effectively terminated in some rivers by dams (Allen, Midgley and Allen 2002).	Moderate	Records on the VBA are from the Yarra River with no records within the Darebin Creek; the species could however occasionally occur upstream of the confluence of the Darebin Creek and the Yarra River so within the Darebin Creek itself; high number of local records for this species	There will be no direct impacts to the Darebin Creek with all works to occur to the south of the existing Darebin Trail. While impacts to this species if present within the Darebin Creek could occur through impacts associated with sedimentation and runoff this can be ameliorated through standard mitigation measures associated with working near a waterway as would be expected by relevant authorities including the EPA. The likelihood of a significant impact on this EPBC Act listed species is therefore considered very low.
VBA PMST		VU	En	*Delma impar*	Striped Legless Lizard	1	1975	Native grasslands and open grassy woodlands; also known to occur in areas with cover of exotic species. Shelters beneath loose rocks and in grass tussocks (Wilson and Swan 2008).	Nil	Species not likely to occur at the Study Area; no records on the VBA.	None

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
PMST		VU	En	*Galaxiella pusilla*	Dwarf Galaxias	-	-	Occurs in vegetated margins of slow-flowing coastal creek backwaters, drains and swamps, often with dense aquatic macrophytes. Ephemeral sites require seasonal flooding and linkages to other more permanent populations for population replenishment, therefore wetland connectivity may be critical to survival. Rare in Victoria, however more abundant in the south-east of the state in Mornington Peninsula & Western Port areas (Allen, Midgley and Allen 2002; Museum Victoria 2006).	Nil	Species unlikely to occur within Darebin Creek; no records on the VBA	None
PMST	B R J C		En	*Tringa nebularia*	Common Greenshank	-	-	Habitat: mudflats, estuaries, saltmarshes, margins of lakes, wetlands, claypans, fresh and saline; commercial saltfields, sewage ponds. Regular, widespread summer migrant to Aust. And Tas. (Sept-April). Mostly coastal but inland in suitable habitat. Some overwinter. (Pizzey and Knight 2007, p.178)	Nil	Species habitat absent; no records on VBA	None
VBA	B R J C		En	*Tringa stagnatilis*	Marsh Sandpiper	1	1999	Salt, brackish, or freshwater wetlands, sewage ponds, commercial saltfields, bore drains, mangroves, tidal mudflats, estuaries, regular summer migrant (aug – may), mostly to coastal Aust, widespread but very scattered throughout inland (Pizzey & Knight 2007).	Nil	May occasionally occur along Darebin Creek	Negligible

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
PMST	B R J C	EN	En	*Calidris canutus*	Red Knot	-	-	Summer migrants to Vic from their Arctic breeding grounds in Siberia and Alaska. Young non-breeding birds may remain during winter, especially in Corner Inlet and hundreds in similar habitat in Port Phillip Bay (mainly Queenscliff and Mud Islands). Small flocks irregularly occur elsewhere along the coast and there are a few inland records (e.g. round saline lakes near Colac). Red Knots feed by probing in soft sand or mud at the edge of water or while wading. During high tides they may move to nearby lakes, sewage lagoons and floodwaters to continue feeding, although usually they roost with other waders on spits and islets.	Nil	No suitable habitat present. Species is unlikely to occur within Study Area due to habitat preference; no records on VBA	None
VBA			Vu	*Oxyura australis*	Blue-billed Duck	2	2020	This species inhabits deep, permanent, well-vegetated swamps, but at times (especially in winter) may occur in large numbers on large open wetlands. The Blue-billed Duck catches food while diving or occasionally by feeding from the water surface. Their nests are built on trampled swamp vegetation around the base of established stands of reeds/rushes, often over water or on small islands (Marchant and Higgins 1990; Pizzey and Knight 2007).	Low	Very limited suitable habitat present, unlikely to make significant use of Darebin Creek, may occur while on passage. Species could make some use of habitat along Darebin Creek although few records on the VBA	Negligible

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
VBA			Vu	*Aythya australis*	Hardhead	67	2019	Hardheads inhabit deep to shallow wetlands with open water and fringing emergent vegetation (Pizzey and Knight 2007). The species feeds by diving in deep water and occasionally by dabbling just under the water surface (Rogers 1990). Nests are built in thick vegetation (e.g. reeds, lignum, cumbungi), usually over water (Halse et al. 2005; Rogers 1990). These birds are most common in the wetland systems of inland Australia (Halse et al. 2005). Birds do visit Victoria from these areas in spring and summer, returning as the northern wetlands is replenished by rain (Halse et al. 2005). However, some birds are present in Victoria all year round depending on the suitability of the wetland (Pizzey and Knight 2007).	Low–Moderate	Species could occur within the Darebin Creek; multiple records in local area	Unlikely. While Study Area extends over the Darebin Creek to appropriately capture Habitat Zone 3, this Darebin Creek and immediate surrounds to the north of the existing Darebin Creek Trail will not be impacted by proposed works. Impacts on this species and its habitat are not likely.
VBA			Vu	*Hieraaetus morphnoides*	Little Eagle	14	2020	Found across mainland Australia and Tasmania. Occurs in mountain forests to nearly treeless plains, occasionally over lakes, beaches and cities	Low–Moderate	Could occasionally hunt over site but unlikely to make significant use.	Unlikely. While species could utilise habitat within the Study Area, at least occasionally, development proposal unlikely to have direct or indirect impact on species use of available habitat.

