



**Flora and Fauna Assessment,
Native Vegetation Impact Assessment
and Land Management Plan,**

**Yarra Flats TreeTop Adventure Park,
Ivanhoe East**



June 2021

Flora and Fauna Assessment, Native Vegetation Impact Assessment and Land Management Plan, Yarra Flats TreeTop Adventure Park, Ivanhoe East

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1. INTRODUCTION

Practical Ecology Pty Ltd was commissioned by Ecoline Pty Ltd to update the existing Flora and Fauna Assessment, No Net Loss Analysis and Land Management Plan for the proposed Yarra Flats Tree Top Adventure Park, Ivanhoe East prepared by Practical Ecology in 2016 and a revised Native Vegetation Impact Assessment in 2018 and 2021.

The initial assessment was undertaken in 2016 to propose a combined planning scheme amendment according to Victoria's Planning Provisions under Clause 52.03 for a Specific Site Exclusion and to support a planning permit application. The initial assessments also provided detailed information in response to native vegetation protection (as required by the state section of the Banyule Planning Scheme and Clause 52.17). The Environmental Significance Overlay was also considered in the context of the development and within the Land Management Plan to ensure both are considered within the context of the relevant planning scheme requirements. Clause 13.05-1S of the Banyule Planning Scheme was also addressed as the site is within a Bushfire Prone Area (BPA).

Since 2016 a planning scheme amendment and planning permit application was submitted 11th May 2018. In response to the application Banyule Council Requested Further Information (RFI) and the report was revised in 2018 to address the items below:

- *An updated flora and fauna assessment and plan or confirmation that information within the 2016 assessment and plan are still up to date and applicable.*

In accordance with Clause 13.02-1S of the Banyule Planning Scheme provide a report that addresses how the proposed use and development considers:

- *The risk of bushfire to people, property and community infrastructure.*
- *Outlines appropriate bushfire protection measures to address the identified bushfire risk.*
- *Explains how the proposed development can implement bushfire protection measures without unacceptable biodiversity impacts.'*

Since the report was revised in 2018 to address the items above the Department of Environment, Land, Water and Planning (DELWP) has since reviewed the information provided for consideration and has further requested the following information in 2021:

1. Information about the native vegetation to be removed, including:

- a) The defensible space requirements around the proposed administration building, as described in the 'Flora and Fauna Assessment, Native Vegetation Impact Assessment, Land Management Plan, Yarra Flats Tree Top Adventure Park Ivanhoe East' (Practical Ecology, December 2018) must be fully accounted for in the Native vegetation removal report (NVRP) for the Fuel Modified Zone (FMZ), including requirements for tree canopy separation and vegetation management within 10 metres of a building. The FMZ is currently accounted for as 50% loss (understorey only).*
- b) A description of the proposed access for the shipping container onto the site and any associated vegetation impacts. Any native vegetation impacts for the access must be accounted for in the NVRP.*

2. targets in section 6.3 of the report 'Flora and Fauna Assessment, Native Vegetation Impact Assessment, Land Management Plan, Yarra Flats Tree Top Adventure Park Ivanhoe East' (Practical Ecology, December 2018) describes and provides supporting evidence of an error with the modelled habitat on site for Pink Mountain–Correa, Correa lawrenceana var. cordifolia

In response to item 1 (a) Practical Ecology has received advice in an email dated 12 May 2021 as advised by Ezaz Sheikh the Planning Approvals Program Officer (Senior Statutory Planner) Land and Built Environment Programs, Port Phillip Region at DELWP that reads:

As discussed, I confirm that the review of Flora and Fauna Assessment, Native Vegetation Impact Assessment and Land Management Plan – Yarra Flats Tree Top Adventure Park, Ivanhoe East (Practical Ecology, 2018) and Native Vegetation Removal Report needs not to meet our requirement referred in item 1(a) of our request. However, the remaining item 1 (b) and 2 should be considered in accounting loss of native vegetation and offset requirement.

Further to this Practical Ecology has addressed item 2 and has been submitted as a separate document *Addendum Report Pink Mountain Correa* (Practical Ecology 2021).

Based on the above this current revised report only addresses item 1(b) and includes revised plans and all relevant information.

1.1 Project Background

The site for the proposed TreeTop Adventure Park is covered with native vegetation and is located in the Yarra Valley Parklands. The site borders the Yarra River, is within Banyule City Council and is managed by Parks Victoria. The native vegetation on the site is Flood Plain Riparian Woodland but is significantly disturbed in the groundstorey and dominated by exotic weeds while the shrub layer is mixed and the tree layer is predominantly indigenous.

The proposed TreeTop Adventure Park at Yarra Flats will comprise of 8 courses with a total of 100 challenges which will comprise a series of challenges suspended between the trees, with non-invasive platforms attached around trees. Other features will include flying foxes, nets, Tarzan jumps and high rope adventure challenges. All of the courses are in the tree canopy off of the ground, are only accessed through rope ladders (secured after hours) and exited by reaching the ground via a flying fox.

Ecoline designs, constructs and operates the TreeTops experiences which currently include; TreeTop Adventure Park, TreeTop Crazy Rider and TreeTop Safari. The first TreeTop Adventure Park was built in NSW, at Wyong Creek on the NSW Central Coast. Three additional parks are now operating in Newcastle, Western Sydney and Taronga Zoo. Previous projects have worked in partnership with government and currently operate on government land.

Ecoline (parent company of TreeTops) was the successful proponent in the EOI process put out in 2009 by Parks Victoria to design, build and operate a high ropes adventure course on the site. Ecoline has advised that Parks Victoria supports the proposal and will provide consent for the permit application.

A draft lease agreement is in preparation by Ecoline Pty Ltd and is being negotiated with Parks Victoria. This assessment attempts to recommend the proposed commitments for the development which will feed into the proposed agreement.

1.2 Aims

In support of the planning permit for the proposed development, this report details the following:

- a **Flora and Fauna Assessment** that details the vegetation and habitat within the study site
- an **Assessment of Native Vegetation Impact** that details how the proposal minimises impacts to biodiversity, calculates loss of native vegetation and details any required native vegetation offsets.
- a **Land Management Plan** detailing how the development and overall site, with consideration to the relevant planning scheme requirements, will be managed during construction works and into the future. This will outline different land-uses and management zones across the site including management of existing vegetation, weeds, areas of defendable space etc.
- a **Bushfire risk assessment** to document relevant bushfire conditions on site to inform the collaboration process, under the Bushfire Prone Area requirements any buildings require a Bushfire Attack Level Assessment, and address any potential requirements under clause 13.02 – 1S of the Planning Scheme.

1.3 Scope

The scope of works includes

- review the relevant flora and fauna databases and available literature
- a description of the existing site conditions
- categorise the vegetation according to *Guidelines for the removal, destruction and lopping of native vegetation* (DELWP 2017a) as either native vegetation patches; scattered trees; or non-native vegetation
- a description of the existing and/or original Ecological Vegetation Classes found within the site and assessment based on the Habitat Hectares scoring method
- tree census for remnant patch canopy trees and scattered trees which will be potentially impacted, based on Australian Standard AS 4970–2009 – Protection of trees on development sites
- the compilation of a list of vascular plants observed across the study site
- consideration of the potential for the occurrence of significant flora and fauna
- the assessment and detailing of the bushfire risk including a Bushfire Attack Level Assessment as per AS3959–2009 for the proposed development
- discussion of relevant ecological and bushfire policy and legislation in relation to the proposed development
- determination of the extent of vegetation removal that may be required for the development proposal
- A Native Vegetation Impact Assessment (NVIA) due to the development proposal

- A statement outlined how the development design has avoided and minimised loss of native vegetation
- the development of a 10 year Land Management Plan for rehabilitation of retained vegetation on-site, and management of the remaining areas of the site with consideration to erosion, weeds, hydrology and dams, tracks, fences, pest animal management and other relevant land management issues
- mapping to illustrate necessary information, including existing conditions and the proposed management zones under the development proposal.

1.4 Subject Site

1.4.1 Site description

The site for the proposed TreeTop Adventure Park is located in the Yarra Valley Parklands at 540 The Boulevard, Ivanhoe East (Map 1). The site borders the Yarra River to the east and Banksia Street is located to the north of the site. The Yarra Flats Entry Road is the main access into the site entering east from The Boulevard. A carpark and amenities are located within nearby surrounding areas and are adjacent to the Yarra Flats Entry Road.

There is an existing entry point into the site from the Yarra Flats Entry Road roundabout which connects a network of existing cleared walking tracks. The site is mostly covered by degraded riparian native vegetation that has some ecological values comprising mostly indigenous Large Old Trees with an exotic understory with steep escarpment that runs through the site.

The study area for the purposes of this assessment and as agreed upon by Ecoline is the area of the course overlay which is approximately 1.5ha, as shown in Map 1. All remaining vegetation that falls outside of this study area will not be impacted in any way by the proposed TreeTop Adventure Park as advised by Ecoline.

1.4.2 Adjacent land

Adjacent land to the north and south contains similar riparian vegetation, mostly bordering the length of the Yarra River. A Floodplain Wetland Aggregate known as the Annulus Billabong and the Banksia Billabong a highly localised asset is located south and northeast of the site and is also surrounded by series of local depressions. The Main Yarra Trail runs adjacent to the site, located to the west towards the Boulevard and is a shared use path for cyclists and pedestrians which follows the Yarra River throughout the north eastern suburbs.

1.4.3 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 Gippsland Plain Bioregion (DELWP 2018a).

Under the Catchment and Land Protection Act 1994 (the CaLP Act), Victoria is divided into ten catchment regions with a Catchment Management Authorities (CMA) established for each region (Victorian Water Industry Association Inc 2015). The study site occurs within the Port Phillip and Westernport Catchment (DELWP 2018a).

The surrounding area is pastoral and heritage landscapes, natural bushland, wetlands and picnic areas and is bordered by the Yarra River. Urban development with homes, offices and businesses is adjacent to the park on the west and east.

1.4.4 Geology and soils

The soils on the site are earths and pale yellow and grey texture contrast soils (Hydrosols) of alluvial origin. There are floodplains of the larger meandering rivers and major creeks, 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.

1.4.5 Land-use history

The current land-use is for conservation purposes and recreational activity mostly for walkers taking advantage of the network of cleared walking tracks that exists throughout the site. Open areas located near the site are being used as picnic areas and recreational purposes.

The site was privately owned farmland for many years before it was acquired for parkland in the 1970's. As such it was heavily cleared and disturbed post-settlement but has recovered fairly well since it became part of Yarra Valley Park. This earlier use has certainly been a dominant influence on its current condition as the native vegetation has recovered significantly in the last few decades although it is still significantly invaded by exotic weeds in the groundstorey and shrub layer.

1.4.6 Zoning and Overlays

The site is zoned Public Conservation and Resource Zone (PCRZ) and Road Zone (RDZ1) and is subject to the following overlays:

- Environmental Significance Overlay (ESO1)
- Environmental Significance Overlay (ESO4)
- Heritage Overlay (HO134)
- Land Subject to Inundation Overlay (LSIO)
- Significant Landscape Overlay (SLO)
- contains Areas of Aboriginal Cultural Heritage Sensitivity (AACHS)
- and is within a Bushfire Prone Area (BPA)

2. METHODS

2.1 Field survey

Field survey was undertaken by Liza James and Lincoln Kern on 17th February 2016, involving:

- mapping and assessing vegetation as per the habitat hectare methodology
- mapping all Large and Scattered Trees where required
- the compilation of a list of vascular plants observed across the study site
- consideration of the site's habitat values for threatened fauna and flora
- the compilation of a list of incidental fauna observed
- an assessment of weeds, erosion and other relevant land management issues across the site

The site was revisited 29th August 2018 by Liza James to reassess the site in accordance with the *Guidelines for the removal, destruction and lopping of native vegetation (DELWP 2017a)* and to review the current site conditions and vegetation quality.

The site was again revisited by Liza James in February 2021 to investigate the proposed access for the shipping container onto the site and any associated vegetation impacts in order to respond to item 1 (b) accordingly.

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 72): plants that are indigenous to Victoria, including trees shrubs, herbs and grasses.
- **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.
- **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 centimeters or greater

- **Scattered Tree:**

A *Scattered Tree* is a native canopy tree that does not form part of a patch.

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

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 on the study area (DELWP 2018a). EVCs were then identified in the field according to observable attributes including dominant and characteristic species consistent with the benchmark descriptions (DELWP 2018b).

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 Subject site (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 2018a).

2.1.1.4 Tree Census

All indigenous Large Canopy Trees and Scattered Trees were identified on the site if present.

The location, species and DBH for each Large Canopy Tree and Scattered Tree was recorded and detailed in Section 3.1.3 and illustrated on Map 1 and listed in Appendix 5 of this report.

Tree Protection Zones (TPZ) were also considered for the purpose of this assessment. A TPZ is the area around the trunk of a tree which has a radius of 12 times the DBH.

A TPZ can be assigned to a maximum of 15 metres and no less than 2 metres. Dead trees greater than 40 cm DBH are assigned a TPZ a radius of 15 metres from the base to be considered retained (DELWP 2017b).

Information was also obtained from the Arborist report prepared by Advanced Treescape Consulting (Kingdom 2018) and tree numbers correspond to those in this report.

2.1.2 Flora survey

Existing flora records on the Victorian Biodiversity Atlas (VBA; DELWP 2020d) for a 5 kilometre radius around the Subject site were obtained on 28/05/2021.

During the field survey, the Subject site 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 Subject site 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 (FFG) Act 1988 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 habitat survey

Existing flora records on the Victorian Biodiversity Atlas (VBA; DELWP 2020d) for a 5 kilometre radius around the Subject site were obtained on 28/05/2021.

The main focus in regards to fauna was to undertake a habitat assessment. The habitat assessment relies upon making judgements on the suitability of habitat present within the study site for any significant species recorded in the database search.

2.1.4 Limitations of flora survey

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

- it was undertaken in late summer and again in late winter which is not the optimal time for plant identification
- 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 and focussed on areas of the site most impacted upon by the proposed development.

Nonetheless the survey was considered an adequate representation of site condition and sufficient to determine potential impacts associated with the development and guide land management across the site.

On this basis, it is considered that the quality of the survey results were at least partially compromised. In particular, many parts of the study site showed signs of damp conditions, indicating that it is likely that in wetter times of the year, a higher cover of native herbs would be present. Additionally, the conditions encountered on the day meant that it is much less likely that it can be concluded that any rare or threatened flora species are not present.

However, the process of assessing the likelihood of the presence of threatened flora that is reported on in Section 3.2.1 assists in mitigating the potential risk that rare or threatened flora species were not identified during the site assessment. It is considered further in the analysis of relevant policy and legislation, Section 5.

2.2 Potentially occurring rare or threatened species

Database information was used to determine likelihood of occurrence of rare or threatened species that occur or are predicted to occur within five kilometres of the study area. In determining likelihood of occurrence and potential use of the study area by national or state significant flora and fauna, the following factors were considered:

- previous recordings of species in the local area
- date of last record
- the habitat requirements of individual 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 site
- the ecological landscape context; i.e. the degree of connectivity, modification and fragmentation across the landscape.

A basic matrix that describes the justification for the likelihood of occurrence is presented in Table 1.

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 site; 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.
Medium	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.

2.3 Taxonomy

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

2.4 Mapping

Spatial data collection was carried out using a combination of a handheld GPS enabled device, aerial photography and the existing feature survey. Determination of vegetation boundaries was undertaken using a combination of GPS data and ground-truthing with aerial photography. GPS data and mapping should be considered approximate only (e.g. +/- 1–5m).

3. RESULTS

3.1 Vegetation Categorisation, Classification and Quality

Native vegetation within the assessment area occurs in one Habitat Zone (HZ) and includes the entire area within the tree course. Similar vegetation occurs beyond the assessment area. Map 4 indicates the distribution of the Habitat Zone and the area assessed across the site. The Ecological Vegetation Classes on site and their bioregional conservation status are indicated in Table 2.

Table 2. Bioregional Conservation Status for Extant EVCs at Study Site.

EVC No.	EVC	Bioregional Conservation Status
56	Floodplain Riparian Woodland	Endangered

3.1.1 Floodplain Riparian Woodland

Floodplain Riparian Woodland vegetation type occupies the majority of the site. For the purposes of this assessment only the area to be impacted was assessed and is identified as one Habitat Zone 1 (Figure 1). HZ1 is in moderate condition dominated by Large River Red Gums *Eucalyptus camaldulensis* approximately 20m tall (Figure 4). Most trees are relatively older but there is a number of younger trees through-out (Figure 2).

Understorey trees and shrub species include Blackwood *Acacia melanoxylon*, Silver Wattle *Acacia dealbata*, Bursaria *Kunzea ericoides* spp. agg. Prickly Currant-bush *Coprosma quadrifida* and Tree Violet *Melicytus dentatus* s.l.

A high cover of exotic shrub species was also present through-out comprising: Box-elder Maple *Acer negundo* Sweet Pittosporum *Pittosporum undulatum* Hawthorn *Crataegus monogyna* Cherry Plum *Prunus cerasifera*.

Wandering Jew *Tradescantia fluminensis*, a high threat weed dominated the groundstorey along with other high threat weeds such as: English Ivy *Hedera helix* White Bladder-flower *Araujia sericifera* Blackberry *Rubus fruticosus* spp. agg. Toowoomba Canary-grass *Phalaris aquatica* and Couch *Cynodon dactylon* (Figure 3).



Figure 1. Floodplain Riparian Woodland



Figure 2. Large trees with younger trees throughout



Figure 3. Wandering Jew *Tradescantia fluminensis* dominating the groundstorey



Figure 4. Large Old River Red Gum

3.1.2 Habitat hectare assessment

Table 3 presents the results of the Habitat hectare assessment.

Table 3. Habitat hectare assessment

Habitat Zone			1
Bioregion			GP
EVC Name (initials)			FRW
EVC Number			56
EVC Conservation Status			EN
Size of Zone (ha)			1.557
		Max Score	Score
Site Condition	Large Old Trees	10	5
	Canopy Cover	5	4
	Understorey	25	5
	Lack of Weeds	15	0
	Recruitment	10	10
	Organic Litter	5	3
	Logs	5	2
	EVC Standardiser		1
	Standardised Site Score	75	29
Landscape Context		25	10
Habitat points		100	39
Habitat Score (habitat points/100)		0.##	0.39
No. of Large Old Trees			15

3.1.3 Tree census

Table 4 shows the tree classification by diameter-at-breast-height (DBH) for the EVCs identified within the study site.

Table 4. Tree Classification for EVCs at Study Site

EVC No.	EVC	DBH of:			
		Very Large Old Tree	Large Old Tree	Medium Old Tree	Small Tree
56	Floodplain Riparian Woodland	≥ 120 cm	≥ 80 cm to <120cm	≥60cm to <80cm	≥20cm to <60

A total of 15 Large Old Canopy Trees were identified within Habitat Zone 1, the species determined, DBH assigned and Tree numbers are consistent with the Arborist report prepared by Advanced Treescape Consulting (Kingdom 2018). The tree census is provided in Appendix 5.

3.2 Flora

A total of 42 plant taxa were recorded in the study area during this survey of which 12 were indigenous (30%) and 30 (70%) were introduced or naturalised outside their natural range. Appendix 1 lists all flora recorded within the study site respectively. Table 5 summarises plant taxa recorded in the study area during this survey.

Table 5. Summary of plant species recorded

Flora Status	Number of Taxa
Indigenous vascular species	12
Exotic species	28
Native species outside of natural range	2
TOTAL	42

3.2.1 Rare or threatened flora

A total of 22 state or nationally significant flora species are recorded within a five-kilometre radius of the study area in the VBA (DELWP 2021 a;b). Details of these species are given in Appendix 2 and the distribution of these species are depicted on Map 3.

No species listed under the EPBC Act were recorded within the study area. It is unlikely that any species listed under the EPBC Act including River Swamp Wallaby-grass *Amphibromus fluitans* are likely to occur due to the highly modified nature of the vegetation, in particularly due to the high weed cover within the understory.

No species listed as threatened under the FFG Act were recorded within the study area. It is unlikely that any species listed as threatened under the FFG Act are likely to occur due to the highly modified nature of the vegetation.

3.3 Fauna

3.3.1 Fauna habitat

The main focus with regards to fauna during the assessment was the consideration of the site's potential to provide fauna habitat. The habitat observed within the site included:

- tree canopies, and trees with small and large hollows
- leaf litter
- sparse understorey vegetation
- small logs

Vegetation on site provides good fauna habitat and is connected to broader areas of native vegetation. Within the site there are many large old trees containing hollows and suitable nesting habitat for many bird and bat species as well as possums. Small hollows also occur within deadwood of the tree canopy and are characteristic of River Red Gum trees which dominate the site.

The midstorey varies and is thick in some areas and sparse in others and generally providing good nesting habitat for smaller birds. Some areas within the site contain thick leaf litter that is ideal habitat for smaller fauna species such as lizards, frogs and invertebrates. It also provides good foraging material for birds. There are many small logs on site that can be used for nesting and foraging by smaller mammals and lizards.

3.3.2 Rare or threatened fauna

No rare or threatened fauna of state or national significance were recorded during the site inspection.

A total of 55 state or nationally significant fauna species are recorded within a five-kilometre radius of the study area in the VBA (DEPI 2014b). Details of these species are given in Appendix 3 and the distribution of these species are depicted on Map 2. Species with a moderate to high likelihood of occurrence is listed below.

Treaty	EPBC	FFG	VROTS	Scientific name	Common name	Likelihood occurrence	Likelihood Reasoning
	VU	L	v	<i>Pteropus poliocephalus</i>	Grey Headed Flying Fox	High	This species has mostly moved to using urban habitats in southern Australia where they forage mainly on native trees but often eat exotic fruits.
		L	v	<i>Falco subniger</i>	Black Falcon	Moderate	This species would hunt across large areas including the study site.
		L	v	<i>Accipiter novaehollandiae</i>	Grey Goshawk	Moderate	This species would hunt across large areas including the study site.
			n	<i>Phalacrocorax varius</i>	Pied Cormorant	Moderate to High	This species would commonly use wetlands along the Yarra River corridor.

		L	v	<i>Ninox strenua</i>	Powerful Owl	Moderate to High	This species would hunt across large areas including the study site.
			n	<i>Ceyx azureus</i>	Azure Kingfisher	Moderate to High	This species would forage along the Yarra River, connected wetlands and river banks potentially including the study site.
C,R,J	VU	L	v	<i>Hirundapus caudacutus</i>	White-throated Needletail	Moderate to High	This species would hunt across large areas including the study site.

The Grey-headed Flying-fox is listed as Vulnerable under the EPBC Act, listed on the FFG Act and is listed as vulnerable under DELWP's Victorian Rare or Threatened (VROT) list. The species may use the area for foraging, but no known camps are present on site. The nearest camp is located approximately more than two km from the study area and will not be impacted by any proposed works. Therefore, no significant impacts are expected to occur to the species.

The Powerful Owl is listed on the FFG Act and is listed as vulnerable under DELWP's Victorian Rare Or Threatened (VROT) list. The Powerful Owl is known to use the Yarra River corridor and riparian vegetation associated with the site for roosting, foraging and breeding. This species is known to occur approximately 2km from the study area, where a pair of breeding Owls are within River Red gum hollows within riparian vegetation located at the end of Macarthur Road (Garry French, Parks Victoria pers. comm.). Furthermore, a known breeding site is located by the banks of the Yarra River at Wilson Reserve in Ivanhoe approximately 3.8km from the study area is (Alice Ewing pers. comm.). Another breeding pair is within 2kms upstream of the site near the Banyule Billabong (Garry French Pers. Comm.) Given this there are no known breeding or roosting sites that occur within the study site and at most the Powerful Owl is likely to only use the site as a connecting corridor to fly through at night (Garry French Pers. Comm.) or to hunt in occasionally.

