



6280 Great Ocean Road, Apollo Bay: Flora and fauna assessment

Prepared for Beveridge Williams

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Summary

Biosis Pty Ltd was commissioned by Beveridge Williams to undertake a flora and fauna assessment of an area of land proposed for subdivision. The study area is located in predominately agricultural land approximately 2.5 kilometres north-east of Apollo Bay, immediately north of the existing Apollo Bay township boundary.

Ecological values

Key ecological values identified within the study area are as follows:

- 2.81 hectares of native vegetation. The highest quality areas of native vegetation were five patches of Wet Forest EVC equating to 2.64 ha in area and containing 30 large trees. The patches of Wet Forest were located in the western section of the study area and will not be impacted by the proposed development. The study area also contained five small dam/wetland areas, 0.17 ha of Swamp Scrub EVC and five scattered remnant trees.
- One patch of Swamp Scrub (HZ4) is located in the Otway Ranges Bioregion and is classified as endangered in this Bioregion. The patches of Wet Forest EVC are classified as least concern and the patches of Swamp Scrub in the Otway Plain Bioregion are considered to be vulnerable.
- Potential habitat for 20 flora and fauna species listed under the EPBC Act or FFG Act (the majority of these species would be found in patches of Wet Forest or wetland/dams and are unlikely to be impacted by the proposed development).

Government legislation and policy

An assessment of the project in relation to key biodiversity legislation and policy is provided and summarised in the table below.

Legislation / policy	Relevant ecological feature on site	Permit / approval required	Notes
EPBC Act	Potential habitat for 11 fauna species.	Referral not recommended	Most of these species (if present) occur in patches of wet forest which will not be impacted by development.
	Potential Growling Grass Frog habitat on site.	Referral not recommended	There is an existing large wetland to the north east of the site which should be fenced during the construction of the drainage reserve and water from the reserve should not be channelled directly into the wetland. There is also another dam to the south mapped as habitat zone 9 which is proposed to be part of an open space area. As long as these two wetlands are not impacted by development and the recommendations outlined in this report are followed there should be no impacts to this species.
FFG Act	Potential habitat for seven fauna species and two flora species.	Protected Flora Permit not required.	Site is private land.
Planning & Environment Act	All indigenous vegetation to be removed.	Planning permit required to lop or remove native vegetation.	Permit application needs to address provisions of BMO, SLO3, SLO5 and EMO1.
CaLP Act	Three noxious weeds	N/A	Comply with requirements to control/eradicate.
Fisheries Act	Dams/ wetlands	Providing that none of the dams/ wetlands in the study area are impacted the potential for protected aquatic biota to be injured, damaged or destroyed is considered to be negligible and no permit is required from DELWP.	Follow recommendations outlined in this report.
SEPP (Waters)	Dams/ wetlands	N/A	Comply with EPA requirements

Guidelines for the removal, destruction or lopping of native vegetation (the Guidelines)

Based on the current design, the proposed development will require the removal of 0.261 hectares of native vegetation, including two large trees, from within location category 1. Therefore, the planning permit application will be assessed on the intermediate assessment pathway. The strategic biodiversity value score of the native vegetation to be removed is 0.4488.

The steps that have been taken during the design of the development to ensure that impacts on biodiversity from the removal of native vegetation have been minimised include:

- Avoiding higher quality areas of remnant Wet Forest native vegetation to the western section of the site.
- Locating temporary site storage and compounds on existing disturbed land to minimise impacts to native vegetation.
- Incorporating open space and drainage reserves around existing wetland areas to avoid impacting these areas.

If a permit is granted, the offset requirements would be 0.066 general habitat units. The general offset must be within the Corangamite Catchment Management Authority (CMA) area or the Colac Otway Shire Council, and must have a minimum strategic biodiversity value score of 0.359.

The proponent will purchase the offset credits from the Victorian native vegetation credit register. An online search of the Native Vegetation Credit Register on 12th December 2019 indicates that there are four offset sites available to purchase that meet the offset requirements stated above.

Recommendations

The results of this assessment should be incorporated into the project design, by adding the flora and fauna mapping information into the planning maps and investigating options to retain as much of the mapped vegetation/habitats as possible.

From our understanding the wetlands/dams will be incorporated into open space areas or drainage reserves and should not be impacted by development.

To ensure that ecological impacts to the wetland/dam areas are minimised it is recommended that:

- The areas around the proposed drainage reserve/open space areas should be fenced during construction to avoid any accidental impacts on the adjacent wetlands. The existing wetlands/dams should be designated as “no-go” areas and preserve as natural wetlands and a feature of the development.
- Water from the drainage reserves should not be channelled or otherwise directed into the existing wetland/dams to avoid contamination by fertiliser or any other pollutants from the development.

If any of the wetlands/dams in the study area will be impacted by development then targeted surveys are recommended for Growling Grass Frog to resolve presence/absence of the species and distribution within the study area. This will then inform the design process further.

Other recommendations to protect/enhance biodiversity within the study area include:

- Control noxious weeds within the study area including Spear Thistle *Cirsium vulgare*, Blackberry *Rubus fruticosus* spp. agg. and Ragwort *Senecio jacobaea*.
- Retain scattered Southern Blue-gum trees where possible.

-
- Undertake re-vegetation of the western slope area with indigenous species suited to Wet Forest EVC and undertake revegetation of the two ephemeral drainage lines. Revegetation in these area would enhance biodiversity values and decrease the risk of erosion.

1. Introduction

1.1 Project background

Biosis Pty Ltd was commissioned by Beveridge Williams to undertake a flora and fauna assessment of an area of land proposed for subdivision. The study area has previously been assessed by Biosis in 2010 and again in 2016. Due to an updated design plan produced by Beveridge Williams on 26/8/19 (Drawing No. 331, Version 36) and request for updated information from Colac Otway Shire the findings of the previous assessments have been re-assessed on 2 December 2019 and updated in this report.

1.2 Scope of assessment

The objectives of this investigation are to:

- Describe the vascular flora (ferns, conifers, flowering plants), vertebrate fauna (mammals, birds, reptiles, frogs, fishes) and decapod crustacea (e.g. crayfish).
- Map native vegetation and other habitat features.
- Conduct a vegetation quality assessment.
- Review the implications of relevant biodiversity legislation and policy, including Victoria's Guidelines for the removal, destruction or lopping of native vegetation ('the Guidelines').
- Identify potential implications of the proposed development and provide recommendations to assist with development design.
- Recommend any further assessments of the site that may be required (such as targeted searches for significant species).

1.3 Location of the study area

The study area is located in predominately agricultural land approximately 2.5 kilometres north-east of Apollo Bay (Figure 1). It encompasses approximately 41 hectares of private land. It is currently zoned Neighbourhood Residential Zone and Rural Conservation Zone.

The study area is within the:

- Otway Plains and Otway Ranges Bioregions
- Otway Coast Basin
- Management area of Corangamite Catchment Management Authority (CMA)
- Colac Otway Shire local government area.

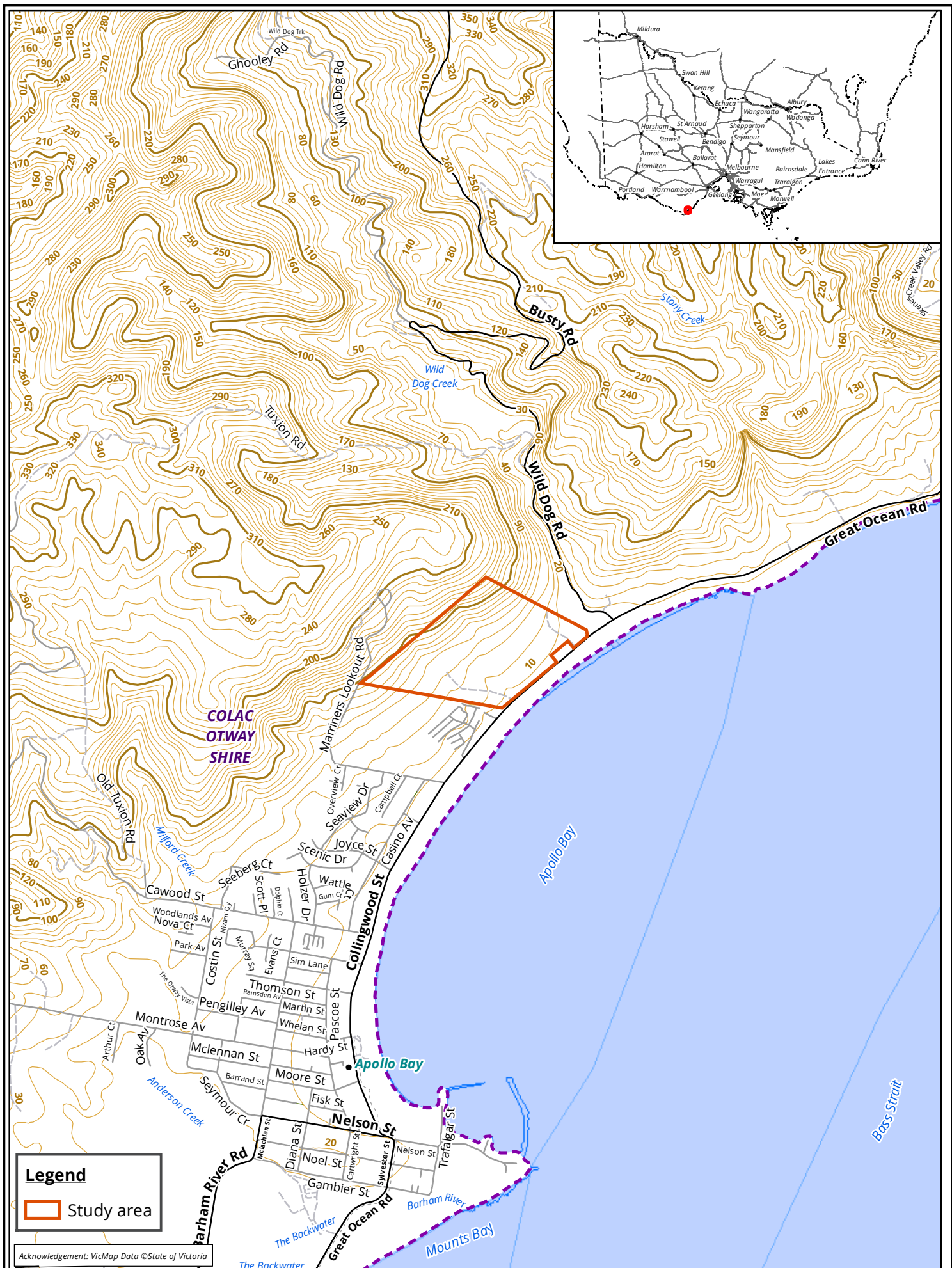
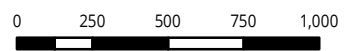


Figure 1 Location of the study area - 6280 Great Ocean Road, Apollo Bay, Victoria