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
VBA			Vu	*Ninox strenua*	Powerful Owl	17	2021	Widespread in foothill and coastal forests where they especially favour gullies with peppermint-Manna Gum forests. Occasionally seen in wetter mountain forests, drier box-ironbark forests and woodlands, and softwood plantations. Hunts at night by flying through the forest canopy catching prey from tree branches. They nest in large holes in trees (DSE 2004).	Moderate	Suitable foraging and roosting habitat, possible to hunt possums in canopy vegetation; previously recorded within 0.5km of Study Area. Site is within normal foraging/territorial range of the species, from known roosting and breeding sites	While direct impacts to potential foraging habitat is unlikely, there is potential for indirect impacts associated with noise during construction and operation that could change the behaviour of individuals utilising the habitat on site. It is expected that given the urban nature often Study Area and adjacent dwellings that construction will be restricted to daylight hours avoiding impacts on foraging potential; impacts from ongoing use of the proposed Alphington Link are expected to be low given the already high traffic (pedestrians and vehicles) nature of the Study Area.

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
VBA			Vu	*Ornithorhynchus anatinus*	Platypus	19	2002	Platypus inhabit a wide variety of streams and lake ranging from small, fast-moving mountain streams, to broad, slow moving and sometimes polluted streams near the coast. They also inhabit artificial lakes but are absent from deep lakes and storage dams (>5m deep) and from brackish and estuarine waters. They require fairly shallow freshwater for easy access to the bottom dwelling invertebrates on which they prey. They also prefer deep vegetated banks with friable soil in which to construct their burrows for shelter and nesting	Moderate	Records on VBA north of Study Area are quite dated; those to the east and west along the Yarra River more recent. Reports in 2017 that indicate species was observed in Darebin Creek near Northland Shopping Centre in Heidelberg although records not on VBA.	There will be no direct impacts to the Darebin Creek with all works to occur to the south of the existing Darebin Trail. While impacts to this species if present within the Darebin Creek could occur through impacts associated with sedimentation and runoff this can be ameliorated through standard mitigation measures associated with working near a waterway as would be expected by relevant authorities including the EPA. The likelihood of a impacts on this is therefore considered low.
VBA			Vu	*Biziura lobata*	Musk Duck	1	1988	Usually seen in small numbers on the deep waters of well vegetated fresh to saline lakes, swamps and occasionally shallow inlets and bays. Nests formed in low vegetation in areas sheltered by surrounding vegetation (Marchant and Higgins 1990; Pizzey and Knight 2007).	Nil	No suitable wetland habitat present	Negligible

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
PMST			Vu	*Falco hypoleucos*	Grey Falcon	_	_	Inhabit grasslands, lightly wooded plains and scrublands of interior Australia. Birds occur sporadically on the periphery of their range, such as nw. Vic. More common in Vic during or after droughts. They surprise their prey on the ground while flying low and fast over open country and also catch prey in flight. Nest in trees, in disused stick-nests of other birds.	Nil	Could occasionally hunt over site but unlikely to make significant use.	Negligible
VBA			Vu	*Spatula rhynchotis*	Australasian Shoveler	2	2018	The Australasian Shoveler occurs mainly on large well vegetated wetlands and lakes, occasionally including areas with saline waters. Populations are found in higher numbers on permanent, well-vegetated freshwater swamps with areas of open water. This species nests in grass nests on the ground, usually in dense cover and near water (Marchant and Higgins 1990; Pizzey and Knight 2007).	Nil-Low	Species may rarely occur while on passage but would not make significant use of the Study Area. Species is unlikely to occur within Study Area; only two records on VBA within 5km	Negligible

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
PMST		CR	Vu	*Synemon plana*	Golden Sun Moth	–	–	It is generally found in temperate grasslands and open grassy woodlands where the ground layer is dominated by native Wallaby Grass. Optimal habitat is dominated by wallaby grasses Austrodanthonia spp with an open tussock structure. It has also been recorded in grasslands dominated by Kangaroo Grass Themeda triandra and exotic dominated grasslands (i.e. Chilean Needlegrass)(O'Dwyer and Attiwill 2000).	Nil	Suitable habitat absent; no records on the VBA	None

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
VBA PMST		VU	Vu	*Pteropus poliocephalus*	Grey-headed Flying-fox	210	2020	Eastern coastal Australia from Gladstone in Qld to South Gippsland and Melbourne in Vic, rare influxes further west and south. Rarely more than 200km inland. In warmer months gathers in very large camps, usually in dense forest in gullies; population more dispersed in winter. Size of camps fluctuates in response to local food supplies; in south numbers fluctuate in regular pattern, being highest in late summer–autumn and lowest in winter (Menkhorst and Knight 2001).	High	Known to frequently forage in canopy trees along Darebin Creek and surrounds, and likely to at least forage and occasionally roost on the site; Grey-headed Flying Fox camp in Yarra Bend Park approximately 2km away from Study Area.	The trees proposed for removal, as outlined in Table 9, are likely to provide at least some potential habitat for this species given they would likely be occasionally used for foraging. While there also may be some indirect impacts to the potential for continued foraging by Grey-headed Flying-fox through noise and disturbance created during construction and operation of the Alphington Link, this species is highly mobile and readily persists within urban areas across Melbourne with high levels of background noise. A review of the Matters of National Environmental Significance – Significant Impact Guidelines (DoE 2013) does not indicate that impacts from the proposal would be deemed a significant impact on this species. The likelihood of a significant impact on this EPBC Act listed species from the proposal is therefore considered low.