The Azure Kingfisher is listed as near threatened under DELWP's Victorian Rare or Threatened (VROT) list. There are recorded records nearby but not suitable habitat for nesting burrows at the site. Perching locations may occur and may use the site to fly through. Therefore, no significant impacts are expected to occur to the species.

There are also several migratory bird species that have been recorded within 5 km of the study site and these species would likely use habitat within existing wetlands along the Yarra River corridor. The difficult issue around this proposed development is the likelihood that the pre-existing but modified Banksia Street Billabong would be rewatered and additional constructed wetlands will be constructed along the north edge of Yarra Flats. These wetlands would likely provide habitat for migratory waterbirds like the rest of the wetlands along the Yarra River. It is likely that the noise and activity of the course will discourage birds from using the habitat in that part of the rewatered Banksia Street Billabong directly affected by the course. However, the majority of the new rewatered and constructed wetlands will be distant from the course and would likely be affected by the significant noise of traffic on Banksia Street and the general noises of people, and often their dogs, using the parkland around them.

The habitat values of the rewatered and new wetlands are already significantly compromised by the current urban context and the noise from the proposed course will likely blend into the significant background noise levels that are already present. Having said that it will be possible to design the rewatered Banksia Street Billabong and new constructed wetlands to have protective clumps of shrubs and shallow water with wetland plant cover installed around them to provide habitat for roosting and areas for foraging for food. The potentially new habitats of rewatered and new constructed wetlands would likely be compromised to a small degree by the proposed course but the majority of any new wetland habitats would be relatively distant from the proposed course with the minimal noise from users not adding significantly to current urban noise levels.

4. DEVELOPMENT PROPOSAL AND POTENTIAL IMPACTS

The current proposal for the study site includes establishment of a TreeTop Adventure Park and associated infrastructure (refer to Map 5 and Appendix 7). Impacts on vegetation and habitat at the study site will arise from various aspects associated with the proposed development and its future use (refer to Map 6). These impacts on native vegetation will occur in the following 'land management zones' (discussed further in section 6 and section 9) that are proposed for establishment on this site. These zones correspond with those shown on Map 8 and are described below:

4.1 Proposed development

Construction Zone (CZ):

- This zone will consist of areas within HZ1 and the current clearing.
- The building envelope (proposed Decking and Reception footprint) will be established within this zone and a 1m buffer area has been included to allow for any impacts to native vegetation that may be caused during the construction/installation phase.
 - The proposed decking will be a small timber deck to be constructed around the base of Tree 1. This deck will measure 10210 mm x 8970mm. The deck will be constructed with spacing between the decking boards for water to move through to the roots. All elements of the deck will be manually transported onto the location on the current path in order to mitigate the impact of a heavy vehicle travelling into this space. The deck will be constructed with unenclosed foundations and the underneath will remain open in the future to allow for the passage of flood waters. The piers for the deck will be installed using low impact portable equipment, with Surefoot footings (steel hybrid all in one footings) going into the ground – the least amount of impact possible for such an installation. As discussed in the Arborists report '*this method of construction will have an acceptable low inground impact on the subject Tree 1. as the excavation for the piers can be supervised by the project arborist and moved to accommodate any roots > 50mm that may be located. The structure will allow water to flow between the decking boards onto the trees root plate. It must be noted that there needs to be a gap of at least 100mm between the trunk of the tree and the Cyprus timber deck boards. These works will have an acceptable impact on this tree*'.
 - The proposed Reception will be made out of recycled shipping containers and clad timber and located in an area with no trees or shrubs alongside the existing track where the delivery of the containers can be easily achieved with minimal impact on vegetation. The site is right beside the road and containers can be delivered by the truck without the truck having to leave the road. The timber deck will measure 11,240mm x 10,210m with unenclosed foundations and will remain open underneath, a steel awing will cover the deck with a slimline water tank to capture the water from the roof surface.
- It is likely that vegetation within this zone, only small native shrubs, will need to be cleared to allow for the decking and the reception location. Therefore, all vegetation within the Construction Zone will be considered lost even though some vegetation may be retained.

- Ecoline has advised that no trees will be removed including Tree Number 1. Ecoline has advised that the tree will be protected by decking with poles that will be constructed well away from the Tree Protection Zone (TPZ) of Tree Number 1. Impacts to Tree Number 1 has been discussed in section 6 (Guidelines for design) of the Arborist report (Kingdom 2018). If the guidelines for design are followed then the arborist has confirmed that the tree can be retained and not deemed lost under the *Guidelines for the removal, destruction and lopping of native vegetation* (DELWP 2017a). The development plans in Appendix 7 also depict how the tree will be avoided.

Fuel Modified Conservation Zone (FMCZ)

- This is the area surrounding the proposed reception area with a buffer of 10m. The purpose of this zone is to provide an area that has reduced bushfire fuel levels but still consists of indigenous vegetation. This also includes a connecting mulched pathway which will provide access to the site

Modified Conservation Zone (MCZ)

- This Zone will include remaining areas of HZ1. This is the broader area within the proposed course overlay. The construction in this area will include 8 courses and associated non-invasive platforms around trees (Figure 5). The courses will include a series of flying foxes, rope ladders and high rope challenges linking platforms. There will also be upgrades to existing pathways which will be widened and mulched (Figure 6).
- All other associated features relating within this zone include a connecting mulched pathway that will be linked to Parks Victoria's existing path system.
- Ecoline has advised that no trees will be removed however; vegetation in this zone may be slightly modified to allow for the obstacle course facilities in trees and for the safety of participants. The majority of the remnant vegetation in particular canopy trees will be retained however as outlined in the Arborist report prepared by Advanced Treescape Consulting (Kingdom 2018) some canopy trees will require some remedial work such as crown cleanup and deadwooding. Furthermore, it is likely that some understorey trees and medium shrubs that reach the height of the canopy and are also growing densely throughout the site will need to be trimmed to clear an aerial pathway for the apparatus in particular the high rope adventure challenges or flying foxes.



Figure 5. non-invasive built platforms around trees with mulched pathways



Figure 6. Proposed pathways

4.2 Future use

- The future use of the site will be limited to daylight hours opening 7 days a week, 364 days per year and closed Christmas Day. Operating hours to vary from the summer months to winter.
 - Summer – Monday to Sunday 9.00am -- 6.00pm
 - Winter -- Monday – Friday 10.00am – 4.00pm (we open at 9.00am for school groups or corporate groups)
 - Saturday – Sunday & School Holidays – 9.00am – 4.30pm
- TreeTops opens in all weather conditions except very heavy winds or lightning. It is likely that due to the site occurring within a Bushfire Prone Area that there will be closure of the facility and evacuation of all staff on Extreme and Code Red fire danger days. An emergency management plan safeguarding Yarra Valley Park and management of the Treetops facility will be incorporated into the plan.
- Capacity: Maximum number of people able to be on the courses at one time is 100. The maximum capacity of the facility on summer's day will be approx. 240.
- The carpark that already exists adjacent to the site will be refurbished to bring it in line with relevant Australian standard and will be configured to allow for 41 car spaces and 2 disabled parking spaces. *It must be noted that this refurbishment is not included in the current assessment.* Access to the car park will be limited to operating hours only.
- Toilets located nearby will also be refurbished and used by visitors
- Public Access: TreeTops will not restrict public access to the park except in the immediate office vicinity where participants are equipped and briefed for the experience.
- All activities will be restricted to the treetops within the courses which start at the Administration building.

4.3 Banksia Street billabong

Melbourne Water has a project planned to bring water into the Banksia Street billabong partly as a way to filter the stormwater before it goes into the river and also for the ecological benefits (see Map 7). It has been advised by the proponent that neither Parks Victoria or Ecoline foresee any problems arising from the presence of water in the billabong as people will be within the treetops above it and no one will be permitted to carry anything onto the courses so there will be no litter or rubbish dropped into the Billabong. Ecoline have advised that if anything it will give the participants an informative experience of the billabong from a different perspective.

Any potential impacts to the billabong including impacts associated with waterbirds likely to visit the site is described in section 7 of this report and on-going monitoring and mitigation is also recommended in section 8.

5. RELEVANT POLICY AND LEGISLATION

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

5.1 Environment Protection and Biodiversity Conservation Act

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) applies to sites where proposed developments or projects may have a significant impact on matters of National Environmental Significance (NES). There are currently seven matters of National Environmental Significance:

- World Heritage properties
- National Heritage places
- nationally listed threatened species and ecological communities
- listed migratory species
- Ramsar wetlands of international importance
- Commonwealth marine areas
- nuclear actions (including uranium mining).

Under the EPBC Act, a proponent must refer proposed actions that may have a significant impact on matters of national environmental significance to the Australian Government Environment Minister (or delegate)

Relevance to proposal

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- lead to a long-term decrease in the size of an important population of a species
 - *No important population on site. Will not impact the camp located at Yarra Bend, located >2km from study site*
- reduce the area of occupancy of an important population
 - *no removal of trees on site*
- fragment an existing important population into two or more populations
 - *No existing important population on site*
- adversely affect habitat critical to the survival of a species
 - *Minimal impact to trees on site*
- disrupt the breeding cycle of an important population
 - *No important population on site*
- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

- *Minimal impact to vegetation on site. No trees proposed for removal*
- result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
 - *No invasive species are likely to establish due to proposal*
- introduce disease that may cause the species to decline, or
 - *N/A*
- interfere substantially with the recovery of the species.
 - *N/A*

What is an important population of a species?

An 'important population' is a population that is necessary for a species' long-term survival and recovery.

This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range.

Migratory water birds listed under the EPBC are likely to use habitat of existing or rewatered wetlands along the Yarra but the proposed development within the study site is not likely to have a significant impact on species, nor any other matters of environmental significance protected under this Act.

The Grey-headed Flying-fox is listed as Vulnerable under the EPBC Act. The species may use the area for foraging, but no known camps are present on site. The nearest camp is located approximately more than two km from the study area and will not be impacted by any proposed works. Therefore, no significant impacts are expected to occur to the species.

5.2 Flora and Fauna Guarantee Act 1988

The *Flora and Fauna Guarantee Act 1988* (FFG Act) 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.

5.2.1 Protected flora

The protected flora controls are set out in Division 2 of Part 5 of the *Flora and Fauna Guarantee Act 1988* (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).

5.2.1.1 Threatened flora

No flora species listed as threatened under the FFG Act were recorded within the study area. It is unlikely that any species listed as threatened under the FFG Act are likely to occur due to the highly modified nature of the vegetation.

Relevance to proposal

There are no implications associated with threatened flora under the FFG Act in relation to the project.

5.2.1.2 Protected flora

Species listed as protected flora that are not listed as threatened, do not occur within the study area.

Relevance to proposal

A permit is not required as the proposed works will not kill, injure or disturb protected flora species.

5.2.1.3 Threatened fauna

There are 55 species of fauna listed under the FFG Act 1988 recorded within a 5 km radius study area; one of these, Grey Headed Flying Fox has a high likelihood of occurrence and the Powerful Owl may potentially occur on site.

Relevance to proposal

There are no known breeding or roosting sites for Powerful Owl or camps for Grey-headed Flying-fox that occur within the study site. Powerful Owl is only known to use the site as a connecting corridor to fly through at night and the Grey-headed Flying-fox may use the area for foraging. The proposed construction of the TreeTops Adventure Park will have minimal impact on habitat (refer to section 3) and furthermore the recreational construction activities following construction will be restricted to daylight hours and therefore it is unlikely that the construction or the future use of the site will have any significant impact on the Powerful Owl or any other species listed under this Act.

Four native fish species and Platypus would all use the aquatic environment of the Yarra River but the proposed course is very unlikely to affect the aquatic environment of the Yarra River.

A range of migratory birds could potentially use the habitat across Yarra Valley Parklands with many of them being water birds. Migratory water birds would use the existing and any enhanced wetlands along the river and there may be enhanced wetlands on the study but it is unlikely that the proposed course would have a significant impact on the level of use because it would be distant from most of the new and enhanced wetlands. The migratory terrestrial birds that use habitat in the local area would not be significantly affected by the proposed course because of its limited footprint.

The Southern Brown Toadlet could occur in the local area and possibly even the site but there will be very little if any of the sheltered damp areas they live in affected by any works associated with the proposed course.

5.2.1.4 Threatened communities

No threatened vegetation communities recorded during the assessment.

Relevance to proposal

There are no implications associated with threatened communities under the FFG Act in relation to the project.

5.2.2 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.

Relevance to project

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 give proper consideration to 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.

For further information on Public Authority Duty under the Amendment Act, see:

https://www.environment.vic.gov.au/_data/assets/pdf_file/0031/466681/Public-Authority-Duty-factsheet.pdf

A new category of protected flora – 'restricted use protected flora' is being introduced. There are changes to offences related to the take, trade, movement or processing of all protected flora, including revised exemptions. There have also been changes to the penalties for not complying with controls.

For further information on Protected Flora under the Amendment Act, see:

<https://www.environment.vic.gov.au/conserving-threatened-species/protected-flora-and-listed-fish>

5.2.3 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.

5.2.4 Ministerial Direction No. 11 Strategic Assessment of Amendments

From time to time, the Minister for Planning issues directions to planning authorities about the preparation of planning schemes and amendments to planning schemes. Planning authorities also must consider any other Ministerial direction when preparing a planning scheme or an amendment to a planning scheme.

The purpose of Direction No. 11 Strategic Assessment of Amendments is to ensure a comprehensive strategic evaluation of a planning scheme amendment and the outcomes it produces. In preparing an amendment a planning authority must evaluate and include in the explanatory report a discussion about how the amendment addresses the following strategic considerations:

- Why is an amendment required?
- How does the amendment implement the objectives of planning in Victoria?
- How does the amendment address any environmental effects?
- How does the amendment address any relevant social and economic effects?
- How does the amendment address any relevant bushfire risk?
- Does the amendment comply with the requirements of any other Minister's Direction applicable to the amendment?
- How does the amendment support or implement the State Planning Policy Framework and any adopted State policy?
- How does the amendment support or implement the Local Planning Policy Framework, and specifically the Municipal Strategic Statement?
- Does the amendment make proper use of the Victoria Planning Provisions?
- How does the amendment address the views of any relevant agency?
- Does the amendment address the requirements of the Transport Integration Act 2010?

It is outside the scope of this document to address all these matters. Section 5.7 of this document aims to respond to the consideration of bushfire risk and consideration of environmental effects are considered throughout.

5.2.5 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 biodiversity.

Clause 13 Environmental Risks

This clause recognises that planning should adopt a best practice environmental management and risk management approach which aims to avoid or minimise environmental degradation and hazards. This includes consideration of:

- climate change
- floodplains
- soil degradation
- erosion and landslip
- noise and air
- air quality
- bushfire

Clause 13.02 Bushfire

The objective of this clause is to assist to strengthen community resilience to bushfire. The overarching strategies are to:

- prioritise the protection of human life over other policy considerations in planning and decision-making in areas at risk from bushfire,
- apply the precautionary principle to planning and decision-making when assessing the risk to life, property and community infrastructure from bushfire.

This includes considerations such as:

- Apply the best available science to identify vegetation, topographic and climatic conditions that create a bushfire hazard.
- Development should not proceed unless the risk to life and property from bushfire can be reduced to an acceptable level.

Relevance to proposal

Consideration of the bushfire risk has been incorporated into the project design and is specifically addressed in detail in section 5.7.

5.2.6 Banyule Zoning

The site is zoned Public Conservation and Resource Zone (PCRZ). The purpose of this zone includes:

- To implement the State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies
- To protect and conserve the natural environment and natural processes for their historic, scientific, landscape, habitat or cultural values.
- To provide facilities which assist in public education and interpretation of the natural environment with minimal degradation of the natural environment or natural processes

Under this zone, the subject site requires a permit to construct a building or construct or carry out works. However, this assessment seeks to support a planning scheme amendment according to Victoria's Planning Provisions under Clause 52.03 for a Specific Site Exclusion.

Clause 52.03 – Specific Sites and Exclusions

The purpose of this clause includes:

- To recognise specific controls designed to achieve a particular land use and development outcome existing on the approval date.
- To provide in extraordinary circumstances specific controls designed to achieve a particular land use and development outcome.

Land identified in the schedule to this clause may be used or developed in accordance with the specific controls contained in the incorporated document corresponding to that land. The specific controls may:

- allow the land to be used or developed in a manner that would otherwise be prohibited or restricted;
- prohibit or restrict the use or development of the land beyond the controls that may otherwise apply;
- exclude any other control in this scheme

Relevance to proposal

Minor changes to zoning will make the proposed development acceptable for the site.

5.2.7 Banyule Overlays

The site is also covered by the following overlays under the Banyule Planning Scheme

- Environmental Significance Overlay (ESO1)
- Environmental Significance Overlay (ESO4)
- Heritage Overlay (HO134)
- Land Subject to Inundation Overlay (LSIO)
- Significant Landscape Overlay (SLO1)

ESO1 – Environmental Significance Overlay – Schedule 1 Yarra River, Plenty River and Darebin Creek

This overlay applies to the entire area and largely focuses on areas along the Yarra River and Darebin Creek that have significant natural habitat and environmental qualities. They include the protection of streamside areas supporting open space and substantial remnants of indigenous vegetation and wetlands of at least local conservation significance, which in turn, provide habitat for a variety of native animals threatened with local extinction.

Under this overlay a permit is required to remove, destroy or lop any vegetation.

The objectives for this overlay are as follows:

- To protect areas along watercourses from development and loss of vegetation that may damage the streamside environment as a visual, conservation, ecological and recreation resource.
- To enhance and encourage the conservation and maintenance of the streamside environment as a conservation, ecological and recreation resource.
- To address the threatening processes associated with widespread habitat loss and degradation that has occurred in North East Melbourne.
- To conserve water quality and watercourse capacity to enable appropriate beneficial land use and water-based activities to be undertaken
- To encourage the retention and enhancement of a continuous corridor of indigenous vegetation along river and creek banks in order to provide corridors and habitat for the movement of wildlife.
- To protect the watercourse and adjoining parkland and its flora and fauna from the effects of polluted waters conveyed by the stormwater system or other means.
- To protect and enhance sites with archaeological or scientific significance.
- To encourage development consistent with any approved concept plan for the area.

- To ensure that development and management of land is compatible with the natural environmental character and landscaped qualities of the watercourse and its surrounds.

Requirements under this overlay are as follows:

Before deciding on an application to remove, destroy or lop any vegetation the responsible authority must consider, as appropriate:

- The role of native vegetation in conserving flora and fauna.
- The need to retain native or other vegetation if it is rare, supports rare species of flora or fauna or forms part of a wildlife corridor.
- The need to retain vegetation which prevents or limits adverse effects on ground water recharge.
- The need to retain vegetation:
 - Where ground slopes exceed 20 percent.
 - Within 30 metres of a watercourse or wetland.
 - On land where the soil or subsoil may become unstable if cleared.
 - On land subject to or which may contribute to soil erosion, slippage or salinisation.
 - In areas where the removal, destruction or lopping of vegetation could adversely affect the integrity or long term preservation of an identified site of scientific, nature conservation or cultural significance.
 - Which is of heritage or cultural significance.
- Any relevant permit to remove, destroy or lop native vegetation in accordance with a land management plan or works program.
- Whether the application includes a land management plan or works program.
- Whether provision is made or is to be made to establish and maintain native vegetation elsewhere on the land.
- *The Middle Yarra River Concept Plan – Dights Falls to Burke Road, August, 1990; the Middle Yarra Concept Plan – Burke Road to Watsons Creek, July 1991; the Lower Plenty River Concept Plan, October 1994; the Lower Darebin Creek Concept Plan, March 1995; or any other approved concept plan, as relevant*
- Any report on the value or otherwise of the specified vegetation including:
 - An Inventory of Sites of Environmental Significance in the City of Banyule and Adjoining Areas, Banyule City Council, September 1995,
 - Sites of Faunal and Habitat Significance in North East Melbourne, Cam Beardsell, 1997,
 - Lower Plenty River Concept Plan Vegetation Report 1991,

- Banyule Weed Management Strategy 2006, and
 - Wildlife Corridor Program, Banyule City Council, 2000.
- The conservation and enhancement of vegetation in the area.
- The benefits of retaining a buffer strip of vegetation within specified distances of watercourses, roads and property boundaries.
- The benefits of requiring planting, replanting or other treatment of any part of the land.
- The views of the relevant drainage authority.
- Any proposed landscape plan or agreement to replace areas of vegetation on the site.
- The management of vegetation to minimise fire hazard and to ensure safety to people and property.
- If appropriate, the views of Parks Victoria, with those views to be sought under Section 52 of the Planning and Environment Act 1987.
- Whether the native or exotic vegetation makes a significant contribution to the visual amenity or landscape qualities of the streamside environment

Relevance to site

The objectives of the Overlay have been met, as although there will be some native vegetation removal, it will be limited and complete loss has been minimised (refer to section 4 for the development proposal and section 6 which refers to vegetation removal). Due to the nature of the development and limited clearing of native vegetation within the construction zone it is unlikely that the site will have adverse effects on landscape values, wildlife habitat or corridors or lead to land degradation through soil erosion or loss of water quality. Furthermore, as although some areas of vegetation will require some remedial work such as crown cleanup and deadwooding, this will be minor and will not have any adverse effects on significant natural habitat and environmental qualities.

The development is consistent with the guidelines in that impacts to significant natural habitat and environmental qualities are low. Significant habitat will be avoided and the planning to ensure the development is sustainable and will be guided through the preparation of a Land Management Plan.

Other sections of the policy have been met or demonstrated throughout this report, particularly in Sections 5, 6 and 9.

ESO4 – Environmental Significance Overlay – Schedule 4 Significant trees and areas of vegetation

This Overlay applies to the many individual trees, groups of trees and areas of vegetation within Banyule, which have special significance. They include a variety of native and exotic trees and other vegetation, which are of landscape, habitat, horticultural or genetic value, are rare or of localised distribution, are outstanding examples of their species or are of cultural or historical significance. All are included on the *Banyule City Council Significant Trees Register* and some are included on the *National Trust of Australia's Register of Significant Trees of Victoria*.

The objective for this overlay is to protect and enhance trees and areas of vegetation that are significant.

A permit is required to remove, destroy or lop any significant tree or area of vegetation specified in the table to this clause.

Before deciding on an application under this overlay the responsible authority must consider, as appropriate:

- The significance of any specified trees or areas of vegetation.
- Whether any specified trees or areas of vegetation are of botanical, scientific or cultural significance and the impact of its removal on the integrity of the landscape.
- The benefit of a condition regarding the method to be employed in lopping any specified trees.
- The benefit of conditions requiring a long-term maintenance program for specified trees or areas of vegetation and especially those subject to continuing works.
- Whether the proposed location or design of any building or works will impair the appearance or health of specified trees or areas of vegetation.
- The “*National Trust (Victoria) Significant Trees Register*”, the “*Banyule City Council Significant Trees and Vegetation Register*” and the “*City of Banyule – Significant Trees and Vegetation Study (March 2000)*”.
- Any report which identifies, describes or deals with specified trees or areas of vegetation.

Relevance to site

The objectives of the Overlay have been met and no trees or areas of vegetation listed on the *Banyule City Council Significant Trees Register* or on the *National Trust of Australia's Register of Significant Trees of Victoria* are proposed to be impacted.

Consideration has been made of the Monterey Cypress *Cupressus macrocarpa 'Horizontalis'* and *C. macrocarpa 'Horizontalis aurea'* (Many) Cupressus Hedges Code 273 listed on Councils Significant Tree Register at 340–680 The Boulevard, Ivanhoe East. The location of these are more than 1 km away from the proposed site and will not be impacted by the proposal.