Biosis Pty Ltd
Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 30972,
Date: 22 November 2019,
Checked by: JH, Drawn by: AEDM, Last edited by: amurray
Location: P:\30900s\30972\Mapping\30972_F1_Locality



Scale 1:25,000 @ A4, GDA 1994 MGA Zone 54



2. Methods

2.1 Database review

In order to provide a context for the study area, information about flora and fauna from within 5 kilometres of the study area (the 'local area') was obtained from relevant biodiversity databases, many of which are maintained by the Victorian Government Department of Environment, Land, Water and Planning (DELWP) or the Australian Government Department of the Environment and Energy (DoEE). Records from the following databases were collated and reviewed:

- DELWP's Victorian Biodiversity Atlas (VBA), including the 'VBA_FLORA25, FLORA100 & FLORA Restricted' and 'VBA_FAUNA25, FAUNA100 & FAUNA Restricted' datasets
- DoEE's Protected Matters Search Tool for matters protected by the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

Other sources of biodiversity information were examined including:

- DELWP's NatureKit mapping tool
- DELWP's Habitat Importance maps
- DELWP's Native Vegetation Information Management (NVIM) system
- DELWP's Native Vegetation Transitional Guidance team was provided with site-based spatial information in order to generate a Native Vegetation Removal Report for the study area.
- Planning Scheme overlays relevant to biodiversity based on <http://planningschemes.dpcd.vic.gov.au>.
- Biosis Research 2010. *6280 Great Ocean Road, Apollo Bay: Flora and Fauna Assessment*. Report to Australian Tourism Investments No. 5 Pty Ltd. Authors: Miller, J. & Armistead, R. Biosis Research Pty Ltd. Ballarat. Project no. 12355.
- Biosis 2015. *6280 Great Ocean Road, Apollo Bay: Ecological reassessment*. Report to Australian Tourism Investments No.5. Author: Miller, J. Biosis Pty Ltd. Ballarat. Project no. 19629

2.2 Definitions of significance

The significance of a species or ecological community is determined by its listing status under Commonwealth or State legislation / policy (Table 1).

Table 1 Criteria for determining significance of species & ecological communities

Significance	
National	Listed as critically endangered, endangered or vulnerable under the EPBC Act
State	Listed as critically endangered, endangered or vulnerable in Victoria on a DELWP Advisory List (DSE 2009; DSE 2013; DEPI 2014a) Listed as threatened under the FFG Act

Lists of significant species generated from the databases are provided in Appendix 1 (flora) and Appendix 2 (fauna) and the species have been assessed to determine their likelihood of occurrence based on the process outlined below.

2.3 Determining likelihood of occurrence of significant species

Likelihood of occurrence indicates the potential for a species or ecological community to occur regularly within the study area. It is based on expert opinion, information in relevant biodiversity databases and reports, and an assessment of the habitats on site. Likelihood of occurrence is ranked as negligible, low, medium, high or recorded. The rationale for the rank assigned is provided for each species in Appendix 1 (flora) and Appendix 2 (fauna). Those species for which there is little or no suitable habitat within the study area are assigned a likelihood of low or negligible and are not considered further.

Only those species listed under the EPBC Act or listed as threatened under the FFG Act (hereafter referred to as 'listed species') are assessed to determine their likelihood of occurrence. The habitat value for species listed on the DELWP Advisory Lists is calculated by the Habitat Importance Modelling produced by DELWP (DELWP 2017). Where DELWP Advisory List species are recorded in the study area this is noted in Appendix 1 (flora) and Appendix 2 (fauna).

Species which have at least medium likelihood of occurrence are given further consideration in this report. The need for targeted survey for these species is also considered.

2.4 Site investigation

2.4.1 Flora assessment

The flora assessment was undertaken on 2 December 2019 and a list of flora species was collected. This list will be submitted to DELWP for incorporation into the Victorian Biodiversity Atlas. Planted species have not been recorded unless they are naturalised.

Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs, and grasses' (Clause 73.01).

The Guidelines classify native vegetation into two categories (DELWP 2017):

- A **patch** of native vegetation (measured in hectares) is either:
 - An area of native vegetation, with or without trees, where at least 25 percent of the total perennial understorey cover is native plants.

- An area with three or more native canopy trees where the drip line (i.e. the outermost boundary of a tree canopy) of each tree touches the drip line of at least one other tree, forming a continuous canopy.
- Any mapped wetland included in the *Current wetlands map*, available in DELWP systems and tools.

Patch vegetation is classified into ecological vegetation classes (EVCs). An EVC contains one or more floristic (plant) communities, and represents a grouping of broadly similar environments. Definitions of EVCs and benchmarks (condition against which vegetation quality at the site can be compared) are determined by DELWP.

- A **scattered tree** is defined as a native canopy tree that does not form part of a patch of native vegetation.

A canopy tree is a mature tree that is greater than three metres in height and is normally found in the upper layer of a vegetation type. Ecological vegetation class descriptions provide a list of the typical canopy species. A scattered tree is defined as either small or large, and is determined using the large tree benchmark for the relevant EVC. The extent of a small scattered tree is the area of a circle with a 10 metre radius (i.e. 0.031 hectares), while the extent of a large scattered tree is a circle with a 15 metre radius (i.e. 0.070 hectares). A condition score is applied to each scattered tree based on information provided by DELWP's NVIM.

A Vegetation Quality Assessment (VQA) was undertaken for all patches of native vegetation identified in the study area. This assessment is consistent with DELWP's habitat hectare method (DSE 2004) and the Guidelines (DELWP 2017). For the purposes of this assessment the limit of the resolution for identification of a patch of native vegetation was taken to be 0.001 habitat hectares (Hha). That is, if a discrete patch native vegetation was present with sufficient cover but its condition and extent would not have resulted in the identification of at least 0.001 habitat hectares, the vegetation patch of vegetation was not mapped or included in the assessment.

Species nomenclature for flora follows the Victorian Biodiversity Atlas (VBA).

2.4.2 Fauna assessment

A desktop fauna assessment was undertaken by a zoologist to assess the fauna habitat values of the study area, and to determine the likelihood of significant fauna species occurring. The desktop fauna assessment incorporated a review of database records of significant fauna species, along with photographs and vegetation descriptions obtained during the flora assessment.

2.4.3 Permits

Biosis undertakes flora and fauna assessments under the following permits and approvals:

- Research Permit/Management Authorisation and Permit to Take/Keep Protected Flora & Protected Fish issued by DELWP under the Victorian *Wildlife Act 1975*, *Flora and Fauna Guarantee Act 1988* (FFG Act), *National Parks Act 1975* and *Crown Land (Reserves) Act 1978* (Permit Number 10008711)
- Permit to catch and release fish issued by the Victorian Fisheries Authority under the Victorian *Fisheries Act 1995* (Permit Number RP 1220, Personal File Number 13041)
- Approvals 30.17 and 19.18 issued by the Wildlife and Small Institutions Animal Ethics Committee of the Victorian Government Department of Economic Development, Jobs, Transport and Resources (DEDJTR)
- Scientific Procedures Fieldwork Licence issued by DEDJTR's Wildlife and Small Institutions Animal Ethics Committee (Licence Number 20020).

2.5 Qualifications

Ecological surveys provide a sampling of flora and fauna at a given time and season. There are a number of reasons why not all species will be detected at a site during survey, such as low abundance, patchy distribution, species dormancy, seasonal conditions, and migration and breeding behaviours. In many cases these factors do not present a significant limitation to assessing the overall biodiversity values of a site.

The current flora and fauna assessment was conducted in early summer, which is an optimal time for survey. During this time many of the flora species within the region contain flowering or fruiting bodies which aid greatly in identification.

Native Vegetation Removal Reports are prepared through DELWP's NVIM system or requested through DELWP's Native Vegetation Transitional Guidance team. Biosis supplies relevant site-based spatial information as inputs to DELWP and we are entirely reliant on DELWP's output reports for all assessment pathway applications. Biosis makes every effort to ensure site and spatial information entered into the NVIM, or supplied to DELWP, is an accurate reflection of proposed native vegetation removal. The Native Vegetation Removal Report can be viewed in Appendix 5.

2.6 Legislation and policy

The implications for the project were assessed in relation to key biodiversity legislation and policy including:

- Matters listed under the EPBC Act), associated policy statements, significant impacts guidelines, listing advice and key threatening processes
- Threatened taxa, communities and threatening processes listed under Section 10 of the FFG Act and associated action statements and listing advice
- Guidelines for the removal, destruction or lopping of native vegetation (DELWP 2017)
- *Planning and Environment Act 1987* – specifically Clauses 12.01-2, 52.17 and 66.02 and Overlays in the Colac Otway Planning Scheme
- Noxious weeds and pest animals lists under the *Catchment and Land Protection Act 1994* (CaLP Act)
- *Fisheries Act 1995*
- *Environment Protection Act 1971*: State Environmental Protection Policy (Waters) 2018.

2.7 Mapping

Beveridge Williams supplied aerial photography and site plans (Version no. 36 job no. 3313).

Mapping was conducted using hand-held GPS-enabled tablets and aerial photo interpretation. The accuracy of this mapping is therefore subject to the accuracy of the tablets (generally ± 7 metres) and dependent on the limitations of aerial photo rectification and registration.

Mapping has been produced using a Geographic Information System (GIS). Electronic GIS files which contain our flora and fauna spatial data are available to incorporate into design concept plans. However this mapping may not be sufficiently precise for detailed design purposes.

3. Results

The ecological features of the study area are described below and mapped in Figure 2.

Species recorded during the flora and fauna assessment are listed in Appendix 1 (flora) and Appendix 2 (fauna). Unless of particular note, these species are not discussed further.

Those species recorded or predicted to occur in the local area is also provided in those appendices, along with an assessment of the likelihood of the species occurring within the study area.

3.1 Vegetation and fauna habitat

The majority of the study area has been highly modified due to past land clearing for agriculture. Most of the study area has been significantly degraded and supports predominantly introduced vegetation that is of limited ecological value. Ecological features present within the study area are limited to relatively degraded patches of Wet Forest EVC, Swamp Scrub EVC and five small dam/wetland areas. These features are described further in Table 2 and mapped in Figure 2.

The topography of the area is relatively steep ranging from roughly 5 - 150 metres above sea level. The rise in gradient from 5 metres to 50 metres is gradual but there is a sharp gradient from 50-150 metres above sea level resulting in very steep slopes to the west of the study area and a change in bioregion from Otway Plains to Otway Ranges. Due to the sudden increase in slope (>20%) there is an erosion management overlay from roughly the 40m contour line to the 150 metre contour line. This area could also be subject to landslides. There are five dam/wetlands within the study area and two major drainage lines.

Photos are provided in Appendix 3.