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
PMST		VU	Vu	*Grantiella picta*	Painted Honeyeater	-	-	The Painted Honeyeater is a summer migrants to Victoria. They are generally found to inhabit box-ironbark, Broad-leaved Peppermint and Red Stringybark forests and box-buloke woodlands in the northern foothills of the great Divide. May also occur in Red Ironbark, Red Box forests in southern Victoria. They are occasionally found along Murray River valley to Hattah-Kulkyne NP where they inhabit Black Box woodlands. This species is usually found in open stands of old eucalypts that are infested with mistletoes (Higgins, Peter and Steele 2001).	Low	Study Area would only be a flyover for this species; no records on the VBA.	Negligible

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
VBA PMST		VU	Vu	*Litoria raniformis*	Growling Grass Frog	15	1991	The species often inhabits water bodies with a diverse assemblage of aquatic vegetation, including emergent species such as sedges (Gahnia spp.), submergent species such as curly pondweed (Potamogeton spp.), floating species such as water ribbon (Triglochin spp.) and filamentous algae (Hamer and Organ 2006; Heard, Robertson and Scroggie 2004). The aquatic vegetation provides sites for male frogs to call from, sites for eggs to be deposited and relatively safe development, and food and shelter for tadpoles. Dense submergent vegetation is especially important to protect eggs and tadpoles from predation (Heard, Robertson and Scroggie 2004). However, it is also known to occur in ditches, dams and swamps or sheltering under discarded debris near those sites (Tyler and Knight 2009, pp. 38–39).	Low	There are no recent records along Darebin Creek for this species within 5km of the Study Area; while recorded recently in Reservoir there could be some potential for this species to occur although suitability of habitat conditions within creek are questionable.	Negligible

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
PMST		VU	Vu	*Antechinus minimus maritimus*	Swamp Antechinus	-	-	Prefers damp habitats with a high percentage of cover of understorey vegetation and has been recorded in forest, woodland, heathland, tussock grassland and sedgeland. The species' preference for sites of low altitude, with a southerly aspect and gentle slope, is consistent with its occurrence close to drainage lines and swamps (Van Dyck and Strahan 2008a).	Nil	No suitable habitat present. Species is unlikely to occur within Study Area due to habitat preference; no records on VBA	None
PMST		VU	Vu	*Petauroides volans*	Greater Glider	-	-	Locally common in wet sclerophyll forest on the ranges and coastal plains from near Mossman, ne. QLD to Daylesford, VIC. Requires Large tree hollows for shelter .	Nil	No suitable habitat present, known populations are a great distance away and there is poor habitat connectivity from these to the Study Area; no records on VBA	None
PMST		VU	Vu	*Potorous tridactylus trisulcatus*	Long-nosed Potoroo	-	-	The Long-nosed Potoroo is most commonly found in heathy coastal vegetation, dry and wet sclerophyll forests with a dense understorey with a sandy loamy soil. Rarely ventures far from cover and preferred habitat has a relatively thick groundcover (Van Dyck and Strahan 2008a).	Nil	No suitable habitat present, well outside normal distribution range. Species is unlikely to occur within Study Area; no records on VBA	None

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
PMST		VU	Vu	*Thinornis cucullatus*	Hooded Plover	-	-	The Hooded Plover is endemic to south-eastern and western Australia. This species is mainly a bird of open sandy ocean beaches, and is occasionally found on bay beaches and coastal/inland saltlakes. It prefers broad, flat beaches with wide wash zone, with seaweed wrack and jetsam, and backed by sparsely vegetated dunes. It sometimes uses tidal flats and estuaries, rocky or sand-covered platforms and reefs, generally those near sandy beaches. In Victoria, it is widespread through all coastal areas (Marchant and Higgins 1993; Pizzey and Knight 2007).	Nil	Species habitat absent; no records on VBA	None
PMST		VU	Vu	*Nannoperca obscura*	Yarra Pigmy Perch	-	-	Inhabits small lakes and streams, preferring habitats with flowing water and abundant aquatic vegetation for shelter. It is found in coastal drainages from southern SA to Frankston, Victoria (Allen, Midgley and Allen 2002).	Nil-Low	The Darebin Creek occurs within the Study Area defined by this study however there are no records for this species on the VBA in the local area	Negligible