LSIO – Land Subject to Inundation Overlay

The objectives for this overlay are as follows:

- To implement the State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies.
- To identify land in a flood storage or flood fringe area affected by the 1 in 100 year flood or any other area determined by the floodplain management authority.
- To ensure that development maintains the free passage and temporary storage of flood waters, minimises flood damage, is compatible with the flood hazard and local drainage conditions and will not cause any significant rise in flood level or flow velocity.
- To reflect any declaration under Division 4 of Part 10 of the Water Act, 1989 where a declaration has been made.
- To protect water quality in accordance with the provisions of relevant State Environment Protection Policies, particularly in accordance with Clauses 33 and 35 of the State Environment Protection Policy (Waters of Victoria).

- To ensure that development maintains or improves river and wetland health, waterway protection and flood plain health.

Before deciding on an application, in addition to the decision guidelines in Clause 65, the responsible authority must consider, as appropriate:

- The State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies.
- Any local floodplain development plan.
- Any comments from the relevant floodplain management authority.
- The existing use and development of the land.
- Whether the proposed use or development could be located on flood free land or land with a lesser flood hazard outside this overlay.
- The susceptibility of the development to flooding and flood damage.
- The potential flood risk to life, health and safety associated with the development. Flood risk factors to consider include:
 - The frequency, duration, extent, depth and velocity of flooding of the site and accessway.
 - The flood warning time available.
 - The danger to the occupants of the development, other floodplain residents and emergency personnel if the site or access way is flooded.
- The effect of the development on redirecting or obstructing floodwater, stormwater or drainage water and the effect of the development on reducing flood storage and increasing flood levels and flow velocities.
- The effect of the development on river health values including wetlands, natural habitat, stream stability, erosion, environmental flows, water quality and sites of scientific significance.

Relevance to site

A permit is required for the proposal under this overlay. Consideration needs to be made of the decision guidelines provided for in the schedule. This report addresses some of these concerns, however most the matters are outside the scope of this report and should be fully considered by the applicant to ensure they are met.

SLO1 – Significant Landscape Overlay – Schedule 1 Yarra (Birraring) River Corridor Environs

The objectives for this overlay are as follows:

Landscape, environmental and cultural values

- To protect and enhance the natural landscape character of the Yarra River corridor where the river, its topography, adjacent public open space and a continuous corridor of vegetation and canopy trees are the dominant features.

- To protect, rehabilitate and expand a continuous corridor of riparian and indigenous vegetation using appropriate indigenous species.
- To protect and enhance both terrestrial and aquatic habitat to allow the movement of wildlife within the Yarra River corridor.
- To protect and conserve areas of known indigenous and non-indigenous cultural or archaeological significance.
- To retain exotic vegetation of heritage or neighbourhood character where it contributes to landscape significance.

Protection of waterway and the riparian zone

- To ensure buildings and works are set back from the banks of the river to protect existing riparian vegetation, habitat and not impede its natural flood and watercourse characteristics.
- To maintain and protect the river's natural geomorphology, banks stability and reduce the risk of erosion.
- To reduce the rate or quantity of stormwater, sediment or other pollutants directly entering watercourses or wetlands.

Public open space and access

- To maintain and protect linear public open space and provide for secluded areas of public open space with appropriate public access to the river and its public open space.
- To encourage the co-location or clustering of buildings, jetties and mooring facilities on public land.
- To encourage bicycle and shared paths that are well located, avoid unnecessary earthworks and vegetation removal and have good visibility to help increase safety for users.

Siting and design of built form

- To avoid light spill and overshadowing from buildings and works on the banks and water of the Yarra River, adjacent public open space and along bicycle and shared paths.
- To minimise the visual intrusion of buildings and works when viewed from the Yarra River and adjacent public open space, bicycle and shared paths and bridge crossings.
- To ensure buildings are sited and designed to reduce visual contrast with the natural landscape character setting of the Yarra River corridor.
- To ensure all buildings are subordinate to the existing vegetation with all views of buildings filtered through vegetation.
- To ensure all fencing within close proximity to the Yarra River is low in scale, visually permeable and does not create contrast with its natural landscape character.

A permit is required to:

- Remove, destroy or lop vegetation.
- Construct a fence within 30 metres of the banks of the Yarra River or where it abuts public open space unless all of the following requirements are met:
 - the maximum height of the fence does not exceed 1.4 metres at any point above natural ground level; and
 - the fence is of timber post and rail, and timber or metal post and wire construction

Relevance to site

The objectives of the Overlay have been met, as although there will be some native vegetation removal, it will be limited and complete loss has been minimised (refer to section 4 for the development proposal and section 6 which refers to vegetation removal). No canopy trees will be removed or deemed lost according to the Arborist Report (Kingdom 2018). Some areas of vegetation will require some remedial work such as crown cleanup and deadwooding however this will be minor and will not have any adverse effects on any Landscape or Environmental Values. Furthermore revegetation and supplementary planting has been recommended to rehabilitate the area to assist with expanding a continuous corridor of riparian and indigenous vegetation using appropriate indigenous species (see section 9.8).

Other sections of the policy have been met or demonstrated throughout this report, particularly in Sections 5, 6 and 9.

A permit is required for the proposal under this overlay. Consideration needs to be made of the decision guidelines provided for in the schedule. This report addresses some of these concerns, however some of the matters are outside the scope of this report and should be fully considered by the applicant to ensure they are met.

5.2.8 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 pathway depending on the location and extent of vegetation removed. The application requirements and decisions depend on the relevant assessment 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.

This report, and in particular, Section 6, seeks to respond to this Clause.

5.3 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 1988.

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, 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.

5.4 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 their propagules, either as plants, seeds or contaminants in other material is prohibited.

Relevance to proposal

There were 5 weeds declared noxious under the *Catchment and Land Protection (CaLP) Act 1994* identified on the site. The following table lists the declared noxious weeds observed on site.

Table 6. Declared noxious weeds occurring within the study area

Scientific Name	Common Name	Control Category (Port Phillip)
<i>*Cirsium vulgare</i>	Spear Thistle	C
<i>*Lycium ferocissimum</i>	African Boxthorn	C
<i>*Crataegus monogyna</i>	Hawthorn	C
<i>*Rubus fruticosus spp. agg.</i>	Blackberry	C
<i>*Foeniculum vulgare</i>	Fennel	R

Established pest animals potentially occurring on the site include:

Table 7. Declared established pest animals potentially occurring on site

Common Name	Scientific Name
Dog	<i>*Canis lupus familiaris</i>
European Hare	<i>*Lepus europaeus</i>
European Rabbit	<i>*Oryctolagus cuniculus</i>
Red Fox	<i>*Vulpes vulpes</i>

5.5 Bushfire Prone Areas

The Victorian *Building Regulations 2006* are created under *Building Act 1993*. The Regulations incorporate the Building Code of Australia (BCA) so that in designated bushfire prone areas (BPA) *Australian Standard 3959-2009 Construction of Buildings in bushfire-prone areas* (Standards Australia 2009) applies to:

- Class 1 (houses)
- Class 2 (apartments)
- Class 3 (residential buildings other than class 1 or 2) buildings
- 'specific use bushfire protected buildings' which includes schools, kindergartens, childcare facilities, aged care facilities and hospitals
- associated Class 10a buildings (carports, garages, sheds and the like).

AS 3959 provides a method of determining the Bushfire Attack Level (BAL) which is a measure of the severity of a building's potential exposure to bushfire. Following the calculation of a building site's BAL, the Standard then provides an appropriate building construction design.

Relevance to site

The site is within a Bushfire Prone Area (BPA), however AS3959 does not apply in this instance as the proposed development does not include any buildings that require its application under the Victorian Building Regulations 2006. However, Clause 13.02-1S requires a bushfire risk assessment for all planning decisions which was done in this case and the minimal risk was addressed through defensible space around the limited buildings.

5.6 Bushfire Risk

The bushfire risk on the study site is highly limited by the surrounding urban environment. There is still however potential for a local bushfire to occur within the constraints of the Yarra Flats. This would include grassland and woodland fuels scattered along the Yarra corridor. With these fuels bushfire behaviour may potentially be intense locally but fire size and intensity, and the overall risk to property and life would be low.

Egress and access from the site is also very good and it would be quite reasonable to anticipate able bodied persons would be able to egress the area at risk should a bushfire start in the local area.

5.7 Recommended Bushfire Risk Management

Ensuring that bushfire risk is adequately addressed is required under Ministerial Direction 11 and Clause 13.02-1S of the planning scheme. Furthermore, under the Victorian *Occupational Health and Safety Act 2004* an "employer must, so far as is reasonably practicable, provide and maintain for employees of the employer a working environment that is safe and without risks to health" (Section 21). If people are employed to work at the facility consideration in relation to bushfire risk is required under this Act.

In order to address the bushfire risk there are a number of considerations that should be made including:

- Building and infrastructure resilience to bushfires, including siting options to reduce risk
- Defendable space
- Access for fire fighting
- Egress from the site
- Water supply for fire fighting
- Management of staff, customers and the public in the event of bushfire.

Building siting and defendable space

Consideration of the need for defendable space has been included in the siting of the reception and storage facilities. As the buildings will be a shipping container, which are non-flammable and not strictly the class of building requiring a response under the Bushfire Prone Mapping, an arbitrary 10 m of defendable space has

been proposed. There is an extra measure of risk mitigation in place for the because it is placed directly next to the existing bitumen carpark which provides an excellent firebreak to the west of the facility.

The management of defensible space is included in the Land Management Plan outlined in section 9. The main consideration here is to ensure that revegetation in this area is limited and does not increase the risk to this infrastructure, and potentially staff inside.

Bushfire Emergency Management Plan

A Bushfire Emergency Management Plan (BEMP) may be required under the planning amendment/application. Regardless one should be prepared to address the requirements of the *Occupational Health and Safety Act 2004*. Addressing bushfire risks could also be addressed in an overall Emergency Management Plan for the facility. Such a plan should include the following principles:

- Induction of all staff members on bushfire procedures with annual reviews
- information notices in designated areas of meeting points and procedures in case of fire
- the need for a designated fire warden on site at all times
- closure of the facility and evacuation of all staff on Extreme and Code Red fire danger days
- Emergency Evacuation Procedures that incorporate a shelter-in-place option as a last resort
- incorporate well-defined triggers to evacuate all personnel off site in an emergency bushfire event or have them shelter-in-place if it is determined that evacuating may be unsafe
- The Bushfire Emergency Management Plan should be reviewed each year to ensure it meets with evolving standards and responds to changing circumstances of the operation.

These general principles that should be followed in perpetuity are provided in lieu of a draft Bushfire Emergency Management Plan. A draft plan would age quickly and become irrelevant over time because a wide range of factors could change over time, from changes in planning law to operational changes for the facilities. The above principles are proposed as the minimum measures to include in a BEMP that would be developed by the facility manager and reviewed on an annual basis. If considered necessary, the Planning Panel may consider how these key principles are followed in the development of a BEMP for the facility over time.

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 categories (shown in the location maps a location 1, 2 or 3)
- the extent of proposed native vegetation removal

Table 8. Determining the Assessment pathway

Extent of native vegetation	Location category		
	Location 1	Location 2	Location 3
Less than 0.5 hectares and not including any large trees	Basic	Intermediate	Detailed
Less than 0.5 hectares and including one or more large trees	Intermediate	Intermediate	Detailed
0.5 hectares or more	Detailed	Detailed	Detailed

Source: 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 3. Figure 7 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.

An approved development will result in the loss of native vegetation patches and scattered trees.

Impacts to remnant patches have been calculated as per (DELWP 2017a) and are depicted on Map 6:

A small area of remnant vegetation (identified as a remnant patch) where the administration building is proposed will be removed and requires offsetting, with the exception of tree number 1 which will be retained. It must be noted that only tree canopy modification will occur across the remainder of the site for the removal of hanging branches, dead wood and some remedial work in the future such as crown cleanup and deadwooding. Other associated works will include some maintenance to existing paths. Further details on these losses are provided in Section 6.2 below.

- the Construction Zone, where all of the vegetation will be potentially removed
 - 100% of the vegetation currently present is considered lost. The CZ is based on identifying all areas of vegetation to be cleared to allow for the proposed decking and the reception infrastructure, with the exception of Tree Number 1 which will be retained
- the Fuel Modified Conservation Zone and Modified Conservation Zone where understorey will be impacted in the form of deadwooding of canopy trees and some understorey trees and medium shrubs that reach the height of the canopy growing densely throughout the site will need to be trimmed to clear an aerial pathway for the apparatus in particular the high rope adventure challenges or flying foxes. Reduced bushfire fuel levels will also be maintained in the area:
 - 50% loss of habitat score (probably well above the actual impact but this is the only partial clearing allowed by DEWLP)

The table below provides an indication of losses from the land management zones that are to be established to facilitate development at the study site.

Table 9. Extent of native vegetation loss due to proposed development

Land Management Zone	Habitat Zone	Habitat Zone score	Area of loss (ha)	Extent of loss	% loss
Construction Zone (CZ)	1a	39	0.029	Complete loss of native vegetation as a result of construction. Encompasses proposed decking and reception building envelope allowing a 1 m buffer zone	100
Modified Conservation Zone (MCZ) and Fuel Modified Conservation Zone (MCZ) (combined)	1b	39	0.38	Assumes some losses to the canopy through dead wooding, mid and some understorey vegetation for fuel reduction. Considers that 50% of existing score will be lost.	50
Total loss			0.41		

6.1.3 Assessment pathway

As the vegetation is within location 3 the proposed clearing within the site follows the detailed assessment pathway.

Table 10 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 10. Application requirements for applications for a permit to remove native vegetation

No.	Application requirements	Assessment Pathway	Provided/response
		Detailed	
1	Information about the native vegetation to be removed, including: <ul style="list-style-type: none"> 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. 	NVR Report and Section 6.1.2	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/a <input type="checkbox"/>
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 Maps 1–8	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/a <input type="checkbox"/>
3	Recent photographs (dated) of the native vegetation to be removed.	Section 3	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/a <input type="checkbox"/>
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.	None	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/a <input type="checkbox"/>
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 6.2	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/a <input type="checkbox"/>
6	A copy of any property vegetation plan that applies to the site.	N/A	Yes <input type="checkbox"/> No <input type="checkbox"/> N/a <input checked="" type="checkbox"/>
7	Where the removal of native vegetation is to create defensible space, a written statement explaining why the removal of native vegetation is necessary. This is not required when the creation of defensible space is	N/A	Yes <input type="checkbox"/> No <input type="checkbox"/> N/a <input checked="" type="checkbox"/>

No.	Application requirements	Assessment Pathway	Provided/response
		Detailed	
	in conjunction with an application under the Bushfire Management Overlay.		
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 <input type="checkbox"/> No <input type="checkbox"/> N/a <input checked="" type="checkbox"/>
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 6.4	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/a <input type="checkbox"/>
10	A site assessment report of the native vegetation to be removed, completed by an accredited native vegetation assessor.	Section 3	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/a <input type="checkbox"/>
11	Information about impacts on rare or threatened species habitat	Appendix 2 and 3	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/a <input type="checkbox"/>

6.2 Minimising impacts to biodiversity

Ecoline has advised that all canopy trees will be retained which has been confirmed by an Arborist (Kingdom 2018). Ecoline have established a non-invasive construction method that will not have any impacts on trees. Given this there will be some impacts associated with the development which have been considered above however steps have been taken to minimise biodiversity impacts.

Table 11 details the steps that have been applied to minimise biodiversity impacts of the proposed development.

Table 11. Steps taken to minimise biodiversity impacts

Steps taken to minimise biodiversity impacts
<ul style="list-style-type: none"> • Avoids clearing of native vegetation by utilising some of the existing pathways. Where vegetation is to be removed for course access, branches will be used to give the outline for the pathway and then fill in with wood chip sourced from an approved supplier. • Avoids removal of Tree 1 due to arborist assessment • The reception building is located in the best area to avoid the removal and indirect removal of any canopy trees. • The reception office will now be located in an area with no trees or shrubs alongside the existing track where the delivery of the containers can be easily achieved with minimal impact on vegetation. The site is right beside the road and containers can be delivered by the truck without the truck having to leave the road. • The reception office will be fully removable, made out of recycled shipping containers and clad timber. A steel, hybrid footing system that has minimal impact called Surefoot Footings may be used or screw piles instead of cement piers in order to have minimal impact on the site. • Minimises impacts by having a small reception building that is fully removable. • Minimises impacts to trees by using a non-invasive technique and makes equipment fully removable. Equipment is built around trees without drilling through and half logs are used to protect trees from the pressure of wires • Minimises impacts by having no heavy machinery for construction on site

Steps taken to minimise biodiversity impacts

- Minimises impacts through the preparation of a Land Management Plan to guide vegetation and habitat management. Avoids clearing of native vegetation by locating some of the proposed building envelope and much of the defensible space in areas with less vegetation.

6.3 Native vegetation impact

The Native Vegetation Impact report is provided by (DELWP 2018e) based on GIS data produced by Practical Ecology and as per the clearing outlined above. A summary of the report is given in Table 12 and the full report is provided in Appendix 4.

Table 12. Summary of native vegetation to be removed

Summary Item	Result
Assessment pathway	Detailed
Total extent	0.414 ha
Extent of past removal	0.000 ha
Extent of proposed removal	0.414 ha
No. of Large Trees proposed to be removed	0
Location category	3

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 13. Offsets required if a permit is granted

Offset type	Offset requirements
Specific offset amount	<ul style="list-style-type: none"> 0.168 species of habitat units of habitat for Grey-headed Flying-fox, <i>Pteropus poliocephalus</i>
Large trees	<ul style="list-style-type: none"> 0 trees

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

At this point in time the required offset is not available for purchase on the Native Vegetation Credit Register. The problem in obtaining credits for this species is that most of their mapped habitat in Victoria is in urban areas where little native vegetation exists or site limitations mean that offsets cannot be created. Over the last

10–20 years Grey-headed Flying Fox have shifted from the coastal ranges of Queensland and NSW to urban areas across southern Australia and this creates difficulties in finding an offset for the species.

However, it is possible to create an offset on public land through revegetation works and such work could be implemented in close proximity to the study site if appropriate and approved by Parks Victoria. This is a better option than just purchasing offset credits off of the Native Vegetation Credit Register. With third party offsets they are often far from the site of loss and so local habitats are not enhanced with offsets. However, with an appropriate first party site the site of habitat gain as implemented in creating offsets can be in close proximity of the site of habitat loss.

If the option of a local revegetation project within Yarra Valley Park is acceptable and implemented there will need to be an effort made to determine an appropriate site with Parks Victoria, a revegetation project with long term maintenance meeting required standards would need to be designed and then implemented.

7. POTENTIAL IMPACTS TO FAUNA

7.1 Migratory Water Birds

There are a wide variety of migratory birds protected under various international treaties and the EBPC Act that have been recorded in the local area and through the Yarra River corridor. Most of these species would use various wetlands and billabongs throughout the Yarra River corridor on a regular basis. The wetlands along the Yarra River corridor would be particularly important for migratory waterbirds in drought years when inland wetlands are limited or absent.

The difficult issue around this proposed development is the likelihood that the pre-existing but modified Banksia Street Billabong would be rewatered and additional constructed wetlands will be built as explained below. These wetlands would likely provide habitat for migratory waterbirds like the rest of the wetlands along the Yarra River. However, at the point of the habitat assessment the billabong on the site, i.e. the remnant Banksia Street Billabong, was dry although I have been provided some documentary evidence that it does occasionally get some floodwater from the Yarra River every few years when a significant flood occurs. With a more reliable watering regime, as planned by Melbourne Water, the habitat of the wetlands will be improved and more migratory birds will likely use the habitat.

So, if the Banksia Street Billabong becomes more reliably watered and new wetlands are constructed there will likely be more migratory birds using the habitat. However, the course will only be over a small part of the enhanced wetland, as indicated on Map 7, and most of the likely more reliable and new wetlands will not be in close proximity of the proposed course. There is no direct conflict between the course and rewatering the wetlands but there is the issue of increased noise and activity from people using the carpark and course.

It is likely that the noise and activity of the course will discourage birds from using the habitat in that part of the rewatered Banksia Street Billabong directly affected by the course. However, the majority of the new rewatered and constructed wetlands will be distant from the course and would likely be affected by the significant noise of traffic on Banksia Street and the general noises of people, and often their dogs, using the parkland around them. The habitat values of the rewatered and new wetlands are already significantly compromised by the current urban context and the noise from the proposed course will likely blend into the significant background noise levels that are already present. Having said that it will be possible to design the rewatered Banksia Street Billabong and new constructed wetlands to have protective clumps of shrubs and shallow water with wetland plant cover installed around them to provide habitat for roosting and areas for foraging for food.

The potentially new habitats of rewatered and new constructed wetlands would likely be compromised to a small degree by the proposed course but the majority of any new wetland habitats would be relatively distant from the proposed course with the minimal noise from users not adding significantly to current urban noise levels.

7.2 Arboreal Mammals

It is also possible that there could be an impact on native fauna species using any hollows in the trees used for the course. Arboreal mammals would generally be nocturnal and only relatively common and secure species, such as possums and Sugar Gliders, have been recorded in the Yarra Valley Park. A variety of native bird species may use the any hollows present as well with little evidence that threatened species use habitat on the site.

Unfortunately, no formal research or detailed observations gives us much insight into the specific impacts a self-guided high ropes course on mammals and birds using hollows in close proximity. It is possible arboreal mammals and birds will find tree hollows around course less desirable or even unusable habitat. However, the actual course has a strictly limited footprint among extensive habitats across Yarra Valley Park and mitigation, in the form of the nest box program and Fauna Management Plan that has been proposed as part of the use, should adequately compensate for the minimal impacts on the common species of native fauna that might use habitat on the proposed course site.

8. RECOMMENDATIONS

Measures to mitigate/ameliorate potential impacts on the ecological values in the study area include:

- Secure offsets in Yarra Valley Parklands as close as possible to the proposed course site through revegetation works
- All vegetation within Modified Conservation Zone should be marked out with pegs and flags, by a qualified Ecologist, to ensure that the area will not be entered during the construction of activities within the construction zone.
- For the construction of Administration building follow the Guidelines for design as outlined in section 6 of the Arborist report (Kingdom 2018) and ensure an arborist is to be onsite during any inground works/excavation within the TPZ of Tree 1.
- All tree pruning is to be carried out by a qualified and experienced arborist who has a thorough knowledge of tree physiology and pruning methods. Pruning must be carried out in accordance with Australian Standard AS 4373–2007 Pruning of Amenity Trees.
- Prior to the removal of any limbs or deadwood from the trees, limbs and deadwood are to be inspected for all hollows for the presence of fauna. The inspection must be carried out by suitably qualified and experience Zoologist. If fauna is located during the inspection, they must be salvaged and relocated by a suitably qualified and experience Zoologist and, if appropriate in consultation with the DELWP.
- As outlined in the Arboricultural Standards (2009) pruning of limbs and deadwood is to be cut to the collar. In this instance due to the presence of hollows and fauna habitat within deadwood, which is characteristic of large old River Red Gums trees, it is advised that this practise be avoided where possible. It is suggested to only prune to a location which maintains the integrity of the existing hollow while adhering to safety guidelines if achievable.
- The trunks and limbs removed from trees are to be retained a placed in the Modified Conservation Zone.
- A Fauna Management Plan is be required to guide the salvage and translocation process and ongoing monitoring of hollows in trees.
- A Construction Environment Management Plan should be developed prior to any works commencing on the project.
- Appropriate sediment and run-off controls should be in place and incorporated into Water Sensitive Urban Design (Melbourne Water 2012) for any proposed development.
- A Weed Management Plan should be developed to control weeds (particularly noxious species), targeting areas within the modified construction zone; and,
- Use indigenous plants associated with the relevant EVCs as part of any landscaping works to increase habitat for native fauna.

9. LAND MANAGEMENT PLAN

The intention of this Land Management Plan is to provide a framework that guides land management practices at the site to ensure environmental values are effectively managed and impacts due to construction and domestic occupation are minimised. It also provides reparation for vegetation loss associated with the proposed development.

The landowner and any third party that enters the property, such as building contractors, are required to follow the guidelines within this plan to ensure environmental impacts are minimised.