Table 2 Summary of vegetation and habitat types within the study area

Vegetation or habitat type	Description	Location	Significant values
Wet Forest EVC	Canopy layer (where present) dominated by Southern Blue-gum <i>Eucalyptus globulus</i> subsp. <i>globulus</i> , understorey containing shrubs (such as Blackwood <i>Acacia melanoxylon</i> , Tree Lomatia <i>Lomatia fraseri</i> and Banyalla <i>Pittosporum bicolor</i>) and ferns (including Rough Tree-fern <i>Cyathea australis</i> and Mother Shield-fern <i>Polystichum proliferum</i>). Ground cover consisting of few native herb species (Bidgee-widgee <i>Acaena novae-zelandiae</i>) and highly invaded with introduced species such as Sweet Vernal Grass <i>Anthoxanthum odoratum</i> and Blackberry <i>Rubus fruticosus</i> spp. agg. Represented by Habitat Zones 3, 5, 6, 7 and 8.	Along drainage lines and higher elevations of the study area.	Eucalypts in these areas offer possible foraging habitat for Swift Parrot <i>Lathamus discolor</i> and Grey-headed Flying-fox <i>Pteropus poliocephalus</i> . Shrubs and understorey vegetation could provide habitat for Swamp Antechinus <i>Antechinus minimus maritimus</i> , Spot-tailed Quoll <i>Dasyurus maculatus maculatus</i> (SE mainland population), Southern Brown Bandicoot <i>Isodon obesulus obesulus</i> , Long-nosed Potoroo <i>Potorous tridactylus tridactylus</i> , Smoky Mouse <i>Pseudomys fumeus</i> and Broad-toothed Rat <i>Mastacomys fuscus</i> .
Swamp Scrub EVC	Highly degraded patches of this EVC were present within the study area, typically characterised by a ground layer of Rushes <i>Juncus</i> spp., Bidgee-widgee and a high cover of exotic species. Represented by Habitat Zones 1, 2, 4 and 9.	Various locations throughout the study area. Typically lower elevations.	Areas of Swamp scrub surrounding dams/wetlands could provide potential habitat for Growling Grass Frog <i>Litoria raniformis</i> .
Planted Native Species	A number of specimens in the north-east corner of the study area have previously been assessed as planted native Australian species.	North-east corner of the study area.	Planted Eucalypts in this area could contain potential habitat for Swift Parrot and Grey-headed Flying-fox.
Dam/wetlands	Areas of open water with varying amounts of surrounding native vegetation. Areas of native vegetation that constituted >25% cover of native perennial species were mapped as Swamp Scrub EVC.	Various locations throughout the study area, typically lower elevations.	Could provide potential habitat for Growling Grass Frog, Australasian Bittern <i>Botaurus poiciloptilus</i> and Australian Painted Snipe <i>Rostratula australis</i> .
Exotic pasture	Most of the study area was dominated by exotic pasture species such as Sweet Vernal Grass and Cocksfoot <i>Dactylis glomerata</i>	Majority of the study area.	Minimal value for native species.

3.2 Landscape context

The ecological values within the region are varied. Remnant forest lies to the west of the study area and to the north along Wild Dog Creek. Areas of revegetation are present in surrounding properties to the north and south. However, further to the north and south are the residential areas of Apollo Bay and Skenes creek with cleared agricultural land between these two townships and the study area. The study area does not form part of a notable wildlife corridor although mobile fauna species may utilise the large trees in the western section of the study area.

3.3 Significant species and ecological communities

3.3.1 EPBC Act and FFG Act listed species

Lists of EPBC Act and FFG Act listed species recorded or predicted to occur within 5 kilometres of the study area or from the relevant catchment (aquatic species) are provided in Appendix 1 (flora) and Appendix 2 (fauna). An assessment of the likelihood of these species occurring in the study area and an indication of where within the site (i.e. which habitats or features of relevance to the species) is included.

Areas of greatest value for significant species within the study area are:

- Wet Forest: potential habitat for eight EPBC Act fauna species including Grey-headed Flying-fox, Smoky Mouse, Long-nosed Potoroo, Swift Parrot, Southern Brown Bandicoot, Spot-tailed Quoll and Swamp Antechinus and Broad-toothed Rat. This EVC could also provide habitat for five FFG Act fauna listed species including Otway Black Snail *Victaphanta compacta*, Powerful Owl *Ninox strenua*, Rufous Bristlebird *Dasyornis broadbenti* and Grey Goshawk *Accipiter novaehollandiae*. One FFG Act listed flora species, Slender Tree-fern *Cyathea cunninghamii*, could occur within patches of Wet Forest.
- Wetland/dams and surrounding Swamp Scrub vegetation: potential habitat for three EPBC Act listed fauna species including Growling Grass Frog, Australasian Bittern and Australian Painted-snipe. Could also provide potential habitat for three FFG Act fauna species including Eastern Great Egret *Ardea alba modesta*, Plumed Egret *Ardea intermedia plumifera* and Swamp Skink *Lissolepis coventryi*. One FFG Act listed flora species; Short Water-starwort *Callitriche brachycarpa*, could occur within the wetland/dams within the study.

3.3.2 DELWP advisory list of rare and threatened species

To support decision making under the Guidelines, DELWP has produced maps for Victoria showing the modelled extent of habitat for most listed rare or threatened species. These maps are called 'habitat importance maps' and they assign a 'habitat importance score' to a location based on the importance of that location in the landscape as habitat for a particular rare or threatened species, in relation to other suitable habitat for that species (DELWP 2017).

Under the Guidelines, these maps form the basis for determining the impact of potential native vegetation removal on rare and threatened species. The maps only apply where a proposal to remove native vegetation is considered on detailed assessment pathway. The habitat importance scores are used to calculate the type and extent of biodiversity offsets required for native vegetation removal that impacts on individual rare or threatened species habitat.

3.3.3 Significant ecological communities

Three threatened ecologically communities listed under the EPBC Act were predicted to occur according to the PMST:

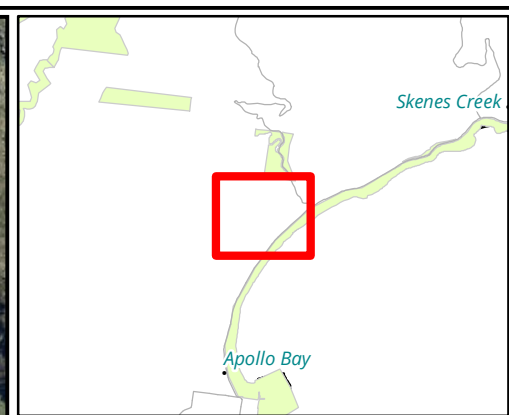
- Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community.
- Giant Kelp Marine Forests of South East Australia.
- Natural Damp Grassland of the Victorian Coastal Plain.

None of these ecological communities were recorded during the site inspection.

No FFG Act listed communities were deemed to be present during the site inspection.

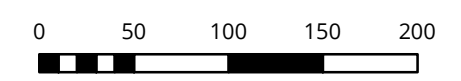
3.4 Further survey recommendations

From our understanding the wetlands/dams will be incorporated into open space areas or drainage reserves and should not be impacted by development as long as the recommendations in this report are followed. If the wetland areas are likely to be directly impacted then it is recommended that targeted surveys for Growling Grass Frog be conducted. No further surveys are needed for species which could occur in patches of Wet Forest as these areas will be not be impacted besides a few scattered trees at lower elevations.



- Legend**
- Study area
 - Planted Australian natives
 - Cable station
 - Large wetland
 - + Large patch tree
 - + Large scattered tree
 - + Small scattered tree
- Ecological Vegetation Class (EVC)**
- Wet forest (OtP0030)
 - Swamp scrub (OtP0053)
 - Swamp scrub (OtR0053)

Figure 2 Ecological features of the study area



Scale: 1:4,000 @ A3
 Coordinate System: GDA 1994 VICGRID94



Matter: 30972,
 Date: 12 December 2019,
 Checked by: JH, Drawn by: AEDM, Last edited by: amurray
 Location: P:\30900s\30972\Mapping\30972_F2_Ecofeatures.mxd

Acknowledgements: Vicmap ©State of Victoria, Imagery - NearMap 2019

4. Biodiversity legislation and government policy

This section provides an assessment of the project in relation to key biodiversity legislation and government policy. This section does not describe the legislation and policy in detail. Where available, links to further information are provided.

4.1 Commonwealth

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act applies to developments and associated activities that have the potential to significantly impact on Matters of National Environmental Significance (MNES) protected under the Act.

Link for further information including a guide to the referral process is available at:

<http://www.environment.gov.au/epbc/index.html>.

MNES relevant to the project are summarised in Table 3. It includes an assessment against the EPBC Act policy statements published by the Australian Government which provide guidance on the practical application of EPBC Act.

Table 3 Assessment of project in relation to the EPBC Act

MNES	Project specifics	Assessment against significant impact guidelines
Threatened species	Four flora species and 52 fauna species have been recorded or predicted to occur in the project search area. The likelihood of these species occurring in the study area is assessed in Appendix 1 (flora) and Appendix 2 (fauna).	Most of these species are not likely to occur and development unlikely to constitute a significant impact on species that may occur within the study area. If the existing wetland/dams are not impacted and recommendations outlined in this report are followed significant impacts to Growling Grass Frog should be avoided (if present).
Threatened ecological communities	Three threatened ecological communities have been recorded or predicted to occur in the project search area.	None of these communities were deemed to be present during the field assessment.
Migratory species	Forty two migratory species have been recorded or predicted to occur in the project search area (Appendix 2).	While some of these species would be expected to use the study area on occasions, and some of them may do so regularly or may be resident, it does not provide important habitat for an ecologically significant proportion of any of these species.
Wetlands of international importance (Ramsar sites).	The study area is not identified as being within the catchment of any Ramsar sites.	Development will not impact any Ramsar sites.

On the basis of criteria outlined in the relevant *Significant Impact Guidelines* it is considered unlikely that a significant impact on a Matter of National Environmental Significance would result from the proposed action. Referral of the proposed action to the Australian Government Minister for the Environment to determine whether the action requires approval under the EPBC Act is therefore unlikely to be required.

4.2 State

4.2.1 Flora and Fauna Guarantee Act 1988 (FFG Act)

The FFG Act is the key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes. Under the FFG Act a permit is required from DELWP to 'take' protected flora species from public land. A permit is generally not required for removal of protected flora from private land. Authorisation under the FFG Act is required to collect, kill, injure or disturb listed fish.

Link for further information: <https://www.environment.vic.gov.au/conserving-threatened-species/flora-and-fauna-guarantee-act-1988>.

Native vegetation on site is not a listed community, but does contain eight protected flora species (Appendix 1).

The land is privately owned, is not declared 'critical habitat' for the purposes of the FFG Act and the flora species are not being taken for the purpose of commercial sale. Therefore a protected flora permit is not required, however the presence of rare or threatened flora and habitat for threatened fauna will be considered by the Responsible Authority in determining its response to an application for vegetation removal under Clause 52.17 (see below).

4.2.2 Catchment and Land Protection Act 1994 (CaLP Act)

The CaLP Act identifies and classifies certain species as noxious weeds or pest animals, and provides a system of controls on noxious species.

Declared noxious weeds identified in the study area are listed in Appendix 1 (Table A1.1) and established pest animals are listed in Appendix 2 (Table A2.1).