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
PMST	B R J C		Vu	*Actitis hypoleucos*	Common Sandpiper	-	-	Regular, widespread but mostly uncommon summer migrant to Australia (Aug–May) (Pizzey and Knight 2007). Wide range of coastal or inland wetlands, with varying levels of salinity. Mainly muddy margins of rocky shores of wetlands; often around estuaries and deltas of streams; also lakes, pools, billabongs, reservoirs, dams and claypans; associated with mangroves. Large coastal mudflats are not favoured (Higgins and Davies 1996).	Nil	No suitable habitat present. Species is unlikely to occur within Study Area due to habitat preference; no records on VBA	Negligible
VBA	C J		Vu	*Ardea alba modesta*	Eastern Great Egret	57	2018	Eastern Great Egret is widespread in Australia and has been observed in a wide range of wetland habitats including swamps and marshes; margins of rivers and lakes; damp or flooded grasslands, pastures or agricultural lands; reservoirs; sewage treatment ponds; drainage channels; salt pans and salt lakes; salt marshes; estuarine mudflats, tidal streams; mangrove swamps; coastal lagoons; and offshore reefs (DEWHA 2010).	Low–Moderate	Likely to at least occasionally forage along Darebin Creek and nearby wetlands where it has been recorded adjacent to the Study Area; could also forage upon the grassed golf driving range when wet	Unlikely. Development proposal is not likely to impact on ongoing use of the Study Area by the species were it to occur there; while a minor amount of habitat will be removed this will not have a significant impact on this species or its overall use of the Study Area and surrounds.
VBA	C J		Vu	*Hydroprogne caspia*	Caspian Tern	1	1970	Mostly sheltered coastal embayments, including harbours, lagoons, inlets, bays, estuaries and river deltas, usually with sandy or muddy margins. Will use artificial wetlands, including reservoirs, sewage ponds and saltworks (Higgins and Davies 1996).	Nil	May rarely fly over Study Area, while on passage but would not make use of the Study Area itself	Negligible

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
VBA PMST	C R J	VU	Vu	*Hirundapus caudacutus*	White-throated Needletail	12	2006	In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Because they are aerial, it has been stated that conventional habitat descriptions are inapplicable. In Australia, White-throated Needletails almost always forage aerially, at heights up to 'cloud level', above a wide variety of habitats ranging from heavily treed forests to open habitats, such as farmland, heathland or mudflats (Higgins 1999).	Low-Moderate	Could occasionally hunt over site but unlikely to make significant use.	Unlikely. While species could utilise habitat within the Study Area, at least occasionally, development proposal unlikely to have direct or indirect impact on species use of available habitat.
PMST	B			*Pandion haliaetus*	Eastern Osprey	-	-	Range: coasts and islands of Australia: now rare or absent far s. NSW, Vic, Tas, Bass Strait and far se. SA, though breeds Yorke and Eyre Pens. and Kangaroo Island (SA). Breeds n. From c. Newcastle-L. Macquarie (NSW); all coastal Q: Gt Barrier Reef; n. Australia and WA, possibly except Eight Mile Beach, extends e. To Kangaroo Island (SA). Sedentary; dispersive, Cosmopolitan. Habitat: coasts, estuaries, bays, inlets; islands and surrounding waters; coral atolls, reefs, lagoons, rock cliffs, stacks. Ascends larger rivers particularly in north, but also Murray River, SA; ventures far inland. {Pizzey & Knight 2007, p.138}	Nil	Species is unlikely to occur within Study Area due to habitat preference; no records on VBA	Negligible

Source	Treaty	EPBC	FFG	Scientific name	Common name	No. Records	Last record	Habitat and species	Likelihood occurrence	Likelihood Reasoning	Potential Impact
PMST	C R J			*Motacilla flava*	Yellow Wagtail	-	-	Habitat requirements are highly variable, but typically include open grassy flats near water. Habitats include open areas with low vegetation such as grasslands, airstrips, pastures, sports fields; damp open areas such as muddy or grassy edges of wetlands, rivers, irrigated farmland, dams, waterholes; sewage farms, sometimes utilise tidal mudflats and edges of mangroves. Breeds from Siberia to west Alaska, migrating to Africa and to Sth and south-eastern Asia, Indonesia and New Guinea. Regular summer migrant to mostly coastal Australia (Pizzey and Knight, 2012) The species is considered a vagrant to Victoria, South Australia and southern Western Australia (SPRATT)	Nil-Low	Habitat on site is largely disturbed; no records on VBA for this species.	Negligible

Appendix 4. Native vegetation removal report

Native vegetation removal report

This report provides information to support an application to remove, destroy or lop native vegetation in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation*. The report **is not an assessment by DELWP** of the proposed native vegetation removal. Native vegetation information and offset requirements have been determined using spatial data provided by the applicant or their consultant.