9.1 Management zones

For the purpose of managing land-use commitments and easy identification of management regimes and issues the site has been broken into management zones. Each of the management zones are depicted on 8

9.1.1 Construction Zone (CZ)

Purpose of zone:

- To provide a location in which construction activities and associated features can be undertaken which include a reception building and a water tank and a decking around Tree 1
- To provide an area for the public to congregate and to undertake recreational activities.
- This zone may require bushfire fuel management

Size of zone:

- The Construction Zone encompasses a total area of approximately 0.029 ha.

9.1.2 Fuel Conservation Modified Zone (FMCZ)

Purpose of Zone:

- To provide an area around the proposed reception building (10m buffer) that has reduced bushfire fuel levels but still consists of indigenous vegetation. This also includes a connecting mulched pathway which will provide access to the site.

Size of Zone:

- The Fuel Modified Conservation Zone has a total area of approximately 0.061 ha.

9.1.3 Modified Conservation Zone (MCZ)

The Modified Conservation Zone is the outer zone of the Construction Zone and is the extent of the course overly.

Purpose of Zone:

- To provide an area around the Construction Zone in which will include the course overlay and associated non-invasive platforms around trees. The courses will also include a series of flying foxes and high rope adventure challenges. This will also include the construction of aerial pathways throughout the site. The majority of vegetation and habitat will be retained and protected within this area with the exception of some remedial work such as crown cleanup and deadwooding of some trees and some understorey trees and medium shrubs which will need to be trimmed to clear the aerial path for the apparatus.
- To provide an area in which vegetation and habitat will be largely retained and managed for conservation purposes and for aesthetics purposes for the public to appreciate while undertaking recreational activities within this zone.

Size of Zone:

- The Modified Conservation Zone has a total area of approximately 0.82 ha.

9.1.4 Bushland Conservation Zone (BCZ)

Purpose of Zone:

- To provide an area in which vegetation and habitat will be retained and protected.

Size of Zone:

- The Bushland Conservation Zone encompasses a total area of approximately 0.719 ha.

9.2 General development/construction guidelines

The following guidelines are presented to assist with ensuring that retained native vegetation is not adversely affected during any construction works:

- contractors are to be made aware of the need to be sensitive to the surrounding native vegetation
- fencing of the vegetation to be retained is to be undertaken prior to any other construction activities.
- during construction all disturbance due to machinery access, stock-piling of fill or building products is to be within the defined Construction Zone
- all earthworks must be undertaken in a manner that will minimise soil erosion and adhere to Construction Techniques for Sediment Pollution Control (EPA 1991) and any exposed areas of soil must be stabilised to prevent erosion
- where earthmoving equipment is needed, smaller versions of equipment should be considered to minimise disturbance
- earthmoving equipment should be cleaned before entering and leaving the site, including the Construction Zone to prevent the spreading of weed propagules and pathogens such as *Phytophthora cinnamomi*.

- the above requirements must be observed outside of the construction zone, i.e. within the Fuel Modified Zone, Modified Conservation Zone and Bushland Conservation Zone:
 - no vehicular access
 - the existing soil level must not be altered
 - the soil must not be compacted or the soil's drainage change
 - no fuels, oils, chemicals, poisons, rubbish and other materials harmful to trees are to be stored or dispersed
 - no storage of equipment, machinery or material is to occur
 - open trenching to lay underground services e.g.: drainage, water, gas, etc. must not be used unless approved by the Responsible Authority
 - nothing whatsoever, including temporary services wires, nails, screws or any other fixing device, is to be attached to any tree
 - no building or any other structure is to be erected
 - tree roots must not be severed or injured
 - machinery must not be used to remove any existing materials or debris.
- copies of this Land Management Plan and associated maps should be provided to contractors when working on site, particularly during any permitted vegetation clearance to ensure management regimes are respected.

9.3 Fencing and demarcation of zones

To control development, vegetation clearance and management it is important that management zones are clearly identifiable on the ground. The demarcation requirements should be the responsibility of the proponent as landowners need to be spatially aware of the limitations imposed on them by a commitment to maintain, and expand, the habitat values across the site.

The following fencing regime is to be implemented at the site:

Demarcation of Construction Zone:

- Temporary installation of star-pickets and para-webbing around the boundary of this zone is to be installed prior to any construction works
- This will help demarcate the edges of the CDZ for any vehicles or machinery, and prevent disturbance beyond this point.

Demarcation of Fuel Modified Conservation Zone.

- To delineate the different vegetation management regimes between the Fuel Modified Zone and the Modified Conservation Zone markers such as temporary painted capped star pickets and para-webbing is to be installed

Demarcation of Modified Conservation Zone.

- To delineate the different vegetation management regimes between the Modified Conservation Zone and the Bushland Conservation Zone vegetation beyond this zone markers such as painted capped star pickets and para-webbing is to be installed

It must be noted that no permanent fencing will be required and fencing is only to be installed during construction. Any other material can be used as long as it clearly defines between zones during construction activities and is removed following construction. If logs are to be used as an alternative, then it is important to note that no logs are to be used from the site as relocating logs within the site will disturb fauna habitat. If logs are to be used ex-situ for fencing, then all logs are to be removed from the site following construction.

9.4 Erosion control

Although the site is generally steep in some areas it is likely that the proposed works will not involve the excavation of soils and therefore erosion is unlikely to be a significant issue. However, all effort should be made to ensure that soil, building debris, litter, vegetative material, weeds, nutrients or other foreign items are not transported out of the CZ. If soil is stockpiled, the capture and trapping of sediment runoff should be managed by careful placement within the CZ and if necessary, an adequate sediment barrier.

Construction site

- A line of straw bales (or equivalent, e.g., silt fencing and star pickets; coir logs) should be placed inside the temporary fence that surrounds the Construction Zone (Figure 11). These bales should be pinned to the ground with stakes, prior to construction. They will effectively line the defined development area, and retain all soil within the fenced area.

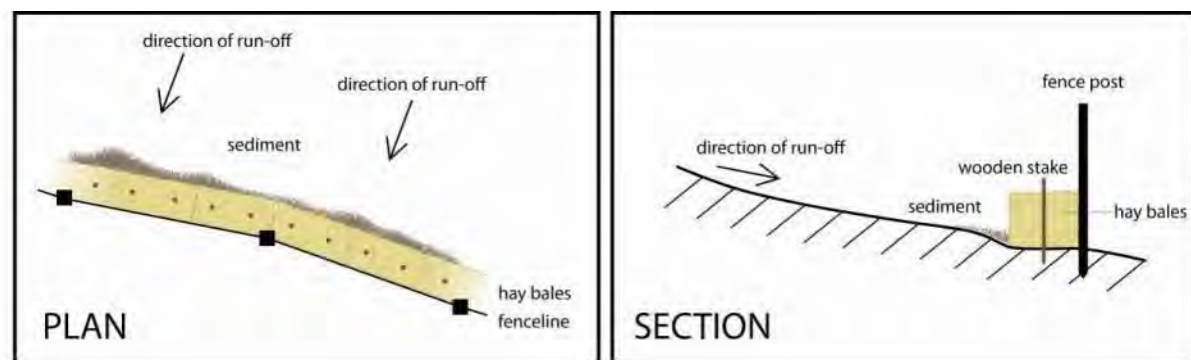


Figure 8. Hay bale installation for control of sediment

- At the end of construction, any displaced soil will need to be kept in the Construction and Domestic Zone to avoid erosion and limit weed spread. Vegetated swales may also be created along the lower boundaries of the Construction Zone, or at the end of diversion weirs, to manage nutrient and water run-off (Figure 9).

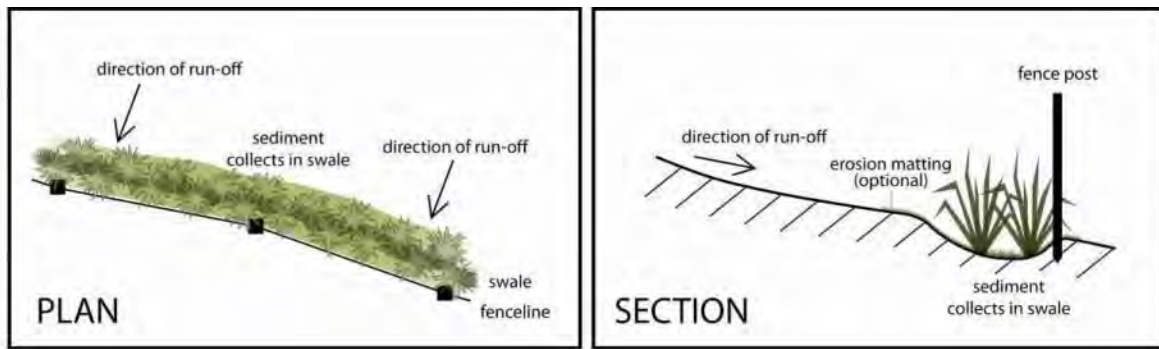


Figure 9. Jute mat spread and vegetated swales planted for erosion control.

9.5 Fuel Reduction

There is a need to manage some vegetation for fuel reduction in order to address the bushfire risk. Fuel reduction is proposed within the Construction Zone and within the Fuel Modified Zone. Fuel reduction will involve some initial work in the first year managing shrubs and tree branches but it should be possible for the ongoing fuel reduction to simply include slashing of the grasses to 5 cm during the declared fire danger period. No other fuel reduction is required at the site after defensible space standards are met apart from considering where revegetation is to occur within the Construction Zone and the Fuel Modified Zone. The following standards adapted from (CFA 2014), with the requirement to maintain 5m canopy gaps removed to protect trees, are provided as a guide for the management of the Construction Zone and the Fuel Modified Zone which is the nominated defensible space (Map 5):

CFA defensible space management standards (CFA 2014):

- Grass must be short cropped and maintained during the declared fire danger period.
- All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.
- Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building.
- Plants greater than 10 centimetres in height must not be placed within 3m of a window or glass feature of the building.
- Shrubs must not be located under the canopy of trees.
- Individual and clumps of shrubs must not exceed 5 sq. metres in area and must be separated by at least 5 metres.
- Trees must not overhang or touch any elements of the building.
- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

There will need to be initial works to achieve the required fuel management standards and then ongoing works each fire danger season. The following recommendations relate to fuel-reduction works that will need to be undertaken on the site:

- thin shrubs by initially targeting the removal of non-indigenous species, eucalypt branches below two metres and then finally, if required, other native species, choosing the most abundant species onsite first

- remove and rake strips of fallen bark from eucalypt trees
- all work is to avoid soil disturbance and should be undertaken in drier months to minimise soil damage
- initial work in reducing elevated fuels will require use of hand-held machinery, such as chainsaw and bladed brush-cutter; this work is to be undertaken without soil disturbance, with rootstocks retained in the soil and woody stumps cut to ground level
- slashing of the groundstorey should be undertaken as close to the beginning of the 'Fire Danger Period' as declared by the CFA, to allow any wildflowers and native grasses the best chance to set seed; additional slashing should not occur after the Fire Danger Period has ended.

9.6 Vegetation Removal

Vegetation removal should be done sensitively to ensure minimal impacts to adjacent infrastructure, retained vegetation and soil profiles. The following conditions are required for vegetation removal:

- All tree pruning is to be carried out by a qualified and experienced arborist who has a thorough knowledge of tree physiology and pruning methods. Pruning must be carried out in accordance with Australian Standard AS 4373-2007 Pruning of Amenity Trees.
- Prior to the removal of limbs from the trees, limbs to be removed are to be inspected for all hollows for the presence of fauna. The inspection must be carried out by suitably qualified and experienced Zoologist. If fauna is located during the inspection, they must be salvaged and relocated by a suitably qualified and experienced Zoologist and, if appropriate in consultation with the DELWP.
- The trunks and limbs removed from trees are to be retained and placed in the Modified Conservation Zone.

9.7 Weed management

Preventing invasion and spread

Particular care during construction and after construction will be required as soil disturbance, destroying native vegetation and introduction of weed seeds facilitates weed invasion. In order to effectively control weeds at the site, the following general guidelines should be followed:

- weeds should be frequently monitored and controlled to ensure sensitive removal of exotic species
- any new and emerging weeds within the Modified Conservation and Bushland Conservation Zones are to be eliminated (< 1% cover)
- soil or vegetative material should be transported as little as possible around the site and particular care should be taken not to introduce such materials into the Modified Conservation Zone;
- all machinery should be cleaned for soil or vegetative material before entering the property during the construction of the dwellings and associated features;
- no earthmoving equipment should be operated outside of the Construction Zone;

- soil and vegetation disturbance during constructions works should be minimised through the use of erosion control methods and defined fencing;
- no topsoil should be transported through or used in any areas but the Construction Zone; and
- no environmental weeds should be planted on the site.

The above guidelines will not only aid the removal of weeds and prevent their spread, it will also minimise the disturbance to areas of retained native vegetation during weed control.

Managing existing weeds

Fuel Modified, Modified Conservation and Bushland Conservation Zones

Woody weeds such as Hawthorn, Sweet Pittosporum, Box-elder Maple, Cherry Plum, English Ivy, and Blackberry are high threat weeds that occur within the Modified Conservation Zone. Current weed levels are high and should be targeted for management.

Herbaceous weeds such as Wandering Jew which dominates the ground layer should also be the main target for weed control as well as Fennel, Toowoomba Canary-grass and Couch also occurs throughout the site.

Other weeds that are scattered through the site include Spear Thistle and African Boxthorn and should also be targeted for control.

The aim of woody weed control is to cut-and-paint or drill-and-fill with herbicide all mature plants and hand pull juveniles in Year 1. There should be ongoing follow up and treatment where any seedlings or plants have been treated to ensure eradication of the species. It must be noted that some of the woody weeds provide habitat for bird species and therefore control of woody weeds should be undertaken in a staged approach to ensure woody weed are being replaced with indigenous shrubs.

The herbaceous weeds will also require an ongoing effort, and will include a variety of methods as outlined below. While a number of control methods have been outlined, the type of method used will depend on the location at which the weed occurs and the impact the control method may have on the surrounding vegetation. The table below lists priority weeds for management on the property with a brief description of their occurrence. Monitoring of these weeds should be undertaken and treatment undertaken to prevent their spread.

Table 14. Priority Weeds for Management

High Threat	Scientific Name	Common Name	Occurrence	Management aim	Control Methods ^A
Woody Weeds					
Yes	* <i>Crataegus monogyna</i>	Hawthorn	Throughout the site	If practical reduce cover and ensure cover does not increase. Eradicate if practical and monitor	H (immature plants), C, D
Yes	* <i>Pittosporum undulatum</i>	Sweet Pittosporum	Throughout the site	If practical reduce cover and ensure cover does not increase. Eradicate if practical and monitor	H (immature plants), C, D
Yes	* <i>Acer negundo</i>	Box-elder Maple	Throughout the site	If practical reduce cover and ensure cover does not increase. Eradicate if practical and monitor	H (immature plants), C, D

High Threat	Scientific Name	Common Name	Occurrence	Management aim	Control Methods [^]
Yes	* <i>Lycium ferocissimum</i>	African Boxthorn	Throughout the site	If practical reduce cover and ensure cover does not increase. Eradicate if practical and monitor	H (immature plants), C, D
Yes	* <i>Rubus fruticosus</i> spp. agg.	Blackberry	Throughout the site	Monitor and prevent spread into site	H (immature plants), S, C, D
Yes	* <i>Prunus cerasifera</i>	Cherry Plum	Throughout the site	If practical reduce cover and ensure cover does not increase. Eradicate if practical and monitor	H (immature plants), C, D
Yes	* <i>Hedera helix</i>	English Ivy	Throughout the site	practical reduce cover and re cover does not increase. cate if practical and monitor	H (immature plants), C, D
Grassy and Herbaceous Weeds					
Yes	* <i>Tradescantia fluminensis</i>	Wandering Jew	Dominates the ground layer	If practical reduce cover and ensure cover does not increase. Eradicate if practical and monitor	H, S
Yes	* <i>Foeniculum vulgare</i>	Fennel	Scattered throughout the site	If practical reduce cover and ensure cover does not increase. Eradicate if practical and monitor	H, S
Yes	* <i>Phalaris aquatica</i>	Toowoomba Canary-grass	Scattered throughout the site	If practical reduce cover and ensure cover does not increase. Eradicate if practical and monitor	H, S
Yes	* <i>Cynodon dactylon</i>	Couch	Scattered throughout the site	If practical reduce cover and ensure cover does not increase. Eradicate if practical and monitor	H, S
[^]Control Methods Legend					
H: Hand weeding	Ensure that the whole plant (including roots) is removed; knife, chisel, mattock are useful.				
C: Cut-and-paint	Cut the stem or trunk of the plant completely and as near to the ground as possible then immediately paint an appropriate herbicide on the freshly cut surface. Initial cut and paint 'sweep' should be followed annually on newly emergent individuals.				
D: Drill-and-fill	Drill hole around the trunk of the plant and immediately fill it with an appropriate herbicide; used especially on larger plants. Initial drill and fill 'sweep' should be followed annually on newly emergent individuals.				
S: Spot Spray	Spray target weed species with an appropriate herbicide avoiding damage to non-target species; this can be facilitated by use of a dye and a low pressure; don't spray when plants are stressed (i.e. too hot or cold). Should be undertaken every 3–4 months within first year then twice yearly in Autumn and Spring afterwards				

9.8 Revegetation and supplementary planting

Modified Conservation Zone and the Bushland Conservation Zone

To enhance the quality of the vegetation and habitat for fauna, and to improve the visual amenity or landscape qualities of riparian vegetation revegetation can be implemented. It is also important to replace vegetation that

will be removed such as weed species that are to be targeted for control. Therefore it is recommended that a supplementary planting regime be implemented.

Placement of planting will need to be well considered and avoid any impacts on existing native vegetation. Planting density may vary depending on the regeneration response of existing native species following the removal of weed species, however it should be at least 3 plants per 1 m² across the zone in particular for graminoid species mainly Common Tussock-grass *Poa labillardierei* and Sword Tussock-grass *Poa ensiformis*. Supplementary planting should focus on areas that are supporting exotic vegetation, bare areas, and areas opened up by removal of weeds in particular areas where Wandering Jew has been removed.

Supplementary planting will be a useful tool to regain a competitive advantage over dominant weeds after the application of herbicide. A summary of suitable species for the site is given in Table 15 and is a species list of EVC 56: Floodplain Riparian Woodland which is the vegetation type identified on site. The land manager should choose appropriate locations for the installation of these plants post weed control. Thought should be given to the appropriate life-form, the substitutive role, the habitat and soil requirements and the effect of follow-up weed control on the species.

Table 15 shows the potential layout of the EVC that occurs on the site. It is structured in a way that indicates the distribution of lifeforms within the Modified Conservation Zone; substitutions of different species of similar lifeforms are appropriate.

Table 15. Revegetation planting guide for supplementary plantings associated with weed control works

Proposed Density (plants per m ²)		3
Ecological Vegetation Class		Floodplain Riparian Woodland
Common Name	Species/Structure	Open, Grassy
Shrubs		
Gold Dust Wattle	<i>Acacia acinacea</i>	
Prickly Moses	<i>Acacia verticillata</i>	2
Silver Banksia	<i>Banksia marginata</i>	
Sweet Bursaria	<i>Bursaria spinosa</i>	
River Bottlebrush	<i>Callistemon sieberi</i>	2
Prickly Currant Bush	<i>Coprosma quadrifida</i>	
Goodenia	<i>Goodenia ovata</i>	2
Bushy Needlewood	<i>Hakea decurrens</i>	
Tree Violet	<i>Hymenanthera dentata</i>	5
Christmas Bush	<i>Prostanthera lasianthos</i>	
Muttonwood	<i>Rapanea howittiana</i>	4
Grasses, Tussocks		
Wallaby Grasses	<i>Austrodanthonia spp.</i>	
Spear Grasses	<i>Austrostipa spp.</i>	
Red-leg Grass	<i>Bothriochloa macra</i>	
Marsh Club-sedge	<i>Bolboschoenus medianus</i>	
Tall Sedge	<i>Carex appressa</i>	
Common Sedge	<i>Carex inversa</i>	20
Poongoor't	<i>Carex tereticaulis</i>	20
Silky Blue Grass	<i>Dicanthium sericeum</i>	
Common Spike-sedge	<i>Eleocharis acuta</i>	
Knobby Clubrush	<i>Isolepis nodosa</i>	
Rushes	<i>Juncus spp.</i>	
Spiny-headed Matrush	<i>Lomandra longifolia</i>	30
Weeping Grass	<i>Microlaena stipoides</i>	30
Sword Tussock Grass	<i>Poa ensiformis</i>	75

	Proposed Density (plants per m2)	3
	Ecological Vegetation Class	Floodplain Riparian Woodland
Common Name	Species/Structure	Open, Grassy
Common Tussock Grass	<i>Poa labillardierei</i>	50
Velvet Tussock Grass	<i>Poa morrissii</i>	
Kangaroo Grass	<i>Themeda triandra</i>	
Wildflowers		
Bulbine Lily	<i>Bulbine bulbosa</i>	
Lemon Beauty Heads	<i>Calocephalus lacteus</i>	
Tall Everlasting	<i>Chrysocephalum semipapposum</i>	
Matted Flax-lily	<i>Dianella amoena</i>	
Pale Flax Lily	<i>Dianella longifolia</i>	20
Black Anther Flax Lily	<i>Dianella revoluta</i>	
Scaly Buttons	<i>Leptorhynchos squamatus</i>	
Wiry Buttons	<i>Leptorhynchos tenuifolius</i>	
Narrow-leaf New Holland Daisy	<i>Vittadinia meulleri</i>	
Native Blebells	<i>Wahlenbergia spp.</i>	
Vines, Creepers		
Bidgee-widgee	<i>Acaena novae-zelandiae</i>	10
Berry Saltbush	<i>Atriplex semibaccata</i>	
Swamp Pennywort	<i>Centella cordifolia</i>	20
Small-leafed Clematis	<i>Clematis microphylla</i>	
Kidney Weed	<i>Dichondra repens</i>	10
Creeping Saltbush	<i>Einadia nutans</i>	
Slender Knotweed	<i>Persecaria decipiens</i>	
Total for a typical 100 m2		300
Total number of plants to be planted within Modified Conservation Zone and Bushland Conservation Zone (1.545ha)		46,350

9.8.1 Maintenance

Maintenance of revegetation areas is critical in the 12 months following installation of plants. The process of site preparation and planting causes significant disturbance of the soil that often results in a flush even through mulch. Prompt weed control before any seed production can deplete the weed seed on the surface of soil and/or mulch resulting in less efforts being required.

The maintenance of revegetation areas does require specific skills. Familiarity with indigenous species, at all stages from seedlings to adults, is the essential requirement.

9.9 Pest animals

Rabbits are likely to be present in the surrounding landscape however there was no evidence that the site is significantly impacted by or is harbouring individuals. So at present there appears not to be a significant threat from introduced herbivores. However, it should be made aware of the potential threats these animals pose. At present there is no need to undertake specific management actions beyond monitoring for their presence.

Foxes and cats are the other likely threat to ecological values.

Any future pest animal management regime should be undertaken in co-operation with Parks Victoria. Some management of foxes (and rabbits) by sensitively destroying any identified fox dens (or rabbit warrens) is an easy and practicable management action that should be undertaken.

9.10 Summary

The table below sets out the land-use and management commitments that the current and any future landowners will need to implement and follow.

The intent of the table is to show the progression of the different development and conservation actions and how works will flow into maintenance regimes over time. The land use and management commitments proposed are essentially in the order in which they are to take place within a particular zone. Referral must be made to the sections above for specific instructions and regulating guidelines.