The land owner must take all reasonable steps to eradicate regionally prohibited weeds, prevent the growth and spread of regionally controlled weeds, and prevent the spread of and as far as possible eradicate established pest animals. The State is responsible for eradicating State prohibited weeds from all land in Victoria.

Link for further information: <http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds>.

4.2.3 Planning and Environment Act 1987 (incl. Planning Schemes)

The *Planning and Environment Act 1987* controls the planning and development of land in Victoria, and provides for the development of planning schemes for all municipalities.

Of particular relevance to the development proposal are controls relating to the removal, destruction or lopping of native vegetation contained within the Colac Otway Planning Scheme (the Scheme), including permit requirements. The Scheme (Clause 73.01) defines 'native vegetation' as 'Plants that are indigenous to Victoria, including trees, shrubs, herbs, and grasses'. It is an objective of Clause 12.01-2 of the State Planning Policy Framework (Native Vegetation Management) that removal of native vegetation results in no net loss in the contribution made by native vegetation to Victoria's biodiversity.

Clause 52.17 (Native Vegetation) requires a planning permit to remove, destroy or lop native vegetation including some dead native vegetation. Decision guidelines that must be considered by the referral or responsible authority are contained in Section 7 of the Guidelines, and referred to in Clause 52.17-4. Clause 52.17 does not apply if a Native Vegetation Precinct Plan corresponding to the land is incorporated in the Scheme. It should be noted that where native vegetation does not meet the definition of a patch or scattered tree, as described in Section 3.1, the Guidelines do not apply. However, a permit may still be required to remove, destroy or lop native vegetation under the provisions of the Scheme.

Clause 65.02 requires consideration of native vegetation retention in a subdivision application and siting of open space areas.

Under Clause 66.02 a permit application to remove, destroy or lop native vegetation is required to be referred to DELWP as a recommending referral authority if any of the following apply:

- the class of application is on the detailed assessment pathway
- a property vegetation precinct plan applies to the site or
- the native vegetation is on Crown land occupied or managed by the Responsible Authority.

The need for a permit to remove native vegetation may also be triggered by four overlays within the Scheme. The location of the overlays in relation to the study area can be determined via the following link:

<https://mapshare.vic.gov.au/vicplan/>. The provisions of the following overlays apply to the study area:

Bushfire Management Overlay (BMO) covers the northern and western sections of the study area. A permit under this overlay is required to subdivide land and to construct a building or construct or carry out works associated with the uses specified under the overlay. An application must also be accompanied by a bushfire hazard site assessment, bushfire hazard landscape assessment and a bushfire management statement.

Significant Landscape Overlay (SLO3) covers the western section of the study area above the 40m contour. Under this overlay a permit is required to remove, destroy or lop any native vegetation unless it is dead or will only be lopped by 20% or less.

Significant Landscape Overlay (SLO5) cover the north-east corner of the study area and a small area in the centre of the study area between the 10-40m contours. Under this overlay a permit is required to remove, destroy or lop any native vegetation unless it is dead or will only be lopped by 20% or less.

Erosion Management Overlay (EMO1) covers the north-east corner and western half of the study area. Under this overlay a permit is not required to remove, destruct or lop any vegetation providing the roots below ground level are retained. If the roots of any vegetation below ground level are to be removed then a permit under this overlay will be required.

Victoria's Guidelines for the removal, destruction or lopping of native vegetation

The Guidelines are incorporated into the Victoria Planning Provisions and all planning schemes in Victoria (DELWP 2017). The Guidelines replaced the previous incorporated document titled *Permitted clearing of native vegetation – Biodiversity assessment guidelines* (DEPI 2013) on 12 December 2017.

The purpose of the Guidelines is to guide how impacts to biodiversity should be considered when assessing a permit application to remove, destroy or lop native vegetation. The objective for the guidelines in Victoria is 'No net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation'.

A detailed assessment of the implications for the project under the Guidelines is provided in Section 5 of this report. Under the Guidelines, there are three assessment pathways for assessing an application for a permit to remove native vegetation: basic, intermediate and detailed.

A detailed determination of the assessment pathway for the planning application relevant to the proposed development is provided in Section 5.2. In summary, the planning application for removal of native vegetation must meet the requirements of, and be assessed in, the intermediate assessment pathway.

4.2.4 Fisheries Act 1995

The Fisheries Act 1995 provides a legislative framework for the regulation, management and conservation of Victorian fisheries including aquatic habitats.

A person must not take, injure, damage, destroy or release any protected aquatic biota. Protected aquatic biota includes all species of the family Syngnathidae (seahorses, sea dragons and pipefish), and any fish or aquatic invertebrate or community that is listed under the FFG Act.

Providing that none of the dams/ wetlands in the study area are impacted the potential for protected aquatic biota to be injured, damaged or destroyed is considered to be negligible and no permit is required from DELWP.

4.2.5 Environment Protection Act 1970: State Environmental Protection Policy (Waters) 2018

The Environment Protection Act underpins the SEPP (Waters) which provides a legal framework for the protection and management of Victoria's water environments, including surface waters, estuarine and marine waters and groundwater.

The project may directly and/or indirectly impact upon two dams/wetlands and two drainage lines within the study area and their aquatic ecosystems. The SEPP requires that aquatic ecosystem values be protected. Environmental quality objectives and indicators are defined to protect beneficial uses (i.e. the uses and values of the water environment) and an attainment program provides guidance on protection of the beneficial uses.

Impacts to surface water quality must not result in changes that exceed background levels and/or the water quality objectives to protect surface water values. Beveridge Williams needs to ensure that direct and indirect (e.g. runoff) impacts to surface water quality do not exceed the background levels and/or water quality objectives.

Link to further information: <https://www.epa.vic.gov.au/about-us/legislation/water-legislation/water-related-policies>.

5. Victoria's Guidelines for the removal, destruction or lopping of native vegetation

The Guidelines were introduced in December 2017. They set out and describe the application of Victoria's statewide policy in relation to assessing and compensating for the removal of native vegetation in order to achieve the objective of 'no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation'.

This objective is to be achieved through Victoria's planning system using an assessment approach that relies on strategic planning and the permit and offset system. The key policy for achieving no net loss to biodiversity is the three-step approach of avoid, minimise and offset:

- **Avoid** the removal, destruction or lopping of native vegetation to ensure that the important biodiversity values of native vegetation continue to be delivered into the future.
- **Minimise** impacts resulting from the removal of native vegetation that cannot be avoided.
- Provide an **offset** to compensate for the biodiversity impact resulting from the removal of native vegetation.

The steps that have been taken during the design of the development to ensure that impacts on biodiversity from the removal of native vegetation have been minimised include:

- Avoiding higher quality areas of remnant Wet Forest native vegetation to the western section of the site.
- Locating temporary site storage and compounds on existing disturbed land to minimise impacts to native vegetation.
- Incorporating open space and drainage reserves around existing wetland areas to avoid impacting these areas.

DELWP has provided biodiversity information tools to assist with determining the assessment pathway associated with the removal of native vegetation and the contribution that native vegetation within the study area makes to Victoria's biodiversity.

All planning permit applications to remove native vegetation are assigned to an assessment pathway determined by the extent and location of proposed native vegetation removal. The assessment pathway will dictate the information to be provided in a planning permit application and the decision guidelines the responsible authority (e.g. Council) and/or DELWP as a referral authority will use to assess the permit application.

The biodiversity information tools have two components:

Site-based information

The site-based information is observable at a particular site. Biosis has collected the requisite site-based information for the assessment against the Guidelines.

Landscape scale information

Landscape scale information requires consideration of information beyond the site. This information is managed by DELWP and can be accessed via the NVIM.

The following section summarises the results of the site-based assessment and the outputs generated by the Native Vegetation Removal Report, which identifies the assessment pathway on which the planning application will be assessed. The full Native Vegetation Removal Report can be viewed in Appendix 5.

5.1 Proposed removal of native vegetation

The extent of native vegetation patches, the location of large trees within patches and any scattered trees were mapped within the study area (Figure 2) and the condition was assessed in relation to standard methods provided by DSE (2004) and pre-determined EVC benchmarks:

<https://www.environment.vic.gov.au/biodiversity/bioregions-and-evc-benchmarks>.

The proposed removal of native vegetation was assessed in accordance with the concept design provided (Beveridge Williams Drawing No. 3313, version 36). The development proposes to remove 0.261 hectares of native vegetation, comprising 0.139 hectares of patch vegetation and three scattered trees (Figure 3). Spatial data (shapefiles) of proposed vegetation removal were submitted to DELWP's native vegetation support team, who provided a Native Vegetation Removal Report for the project. This is provided in Appendix 5 and summarised in the following sections.

5.1.1 Habitat hectares

A continuous area of the same EVC is termed a 'habitat zone'. Different habitat zones exist where there are different EVCs present and/or discrete (non-continuous) patches of the same EVC. A separate vegetation quality assessment was conducted for each habitat zone. The vegetation quality assessment score was multiplied by the extent of the habitat zone to give a value in habitat hectares.

Nine habitat zones were identified (Table 4). The results of the vegetation quality assessment are provided in Table 4, with the number of habitat hectares in each habitat zone.

Table 4 Habitat hectares of native vegetation within the study area

Site ID		1	2	3	4	5	6	7	8	9	
Habitat Zone ID		A	A	A	A	A	A	A	A	A	
EVC #: Name		OtP 0053: SS	OtP 0053: SS	OtP 0030: WF	OtR 0053: SS	OtP 0030: WF	OtP 0030: WF	OtP 0030: WF	OtP 0030: WF	OtP 0053: SS	
	Max	Score	Score	Score	Score	Score	Score	Score	Score	Score	Total
Site Condition	Large Old Trees	10	NA	NA	0	NA	3	4	10	10	NA
	Canopy Cover	5	0	0	0	0	0	3	5	5	0
	Lack of Weeds	15	2	2	2	9	4	4	0	0	9
	Understorey	25	5	5	5	15	15	10	10	10	15
	Recruitment	10	0	0	3	0	6	10	6	6	0
	Organic Matter	5	0	0	0	0	3	0	2	2	0
	Logs	5	0	0	0	0	0	0	4	4	0
	Standardiser		1.15	1.15	NA	1.15	NA	NA	NA	NA	1.15
	Total Site Score		8.05	8.05	10	27.6	31	31	37	37	27.6
Landscape Value	Patch Size	10	1	1	1	1	1	1	1	1	1
	Neighbourhood	10	1	1	2	2	2	4	4	4	2
	Distance to Core	5	3	3	3	3	3	3	3	3	3
	Total Landscape Score		5	5	6	6	6	8	8	8	6
HABITAT SCORE	100	13.05	13.05	16	33.6	37	39	45	45	33.6	
Habitat points = #/100	1	0.13	0.13	0.16	0.34	0.37	0.39	0.45	0.45	0.34	
Habitat Zone area (ha)		0.03	0.02	0.01	0.03	0.51	1.15	0.88	0.09	0.09	
Habitat hectares (Hha)		0.0039	0.0026	0.0016	0.0102	0.1887	0.4485	0.396	0.0405	0.0306	1.226

OtP = Otway Plain Bioregion, OtR = Otway Ranges Bioregion, WF = Wet Forest, SS = Swamp Scrub

A total of 30 large trees occur within patches of native vegetation within the study area. The locations of large trees within patches are shown in Figure 2 and the circumference of each large tree is provided in Appendix 4.