Date of issue: **10/12/2021**
Time of issue: **3:59 pm**

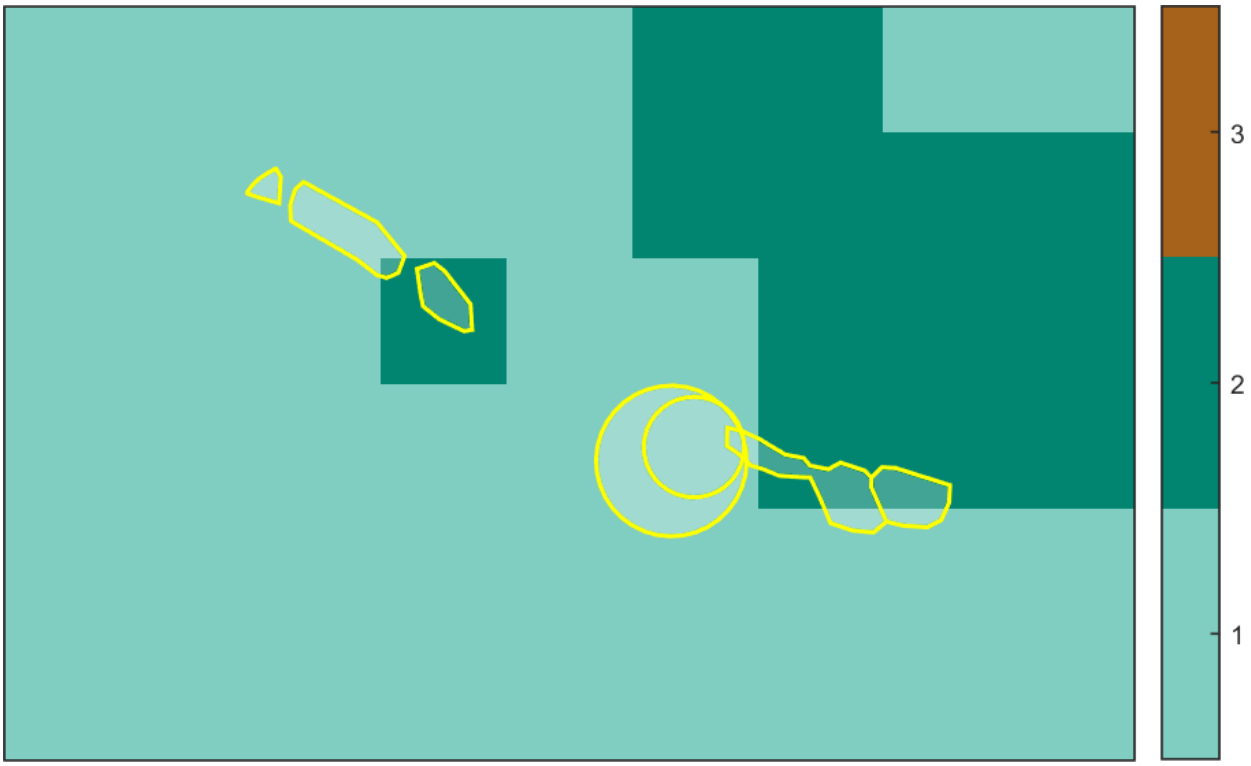
Report ID: PRE_2021_049

Project ID	Farm_Road_Alphington_GDA94

Assessment pathway

Assessment pathway	**Intermediate Assessment Pathway**
Extent including past and proposed	0.136 ha
Extent of past removal	0.000 ha
Extent of proposed removal	0.136 ha
No. Large trees proposed to be removed	1
Location category of proposed removal	Location 2 The native vegetation is in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map). Removal of less than 0.5 hectares of native vegetation in this location will not have a significant impact on any habitat for a rare or threatened species.

1. Location map



Offset requirements if a permit is granted

Any approval granted will include a condition to obtain an offset that meets the following requirements:

General offset amount[1]	0.026 general habitat units
Vicinity	Port Phillip and Westernport Catchment Management Authority (CMA) or Yarra City Council
Minimum strategic biodiversity value score[2]	0.208
Large trees	1 large tree

NB: values within tables in this document may not add to the totals shown above due to rounding

Appendix 1 includes information about the native vegetation to be removed

Appendix 2 includes information about the rare or threatened species mapped at the site.

Appendix 3 includes maps showing native vegetation to be removed and extracts of relevant species habitat importance maps

1 The general offset amount required is the sum of all general habitat units in Appendix 1.

2 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 Intermediate Assessment Pathway and it will be assessed under the Intermediate Assessment Pathway.

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

This *Native vegetation removal report* must be submitted with your application for a permit to remove, destroy or lop native vegetation.

Refer to the *Guidelines for the removal, destruction or lopping of native* vegetation (the Guidelines) for a full list of application requirements This report provides information that meets the following application requirements:

- The assessment pathway and reason for the assessment pathway
- A description of the native vegetation to be removed (met unless you wish to include a site assessment)
- Maps showing the native vegetation and property
- The offset requirements determined in accordance with section 5 of the Guidelines that apply if approval is granted to remove native vegetation.

Additional application requirements must be met including:

- Topographical and land information
- Recent dated photographs
- Details of past native vegetation removal
- An avoid and minimise statement
- A copy of any Property Vegetation Plan that applies
- A defendable space statement as applicable
- A statement about the Native Vegetation Precinct Plan as applicable
- An offset statement that explains that an offset has been identified and how it will be secured.

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

For more information contact the DELWP Customer Service Centre 136 186

www.delwp.vic.gov.au

Appendix 1: Description of native vegetation to be removed

All zones require a general offset, the general habitat units each zone is calculated by the following equation in accordance with the Guidelines:

General habitat units = extent x condition x general landscape factor x 1.5, where the general landscape factor = 0.5 + (strategic biodiversity value score/2)

The general offset amount required is the sum of all general habitat units per zone.