Table 16. Land Management Plan summary by zone

Construction Zone		
Land-use Commitment		
<ul style="list-style-type: none"> Ensure all activities associated with construction of the administration building and associated infrastructure is confined to this zone. Utilise appropriate machinery and equipment during construction to minimise impacts to vegetation surrounding Construction Zone and trees within this zone Ensure that all soil displaced during building is kept within this zone and not transported to other areas of the property. If this is not possible displaced soil may need to be moved to an appropriate offsite location. Ensure that during building of the administration building and associated infrastructure, damage to root structures of vegetation is minimised as much as possible. Ensure that any plants installed are not environmental weeds or listed as noxious under the Catchment and Land Protection Act 1994. Implement seasonal fuel reduction efforts throughout zone, including preventing contact of any vegetation with dwelling. Ensure that weeds and any other threats that may impact on adjacent native vegetation are controlled. 		
Management Commitments		
Years from Commencement	Management actions to be completed	Timing of activity (if applicable)
One to Three	Construct temporary fencing of Construction Zone	On commencement of works
	Sensitively clear vegetation in accordance with erosion management guidelines	
	Construction of administration building and associated infrastructure	
	Ensure that any plants installed are not considered to be environmental weeds, or those listed as noxious under the <i>Catchment and Land Protection Act 1994</i> .	All year
	Implement fuel reduction efforts across zone as per required standards	Fire danger period
	Monitor and treat weeds as appropriate	All year
Four to Ten	Continue to ensure that any plants installed are not considered to be environmental weeds, or those listed as noxious under the <i>Catchment and Land Protection Act 1994</i> .	
	Implement fuel reduction efforts across Zone during the fire danger period	Fire danger period
	Monitor and treat weeds as appropriate	All year
Ongoing	Maintain seasonal fuel reduction efforts across Zone. Continue to control weed species.	See above

Fuel-Modified Zone		
Land-use Commitment		
<ul style="list-style-type: none"> • Ensure clear demarcation between Fuel-modified Conservation Zone and Modified Conservation Zone • Retain native vegetation in a fuel reduced state • Implement seasonal fuel reduction efforts without soil disturbance across entire zone • Minimise vehicle use in the zone and minimise all other land disturbance activities • Ensure no accumulation of rubbish or materials occurs • Ensure that weeds and any other threats that may impact on adjacent native vegetation are controlled 		
Management Commitments		
Years from Commencement	Management actions to be completed	Timing of activity (if applicable)
One to Three	Construct temporary fence to separate Fuel-modified Conservation Zone from the Construction Zone	On commencement of works
	Install pickets or similar markings to delineate Fuel-modified Conservation Zone from Modified Conservation Zone.	Prior to commencement of construction works
	Undertake initial fuel reduction to achieve required standards: <ul style="list-style-type: none"> • Use hand held machinery and tools to limit disturbance, such as chainsaw and bladed brush-cutter • Rake and remove without soil disturbance 	Prior to first summer of occupation
	Implement seasonal fuel reduction efforts across zone during the fire danger period without soil disturbance	Fire danger period
	Monitor and treat weeds as appropriate	All year
Four to Ten	Implement seasonal fuel reduction efforts across zone during the fire danger period without soil disturbance	Fire danger period
	Monitor and treat weeds as appropriate	All year
Ongoing	Maintain seasonal fuel reduction efforts across Zone. Continue to control weed species.	As required

Modified Conservation Zone		
Land-use Commitment		
<ul style="list-style-type: none"> • Ensure clear demarcation between Modified Conservation Zone and the Construction Zone and vegetation beyond this zone • Ensure no accumulation of rubbish or materials occurs • Prior to the removal of any limbs from the trees, limbs to be removed are to be inspected for all hollows for the presence of fauna • Ensure tree pruning is to be carried out by a qualified and experienced arborist • Ensure that weeds and any other threats that may impact on native vegetation are controlled • Implement supplementary planting regime 		
Management Commitments		
Years from Commencement	Management actions to be completed	Timing of activity (if applicable)
One to Three	Construct temporary fence to separate Modified Conservation Zone from the Construction Zone	On commencement of works
	Install pickets or similar markings to delineate Modified Conservation Zone from all vegetation beyond this zone.	Prior to commencement of construction works
	limbs to be removed are to be inspected for all hollows for the presence of fauna	Prior to commencement of construction works
	Monitor and treat weeds as appropriate	All year
	Consider and source stock material for supplementary planting	All year
	Implement supplementary planting regime	All year
Four to Ten	Monitor and treat weeds as appropriate	All year
	Implement and monitor supplementary planting regime	All year
Ongoing	Implement and monitor supplementary planting regime where required	As required
	Continue to control weed species.	As required

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Appendix 1. Flora recorded at study site

The following table provides a list of flora recorded in the study area during fieldwork.

Conservation status under EPBC Act 1999:			Conservation status under FFG Act 1988:		
EX: Extinct, CR: Critically endangered, EN: Endangered, VU: Vulnerable and CD: Conservation dependant			L: Listed, N: Nominated, R: Rejected, D: Delisted, I: Invalid		
Victorian Rare or Threatened Species (VROT) (DEPI 2014)			Origin		
x: Presumed extinct, e: Endangered, v: Vulnerable, r: rare and k: poorly known			*: exotic species; #: Victorian native species extended beyond natural range; Empty: Indigenous species		

Family	Origin	Scientific Name	Common Name	EPBC	FFG
DICOTS					
Amaranthaceae		<i>Alternanthera denticulata s.l.</i>	Lesser Joyweed		
Apiaceae	*	<i>Foeniculum vulgare</i>	Fennel		
Apocynaceae	*	<i>Araujia sericifera</i>	White Bladder-flower		
Araliaceae	*	<i>Hedera helix</i>	English Ivy		
Asteraceae	*	<i>Cirsium vulgare</i>	Spear Thistle		
Asteraceae	*	<i>Conyza bonariensis</i>	Flaxleaf Fleabane		
Asteraceae	*	<i>Sonchus spp.</i>	Sow Thistle		
Brassicaceae	*	<i>Brassica X juncea</i>	Indian Mustard		
Chenopodioideae	*	<i>Atriplex prostrata</i>	Hastate Orache		
Fumariaceae	*	<i>Fumaria spp.</i>	Fumitory		
Hippocastanoideae	*	<i>Acer negundo</i>	Box-elder Maple		
Mimosaceae		<i>Acacia dealbata</i>	Silver Wattle		
Mimosaceae	*	<i>Acacia decurrens</i>	Early Black-wattle		
Mimosaceae		<i>Acacia melanoxylon</i>	Blackwood		
Myrtaceae		<i>Eucalyptus camaldulensis</i>	River Red-gum		
Myrtaceae		<i>Kunzea ericoides spp. agg.</i>	Burgan		
Oleaceae	*	<i>Fraxinus angustifolia subsp. angustifolia</i>	Desert Ash		
Pittosporaceae	#	<i>Pittosporum undulatum</i>	Sweet Pittosporum		
Polygonaceae	*	<i>Acetosa sagittata</i>	Rambling Dock		
Polygonaceae		<i>Persicaria decipiens</i>	Slender Knotweed		
Polygonaceae	*	<i>Rumex pulcher subsp. pulcher</i>	Fiddle Dock		
Proteaceae	*	<i>Hakea salicifolia subsp. salicifolia</i>	Willow-leaf Hakea		
Rosaceae	*	<i>Crataegus monogyna</i>	Hawthorn		
Rosaceae	*	<i>Prunus cerasifera</i>	Cherry Plum		
Rosaceae	*	<i>Rubus fruticosus spp. agg.</i>	Blackberry		
Rubiaceae		<i>Coprosma quadrifida</i>	Prickly Currant-bush		
Solanaceae	*	<i>Lycium ferocissimum</i>	African Boxthorn		
Solanaceae		<i>Solanum aviculare</i>	Kangaroo Apple		
Solanaceae	*	<i>Solanum nigrum s.l.</i>	Black Nightshade		
Solanaceae	*	<i>Solanum pseudocapsicum</i>	Madeira Winter-cherry		
Verbenaceae	#	<i>Verbena officinalis s.l.</i>	Common Verbena		
Violaceae		<i>Melicytus dentatus s.l.</i>	Tree Violet		
MONOCOTS					
Commelinaceae	*	<i>Tradescantia fluminensis</i>	Wandering Jew		
Cyperaceae	*	<i>Cyperus eragrostis</i>	Drain Flat-sedge		
Juncaceae		<i>Juncus filicaulis</i>	Thread Rush		
Poaceae	*	<i>Bromus catharticus</i>	Prairie Grass		
Poaceae	*	<i>Cenchrus clandestinus</i>	Kikuyu		
Poaceae	*	<i>Cynodon dactylon</i>	Couch		

Family	Origin	Scientific Name	Common Name	EPBC	FFG	VROT
Poaceae	*	<i>Ehrharta erecta var. erecta</i>	Panic Veldt-grass			
Poaceae	*	<i>Holcus lanatus</i>	Yorkshire Fog			
Poaceae	*	<i>Phalaris aquatica</i>	Toowoomba Canary-grass			
Poaceae	*	<i>Dactylis glomerata</i>	Cocksfoot			

Appendix 2. Potentially occurring rare or threatened flora species

Conservation status under EPBC Act 1999:			Conservation status under FFG Act 1988:			Victorian Rare or Threatened Species (VROT) (DEPI 2014)			
EX: Extinct, CR: Critically endangered, EN: Endangered, VU: Vulnerable and CD: Conservation dependant			L: Listed, N: Nominated, R: Rejected, D: Delisted, I: Invalid			x: Presumed extinct, e: Endangered, v: Vulnerable, r: rare and k: poorly known			
EPBC	FFG	VROT	Scientific name	Common name	Habitat and species	Last record	No. recs.	Likelihood of occurrence	Likelihood Reasoning
VU	X		<i>Amphibromus fluitans</i>	River Swamp Wallaby-grass	Moist soils, usually confined to permanent swamps, and tolerates inundation. Mainly distributed along Murray River, it is rarer in southern Victoria (Australian Plants Society Maroondah 2001, p. 449; Walsh and Entwisle 1994). 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.)	2011	5	Low	Poor habitat and would likely have been observed
		k	<i>Caesia parviflora var. minor</i>	Pale Grass-lily	Moist, well-drained soils of damp lowland grassland, open grassy woodland and tea-tree heath (Australian Plants Society Maroondah 2001, p. 657; Walsh and Entwisle 1994).	1886	1	Low	Unsuitable habitat
	X	r	<i>Callitriche umbonata</i>	Winged Water-starwort	Occurs mostly inland in swampy or wet areas (Walsh and Entwisle 1999).	1770	2	Low	Unsuitable habitat
		k	<i>Convolvulus angustissimus subsp. omnigracilis</i>	Slender Bindweed	No info in Flora of Vic	2006	1	Low	Unsuitable habitat
		v	<i>Corymbia maculata</i>	Spotted Gum	Native distribution only in Tara Range, south of Buchan, Vic. Otherwise, widely planted in urban environment as an ornamental species (Walsh and Entwisle 1999, p. 953).	2019	6	Low	Unsuitable habitat
EN	L	e	<i>Dianella amoena</i>	Matted Flax-lily	This plant is known to occur in lowland grasslands, grassy woodlands and grassy wetlands. It ranges from well drained to seasonally wet soils (DSE 2006).	2009	9	Low	Unsuitable habitat and would likely have been observed
		r	<i>Eucalyptus fulgens</i>	Green Scentbark	Open forest areas, tolerating damp conditions. Found in areas east of Healesville and Woori Yallock to the Latrobe Valley (Walsh and Entwisle 1996).	1989	1	Low	Not within natural range

EPBC	FFG	VROT	Scientific name	Common name	Habitat and species	Last record	No. recs.	Likelihood of occurrence	Likelihood Reasoning
	L	e	<i>Eucalyptus leucoxylon subsp. megalocarpa</i>	Large-fruit Yellow-gum	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 (Walsh and Entwisle 1996, p. 993).	2019	2	Low	Poor habitat and would likely have been observed
		e	<i>Eucalyptus X studleyensis</i>	Studley Park Gum	A naturally occurring hybrid (<i>E. ovata</i> × <i>E. camaldulensis</i>) found in Studley Park/Yarra Bend and along the Yarra Valley (Australian Plants Society Maroondah 2001).	2019	14	Low	Not identified on site
		r	<i>Fimbristylis velata</i>	Veiled Fringe-sedge	On drying mud beside lakes and rivers and in seasonally wet depressions (Walsh and Entwisle 1994, p. 332).	2011	1	Low	Unsuitable habitat
VU	L	v	<i>Glycine latrobeana</i>	Clover Glycine	Widespread, infrequent populations in southern Victoria (Walsh and Entwisle 1996). Plains Grassland and Woodlands in moist well drained soils (Australian Plants Society Maroondah 2001).	1988	1	Low	Unsuitable habitat
EN	L	e	<i>Lepidium hyssopifolium</i>	Basalt Peppercross	Grows on basalt plains; rarely reported in western Victoria and only present at two known locations north and north-east of Melbourne (Walsh and Entwisle 1996).	1990	1	Low	Unsuitable habitat
		k	<i>Lepidium pseudohyssopifolium</i>	Native Peppercross	Uncommon plant, most recent reports from heavy soils of the Murray River floodplain in the far north-west (Walsh and Entwisle 1996, p. 421).	2007	1	Low	Unsuitable habitat
		r	<i>Melaleuca armillaris subsp. armillaris</i>	Giant Honey-myrtle	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 (Walsh and Entwisle 1996, p. 1031).	2011	4	Low	Not within natural range
		r	<i>Acacia boormanii</i>	Snowy River Wattle	Restricted mostly to open-forest on rocky slopes and along banks of the Snowy River and its tributaries, with outlying populations at Mt Typo and Gapsted in the Mytleford area. Occasionally sparingly established on roadside plantings, for example between Bungal and Mt Egerton.	2017	1	Low	Not within natural range

EPBC	FFG	VROT	Scientific name	Common name	Habitat and species	Last record	No. recs.	Likelihood of occurrence	Likelihood Reasoning
					Plants previously regarded as a slow-growing dwarf variant of this species from the upper catchment of Little River near Wulgulmerang are now regarded to be a distinct species				
		k	<i>Anthosachne kingiana subsp. multiflora</i>	Short-awned Wheat-grass	Scattered and rather uncommon, associated to some extent with temporary or permanent swamps, lagoons, floodplains and banks of watercourses, but also recorded from near-coastal sandy ground in east Gippsland and a dry, stony slope above the Macalister River, north of Licola.	2005	1	Low	Unsuitable habitat
		k	<i>Berula erecta</i>	Water Parsnip	Naturalised in Australia (Walsh and Entwisle 1999).	2017	1	Low	Unsuitable habitat
		r	<i>Billardiera scandens s.s.</i>	Velvet Apple-berry	Common in well-drained, dry to moist soils, particularly heathland, woodland and forests from near-sea level to sub-alpine regions (Australian Plants Society Maroondah 2001; Walsh and Entwisle 1996, p. 531).	1986	1	Low	Unsuitable habitat
		k	<i>Bolboschoenus fluviatilis</i>	Tall Club-sedge	Scattered and rather uncommon, requires moist to wet habitat, usually in shallow water on swamp or lake margins of valley sclerophyll forest (Australian Plants Society Maroondah 2001, p. 322; Walsh and Entwisle 1994).	2017	1	Low	Unsuitable habitat
		k	<i>Carex chlorantha</i>	Green-top Sedge	Rather uncommon and scattered throughout cooler, mostly southern Victoria from near sea-level (Orbost) to the alps (e.g. Buckety Plain). Usually situated on open sites, such as swamps with permanently moist to wet, fertile soils (Australian Plants Society Maroondah 2001; Walsh and Entwisle 1994, p. 351).	2011	3	Low	Unsuitable habitat
		r	<i>Eucalyptus sideroxylon subsp. sideroxylon</i>	Mugga	Distributions in Victoria are confined to the Chiltern region, northern Warby Range and south of Winton (Walsh and Entwisle 1996, pp. 989-90).	1988	1	Low	Not within natural range
		k	<i>Kunzea leptospermoides</i>	Yarra Burgan	Distribution localised to the Yarra River and tributaries, occurring in or near riparian vegetation (DSE 2011).	2017	1	Low	Unsuitable habitat

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 status

L: Listed, N: Nominated, I: Invalid or ineligible, R: Rejected, D: Delisted

Victorian Rare or Threatened Species (VROTS) (DSE 2013)

ex: Extinct, rx: Regionally Extinct, wx: Extinct in the Wild, cr: Critically Endangered, en: Endangered, vu: Vulnerable, nt: Near Threatened, dd: Data Deficient

Treaty	EPBC	FFG	VROTS	Scientific name	Common name	Last record	No. counts	Likelihood occurrence	Likelihood Reasoning	Habitat and species (without endnote)
	VU	L	v	<i>Prototroctes maraena</i>	Australian Grayling	2019	5	Nil	This species has an established population in the Yarra River, which would be unaffected by the proposed course.	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).
	VU	L	v	<i>Maccullochella peelii</i>	Murray Cod	2020	19	Nil	This species has an established population in the Yarra River, which would be unaffected by the proposed course.	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).
		R	n	<i>Macquaria ambigua</i>	Golden Perch	2008	1	Nil	This species has an established population in the Yarra River, which would be unaffected by the proposed course.	Occurs in a variety of riverine habitats, but prefers warm, slow-moving, turbid sections of streams. Also found in flooded lakes, backwaters and impoundments. Tolerant of temperatures between 4° and 35°C and high salinity levels (up to 35 p.p.t) (Allen, Midgley and Allen 2002, p. 199).

Treaty	EPBC	FFG	VROTS	Scientific name	Common name	Last record	No. counts	Likelihood occurrence	Likelihood Reasoning	Habitat and species (without endnote)
	EN	L	e	Macquaria australasica	Macquarie Perch	2020	53	Nil	This species has an established population in the Yarra River, which would be unaffected by the proposed course.	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 form schools during breeding season. The Macquarie Perch is more commonly found in slow moving rivers, reservoirs and lakes (Allen, Midgley and Allen 2002).
			Data deficient	Chelodina longicollis	Common Long-necked Turtle	2016	27	Low	This species has an established population in the Yarra River and connected wetlands, which would be unaffected by the proposed course, but it uses Banksia Street Billabong on the rare occasions when water is in the wetland..	Distributed throughout south eastern Australia, Coastal Rivers of Victoria, occurs in a broad range of habitats including permanent riverine waterholes, lakes, farm dams and shallow temporary ponds, greatest abundance in shallow, ephemeral waterholes or in bodies of water that are remote from remanent rivers, often in the absence of other turtle species. Able to distribute overland. {Kennet, 2009 #11099}
		L	v	Ornithorhynchus anatinus	Platypus	2020	38	Nil	This species has an established population in the Yarra River, which would be unaffected by the proposed course.	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

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			n	<i>Dromaius novaehollandiae</i>	Emu	1976	1	Nil	It is long time since the last record and this species can't survive in urban environments.	Plains, scrublands, open woodlands, coastal heaths, alpine pastures, semi-deserts, margins of lakes, pastoral and cereal growing areas, mostly absent from closely settled parts, common in pastoral and cropping regions, state forests and national parks (Pizzey & Knight 2007)
	CR	L	cr	<i>Pedionomus torquatus</i>	Plains-wanderer	1980	1	Nil	It is long time since the last record and this species can't survive in urban environments.	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 <i>Danthonia</i> and <i>Stipa</i> 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).
		L	v	<i>Lewinia pectoralis</i>	Lewin's Rail	2019	15	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	Inhabits densely vegetated, fresh, brackish or saline wetlands, usually with areas of standing water. Use long tussocky grass, reeds, rushes, sedges or bracken and are occasionally found amongst tangled clumps of weeds such as Blackberries and Lantana (Marchant and Higgins 1993).
		L	v	<i>Porzana pusilla</i>	Baillon's Crane	2019	16	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	This species returns to northern Victoria in spring, but few details on migration. It inhabits freshwater wetlands and floodwaters usually containing floating plants or tall emergent vegetation. The Baillon's Crane feeds in shallow water, mud and emergent aquatic plants. It has been found to nest in clumps or tussocks of vegetation surrounded by water (Marchant and Higgins 1993; Pizzey and Knight 2007).

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			n	Phalacrocorax varius	Pied Cormorant	2019	33	Moderate to High	This species would commonly use wetlands along the Yarra River corridor.	This species is most often found along the coast, however are known to use inland wetlands including billabongs, deep and open swamps and rivers (large freshwater and saline wetlands). They nest in colonies, building platforms nests in mangroves or other trees (Marchant and Higgins 1990; Pizzey and Knight 2007).
C,J		L	n	Hydroprogne caspia	Caspian Tern	1980	2	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	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).
B,R,J,C			v	Tringa stagnatilis	Marsh Sandpiper	2004	3	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	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).
B,R,J,C			n	Gallinago hardwickii	Latham's Snipe	2019	172	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	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

Treaty	EPBC	FFG	VROTS	Scientific name	Common name	Last record	No. counts	Likelihood occurrence	Likelihood Reasoning	Habitat and species (without endnote)
										seen feeding during the day. This species feeds by probing in soft mud and rarely moves far from concealing vegetation (Higgins and Davies 1996).
C	EN	L	cr	<i>Rostratula australis</i>	Australian Painted Snipe	2001	4	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	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).
B,C			n	<i>Plegadis falcinellus</i>	Glossy Ibis	2007	3	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	Found in terrestrial wetlands, occasionally wet grasslands and sheltered marine habitats. Forages in shallow water over soft substrate or on grassy or muddy verges of wetlands, preferring those that provide a variety of depths. Will use brackish and occasionally saline wetlands, mangroves and mudflats (Marchant and Higgins 1990; Pizzey and Knight 2007).
			n	<i>Platalea regia</i>	Royal Spoonbill	2020	73	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	The Royal Spoonbill inhabits the shallow parts of fresh and saline wetlands; these birds are gregarious in small flocks. They are mostly common on intertidal mudflats in coastal bays. Their stick-nests are built in reeds, shrubs or trees, singly or in loose colonies and are often seen with other species (Marchant and Higgins 1990).

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		L	v	<i>Ardea alba</i>	Great Egret	2013	192	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	
		L	e	<i>Egretta garzetta</i>	Little Egret	2019	12	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	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).
		L	v	<i>Ardea alba modesta</i>	Eastern Great Egret	2019	31	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	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).
			n	<i>Nycticorax caledonicus</i>	Plumed Egret	2020	244	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	The Nankeen Night Heron has a widespread distribution in wetlands throughout Australia, particularly in the north, south, and southwest. This species inhabits shorelines of lakes and rivers, estuaries, terrestrial wetlands and grasslands. Particularly those sheltered by tall ground vegetation and/or trees, with shallow, slow-moving water. Breeds in colonies, usually in the crown or canopy of trees, in forks or on horizontal boughs;

Treaty	EPBC	FFG	VROTS	Scientific name	Common name	Last record	No. counts	Likelihood occurrence	Likelihood Reasoning	Habitat and species (without endnote)
										also in reed beds or atop shrubs. In Victoria, most numerous in the Murray River region, and in smaller numbers in more coastal/near-coastal regions (Marchant and Higgins 1990; Pizzey and Knight 2007).
		L	e	<i>Ixobrychus dubius</i>	Little Bittern	1991	1	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	Occurs mainly in dense emergent vegetation in freshwater swamps, lakes and watercourses, where forage in shallow water or from supporting emergent or aquatic vegetation over deep water. Tolerate brackish-saline waters in mangrove swamps, <i>Juncus</i> -dominated saltmarsh, and wooded margins of coastal lagoons. Nests in densely vegetated freshwater wetlands; invariably over water; in sedge, reeds or rush, either in pure stands or interspersed in woodland thickets. Most records from the Murray-Darling Basin (Marchant and Higgins 1990, p. 1040).
	EN	L	e	<i>Botaurus poiciloptilus</i>	Australasian Bittern	2007	6	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	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).
		L	n	<i>Anseranas semipalmata</i>	Magpie Goose	1908	1	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	Most of the populations of this species has been re-introduced. They breed colonially and build platform nests over water, usually among tall rushes or reedbeds. The Magpie Goose feeds by digging in mud or by up-ending in shallow water, they have also been seen grazing and digging well away from water (Marchant and Higgins 1990).