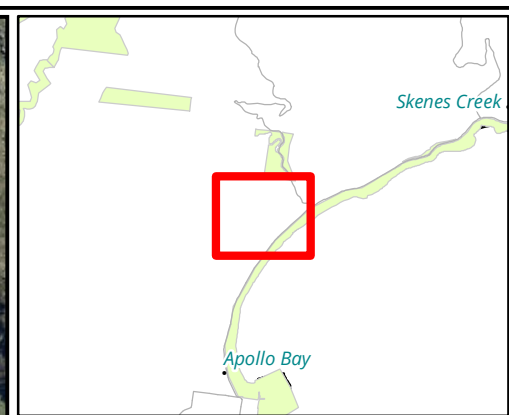
There is one scattered small tree and four scattered large trees within the study area. For applications that propose to remove scattered trees, the extent of scattered trees is calculated using the standard extents described in Section 2.4.1. A condition score is applied to each scattered tree based on information provided by DELWP's NVIM. Scattered trees within the study area equate to 0.0118 habitat hectares (Table 5). The locations of scattered trees within the study area are shown in Figure 2 and further details for each tree (e.g. size, extent and circumference) are provided in Appendix 4.

Table 5 Habitat hectare conversion for scattered trees within the study area

	Number within study area	Condition score	Standard extent (ha)	Habitat hectares (Hha)
Large scattered trees	4	0.200	0.070 ha	0.056
Small scattered trees	1	0.200	0.031 ha	0.0062

Summary of habitat hectares within the study area

In summary, the study area supports 1.24 habitat hectares.



- Legend**
- Study area
 - Proposed development
 - Impact area
 - Planted Australian natives
 - Cable station
 - Large wetland
 - + Patch tree to be retained
 - + Scattered tree to be retained
 - + Scattered tree to be removed
 - Proposed vegetation removal
- Ecological Vegetation Class (EVC)**
- Wet forest (OtP0030)
 - Swamp scrub (OtP0053)
 - Swamp scrub (OtR0053)

Figure 3 Vegetation removal

0 50 100 150 200
 Metres
 Scale: 1:4,000 @ A3
 Coordinate System: GDA 1994 VICGRID94



Acknowledgements: Vicmap ©State of Victoria, Imagery - NearMap 2019

Matter: 30972,
 Date: 12 December 2019,
 Checked by: JH, Drawn by: AEDM, Last edited by: amurray
 Location: P:\30900s\30972\Mapping\30972_F3_VegRemoval.mxd

5.2 Determining the assessment pathway

Applications to remove native vegetation are categorised into one of three assessment pathways: basic, intermediate or detailed. Two factors are used to determine the assessment pathway for a permit application, the **location** and **extent** of the native vegetation proposed to be removed. Location has been divided into three possible categories by DELWP, and has been pre-determined by DELWP for all locations in Victoria. The location of a particular site is determined using the *location map* available in the Native Vegetation Information Management (NVIM) system (<http://nvim.depi.vic.gov.au>).

The extent of native vegetation proposed to be removed determines the assessment pathway by considering the following:

- The total area (hectares) of native vegetation (including any patches and scattered trees) proposed to be removed
- Whether any large trees are proposed to be removed, either as scattered trees or occurring in patches.

It is proposed to remove < 0.5 hectares and two large trees of native vegetation from within location category 1, therefore the application for removal of this native vegetation must meet the requirements of, and be assessed in, the intermediate assessment pathway. These requirements are provided in Appendix 5.

5.3 Offset requirements

In order to ensure a gain to Victoria's biodiversity that is equivalent to the loss resulting from the proposed removal of native vegetation, compensatory offsets are required. Losses and gains are measured in general or species habitat scores or units. The offset must also include at least one large tree for every large tree removed.

Under the Guidelines any losses of vegetation within sites that are assessed under the intermediate assessment pathway can be offset by the provision of a 'general offset'.

The general offset requirements are provided in Appendix 5 and summarized in Table 6.

Table 6 Summary of DELWP Native Vegetation Removal Report

Attribute	Outcome	Notes
Location category	1	
Native vegetation removal extent	0.261 hectares	Three patches, one small scattered tree and two large scattered trees
Assessment pathway	Intermediate	
Habitat hectares to be removed	1.24	
Strategic Biodiversity Value Score	0.4488	
Modelled habitat for rare or threatened species	No	Extent is below 0.5 hectares and removal will not have a significant impact on any habitat for a rare or threatened species.
Offset type	General	
Offset multiplier	1.5	

Attribute	Outcome	Notes
Offset amount: general habitat units	0.066 units	
General offset vicinity	Corangamite Catchment Management Authority (CMA) or Colac Otway Shire Council	The offset site must be located within the same Catchment Management Authority boundary or municipal district as the native vegetation to be removed.
General offset minimum Strategic Biodiversity Value Score	0.359	
Large tree attributes	Two large trees	The offset must include protection of at least one large tree for every large tree to be removed.

5.4 Proposed offset strategy

The proponent will purchase the offset credits from the Victorian native vegetation credit register. An online search of the Native Vegetation Credit Register on 12th December 2019 indicates that there are four offset sites available to purchase that meet the offset requirements stated above.

6. Key ecological values and recommendations

This section identifies the key ecological features of the study area, provides an outline of potential implications of proposed development on those values and includes recommendations to minimise impacts on biodiversity.

The primary measure to reduce impacts to biodiversity values within the study area is to avoid and minimise removal of native vegetation and terrestrial and aquatic habitat. It is critical that this be considered during the design phase of the project, when key decisions are made about the location of open space reserves, drainage reserves, roads, footpaths and subdivision layout. The results of this assessment should therefore be incorporated into the project design, by adding the flora and fauna mapping information into the planning maps and investigating options to retain as much of the mapped vegetation/habitats as possible. Priority should be given to highest value areas and retaining larger areas in preference to numerous smaller ones.

The design phase is also the time during which future requirements for infrastructure and services must be forecast and allowance made outside any nominated reserves for all construction works, such as road batters, footpaths, drainage and services. All areas of vegetation/habitat nominated in the design plan as 'retained' are to be treated as no-go zones and are not to be encroached upon as development progresses.

A summary of potential implications of development of the study area and recommendations to minimise impacts during the **design phase** of the project is provided in Table 7.

Table 7 Summary of key ecological values, potential implications of developing the study area and recommendations to minimise ecological impacts during the design phase.

Ecological feature (Figure 2)	Implications of development	Recommendations
Native vegetation	The permanent removal of 0.261 hectares of vegetation, comprised of 0.139 hectares of patch vegetation, one small scattered tree and two large scattered trees.	Avoid and minimise removal of native vegetation, in accordance with the Guidelines. Refer to Section 5. Retained vegetation should be fenced off and treated as no-go zones.
	The application will be assessed on the intermediate assessment pathway.	Identify and implement appropriate offsets for vegetation losses as outlined in Section 5.3.
Significant species and ecological communities	Potential habitat for species listed in section 3.3.1.	Avoid impacting upon dams/wetlands within the study area, as these may provide habitat for Growling Grass Frog. If dams/wetlands are to be impacted then targeted surveys are recommended for Growling Grass Frog.

Ecological feature (Figure 2)	Implications of development	Recommendations
Aquatic habitat features	Potential loss of, or alterations to, riparian and aquatic habitat (existing wetlands/dams) within the study area via potential hydrological changes, deterioration in water quality (including pollution event) and, sedimentation.	<p>Avoid/minimise removal of terrestrial and/or aquatic habitat by designing to avoid or minimise instream works.</p> <p>Place any stormwater treatment/retention wetlands adjacent to waterways and not online.</p> <p>Protect key values (including waterways) by retaining features and including appropriate buffers into design.</p>

Construction and post-construction management

Specific detail relating to preventing impacts to retained native vegetation and aquatic and terrestrial habitat should be addressed in a site-specific Construction Environmental Management Plan. This will include issues relating to contractors such as environmental inductions, installation of temporary fencing/signage, drainage and sediment control.

An Ecological Management Plan should be prepared by an ecological consultant to provide detailed advice on the ongoing protection and long-term management of retained vegetation/ habitat, creation of linkages and other habitat features such as wetlands, if proposed.

Recommendations

To ensure that ecological impacts to the wetland/dam areas are minimised it is recommended that:

- The areas around the proposed drainage reserve/open space areas should be fenced during construction to avoid any accidental impacts on the adjacent wetlands. The existing wetlands/dams should be designated as “no-go” areas and preserve as natural wetlands and a feature of the development.
- Water from the drainage reserves should not be channelled or otherwise directed into the existing wetland/dams to avoid contamination by fertiliser or any other pollutants from the development.

Other recommendations to protect/enhance biodiversity within the study area include:

- Control noxious weeds within the study area including Spear Thistle *Cirsium vulgare*, Blackberry *Rubus fruticosus* spp. agg. and Ragwort *Senecio jacobaea*.
- Retain scattered Southern Blue-gum trees where possible.
- Undertake re-vegetation of the western slope area with indigenous species suited to Wet Forest EVC and undertake revegetation of the two ephemeral drainage lines. Revegetation in these area would enhance biodiversity values and decrease the risk of erosion.