Native vegetation to be removed

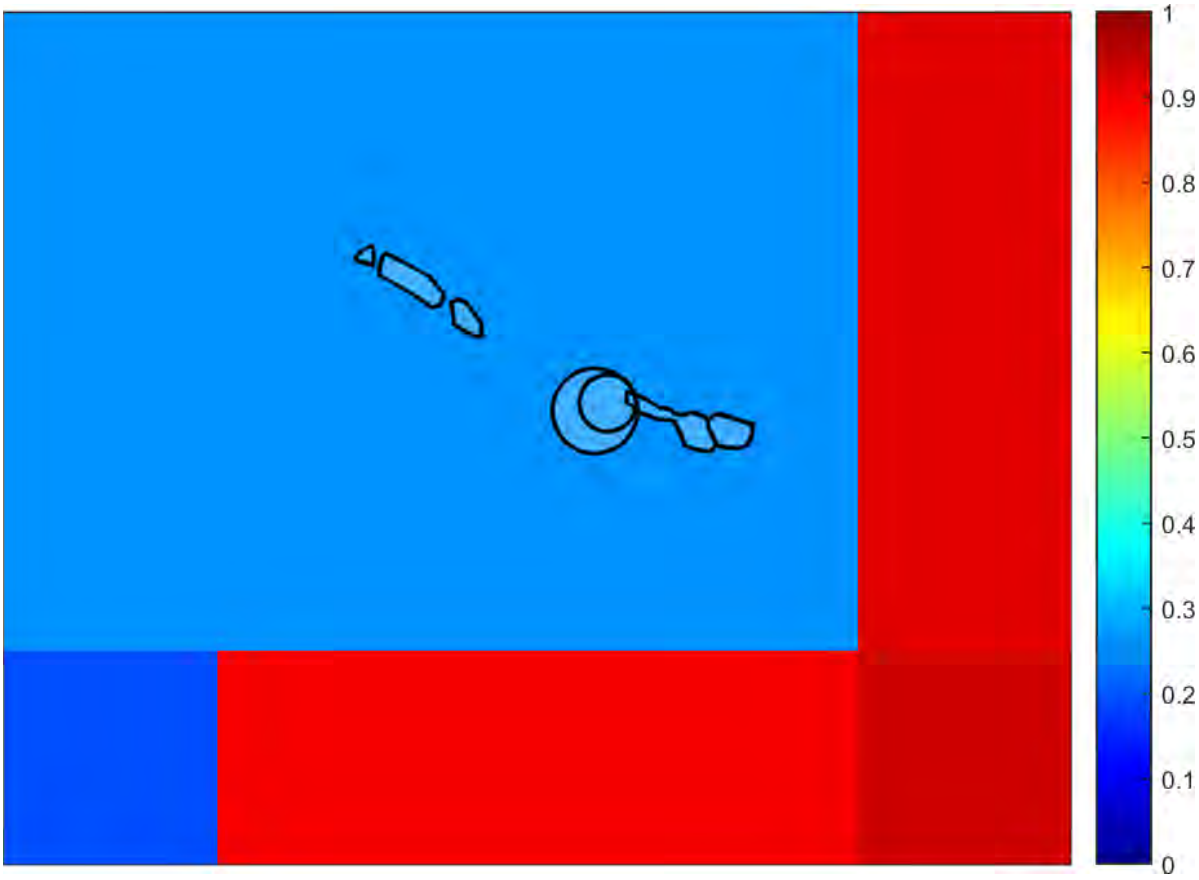
Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	**Type**	**BioEVC**	**BioEVC conservation status**	**Large tree(s)**	**Partial removal**	**Condition score**	**Polygon Extent**	**Extent without overlap**	**SBV score**	**HI score**	**Habitat units**	**Offset type**
1-1c	Patch	vvp_0055_61	Endangered	0	no	0.150	0.009	0.009	0.260		0.001	General
1-1b	Patch	vvp_0055_61	Endangered	0	no	0.150	0.020	0.020	0.260		0.003	General
1-2	Patch	vvp_0056	Endangered	0	no	0.230	0.022	0.022	0.260		0.005	General
1-3	Patch	vvp_0056	Endangered	0	no	0.320	0.014	0.014	0.260		0.004	General
1-1a	Patch	vvp_0055_61	Endangered	0	no	0.150	0.003	0.003	0.260		0.000	General
1-10	Scattered Tree	vvp_0056	Endangered	1	no	0.200	0.070	0.069	0.260		0.013	General
1-11	Scattered Tree	vvp_0056	Endangered	0	no	0.200	0.031	0.000	0.260		0.000	General

Appendix 2: Information about impacts to rare or threatened species' habitats on site

This is not applicable in the Intermediate Assessment Pathway.

Appendix 3 – Images of mapped native vegetation

2. Strategic biodiversity values map



3. Aerial photograph showing mapped native vegetation

4. Map of the property in context

Yellow boundaries denote areas of proposed native vegetation removal.

Appendix 5. Available native vegetation credits

Report of available native vegetation credits

This report lists native vegetation credits available to purchase through the Native Vegetation Credit Register.

This report is **not evidence** that an offset has been secured. An offset is only secured when the units have been purchased and allocated to a permit or other approval and an allocated credit extract is provided by the Native Vegetation Credit Register.

Date and time: 09/12/2021 06:23 **Report ID: 12191**

What was searched for?