Treaty	EPBC	FFG	VROTS	Scientific name	Common name	Last record	No. counts	Likelihood occurrence	Likelihood Reasoning	Habitat and species (without endnote)
			v	<i>Spatula rhynchotis</i>	Australasian Shoveler	2019	102	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	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).
		L	e	<i>Stictonetta naevosa</i>	Freckled Duck	2018	12	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	Terrestrial wetlands with shallow productive waters or soft mud at wetland edges. In breeding range (Lake Eyre and Murray-Darling Basin) densely vegetated waters, particularly flood water swamps and creeks vegetated with lignum. In coastal regions , prefer swamps and lakes with dense thickets of Melaleuca, Casuarina or Leptospermum (Marchant and Higgins 1990).
			v	<i>Aythya australis</i>	Hardhead	2020	391	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	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).

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		L	e	<i>Oxyura australis</i>	Blue-billed Duck	2018	2	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	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).
			v	<i>Biziura lobata</i>	Musk Duck	2017	31	Low prior to improved wetlands and moderate if wetlands plans are implemented.	This species would commonly use wetlands along the Yarra River corridor.	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).
		L	v	<i>Accipiter novaehollandiae</i>	Grey Goshawk	2018	15	Moderate	This species would hunt across large areas including the study site.	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).
	VU	L	e	<i>Falco hypoleucos</i>	Grey Falcon	1977	1	Low	This species may hunt across large areas including the study site but is likely to be absent from the local areas	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

Treaty	EPBC	FFG	VROTS	Scientific name	Common name	Last record	No. counts	Likelihood occurrence	Likelihood Reasoning	Habitat and species (without endnote)
									considering the age of the record.	while flying low and fast over open country and also catch prey in flight. Nest in trees, in disused stick-nests of other birds.
		L	v	Falco subniger	Black Falcon	2017	6	Moderate	This species would hunt across large areas including the study site.	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).
		L	e	Ninox connivens	Barking Owl	2018	2	Low	This species would hunt across large areas including the study site.	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).
		L	v	Ninox strenua	Powerful Owl	2020	156	Moderate to High	This species would hunt across large areas including the study site.	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).
		L	e	Tyto novaehollandiae	Masked Owl	1949	1	Nil	It is long time since the last record and this species can't survive in urban environments.	Inhabits forests, woodlands and caves. Active in middle storey (Simpson and Day 2000/2001). Inhabits diverse range of wooded habitats that provide tall or dense mature trees with hollows

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										suitable for nesting and roosting, and nearby open areas for foraging (Higgins 1999).
	VU	L	e	<i>Polytelis swainsonii</i>	Superb Parrot	1999	2	Low	It is long time since the last record although this species could still occasionally use local habitats and just hasn't been observed.	Found only in the Upper Murray Valley, mainly in the riverine forests and woodlands of Barmah Forest in Victoria. All other sightings have been made along or within 10 km of the Murray, Ovens and Goulburn Rivers. Nests located in hollows of very large riparian trees in River Red Gum forests. Feeds mainly in Black Box, Grey Box and Yellow Box woodlands and wooded farmlands away from their nest-trees but also within the River Red Gum forests round their nest. All nests are within 10km of major feeding areas. Forages on the ground and occasionally in eucalypts and mistletoes. The loss in range of this species is attributed to clearing and grazing of woodland feeding habitats but laying of poison baits for rabbits and Galahs, illegal trapping for the avicultural trade and logging of nest-trees are other possible causes (Higgins 1999` . pp. 287-295).
	CR	L	e	<i>Lathamus discolor</i>	Swift Parrot	2018	22	Low	This species breeds in Tasmania each summer and migrates across to the mainland each winter mainly relying on flowering eucalypts in dry forest and would only occasionally use habitat along the river.	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

Treaty	EPBC	FFG	VROTS	Scientific name	Common name	Last record	No. counts	Likelihood occurrence	Likelihood Reasoning	Habitat and species (without endnote)
										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).
			n	<i>Ceyx azureus</i>	Azure Kingfisher	2019	65	Moderate to High	This species would forage along the Yarra River, connected wetlands and river banks potentially including the study site.	This species is usually found near well vegetated wetlands. Uses root-festooned banks of fresh or tidal creeks, rivers, streams, lakes, swamps, estuaries or mangroves for perching. It forages by plunge-diving from perches to below surface of still or slow moving water, which may sometimes be only a few centimetres deep (Higgins 1999). Nesting occurs in small burrows in creek banks (Pizzey and Knight 2007).
C,R,J	VU	L	v	<i>Hirundapus caudacutus</i>	White-throated Needletail	2019	86	Moderate to High	This species would hunt across large areas including the study site.	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).
			n	<i>Chrysococcyx osculans</i>	Black-eared Cuckoo	2003	3	Low	It is long time since the last record although this species could still occasionally use local habitats and just hasn't been observed.	Summer migrants to Vic from northern wintering areas. Occur in mallee scrubs, dry woodlands and box-ironbark forests, mainly north of the Great Divide. They feed in low shrubs and from open ground among trees; lay their eggs in nests of

Treaty	EPBC	FFG	VROTS	Scientific name	Common name	Last record	No. counts	Likelihood occurrence	Likelihood Reasoning	Habitat and species (without endnote)
										other birds. Occasional or irregular visitor south of the Great Divide (Higgins 1999).
		L	n	Melanodryas cucullata	Hooded Robin	1992	3	Nil	It is long time since the last record although this species could still occasionally use local habitats and just hasn't been observed.	Highest density in semi-arid nw. Victoria where they inhabit mallee scrubs, cypress pine woodlands, mallee heaths with scattered trees and box-ironbarks forests. Uncommon in southern Vic where they occur in a range of lightly timbered habitats containing tall shrubs. These include Box woodlands, coastal heaths and heathy woodlands. Forage on bare ground, using vantage points such as dead limbs or fence posts to detect prey (Marchant and Higgins 1993; Pizzey and Knight 2007).
	CR	L	cr	Anthochaera phrygia	Regent Honeyeater	1998	18	Nil	It is long time since the last record although this species could still occasionally use local habitats and just hasn't been observed.	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).
	EN	L	rx	Dasyurus viverrinus	Eastern Quoll	1948	10	Nil	This species certainly does not occur in metropolitan Melbourne.	A range of open forests, woodlands and grasslands, where they would build a den amongst fallen logs or rock piles (DSE 2009). Found in open forest, scrubland and heath habitats, especially where interspersed with grassy clearings. Dens in burrow, hollow log or rock crevice.
	VU	L	Extinct in the Wild	Perameles gunnii	Eastern Barred Bandicoot	1883	1	Nil	This species certainly does not occur in metropolitan Melbourne.	In Victoria confined to a few colonies derived from captive-bred animals and dependent on on-going control of foxes and cats. Occupies open grassland, including introduced pasture, with

Treaty	EPBC	FFG	VROTS	Scientific name	Common name	Last record	No. counts	Likelihood occurrence	Likelihood Reasoning	Habitat and species (without endnote)
										patches of dense vegetation for shelter (Van Dyck and Strahan 2008a).
	VU	L	v	<i>Pteropus poliocephalus</i>	Grey Headed Flying Fox	2020	38	High	This species has mostly moved to using urban habitats in southern Australia where they forage mainly on native trees but often eat exotic fruits.	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).
		L	Data deficient	<i>Saccolaimus flaviventris</i>	Yellow–bellied Sheathtail Bat	1990	1	Nil	It is long time since the last record although this species could still occasionally use local habitats and just hasn't been observed.	Summer migrants to southern Australia, between January and April, the Yellow–bellied Sheathtail Bat is found in a wide variety of habitat types, including; wet and dry sclerophyll forests, open woodland, Acacia shrubland, mallee, grasslands and deserts. They generally roost in large tree hollows (Churchill 2008). Common in N. Australia but rare late–summer autumn visitors to South, occurs in most environments from wet forests to deserts, roosts singly or in small groups in tree hollows, in treeless areas known to roost in burrows of terrestrial mammals (Menkhorst & Knight 2001)
BA1	EN	L	cr	<i>Eubalaena australis</i>	Southern Right Whale	2018	2	Nil	This is along way from the ocean.	The Southern Right Whale is a strictly marine species which has a southern circumpolar distribution. This species migrates to the southern coastlines, including Australia, to breed and calve

Treaty	EPBC	FFG	VROTS	Scientific name	Common name	Last record	No. counts	Likelihood occurrence	Likelihood Reasoning	Habitat and species (without endnote)
										in the austral winter–spring (Van Dyck and Strahan 2008a).
			v	<i>Pseudemoia rawlinsoni</i>	Glossy Grass Skink	1991	2	Nil	It is long time since the last record.	Inhabits swamp and lake edges, salt-marshes and boggy creeks with dense vegetation (Wilson and Swan 2008).
			v	<i>Pseudemoia pagenstecheri</i>	Tussock Skink	1979	1	Nil	It is long time since the last record.	Tussock Skinks favour tussock grasslands with few/no trees, with a disjunct distribution within the NSW highlands, and throughout the NSW–VIC high country to VIC low altitude basalt plains, and parts of SE SA, and Tas. (Wilson & Swan 2008)
		L	e	<i>Pseudophryne bibronii</i>	Brown Toadlet	2005	2	Low	This species could still occur along the Yarra River corridor because suitable habitat is likely present and records may be minimal because of the species cryptic nature.	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).
			v	<i>Pseudophryne semimarmorata</i>	Southern Toadlet	1988	11	Low	This species could still occur along the Yarra River corridor because suitable habitat is likely present and records may be minimal because of the species cryptic nature.	The Southern Toadlet can be found in dry forest, woodland, shrubland, grassland and heaths. It shelters under leaf litter and other debris in moist soaks and depressions. Their eggs are spawned in shallow burrows under organic litter in low areas close to water (Hero, Littlejohn and Marantelli 1991).
	VU	L	e	<i>Litoria raniformis</i>	Growling Grass Frog	1991	20	Low	This species could still occur along the Yarra River corridor but is unlikely to because it is	The species often inhabits water bodies with a diverse assemblage of aquatic vegetation, including emergent species such as sedges (<i>Gahnia</i> spp.), submergent species such as curly pondweed

Treaty	EPBC	FFG	VROTS	Scientific name	Common name	Last record	No. counts	Likelihood occurrence	Likelihood Reasoning	Habitat and species (without endnote)
									more susceptible to chytrid fungus in freshwater.	(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).
			n	Larus pacificus	Pacific Gull	1997	1	Low	It is long time since the last record but it may be an occasional visitor that hasn't been recorded often.	The Pacific Gull is one of the largest gulls within the Australian and New Zealand territories, confined to the coast where flocks occur on intertidal mudflats and nearby rubbish tips in Port Phillip Bay, Western Port and Corner Inlet, with smaller numbers elsewhere on estuaries, along beaches and on other intertidal habitats (Higgins and Davies 1996). This species breeds mainly on islands in Bass Strait and off Tasmania. Some smaller numbers breed on islands off Wilsons Promontory. Their nests are built on the ground on the tops of steep-sided islands (Higgins and Davies 1996).
			n	Climacteris picumnus	Brown Treecreeper (south-eastern ssp.)	1977	1	Nil	It is long time since the last record and this species can't easily survive in urban environments.	Occurs in eucalypt woodlands, particularly open woodland lacking a dense understorey (Higgins, Peter and Steele 2001). It is sedentary and nests in tree hollows within permanent territories, breeding in pairs or communally in small groups. Birds forage on tree trunks and on the ground amongst

Treaty	EPBC	FFG	VROTS	Scientific name	Common name	Last record	No. counts	Likelihood occurrence	Likelihood Reasoning	Habitat and species (without endnote)
										leaf litter and on fallen logs for ants, beetles and larvae (Higgins, Peter and Steele 2001).
	EN	L	n	<i>Isodon obesulus obesulus</i>	Southern Brown Bandicoot	1948	1	Nil	It is long time since the last record and this species hasn't survived in most urban environments.	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).

Appendix 4. Native Vegetation Impact Assessment 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: 28/05/2021

Report ID: PRE_2021_013

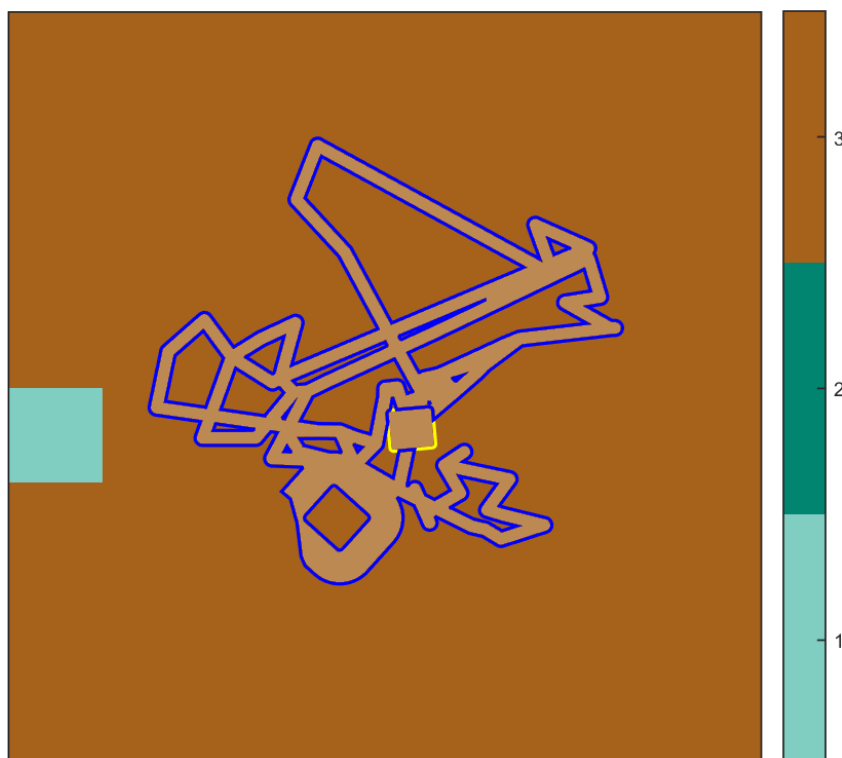
Time of issue: 1:33 pm

Project ID	Tree_Tops_Yarra_Flats
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Assessment pathway

Assessment pathway	Detailed Assessment Pathway
Extent including past and proposed	0.414 ha
Extent of past removal	0.000 ha
Extent of proposed removal	0.414 ha
No. Large trees proposed to be removed	0
Location category of proposed removal	Location 3 The native vegetation is in an area where the removal of less than 0.5 hectares could have a significant impact on habitat for one or more rare or threatened species. The native vegetation is also in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map).

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:

Species offset amount¹	0.168 species units of habitat for Grey-headed Flying-fox, <i>Pteropus poliocephalus</i>
Large trees	0 trees

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 species offset amount(s) required is the sum of all species habitat units in Appendix 1.

Next steps

Any proposal to remove native vegetation must meet the application requirements of the Detailed Assessment Pathway and it will be assessed under the Detailed 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 (partly met)
- Maps showing the native vegetation and property (partly met)
- Information about the impacts on rare or threatened species.
- 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 defensible space statement as applicable
- A statement about the Native Vegetation Precinct Plan as applicable
- A site assessment report including a habitat hectare assessment of any patches of native vegetation and details of trees
- An offset statement that explains that an offset has been identified and how it will be secured.

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Obtaining this publication does not guarantee that an application will meet the requirements of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes or that a permit to remove native vegetation will be granted.

Notwithstanding anything else contained in this publication, you must ensure that you comply with all relevant laws, legislation, awards or orders and that you obtain and comply with all permits, approvals and the like that affect, are applicable or are necessary to undertake any action to remove, lop or destroy or otherwise deal with any native vegetation or that apply to matters within the scope of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes.

Appendix 1: Description of native vegetation to be removed

The species-general offset test was applied to your proposal. This test determines if the proposed removal of native vegetation has a proportional impact on any rare or threatened species habitats above the species offset threshold. The threshold is set at 0.005 per cent of the mapped habitat value for a species. When the proportional impact is above the species offset threshold a species offset is required. This test is done for all species mapped at the site. Multiple species offsets will be required if the species offset threshold is exceeded for multiple species.

Where a zone requires species offset(s), the species habitat units for each species in that zone is calculated by the following equation in accordance with the Guidelines:

$$\text{Species habitat units} = \text{extent} \times \text{condition} \times \text{species landscape factor} \times 2, \text{ where the species landscape factor} = 0.5 + (\text{habitat importance score}/2)$$

The species offset amount(s) required is the sum of all species habitat units per zone

Where a zone does not require a species offset, the general habitat units in that zone is calculated by the following equation in accordance with the Guidelines:

$$\text{General habitat units} = \text{extent} \times \text{condition} \times \text{general landscape factor} \times 1.5, \text{ where the general landscape factor} = 0.5 + (\text{strategic biodiversity value score}/2)$$

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
1-1	Patch	gipp0056	Endangered	0	yes	0.210	0.385	0.385	0.995	0.805	0.146	11280 Grey-headed Flying-fox <i>Pteropus poliocephalus</i>
1-2	Patch	gipp0056	Endangered	0	no	0.420	0.013	0.013	1.000	0.810	0.010	11280 Grey-headed Flying-fox <i>Pteropus poliocephalus</i>
1-3	Patch	gipp0056	Endangered	0	no	0.420	0.016	0.016	1.000	0.810	0.012	11280 Grey-headed Flying-fox <i>Pteropus poliocephalus</i>

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

This table lists all rare or threatened species' habitats mapped at the site.

Species common name	Species scientific name	Species number	Conservation status	Group	Habitat impacted	% habitat value affected
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	11280	Vulnerable	Dispersed	Top ranking map	0.0062
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	11280	Vulnerable	Dispersed	Habitat importance map	0.0003
Australian Mudfish	<i>Neochanna cleaveri</i>	4703	Critically endangered	Dispersed	Habitat importance map	0.0002
Keferstein's Tree Frog	<i>Litoria dentata</i>	528551	Vulnerable	Dispersed	Habitat importance map	0.0002
Yarra Pygmy Perch	<i>Nannoperca obscura</i>	4882	Vulnerable	Dispersed	Habitat importance map	0.0002
Australian Grayling	<i>Prototroctes maraena</i>	4686	Vulnerable	Dispersed	Habitat importance map	0.0001
Lacey River Buttercup	<i>Ranunculus amplus</i>	505019	Rare	Dispersed	Habitat importance map	0.0001
Grey Billy-buttons	<i>Craspedia canens</i>	504643	Endangered	Dispersed	Habitat importance map	0.0001
Veined Spear-grass	<i>Austrostipa rudis subsp. australis</i>	504940	Rare	Dispersed	Habitat importance map	0.0000
Glossy Grass Skink	<i>Pseudemoia rawlinsoni</i>	12683	Vulnerable	Dispersed	Habitat importance map	0.0000
Salt Lawrencia	<i>Lawrencia spicata</i>	501888	Rare	Dispersed	Habitat importance map	0.0000
Common Sandpiper	<i>Actitis hypoleucos</i>	10157	Vulnerable	Dispersed	Habitat importance map	0.0000
Small Golden Moths	<i>Diuris basaltica</i>	501473	Endangered	Dispersed	Habitat importance map	0.0000
Veiled Fringe-sedge	<i>Fimbristylis velata</i>	501369	Rare	Dispersed	Habitat importance map	0.0000
Green Scentbark	<i>Eucalyptus fulgens</i>	505175	Rare	Dispersed	Habitat importance map	0.0000
Growling Grass Frog	<i>Litoria raniformis</i>	13207	Endangered	Dispersed	Habitat importance map	0.0000
Round-leaf Pomaderris	<i>Pomaderris vacciniifolia</i>	502675	Endangered	Dispersed	Habitat importance map	0.0000
Spurred Helmet-orchid	<i>Corybas aconitiflorus</i>	500835	Rare	Dispersed	Habitat importance map	0.0000
Swamp Skink	<i>Lissolepis coventryi</i>	12407	Vulnerable	Dispersed	Habitat importance map	0.0000

White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	10226	Vulnerable	Dispersed	Habitat importance map	0.0000
Fringed Helmet-orchid	<i>Corybas fimbriatus</i>	500839	Rare	Dispersed	Habitat importance map	0.0000
Plains Yam-daisy	<i>Microseris scapigera</i> s.s.	504657	Vulnerable	Dispersed	Habitat importance map	0.0000
Lewin's Rail	<i>Lewinia pectoralis pectoralis</i>	10045	Vulnerable	Dispersed	Habitat importance map	0.0000
Swamp Everlasting	<i>Xerochrysum palustre</i>	503763	Vulnerable	Dispersed	Habitat importance map	0.0000
Little Egret	<i>Egretta garzetta nigripes</i>	10185	Endangered	Dispersed	Habitat importance map	0.0000
Black-tailed Godwit	<i>Limosa limosa</i>	528553	Vulnerable	Dispersed	Habitat importance map	0.0000
Floodplain Fireweed	<i>Senecio campylocarpus</i>	507136	Rare	Dispersed	Habitat importance map	0.0000
Australasian Bittern	<i>Botaurus poiciloptilus</i>	10197	Endangered	Dispersed	Habitat importance map	0.0000
Sticky Wattle	<i>Acacia howittii</i>	500044	Rare	Dispersed	Habitat importance map	0.0000
Blue-billed Duck	<i>Oxyura australis</i>	10216	Endangered	Dispersed	Habitat importance map	0.0000
Australian Little Bittern	<i>Ixobrychus dubius</i>	10195	Endangered	Dispersed	Habitat importance map	0.0000
Pale Swamp Everlasting	<i>Coronidium gunnianum</i>	504655	Vulnerable	Dispersed	Habitat importance map	0.0000
Purple Blown-grass	<i>Lachnagrostis punicea</i> subsp. <i>filifolia</i>	504222	Rare	Dispersed	Habitat importance map	0.0000
Australian Painted Snipe	<i>Rostratula australis</i>	10170	Critically endangered	Dispersed	Habitat importance map	0.0000
Eastern Great Egret	<i>Ardea modesta</i>	10187	Vulnerable	Dispersed	Habitat importance map	0.0000
Intermediate Egret	<i>Ardea intermedia</i>	10186	Endangered	Dispersed	Habitat importance map	0.0000
Musk Duck	<i>Biziura lobata</i>	10217	Vulnerable	Dispersed	Habitat importance map	0.0000
Purple Diuris	<i>Diuris punctata</i>	501084	Vulnerable	Dispersed	Habitat importance map	0.0000
Common Bent-wing Bat (eastern ssp.)	<i>Miniopterus schreibersii</i> <i>oceanensis</i>	61342	Vulnerable	Dispersed	Habitat importance map	0.0000
Baillon's Crake	<i>Porzana pusilla palustris</i>	10050	Vulnerable	Dispersed	Habitat importance map	0.0000
Grey Goshawk	<i>Accipiter novaehollandiae</i> <i>novaehollandiae</i>	10220	Vulnerable	Dispersed	Habitat importance map	0.0000
Hardhead	<i>Aythya australis</i>	10215	Vulnerable	Dispersed	Habitat importance map	0.0000