References

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Appendices

Appendix 1 Flora

Notes to tables:

<p>EPBC Act: CR - Critically Endangered EN - Endangered VU - Vulnerable</p> <p>PMST – Protected Matters Search Tool</p>	<p>DEPI 2014a: e - endangered v - vulnerable r - rare k - poorly known</p>
<p>FFG Act: L - listed as threatened under FFG Act P - protected under the FFG Act (public land only)</p>	<p>Noxious weed status: SP - State prohibited species RP - Regionally prohibited species RC - Regionally controlled species R - Restricted species</p> <p># - Native species outside natural range</p>

A1.1 Flora species recorded from the study area

Table A1.1 Flora species recorded from the study area

Status	Scientific Name	Common Name
Indigenous species		
	<i>Acaena novae-zelandiae</i>	Bidgee-widgee
	<i>Acaena</i> spp.	Sheep's Burr
P	<i>Blechnum minus</i>	Soft Water-fern
	<i>Cardamine</i> spp.	Bitter Cress
	<i>Carex appressa</i>	Tall Sedge
	<i>Coprosma quadrifida</i>	Prickly Currant-bush
P	<i>Cyathea australis</i>	Rough Tree-fern
	<i>Eleocharis acuta</i>	Common Spike-sedge
r	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum
	<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	Manna Gum
	<i>Juncus sarphorus</i>	Broom Rush
	<i>Juncus</i> spp.	Rush
	<i>Leptospermum scoparium</i>	Manuka
	<i>Linum marginale</i>	Native Flax
	<i>Lobelia anceps</i>	Angled Lobelia
	<i>Lomatia fraseri</i>	Tree Lomatia
P	<i>Microtis</i> spp.	Onion Orchid
P	<i>Olearia lirata</i>	Snowy Daisy-bush
	<i>Oxalis</i> spp.	Wood Sorrel
P	<i>Ozothamnus ferrugineus</i>	Tree Everlasting

Status	Scientific Name	Common Name
	<i>Phragmites australis</i>	Common Reed
	<i>Pittosporum bicolor</i>	Banyalla
P	<i>Polystichum proliferum</i>	Mother Shield-fern
	<i>Ranunculus</i> spp.	Buttercup
	<i>Rubus parvifolius</i>	Small-leaf Bramble
	<i>Rumex</i> spp.	Dock
	<i>Rytidosperma</i> spp.	Wallaby Grass
P	<i>Senecio minimus</i>	Shrubby Fireweed
P	<i>Senecio</i> spp.	Groundsel
Introduced species		
	<i>Alopecurus pratensis</i>	Meadow Fox-tail
	<i>Callitriche stagnalis</i>	Common Water-starwort
	<i>Carduus</i> spp.	Slender Thistle
	<i>Cerastium glomeratum</i> s.l.	Common Mouse-ear Chickweed
R	<i>Cirsium vulgare</i>	Spear Thistle
	<i>Cupressus</i> spp.	Cypress
	<i>Dactylis glomerata</i>	Cocksfoot
	<i>Erica lusitanica</i>	Spanish Heath
	<i>Galium aparine</i>	Cleavers
	<i>Holcus lanatus</i>	Yorkshire Fog
	<i>Hordeum leporinum</i>	Barley-grass
	<i>Hypochaeris radicata</i>	Flatweed
	<i>Ilex aquifolium</i>	English Holly
	<i>Juncus articulatus</i> subsp. <i>articulatus</i>	Jointed Rush
	<i>Lolium perenne</i>	Perennial Ryegrass
	<i>Lotus uliginosus</i>	Greater Bird's-foot Trefoil
	<i>Plantago lanceolata</i>	Ribwort
	<i>Prunella vulgaris</i>	Self-heal
RC	<i>Rubus fruticosus</i> spp. agg.	Blackberry
	<i>Rumex crispus</i>	Curled Dock
RC	<i>Senecio jacobaea</i>	Ragwort
	<i>Sonchus oleraceus</i>	Common Sow-thistle
	<i>Vicia</i> spp.	Vetch

A1.2 Listed flora species

The following table includes the listed flora species that have potential to occur within the study area. The list of species is sourced from the Victorian Biodiversity Atlas and the Protected Matters Search Tool (DoEE; accessed on 29.11.2019).

Table A1.2 Listed flora species recorded / predicted to occur within 5 km of the study area

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
National significance									
<i>Amphibromus fluitans</i>	River Swamp Wallaby-grass	VU		I		PMST	Swampy areas, mainly along the Murray River between Wodonga and Echuca with scattered records from southern Victoria.	Low	Outside species typical range.
<i>Prasophyllum frenchii</i>	Maroon Leek-orchid	EN	e	L		PMST	Grassland and grassy woodland environments on sandy or black clay loam soils, that are generally damp but well drained.	Negligible	No suitable habitat.
<i>Prasophyllum spicatum</i>	Dense Leek-orchid	VU	e			PMST	Heath and heathy woodlands.	Negligible	No suitable habitat.
<i>Pterostylis cucullata</i>	Leafy Greenhood	VU		L		PMST	Sand dune scrubs in coastal areas, and inland on slopes and river flats in moist foothill and montane forests.	Low	<i>Pterostylis cucullata</i> subsp. <i>cucullata</i> is the only subspecies likely to occur near Apollo Bay. However, this subspecies is typically found in coastal scrub on sand dunes. This habitat was not present within the study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
State significance									
<i>Callitriche brachycarpa</i>	Short Water-starwort		v	L	1770		Sites subject to inundation.	Medium	Could potentially occur in the dam/wetland areas,
<i>Cyathea cunninghamii</i>	Slender Tree-fern		v	L	2002		Deep loamy humus soils on the banks of sheltered gullies in wet, hilly regions.	Medium	Could potentially occur in patches of Wet Forest.
<i>Calystegia soldanella</i>	Sea Bindweed		v		2008		Coastal sand dunes.	Negligible	No suitable habitat.
<i>Cyathea X marcescens</i>	Skirted Tree-fern		v		2002		Wet, sheltered gullies.	Medium	Could potentially occur in patches of Wet Forest.
<i>Billardiera scandens s.s.</i>	Velvet Apple-berry		r		1983		Common in heathland, woodland and forests from near sea level to the subalps.	Low	Outside species typical range.
<i>Eucalyptus brookeriana</i>	Brooker's Gum		r		1999		Moist forest communities in valleys and on hills and ridges, often in association with <i>E. obliqua</i> .	Negligible	Not recorded during field assessments.
<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum		r		1953		Damp forest communities. Restricted to South Gippsland and the Otway Ranges.	High	Recorded during the assessment. In elevations above the 40m contour
<i>Monotoca glauca</i>	Currant-wood		r		1999		High rainfall areas on infertile sandy soils in open-forest, heathy woodland, wet closed scrub and on the margins of cool-temperate rainforest.	Medium	Could potentially occur in patches of Wet Forest.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Nematolepis squamea</i> subsp. <i>squamea</i>	Satinwood		r		1988		Primarily in wet tall forest and damp gullies of the Otways, but with isolated occurrences in drier forests elsewhere in the State.	Medium	Could potentially occur in patches of Wet Forest.
<i>Poa billardierei</i>	Coast Fescue		r		2009		Coastal dunes.	Negligible	No suitable habitat.
<i>Pteris comans</i>	Netted brake		r		1770		Deep, loamy soils in damp, shaded mountain gullies.	Low	Could potentially occur in patches of Wet Forest, although has not been recorded in area for over 200 years.
<i>Pultenaea canaliculata</i>	Coast Bush-pea		r		1909		Coastal dunes and limestone cliffs.	Negligible	No suitable habitat.
<i>Pultenaea reflexifolia</i>	Wombat Bush-pea		r		1770		Restricted to a few small areas of dry forest west of Melbourne in Gisborne, Barkstead and Lerderderg areas with an isolated, very old record from Apollo Bay	Low	Limited suitable habitat, only record in area over 200 years old.

Appendix 2 Fauna

Notes to tables:

<p>EPBC Act:</p> <p>EX - Extinct CR - Critically Endangered EN - Endangered VU - Vulnerable CD - Conservation dependent</p>	<p>DSE 2009, DSE 2013:</p> <p>ex - extinct cr - critically endangered en - endangered vu - vulnerable nt - near threatened dd - data deficient rx - regionally extinct</p>
<p>FFG Act:</p> <p>L - listed as threatened under FFG Act N - nominated for listing as threatened I - determined ineligible for listing</p>	<p>Introduced species</p> <p>PS - pest species listed under the CaLP Act * - introduced species</p>

Most recent database records are from the Victorian Biodiversity Atlas unless otherwise specified as follows

PMST – Protected Matters Search Tool

A2.1 Fauna species recorded from the study area

Table A2.1 Vertebrate fauna recorded from the study area (present assessment)

Status	Scientific Name	Common Name
	<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo
	<i>Rhipidura albiscapa</i>	Grey Fantail
	<i>Colluricincla harmonica</i>	Grey Shrike-thrush
	<i>Malurus cyaneus</i>	Superb Fairy-wren
	<i>Phascolarctos cinereus</i>	Koala

A2.2 Listed fauna species

The following table includes a list of the listed fauna species that have potential to occur within the study area. The list of species is sourced from the Victorian Biodiversity Atlas and the Protected Matters Search Tool (DoEE; accessed on 29.11.2019).

Table A2.2 Listed fauna species recorded, or predicted to occur, within 5 km of the study area