General offset

General habitat units	Strategic biodiversity value	Large trees	Vicinity (Catchment Management Authority or Municipal district)	
0.026	0.208	1	CMA	Port Phillip and Westernport
			or LGA	Yarra City

Details of available native vegetation credits on 09 December 2021 06:23

These sites meet your requirements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
BBA-0277	7.877	463	Port Phillip and Westernport	Mornington Peninsula Shire	No	Yes	No	Abezco, Ethos, VegLink
BBA-0670	18.338	151	Port Phillip and Westernport	Cardinia Shire	No	Yes	No	Abezco, VegLink
BBA-0677	17.824	1527	Port Phillip and Westernport	Whittlesea City	No	Yes	No	Abezco, VegLink
BBA-0678	48.077	2630	Port Phillip and Westernport	Nillumbik Shire	No	Yes	No	VegLink
BBA-0678_2	0.388	59	Port Phillip and Westernport	Nillumbik Shire	No	Yes	No	VegLink
BBA-0931	0.034	2	Port Phillip and Westernport	Moorabool Shire	Yes	Yes	No	Bio Offsets
BBA-2789	1.317	14	Port Phillip and Westernport	Baw Baw Shire	Yes	Yes	No	Contact NVOR
BBA-2790	2.911	116	Port Phillip and Westernport	Baw Baw Shire	Yes	Yes	No	Contact NVOR
BBA-2832	0.737	1	Port Phillip and Westernport	Nillumbik Shire	Yes	Yes	Yes	Nillumbik SC
BBA-2870	2.544	431	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	No	Contact NVOR
BBA-2871	16.335	1668	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	No	Contact NVOR
BBA-3013	0.069	136	Port Phillip and Westernport	Moorabool Shire	Yes	Yes	No	VegLink
BBA-3045	0.076	5	Port Phillip and Westernport	Melton City	Yes	Yes	No	Bio Offsets

TFN-C1636	1.556	130	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	Yes	Yarra Ranges SC
TFN-C1650	0.182	20	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	Yes	Yarra Ranges SC
TFN-C1663	0.109	27	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	Yes	Yarra Ranges SC
TFN-C1664	3.016	85	Port Phillip and Westernport	Yarra Ranges Shire	No	Yes	No	Yarra Ranges SC
TFN-C1667	0.299	2	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	Yes	Yarra Ranges SC
TFN-C1750	1.736	10	Port Phillip and Westernport	Cardinia Shire	Yes	Yes	No	Bio Offsets
TFN-C1962	0.428	16	Goulburn Broken, Port Phillip and Westernport	Macedon Ranges Shire	No	Yes	No	Contact NVOR
VC_CFL-0838_01	0.213	712	Port Phillip And Westernport	Yarra Ranges Shire	Yes	Yes	No	VegLink
VC_CFL-3084_01	0.766	546	Port Phillip And Westernport	Cardinia Shire	Yes	Yes	No	VegLink
VC_CFL-3687_01	1.085	96	Port Phillip And Westernport	Baw Baw Shire	Yes	Yes	No	Baw Baw SC
VC_CFL-3700_01	0.224	1	Port Phillip And Westernport	French-Elizabeth-Sandstone Islands (Unincorporated)	Yes	Yes	No	VegLink
VC_CFL-3705_01	0.142	7	Port Phillip And Westernport	Melton City	Yes	Yes	No	VegLink
VC_CFL-3708_01	0.218	517	Port Phillip And Westernport	Yarra Ranges Shire	Yes	Yes	No	VegLink
VC_CFL-3709_01	0.154	396	Port Phillip And Westernport	Yarra Ranges Shire	Yes	Yes	No	VegLink
VC_CFL-3729_01	0.086	13	Port Phillip And Westernport	Melton City	Yes	Yes	No	VegLink

These sites meet your requirements using alternative arrangements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)

There are no sites listed in the Native Vegetation Credit Register that meet your offset requirements when applying the alternative arrangements as listed in section 11.2 of the Guidelines for the removal, destruction or lopping of native vegetation.

These potential sites are not yet available, land owners may finalise them once a buyer is confirmed.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
VC_CFL-3710_01	7.606	322	Port Phillip And Westernport	Yarra Ranges Shire	Yes	Yes	No	Contact NVOR
VC_CFL-3744_01	3.717	384	Port Phillip And Westernport	Macedon Ranges Shire	Yes	Yes	No	VegLink

LT - Large Trees *CMA - Catchment Management Authority* *LGA - Municipal District or Local Government Authority*

Next steps

If applying for approval to remove native vegetation
Attach this report to an application to remove native vegetation as evidence that your offset requirement is currently available.

If you have approval to remove native vegetation
Below are the contact details for all brokers. Contact the broker(s) listed for the credit site(s) that meet your offset requirements. These are shown in the above tables. If more than one broker or site is listed, you should get more than one quote before deciding which offset to secure.

Broker contact details

Broker Abbreviation	Broker Name	Phone	Email	Website
Abezco	Abzeco Pty. Ltd.	(03) 9431 5444	offsets@abzeco.com.au	www.abzeco.com.au
Baw Baw SC	Baw Baw Shire Council	(03) 5624 2411	bawbaw@bawbawshire.vic.gov.au	www.bawbawshire.vic.gov.au
Bio Offsets	Biodiversity Offsets Victoria	0452 161 013	info@offsetsvictoria.com.au	www.offsetsvictoria.com.au
Contact NVOR	Native Vegetation Offset Register	136 186	nativevegetation.offsetregister@delwp.vic.gov.au	www.environment.vic.gov.au/native-vegetation
Ecocentric	Ecocentric Environmental Consulting	0410 564 139	ecocentric@me.com	Not avaliable
Ethos	Ethos NRM Pty Ltd	(03) 5153 0037	offsets@ethosnrm.com.au	www.ethosnrm.com.au
Nillumbik SC	Nillumbik Shire Council	(03) 9433 3316	offsets@nillumbik.vic.gov.au	www.nillumbik.vic.gov.au
TFN	Trust for Nature	8631 5888	offsets@tfn.org.au	www.trustfornature.org.au
VegLink	Vegetation Link Pty Ltd	(03) 8578 4250 or 1300 834 546	offsets@vegetationlink.com.au	www.vegetationlink.com.au
Yarra Ranges SC	Yarra Ranges Shire Council	1300 368 333	biodiversityoffsets@yarraranges.vic.gov.au	www.yarraranges.vic.gov.au