Australasian Shoveler	<i>Anas rhynchos</i>	10212	Vulnerable	Dispersed	Habitat importance map	0.0000
Arching Flax-lily	<i>Dianella sp. aff. longifolia</i> (<i>Benambra</i>)	505560	Vulnerable	Dispersed	Habitat importance map	0.0000
Powerful Owl	<i>Ninox strenua</i>	10248	Vulnerable	Dispersed	Habitat importance map	0.0000
Black Falcon	<i>Falco subniger</i>	10238	Vulnerable	Dispersed	Habitat importance map	0.0000
Square-tailed Kite	<i>Lophoictinia isura</i>	10230	Vulnerable	Dispersed	Habitat importance map	0.0000
White-throated Needletail	<i>Hirundapus caudacutus</i>	10334	Vulnerable	Dispersed	Habitat importance map	0.0000
Southern Toadlet	<i>Pseudophryne semimarmorata</i>	13125	Vulnerable	Dispersed	Habitat importance map	0.0000
Elegant Parrot	<i>Neophema elegans</i>	10307	Vulnerable	Dispersed	Habitat importance map	0.0000

Habitat group

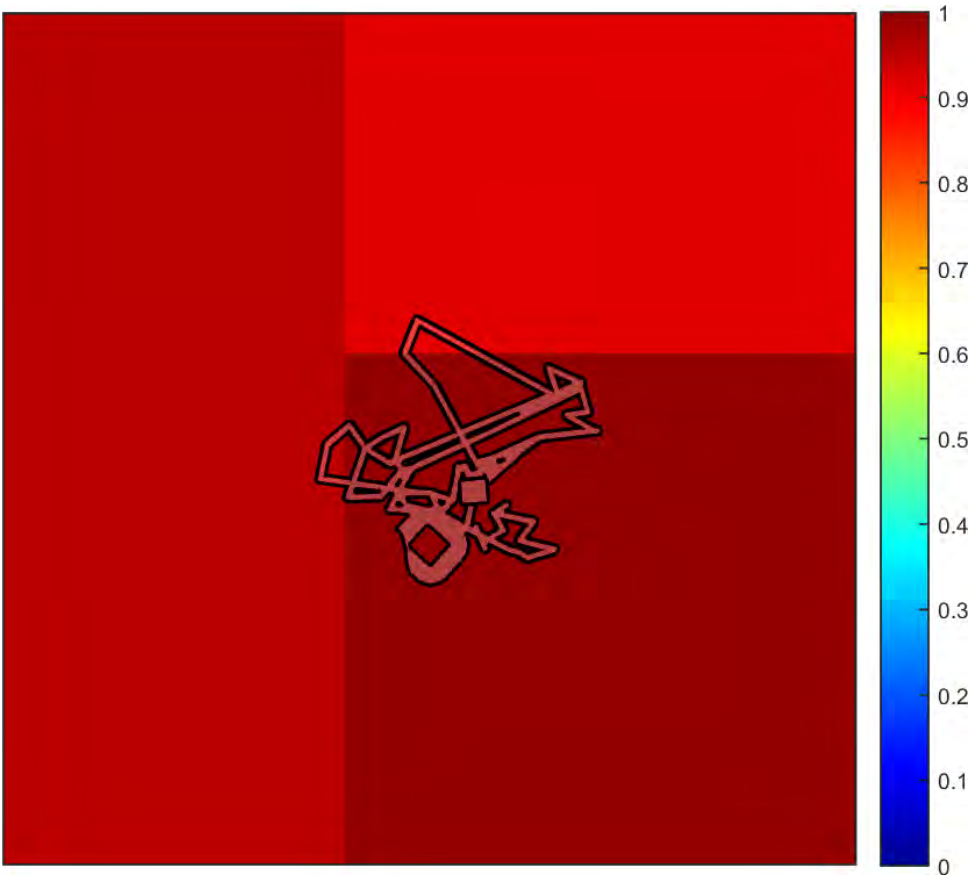
- Highly localised habitat means there is 2000 hectares or less mapped habitat for the species
- Dispersed habitat means there is more than 2000 hectares of mapped habitat for the species

Habitat impacted

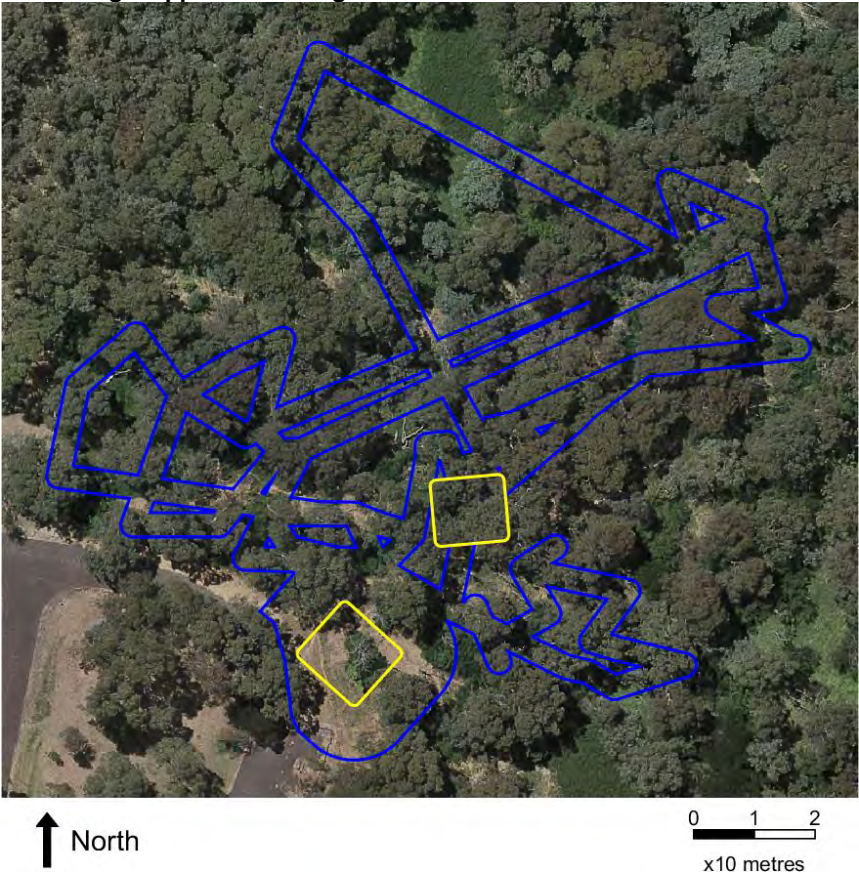
- Habitat importance maps are the maps defined in the Guidelines that include all the mapped habitat for a rare or threatened species
- Top ranking maps are the maps defined in the Guidelines that depict the important areas of a dispersed species habitat, developed from the highest habitat importance scores in dispersed species habitat maps and selected VBA records
- Selected VBA record is an area in Victoria that represents a large population, roosting or breeding site etc.

Appendix 3 – Images of mapped native vegetation

2. Strategic biodiversity values map



3. Aerial photograph showing mapped native vegetation



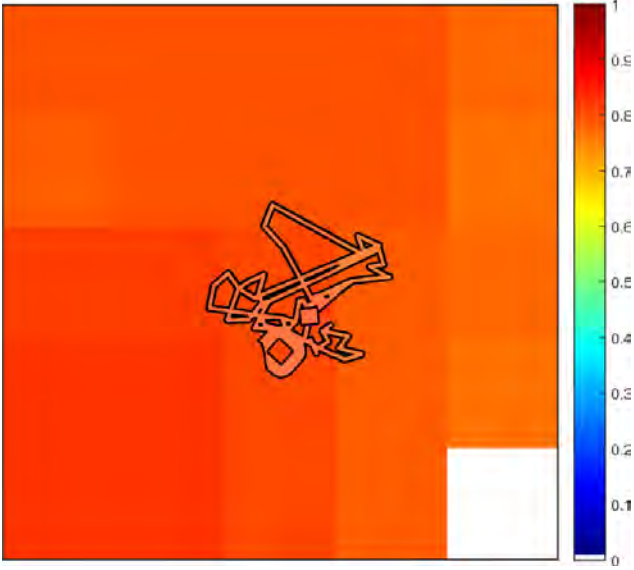
4. Map of the property in context



Yellow boundaries denote areas of proposed native vegetation removal.
Blue boundaries denote zones of partial removal with a halved condition score.

4. Habitat importance maps

Grey-headed Flying-fox
Pteropus poliocephalus
11280



Appendix 5. Tree Census (Large Canopy Trees)

Legend

DBH = diameter-at-breast-height

Tree ID	Tree species	DBH (cm)	Retain/Remove
1	<i>Eucalyptus camaldulensis</i>	94	Retain
9	<i>Eucalyptus camaldulensis</i>	82	Retain
13	<i>Eucalyptus camaldulensis</i>	101	Retain
15	<i>Eucalyptus camaldulensis</i>	85	Retain
16	<i>Eucalyptus camaldulensis</i>	95	Retain
17	<i>Eucalyptus camaldulensis</i>	85	Retain
18	<i>Eucalyptus camaldulensis</i>	94	Retain
20	<i>Eucalyptus camaldulensis</i>	105	Retain
20	<i>Eucalyptus camaldulensis</i>	120	Retain
23	<i>Eucalyptus camaldulensis</i>	80	Retain
29	<i>Eucalyptus camaldulensis</i>	90	Retain
49	<i>Eucalyptus camaldulensis</i>	90	Retain
50	<i>Eucalyptus camaldulensis</i>	100	Retain
59	<i>Eucalyptus camaldulensis</i>	80	Retain
60	<i>Eucalyptus camaldulensis</i>	80	Retain


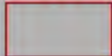


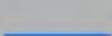
Appendix 6. Maps



Map 1. Subject Site

TreeTops Adventure Park,
Yarra Flats, Ivanhoe East

Legend

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

Details

Date: 10/06/2021

Aerial photography from

NearMap (02/05/2021).

Base map data Copyright © The State of Victoria.



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Scale 1:1,691 (Page size A3)

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TreeTops Adventure Park, Yarra Flats,
Ivanhoe East

Significant Fauna VBA
Records (5km)

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Details Scale 1:29,586 N
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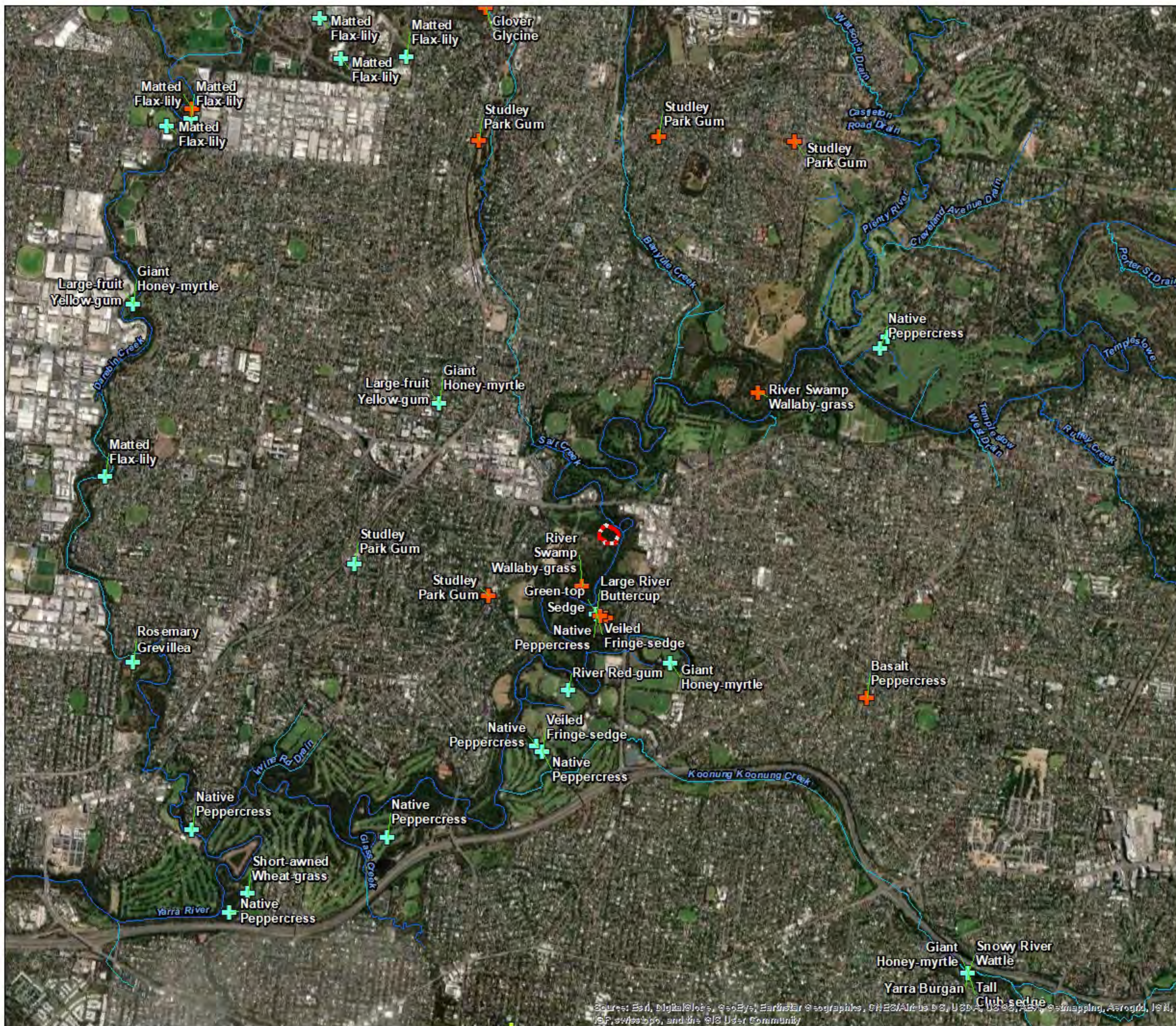


TreeTops Adventure Park, Yarra Flats,
Ivanhoe East

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Details Scale 1:29,586 


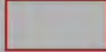


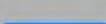
Date: 10/06/2021
Aerial photography from
Google Earth Pro (31/01/2014).
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Map 4. Ecological Assessment

TreeTops Adventure Park,
Yarra Flats, Ivanhoe East

Legend

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

Native Vegetation

-  EVC 56: Floodplain Riparian Woodland
-  Large Canopy Trees (>80cm DBH)

Details

Date: 10/06/2021
Aerial photography from
NearMap (02/05/2021).
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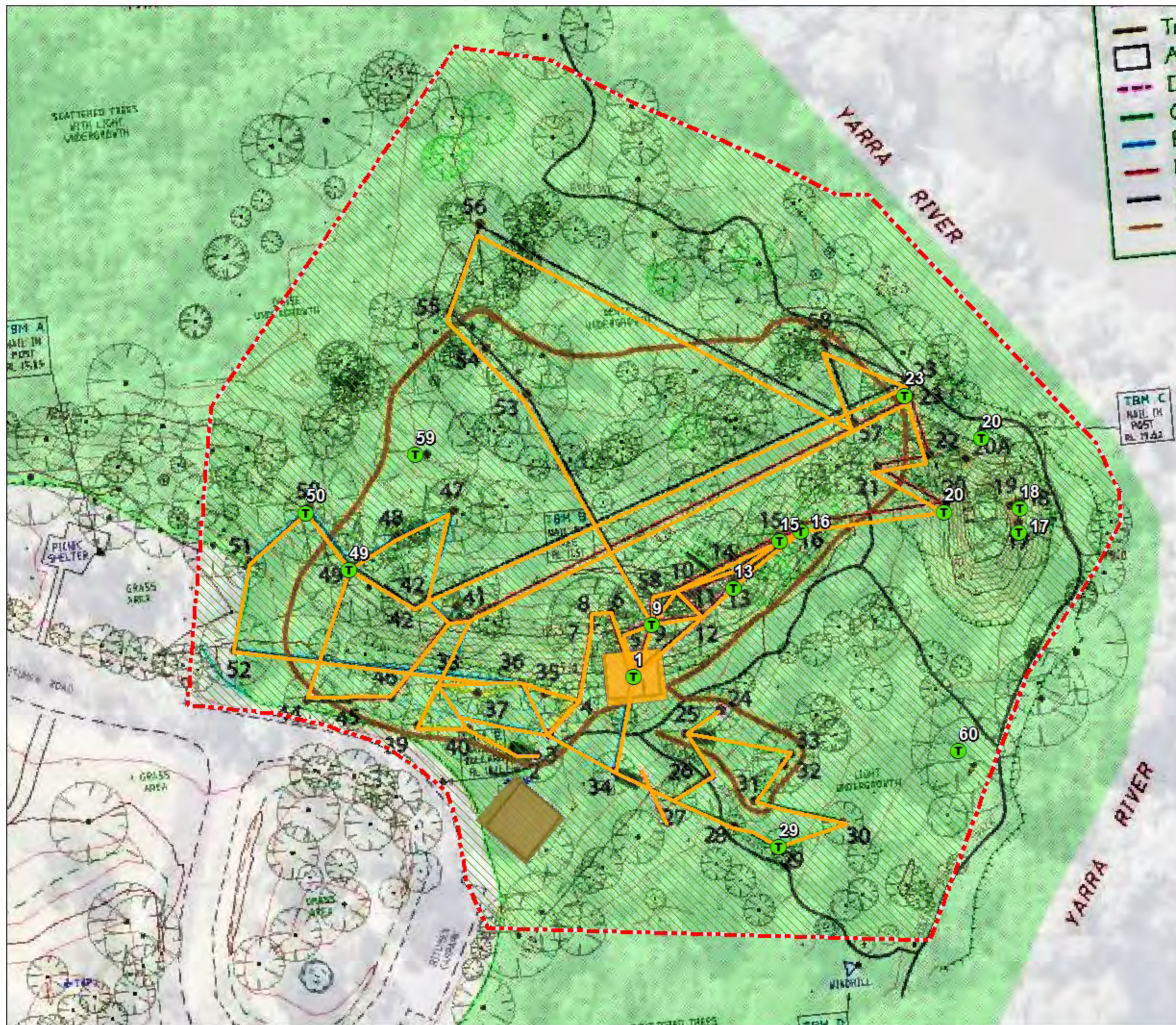
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Map 5. Proposed Tree Course

Proposed TreeTops Adventure Park,
Yarra Flats, Ivanhoe East



Legend

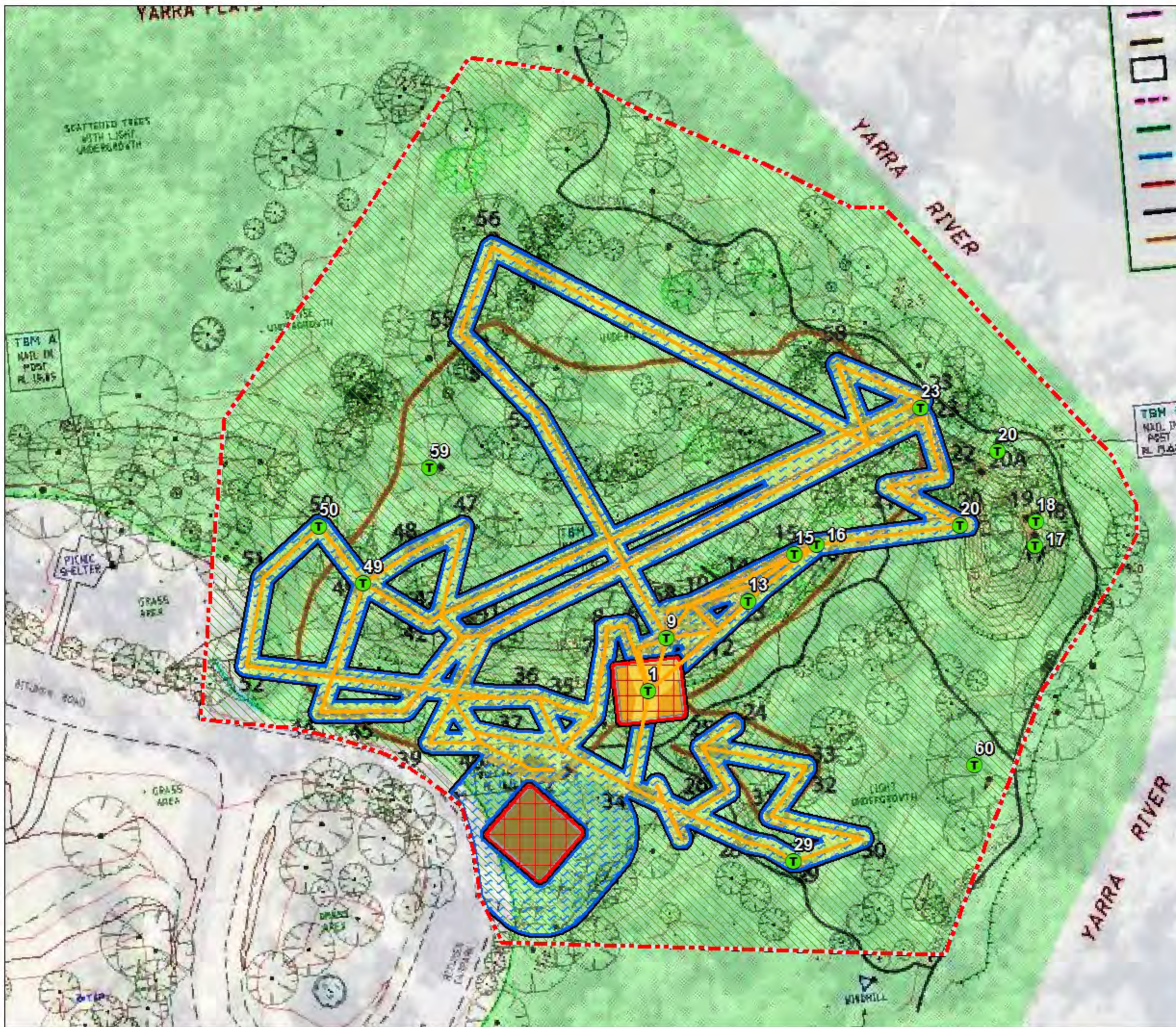
- Subject Site
- EVC 56: Floodplain
Riparian Woodland
- T Large Canopy Tree
DBH>80cm
- Proposed Tree Course
- Proposed Decking (10.21m
x 8.97m)
- Proposed Reception
(11.24m x 10.21m)

Date: 10/06/2021
Plans prepared by
Thomas & George P/L Version 8
(06/04/2021).

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Map 6. Vegetation Losses

Proposed TreeTops Adventure Park,
Ivanhoe

Legend

- Subject Site
- EVC 56: Floodplain
Riparian Woodland
- T Large Canopy Tree
DBH > 80cm
- Proposed Tree Course
- Proposed Tree Course
Buffer (2m)
- Proposed Decking (10.21m
x 8.97m)
- Proposed Reception
(11.24m x 10.21m)
- Construction Buffer (1m)

Vegetation Losses

- 100% Losses
- 50% Partial Losses

Date: 10/06/2021
Plans prepared by
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Scale 1:613 (Page size A3)

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Map 7. Banksia Steet Billabong and Tree Course

Proposed TreeTops Adventure Park, Ivanhoe

Legend

- Subject Site
- Proposed Tree Course
- Proposed Tree Course Buffer (2m)
- Proposed Decking (10.21m x 8.97m)
- Proposed Reception (11.24m x 10.21m)



Date: 10/06/2021
Banksia Street Billabong,
with LiDAR-derived elevations
and anticipated flow path



0 20 40 m

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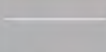
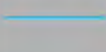
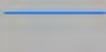

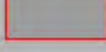


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Map 8. Land Management Plan

TreeTops Adventure Park,
Yarra Flats, Ivanhoe East

Legend

-  Study area
-  Parcels
-  Contours (10m)
- Watercourse**
 -  Constructed watercourse
 -  Natural watercourse
 -  Proposed Tree Course
 -  Proposed infrastructure (1m)

Management Zones

-  Construction Zone
-  Fuel Modified Conservation Zone (10m)
-  Modified Conservation Zone
-  Bushland Conservation Zone

Details

Date: 21/06/2021
Aerial photography from
NearMap (02/05/2021).
Base map data Copyright © The State of Victoria.



0 10 20 m

Scale 1:999 (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.