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
National significance									
<i>Antechinus minimus maritimus</i>	Swamp Antechinus	VU	nt	L	2007		Predominantly found in near-coastal habitat characterised by dense wet heath, tussock grassland or sedgeland with relatively open ground vegetation and dense cover.	Medium	Could potentially find suitable habitat within areas of Wet Forest.
<i>Anthochaera phrygia</i>	Regent Honeyeater	CR	cr	L		PMST	A range of dry woodlands and forests dominated by nectar-producing tree species.	Negligible	No suitable habitat.
<i>Botaurus poiciloptilus</i>	Australasian Bittern	EN	e	L	1991		Occurs in wetlands with tall, dense vegetation where it forages in shallow water at the edges of pools or waterways. Prefers permanent freshwater habitats, particularly when dominated by sedges, rushes and reeds.	Medium	Could potentially find suitable habitat within the dams/wetlands located within the study area.
<i>Calidris canutus</i>	Red Knot	EN	en			PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Calidris ferruginea</i>	Curlew Sandpiper	CR	en	L		PMST	Large intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Carcharodon carcharias</i>	Great White Shark	VU	vu	L		PMST	Near coastal and offshore waters.	Negligible	No suitable habitat.
<i>Caretta caretta</i>	Loggerhead Turtle	EN				PMST	Loggerhead Turtles forage widely in the waters of coral and rocky reefs, seagrass beds and muddy bays throughout eastern, northern and western Australia. Nesting occurs in coastal environments of northern WA, NT and QLD.	Negligible	No suitable habitat.
<i>Chelonia mydas</i>	Green Turtle	VU				PMST	Marine species with a pan-tropical distribution throughout the world. More abundant along the tropical coasts of Australia and the Great Barrier Reef. Green Turtles spend their first five to ten years drifting on ocean currents.	Negligible	No suitable habitat.
<i>Dasyurus maculatus maculatus</i> (SE mainland population)	Spot-tailed Quoll	EN	e	L	1974	PMST	Rainforest and wet and dry sclerophyll forests and woodlands.	Medium	Could potentially find suitable habitat within areas of Wet Forest.
<i>Dermochelys coriacea</i>	Leathery Turtle	EN	e	L	1979		Marine species usually sighted along the eastern seaboard often in bays, estuaries and rivers. No major nesting events have been recorded in Australia.	Negligible	No suitable habitat.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Diomedea antipodensis</i>	New Zealand Wandering Albatross	VU				PMST	A marine, pelagic species that ranges widely throughout the Pacific region of the Southern Ocean. It visits off-shore waters of southern Australia.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Diomedea epomophora</i>	Southern Royal Albatross	VU	vu	L		PMST	The range of the Southern Royal Albatross extends throughout the oceans of the Southern Hemisphere. The Southern Royal Albatross nests almost exclusively on the Chatham Islands, located hundreds of miles east of New Zealand.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Diomedea exulans</i>	Wandering Albatross	VU	en	L		PMST	Occurs from Antarctic to subtropical areas in the southern hemisphere. In Australia, observed over continental shelves often in areas of continental upwellings. Regularly recorded feeding in sheltered harbours, often gathering at sewerage outfalls.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Diomedea sanfordi</i>	Northern Royal Albatross	EN				PMST	The Northern Royal Albatross is marine, pelagic species and its habitat includes subantarctic, subtropical, and occasionally Antarctic waters (Marchant & Higgins 1990). The species nests on flat or gently sloping ground, on slopes, ridges, gullies and plateaux of large islands, and on the summits of islets (Bailey & Sorensen 1962; Dawson 1973; Westerkov 1963). Northern royal albatrosses (<i>D. e. sanfordi</i>) commonly nest on Campbell Island and the Auckland Islands.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Eubalaena australis</i>	Southern Right Whale	EN	e	L	2015		Migrates between summer feeding grounds in the Southern Ocean to warmer northern waters over winter, where it can be found along the Victorian coastline. The coast 8 km east of Warrnambool is a locally important calving and nursing site until late October or early November.	Negligible	No suitable habitat.
<i>Galaxiella pusilla</i>	Dwarf Galaxis	VU	en	L		PMST	Occurs in relatively shallow still or slow flowing water bodies including streams, wetlands, drains, that in many instances are ephemeral and partially dry up over summer. Typically requires abundant marginal and aquatic vegetation.	Negligible	No suitable habitat.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Halobaena caerulea</i>	Blue Petrel	VU				PMST	A marine species, usually pelagic but sometimes observed over shallow waters. A regular visitor to southern Australian waters.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Hirundapus caudacutus</i>	White-throated Needletail	VU	v		2001		An almost exclusively aerial species within Australia, occurring over most types of habitat, particularly wooded areas.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Isoodon obesulus obesulus</i>	Southern Brown Bandicoot	EN	nt	L		PMST	Heathland, shrubland, sedgeland, heathy open forest and woodland; also exotic vegetation, such as blackberry thickets and rank grasses where native vegetation has been removed.	Medium	Could possibly find suitable habitat within the study area, especially in the higher elevations amongst blackberry thickets and patches of Wet Forest.
<i>Lathamus discolor</i>	Swift Parrot	CR	en	L		PMST	A range of forests and woodlands, especially those supporting nectar-producing tree species. Also well-treed urban areas.	Medium	Could potentially use the large Blue Gum trees within the western section of the study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Limosa lapponica baueri</i>	Bar-tailed Godwit (baueri)	VU				PMST	Bar-tailed Godwits inhabit estuarine mudflats, beaches and mangroves. They are common in coastal areas around Australia. They are social birds and are often seen in large flocks and in the company of other waders.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Limosa lapponica menzbieri</i>	Northern Siberian Bar-tailed Godwit	CR				PMST	Bar-tailed Godwits inhabit estuarine mudflats, beaches and mangroves. They are common in coastal areas around Australia. They are social birds and are often seen in large flocks and in the company of other waders.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Litoria raniformis</i>	Growling Grass Frog	VU	en	L		PMST	Occupies a variety of permanent and semi-permanent water bodies generally containing abundant submerged and emergent vegetation, within lowland grasslands, woodlands and open forests.	Medium	Dams/wetlands within the study area, particularly those with surrounding vegetation, may support Growling Grass Frog populations.
<i>Macquaria australasica</i>	Macquarie Perch	EN	e	L	1970		Streams with clear water and deep, rocky holes with abundant cover.	Negligible	No suitable habitat.
<i>Macronectes giganteus</i>	Southern Giant-Petrel	EN	vu	L		PMST	Adults of this species are present all year round at Antarctic breeding colonies, from where immature birds disperse, some as far north as subtropical areas.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Macronectes halli</i>	Northern Giant-Petrel	VU	nt	L		PMST	Breeds in coastal habitats on subantarctic islands. Dispersal movements of juveniles are poorly known but have been observed along temperate coastal areas of Australia. Often seen around sewer outfalls or seal and penguin colonies.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Mastacomys fuscus mordicus</i>	Broad-toothed Rat	VU	en	L		PMST	Sub-alpine Woodland, Heathland, Sedgeland, and sedge-dominated areas within forest.	Medium	Could potentially find suitable habitat within areas of Wet Forest.
<i>Megaptera novaeangliae</i>	Humpback Whale	VU				PMST	Open oceans and near coastlines.	Negligible	No suitable habitat.
<i>Miniopterus orianae bassanii</i>	Southern Bent-wing Bat	CR				PMST	Roosts in mines and caves, often near coastal cliffs.	Negligible	No suitable roosting habitat.
<i>Mirounga leonina</i>	Southern Elephant Seal	VU			2015		Occurs in antarctic and subantarctic areas. Victorian records likely to be of vagrants, which have been found on rare occasions along the entire Victorian coast, including Port Phillip and Hobsons Bay.	Negligible	No suitable habitat.
<i>Neophema chrysogaster</i>	Orange-bellied Parrot	CR	cr	L		PMST	Coastal vegetation including saltmarshes, dunes, pastures, shrublands, sewage plants, saltworks, islands, and beaches.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Numenius madagascariensis</i>	Eastern Curlew	CR	vu	L		PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Pachyptila turtur subantarctica</i>	Fairy Prion (southern)	VU				PMST	Open ocean over continental shelves and slopes, and rarely coming close to shore except at breeding islands and during rough weather.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Phoebastria fusca</i>	Sooty Albatross	VU		L		PMST	Subantarctic and subtropical marine waters.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Potorous tridactylus tridactylus</i>	Long-nosed Potoroo (SE mainland)	VU	nt	L		PMST	Found in coastal heaths and wet and dry sclerophyll forests. Habitat preferences include a dense canopy and shrub cover with a ground layer possessing low floristic diversity.	Medium	Could potentially find suitable habitat within areas of Wet Forest.
<i>Prototroctes maraena</i>	Australian Grayling	VU	v	L	1999		Adults inhabit cool, clear, freshwater streams.	Negligible	No suitable habitat.
<i>Pseudomys fumeus</i>	Smoky Mouse	EN	en	L		PMST	Coastal heath and heathy woodland, wet forest, sub-alpine heath and dry sclerophyll forest.	Medium	Could potentially find suitable habitat within areas of Wet Forest.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Pterodroma leucoptera leucoptera</i>	Gould's Petrel	EN				PMST	The Gould's Petrel is a marine pelagic spending the majority of its time at sea. It has breeding colonies on Cabbage Tree Island and Boondelbah Island.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Pterodroma mollis</i>	Soft-plumaged Petrel	VU				PMST	A marine, oceanic species that breeds on islands including islands off Tasmania. Burrows among tussock grass and ferns on slopes and valleys.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	VU	vu	L		PMST	Rainforest, wet and dry sclerophyll forest, woodland and urban areas.	Medium	Could potentially roost in the large Blue Gums in the western section of the study area.
<i>Rostratula australis</i>	Australian Painted-snipe	EN	cr	L		PMST	Generally found in shallow, terrestrial freshwater wetlands with rank, emergent tussocks of grass, sedges and rushes. Australian Painted Snipe can occur in well-vegetated lakes, swamps, inundated pasture, saltmarsh and dams.	Medium	Could potentially find suitable habitat within the dams/wetlands located within the study area.
<i>Sternula nereis nereis</i>	Australian Fairy Tern	VU				PMST	Fairy Terns inhabit coastal environments including intertidal mudflats, sand flats and beaches. Nests above high-water mark on sandy shell-grit beaches.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Thalassarche bulleri</i>	Buller's Albatross	VU		L		PMST	Buller's Albatross breeds in New Zealand and is a seasonal visitor to Victorian coastal waters where it occurs in pelagic and inshore waters.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Thalassarche bulleri platei</i>	Northern Buller's Albatross	VU				PMST	Buller's Albatross breeds in New Zealand and is a seasonal visitor to Victorian coastal waters where it occurs in pelagic and inshore waters.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Thalassarche carteri</i>	Indian Yellow-nosed Albatross	VU	v	L	2001		The Indian Yellow-nosed Albatross is a marine bird, located in subtropical and warmer subantarctic waters .	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Thalassarche cauta cauta</i>	Shy Albatross	VU				PMST	The Shy Albatross is a marine pelagic species inhabiting sub-Antarctic and subtropical waters, spending the majority of their time at sea. Occasionally it is observed in continental shelf waters in bays and harbours.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Thalassarche cauta steadi</i>	White-capped Albatross	VU				PMST	The Shy Albatross is a marine pelagic species inhabiting sub-Antarctic and subtropical waters, spending the majority of their time at sea. Occasionally it is observed in continental shelf waters in bays and harbours.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Thalassarche chrysostoma</i>	Grey-headed Albatross	EN	vu	L		PMST	Occurs in warmer areas over winter, its breeding grounds are found in the Antarctic and subantarctic islands. Generally, forages over the open oceans. There have been a small number of records over inshore and offshore areas along the Victorian coast.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Thalassarche impavida</i>	Campbell Albatross	VU				PMST	The Campbell Albatross is a marine sea bird inhabiting sub-Antarctic and subtropical waters from pelagic to shelf-break water habitats (Marchant & Higgins 1990). The Campbell Albatross breed on Campbell Island (Marchant & Higgins 1990). They make their nests on tussock-covered ledges and terraces of cliffs, slopes and hills, overlooking the sea or valleys, and on the summits of rocky islets (Bailey & Sorenson 1962; Downes et al. 1959; Weimerskirch et al. 1986).	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Thalassarche melanophris</i>	Black-browed Albatross	VU	v		2009		Salvin's Albatross is a marine species occurring in subantarctic and subtropical waters (Marchant & Higgins 1990). Salvin's Albatross nest's on level or gently sloping ledges, summits, slopes and caves of rocky islets and stacks, usually in broken terrain with little soil and vegetation (Brothers 1979a, 1979b; Fleming 1939; Green 1974; Miskelly 1984).	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Thalassarche salvini</i>	Salvin's Albatross	VU				PMST	Salvin's Albatross is a marine species occurring in subantarctic and subtropical waters (Marchant & Higgins 1990). Salvin's Albatross nest's on level or gently sloping ledges, summits, slopes and caves of rocky islets and stacks, usually in broken terrain with little soil and vegetation (Brothers 1979a, 1979b; Fleming 1939; Green 1974; Miskelly 1984).	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Thinornis rubricollis rubricollis</i>	Hooded Plover (eastern)	VU	v	L	2006	PMST	Sandy ocean beaches, estuaries and inland lakes.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
State significance									
<i>Accipiter novaehollandiae</i>	Grey Goshawk		v	L	2013		Favours tall, wet forests in gullies but can occur in woodlands, dry forests, wooded farmlands and suburban parks. Relies on mature forests for breeding.	Medium	Could potentially use the large Blue Gum trees within the wester section of the study area.
<i>Actitis hypoleucos</i>	Common Sandpiper		v		2009		Migrates to Australia from Eurasia in August where it inhabits a wide variety of coastal and inland wetlands with muddy margins before departing north in March.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Ardea alba modesta</i>	Eastern Great Egret		v	L	2006		Prefer shallow water, particularly when flowing, but may be seen on any watered area, including damp grasslands.	Medium	Could use dams/wetlands within the study area.
<i>Ardea intermedia plumifera</i>	Plumed Egret		e	L	1999		Densely-vegetated freshwater wetlands including lakes, swamps and billabongs. Breeds in trees standing in water.	Medium	Could use dams/wetlands within the study area.
<i>Arenaria interpres</i>	Ruddy Turnstone		v		2002		Mainly found on coastal beaches, exposed reefs, and rock platforms.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Aythya australis</i>	Hardhead		v		2001		A mainly aquatic species preferring large, deep freshwater environments with abundant aquatic vegetation, including slow moving areas of rivers. Also occurs in brackish wetlands and may be found in deep dams and water storage ponds. Occasionally in estuarine and littoral habitats such as saltpans, coastal lagoons and sheltered inshore waters. Avoids main streams or rivers, except in calm reaches where aquatic flora is developed.	Medium	Could use dams/wetlands within the study area.
<i>Dasyornis broadbenti</i>	Rufous Bristlebird		nt	L	2012		Dense coastal heathlands and undergrowth of wet forests.	Medium	Could find suitable habitat within the shrubs of Wet Forest patches.
<i>Engaeus fultoni</i>	Otway Burrowing Crayfish		v		1905		Wet sclerophyll forest at altitudes above 100m in the Otway Ranges, although some records exist from areas at sea level. Burrows are usually found adjacent to water courses, although not connected to areas of surface water.	Medium	Potential habitat in areas of Wet Forest near the two drainage lines running through the study area.
<i>Engaeus sericatus</i>	Hairy Burrowing Crayfish		v		1982		Burrows are connected to the water table, typically adjacent to creeks or on floodplains. Although it is widespread in Victoria, most records are found in an area extending from the Otways, west to Port Fairy and north to Ballarat.	Medium	Could be found near dams/wetlands within the study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Geopelia cuneata</i>	Diamond Dove		nt	L	1985		Drier woodlands and scrub, spinifex and mulga.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Hydroprogne caspia</i>	Caspian Tern		nt	L	2009		Occurs on exposed ocean beaches or in sheltered coastal embayments including harbours, lagoons, inlets, estuaries and river deltas usually with sandy or muddy margins and breeds in a variety of coastal habitats including banks, ridges and beaches of sand and shell, often in open or among low or sparse vegetation.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Lissolepis coventryi</i>	Swamp Skink		v	L	1993		Densely vegetated swamps and associated watercourses, and adjacent wet heaths, sedgelands and saltmarshes.	Medium	Potential habitat surrounding some of the dams within the study area.
<i>Macquaria ambigua</i>	Golden Perch		nt	I	1955		Warm, turbid, sluggish, inland rivers and their associated backwaters and billabongs. Naturally occurs north of the Great Dividing Range, in the Murray-Darling River system.	Negligible	No suitable habitat.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Megaptera novaeangliae australis</i>	Southern Humpback Whale		v	L	1993		Migrate between summer feeding grounds in the Southern Ocean to Northern waters where birthing and mating occurs. Increasingly recorded along the Victorian coast, occasionally entering Port Phillip and Western Port.	Negligible	No suitable habitat.
<i>Neochanna cleaveri</i>	Australian Mudfish		e	L	2011		Freshwater habitats with abundant aquatic vegetation such as streams, backwaters, billabongs and floodplain wetlands.	Negligible	No suitable habitat.
<i>Ninox strenua</i>	Powerful Owl		v	L	2002		Eucalypt forests and woodlands, well-treed urban areas.	Medium	Could potentially use the large Blue Gum trees within the wester section of the study area.
<i>Pelagodroma marina</i>	White-faced Storm-Petrel		v		2001		Coastal in pelagic and inshore waters; breeding colonies on Mud and South Channel Islands in Port Phillip Bay.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Perameles gunnii</i>	Eastern Barred Bandicoot		ew	L	1933		Natural temperate grasslands and grassy woodlands.	Negligible	No grassland or grassy woodland habitat within study area.