For more information contact the DELWP Customer Service Centre 136 186 or the Native Vegetation Credit Register at nativevegetation.offsetregister@delwp.vic.gov.au

Appendix 6. Maps

Map 1. Study Area

Farm Road, Alphington

Legend

- Subject Site
- Contours (10m)
- Natural watercourse

Details

Date: 30/08/2021
Version: 1
Aerial photography from Nearmap (Apr 2021).

N

0 10 20 30 40 m

Scale 1:1,000 (Page size A3)

Disclaimer

Practical Ecology bears no responsibility for the accuracy and completeness of this information and any decisions or actions taken on the basis of the map. While information appears accurate at publication, nature and circumstances are constantly changing.

PRACTICAL ECOLOGY
ecological restoration & consulting
p: (03) 9484 1555 e: enquiries@practicalecology.com.au

Map 2. Existing Conditions

Farm Road, Alphington

Legend

- Subject Site
- Parcels
- Contours (10m)
- Natural watercourse

Native Vegetation

- EVC 55: Plains Grassy Woodland
- EVC 56: Floodplain Riparian Woodland

Trees

- Small Scattered Tree
- Large Scattered Tree
- Small Canopy Tree
- Large Canopy Tree
- Australian Native Tree
- Indigenous Tree (Planted)
- Victorian Native Tree (Planted)

Details

Date: 9/12/2021
Version: 1
Aerial photography from Nearmap (Apr 2021).
Base map data Copyright © The State of Victoria.

N

0 10 20 30 40 m

Scale 1:900 (Page size A3)

Disclaimer

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p: (03) 9484 1555 e: enquiries@practicalecology.com.au

Map 3. Vegetation Losses

Farm Road, Alphington

Legend

- Subject Site
- Parcels
- Contours (10m)
- Natural watercourse
- Vegetation Losses

Native Vegetation

- EVC 55: Plains Grassy Woodland
- EVC 56: Floodplain Riparian Woodland

Trees

- Small Scattered Tree
- Large Scattered Tree
- Small Canopy Tree
- Large Canopy Tree
- Australian Native Tree
- Indigenous Tree (Planted)
- Victorian Native Tree (Planted)
- Lost

Details

Date: 9/12/2021
Version: 1
Aerial photography from Nearmap (Apr 2021).

N

0 10 20 30 40 m

Scale 1:900 (Page size A3)

Disclaimer

Practical Ecology bears no responsibility for the accuracy and completeness of this information and any decisions or actions taken on the basis of the map. While information appears accurate at publication, nature and circumstances are constantly changing.

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Appendix 7. Detailed plans

UNFINISHED DRAWING
SUBJECT TO FURTHER AMENDMENT
FOR DISCUSSION PURPOSES ONLY
INFORMATION SHOWN IS CURRENT AS AT
DATE : 24 / 11 / 2021
CONTACT : G HOUSE

TEMPORARY ACCESS GATE
TO FRONT FAIRWAY

SITE COMPOUND 10mX4m

GOLF CLUB MAINTAIANCE
ACCESS GATE

DAREBIN-YARRA BIKE TRAIL

FARM ROAD

CONSTRUCTION ACCESS

CONSTRUCTION FENCE SET
2M FROM BACK OF KERB

CONSTRUCTION ACCESS

LATROBE
GOLF CLUB

N

ISSUE	APP'D	DATE	AMENDMENT
E			
D			
C			
B			
A			

GENERAL NOTES
- SITE CONSTRUCTION ZONE
- AREA FOR BEAM LIFT
- SITE CONSTRUCTION ZONE WITH SHARED ACCESS
- TEMPORARY CONSTRUCTION FENCE
- GATE
- TREES TO STAY
- TREES TO BE REMOVED
- TREES WITH MAJOR IMPACT

INVESTMENT AND DESIGN SERVICES
NETWORK DESIGN SERVICES
12 LAKESIDE DRIVE, BURWOOD EAST, VICTORIA, 3151
PHONE (03) 9881 8010

DESIGNED
DESIGN EAST
18/11/21

APPROVED

CAT: Metro_South_East
PROJ: DE11835 - Farm Rd
FILE: 11835-de--cp-02.dgn

SCALE OF METRES
HOR 0 6.5 13
VER

FARM RD
DAREBIN TRAIL LINK TO FARM RD

CONSTRUCTION ZONE PLAN
SPECIFIC CONTROL OVERLAY

FILE NO.	CONTRACT NO.	SHEET NO.	DRAWING NO.	ISSUE
		0	0	

24/11/2021 12:36:46 PM Default 11835-de--cp-02