Appendix 7. Detailed plans

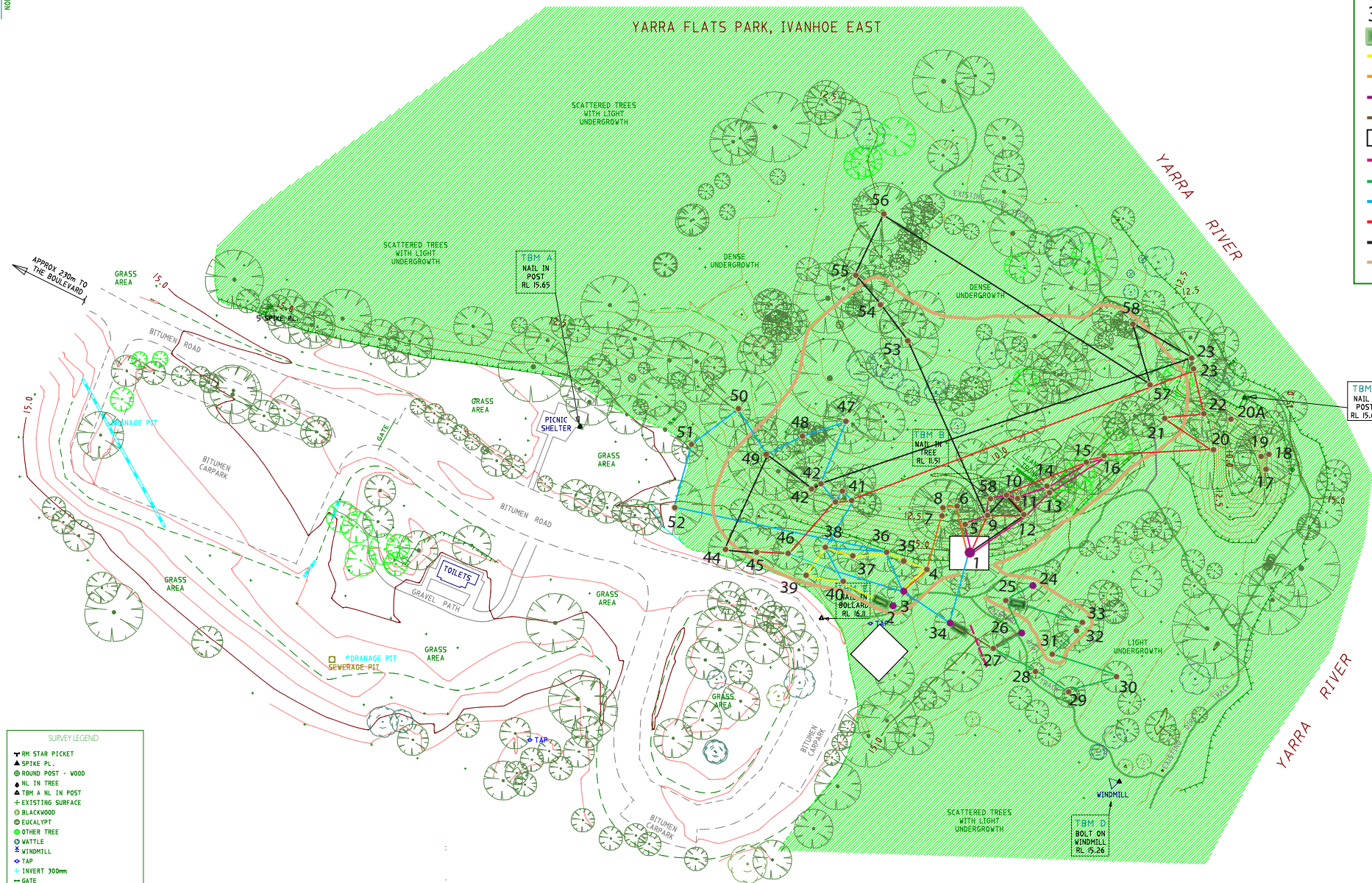
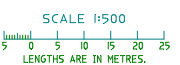


SURVEY LEGEND

- ▲ STAIR FLIGHT
- ▲ SPIKE IN
- ROUGH POST - WOOD
- IN TRAIL
- ▲ TRAIL & FE. IN POST
- + EXISTING SURFACE
- SHELLOWOOD
- EUCALYPT
- OTHER TREE
- HAZLE
- WILLOW
- FILL
- (EXIST. FILL)
- GATE
- SPOURAGE PFT
- SPOURAGE PFT
- EXISTING TRAIL
- TOP OF BANK
- GROUP OF TREES
- TOP OF BANK
- POST & RAIL
- BUILDING
- FENCE OF RETURN
- GATE
- SPOURAGE PFT
- SPOURAGE PFT
- SPOURAGE PFT
- SPOURAGE PFT

	Yarra Flats - VIC		Version: 8
	TreeTop Adventure Park		Courses: 8
	16/04/21	Challenges: 90	

ARBITRARY NORTH



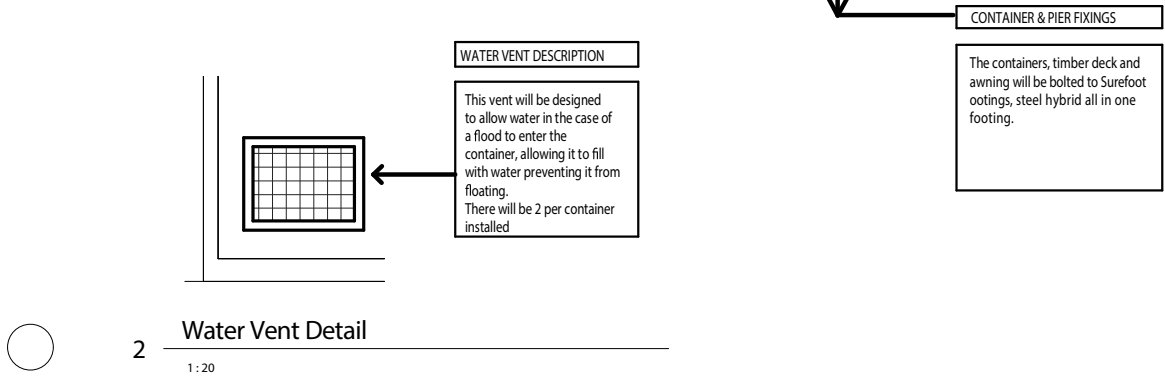
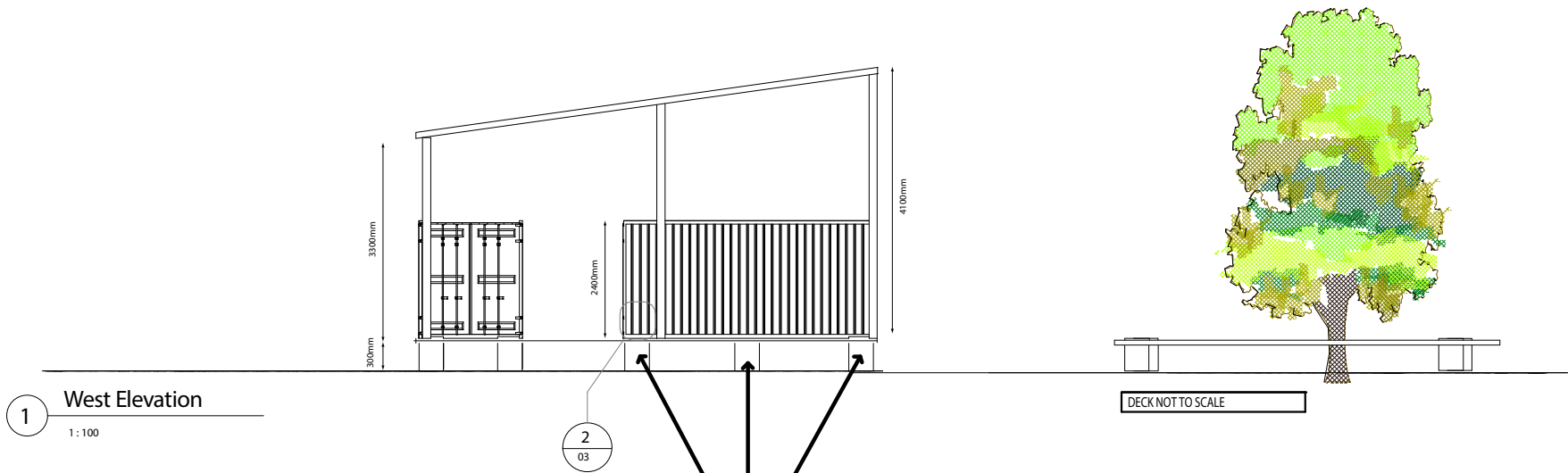
KEY TO COURSES AND OFFICE OVERLAY

- Tree with platform
- Tree with ground access
- 38 Tree number
- Flying Fox landing
- Yellow course
- Orange course
- Purple course
- Training Course
- Administration Area
- Dispersal trench
- Green course
- Blue course
- Red course
- Black course
- Paths

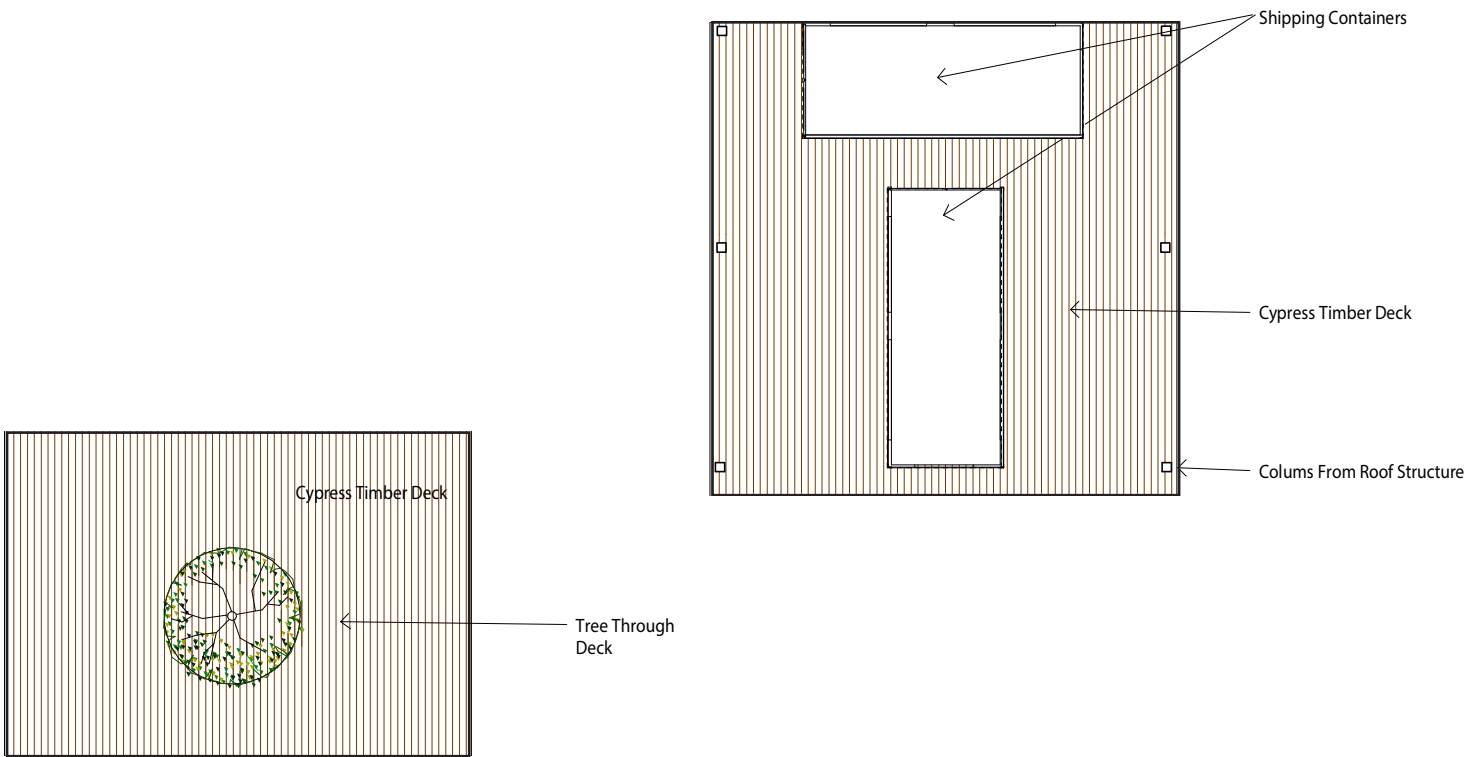
SURVEY LEGEND

- RM STAR PICKET
- SPIKE PL.
- ROUND POST - WOOD
- NL IN TREE
- TBM A NL IN POST
- EXISTING SURFACE
- BLACKWOOD
- EUCALYPT
- OTHER TREE
- WATTLE
- WINDMILL
- TAP
- INVERT 300mm
- GATE
- SEWERAGE PIT
- DRAINAGE PIT
- EXISTING TRACK
- TOE OF BANK
- GROUP OF TREES
- TOP OF BANK
- POST & RAIL
- BUILDING
- EDGE OF BITUMEN
- GATE
- U/G DRAINAGE PIPE
- VEGETATION UNDERGROWTH

	Yarra Flats - VIC		Version: 8	
	TreeTop Adventure Park		Courses: 8	
	16/04/21	Challenges: 90		



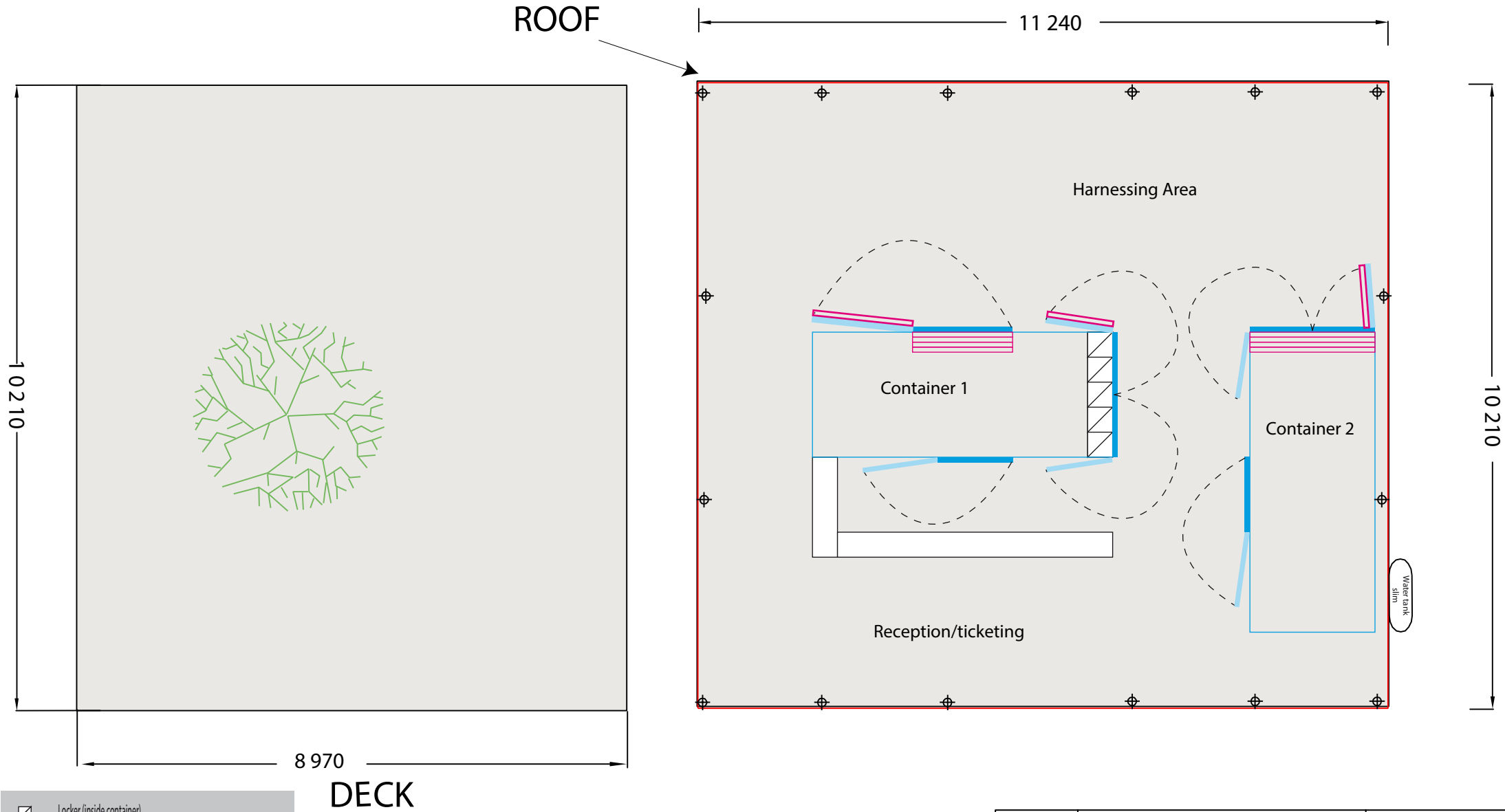
Issued by	Revision Number	Revision Description	Date	Building Designer	DISCLAIMER	NOTES	Legend	Client	Sheet Name :	Scale As indicated
Josh Clarke	1	Elevation details	18/09/2020	Josh Clarke	<p>THESE DRAWINGS ARE PRELIMINARY DRAWINGS AND ARE SUBJECT TO CHANGE WITHOUT NOTICE DURING THE COURSE OF THE PROPOSED DEVELOPMENT AND IN CONSULTATION WITH COUNCIL. SUBMISSION OF THE DRAWINGS DOES NOT CONSTITUTE A REPRESENTATION OR WARRANTY BY THE DEVELOPER OR ITS SUBSIDIARIES, AGENTS OR CONTRACTORS THAT THE PROPOSED DEVELOPMENT WILL TAKE PLACE IN ACCORDANCE WITH THESE DRAWINGS.</p> <p>BEFORE CARRYING OUT ANY WORK ENSURE THAT THE DRAWINGS USED CARRY THE LATEST AMENDMENTS NO.</p>	<p>ALL WORK SHOULD COMPLY TO THE CONTRACT DOCUMENTS WHICH INCLUDE SPECIFICATIONS, THE DRAWINGS, ALL ADDENDUMS, PROFILES, SCHEDULES AND MODIFICATIONS ISSUED BY THE BUILDING DESIGNER.</p> <p>THE GENERAL CONTRACTOR SHALL REVIEW ALL DOCUMENTS AND VERIFY ALL DIMENSIONS AND FIELD CONDITIONS AND SHALL CONFIRM THAT WORK IS BUILDABLE AS SHOWN. ANY CONFLICTS OR OMISSIONS, ETC. SHALL BE IMMEDIATELY REPORTED TO THE BUILDING DESIGNER FOR CLARIFICATION PRIOR TO THE PERFORMANCE OF ANY WORK IN QUESTION.</p> <p>ALL THE CONSTRUCTION DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL CONSULTANTS AND CONTRACTOR DRAWINGS, SCHEDULES AND SPECIFICATIONS. IN CASE OF CONFLICT BETWEEN BUILDING DESIGNERS AND CONSULTANTS DRAWINGS IN LOCATING STRUCTURAL ELEMENTS AND INSTALL EQUIPMENT, THE BUILDING DESIGNER SHALL BE NOTIFIED FOR CLARIFICATION PRIOR TO PROCEEDING WITH CONSTRUCTION.</p> <p>DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS GOVERN PARTITION LOCATIONS, DIMENSIONS AND TYPES. IN CASE OF CONFLICT, NOTIFY THE BUILDING DESIGNER OR WRITTEN CLARIFICATION PRIOR TO PROCEEDING OR COMMENCEMENT OF CONSTRUCTION.</p>	CONCEPT DESIGN PROPOSAL	TREETOPS	Elevations	Date : 27/04/2021
								Project Address	Amendment :	Drawing Number :
								YARRA FLATS, VIC		Drawing Status
								Project Discription	B	Commencement Date :
								SITE OFFICE		



1 02 Timber Deck Level
1 : 100

				Building Designer	DISCLAIMER	NOTES	Legend	Client	Sheet Name :	Scale	1 : 100
Issued by	Revision Number	Revision Description	Date	Josh Clarke	"THESE DRAWINGS ARE PRELIMINARY DRAWINGS AND ARE SUBJECT TO CHANGE WITHOUT NOTICE DURING THE COURSE OF THE PROPOSED DEVELOPMENT AND IN CONSULTATION WITH COUNCIL. SUBMISSION OF THE DRAWINGS DOES NOT CONSTITUTE A REPRESENTATION OR WARRANTY BY THE DEVELOPER OR ITS SUBSIDIARIES, AGENTS OR CONTRACTORS THAT THE PROPOSED DEVELOPMENT WILL TAKE PLACE IN ACCORDANCE WITH THESE DRAWINGS."	DRAWINGS MADE TO A LARGER SCALE AND THOSE SHOWING PARTICULAR DETAILS OF WORK SHALL TAKE PRECEDENCE OVER DRAWINGS MADE TO A SIMILAR SCALE AND FOR MORE GENERAL PURPOSES.	ALL WORK SHOULD CONFORM TO THE CONTRACT DOCUMENTS WHICH INCLUDE SPECIFICATIONS, THE DRAWINGS, ALL ADDENDUMS, FIRSTS, SCHEDULES AND MODIFICATIONS ISSUED BY THE BUILDING DESIGNER.	TREETOPS	Site Plan	Date : 27/04/21	1 : 100
					BEFORE CARRYING OUT ANY WORK ENSURE THAT THE DRAWINGS USED CARRY THE LATEST AMENDMENTS No.	WHERE ANY DISCREPANCY EXISTS BETWEEN FIGURED AND SCALED DIMENSIONS, THE FIGURED DIMENSION SHALL PREVAIL.	THE GENERAL CONTRACTOR SHALL REVIEW ALL DOCUMENTS AND VERIFY ALL DIMENSIONS AND FIELD CONDITIONS AND SHALL CONFIRM THAT WORK IS BUILDABLE AS SHOWN. ANY CONFLICTS OR OMISSIONS, ETC. SHALL BE IMMEDIATELY REPORTED TO THE BUILDING DESIGNER FOR CLARIFICATION PRIOR TO THE PERFORMANCE OF ANY WORK IN QUESTION.	Project Address	Amendment :	Drawing Number :	
						BUILDER TO CHECK ALL SITE DIMENSIONS PRIOR TO FABRICATION OF FITTINGS.	ALL THE CONSTRUCTION DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL CONSULTANTS AND CONTRACTOR DRAWINGS, SCHEDULES AND SPECIFICATIONS. IN CASE OF CONFLICT BETWEEN BUILDING DESIGNERS AND CONSULTANTS DRAWINGS IN LOCATING STRUCTURAL ELEMENTS, MATERIALS, EQUIPMENT, THE BUILDING DESIGNER SHALL BE NOTIFIED FOR CLARIFICATION PRIOR TO PROCEEDING WITH CONSTRUCTION.	YARRA FLATS, VIC		Drawing Status	
						ALL WORK SHOULD COMPLY WITH RELEVANT AUSTRALIAN STANDARDS AND BUILDING CODES OF AUSTRALIA (NCC).	DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS GOVERN PARTITION LOCATIONS, DIMENSIONS AND TYPES. IN CASE OF CONFLICT, NOTIFY THE BUILDING DESIGNER OR WRITTEN CLARIFICATION PRIOR TO PROCEEDING OR COMMENCEMENT OF CONSTRUCTION.	Project Discription			
								SITE OFFICE			
				</							

PRELIMINARY PLAN FOR PROPOSED ADMINISTRATION AREA - YARRA FLATS



- Locker (inside container)
- Counter
- Harness hooks
- Door closed
- Door open

FLOOR PLAN



Yarra Flats - VIC		Version: 3
Proposed TreeTops Site		
27/04/21	Administration Area	Not to scale