Scientific name	Common name	Conservation status			Most recent database record	Other records	Habitat description	Likely occurrence in study area	Rationale for likelihood ranking
		EPBC	VIC	FFG					
<i>Sternula nereis</i>	Fairy Tern		e	L	2001		Fairy Terns inhabit coastal environments including intertidal mudflats, sand flats and beaches. Nests above high-water mark on sandy shell-grit beaches.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Thalassarche cauta</i>	Shy Albatross		v	L	2009		The Shy Albatross is a marine pelagic species inhabiting sub-Antarctic and subtropical waters, spending the majority of their time at sea. Occasionally it is observed in continental shelf waters in bays and harbours.	Low	Could potentially fly over the study area, but would not rely on the study area for habitat.
<i>Victaphanta compacta</i>	Otway Black Snail		e	L	1998		Wet forests and cool temperate rainforests in the Otway Ranges, Victoria.	Medium	Could find habitat within patches of Wet Forest.

A2.3 Migratory species (EPBC Act listed)

Table A2.3 Migratory fauna species recorded or predicted to occur within 5 km of the study area

Scientific name	Common name	Most recent record
Migratory species		
<i>Actitis hypoleucos</i>	Common Sandpiper	2009
<i>Apus pacificus</i>	Fork-tailed Swift	PMST
<i>Ardenna tenuirostris</i>	Short-tailed Shearwater	2002
<i>Arenaria interpres</i>	Ruddy Turnstone	2002
<i>Balaenoptera musculus</i>	Blue Whale	PMST
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	PMST
<i>Calidris alba</i>	Sanderling	1986
<i>Calidris canutus</i>	Red Knot	PMST
<i>Calidris ferruginea</i>	Curlew Sandpiper	PMST
<i>Calidris melanotos</i>	Pectoral Sandpiper	PMST
<i>Calidris ruficollis</i>	Red-necked Stint	2001
<i>Caretta caretta</i>	Loggerhead Turtle	PMST
<i>Charadrius bicinctus</i>	Double-banded Plover	2008
<i>Chelonia mydas</i>	Green Turtle	PMST
<i>Dermochelys coriacea</i>	Leathery Turtle	PMST
<i>Diomedea antipodensis</i>	New Zealand Wandering Albatross	PMST
<i>Diomedea epomophora</i>	Southern Royal Albatross	PMST
<i>Diomedea exulans</i>	Wandering Albatross	PMST
<i>Diomedea sanfordi</i>	Northern Royal Albatross	PMST
<i>Gallinago hardwickii</i>	Latham's Snipe	2001
<i>Hirundapus caudacutus</i>	White-throated Needletail	2001
<i>Hydroprogne caspia</i>	Caspian Tern	2009
<i>Limosa lapponica</i>	Bar-tailed Godwit	PMST
<i>Macronectes giganteus</i>	Southern Giant-Petrel	PMST
<i>Macronectes halli</i>	Northern Giant-Petrel	PMST
<i>Monarcha melanopsis</i>	Black-faced Monarch	PMST
<i>Motacilla flava</i>	Yellow Wagtail	PMST
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	2001
<i>Numenius madagascariensis</i>	Eastern Curlew	PMST
<i>Pandion cristatus</i>	Osprey	2011
<i>Pandion haliaetus</i>	Osprey	PMST
<i>Phoebastria fusca</i>	Sooty Albatross	PMST
<i>Procellaria cinerea</i>	Grey Petrel	2000
<i>Rhipidura rufifrons</i>	Rufous Fantail	2012
<i>Thalassarche bulleri</i>	Buller's Albatross	PMST
<i>Thalassarche carteri</i>	Indian Yellow-nosed Albatross	2001
<i>Thalassarche cauta</i>	Shy Albatross	2009

Scientific name	Common name	Most recent record
<i>Thalassarche chrysostoma</i>	Grey-headed Albatross	PMST
<i>Thalassarche impavida</i>	Campbell Albatross	PMST
<i>Thalassarche melanophris</i>	Black-browed Albatross	2009
<i>Thalassarche salvini</i>	Salvin's Albatross	PMST
<i>Thalasseus bergii</i>	Crested Tern	2014

Appendix 3 Photos of the study area



Photo 1 Swamp Scrub - Habitat Zone 1; Looking approximately south (see Figure 2).



Photo 2 Swamp Scrub - Habitat Zone 2; looking approximately south-east (see Figure 2).



Photo 3 Wet Forest – Habitat Zone 3; looking approximately south-east (see Figure 2).



Photo 4 Swamp Scrub – Habitat Zone 4; looking approximately east (see Figure 2).



Photo 5 Wet Forest – Habitat Zone 5; looking approximately south (see Figure 2).



Photo 6 Wet Forest– Habitat Zone 6; looking approximately west (see Figure 2).



Photo 7 Wet Forest- Habitat Zone 7; looking approximately north (see Figure 2).



Photo 8 Wet Forest- Habitat Zone 8; looking approximately east (see Figure 2).



Photo 9 Swamp Scrub – Habitat Zone 9; looking approximately east (see Figure 2).



Photo 10 Exotic grassland- dominated most of the study area; looking approximately east (see Figure 2).



Photo 11 Overview of study area-looking approximately south-east (see Figure 2).



Photo 12 Wetland in the north-east of the study area; photo taken 2010 (see Figure 2).

Appendix 4 Vegetation impact assessment results

A4.1 Tree data

Table A4.2.1 Scattered trees within the study area

Tree #	Scientific name	Common name	DBH (cm)	Circumference (cm)	Size	Extent (ha)	Tree protection zone (m)	Other attributes	Status
1	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	133	417.83	Large	0.070	15.96	Koala recorded in tree during assessment	Retain
2	<i>Eucalyptus</i> spp	Gum Tree	53	166.50	Small	0.031	6.36	Dead	Remove
3	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	400	1256.64	Large	0.070	48		Remove
4	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	210	659.73	Large	0.070	25.2		Remove
5	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	116	364.42	Large	0.070	13.92		Retain

Table A4.2.2 Large trees within patches within the study area

Tree #	Scientific name	Common name	DBH (cm)	Circumference (cm)	Habitat zone/EVC	Tree protection zone (m)	Other attributes	Status
1	<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	Manna Gum	91	285.8849	5/ Wet Forest	10.92		Retain
2	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	92	289.0265	6/Wet Forest	11.04		Retain
3	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	109	342.4336	6/Wet Forest	13.08		Retain
4	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	117	367.5663	6/Wet Forest	14.04		Retain
5	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	115	361.2832	6/Wet Forest	13.8		Retain
6	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	131	411.5486	6/Wet Forest	15.72		Retain
7	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	115	361.2832	6/Wet Forest	13.8		Retain
8	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	143	449.2477	6/Wet Forest	17.16		Retain
9	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	>90	282.7433	7/Wet Forest	10.8		Retain
10	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	121	380.1327	7/Wet Forest	14.52		Retain
11	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	>90	282.7433	7/Wet Forest	10.8		Retain

Tree #	Scientific name	Common name	DBH (cm)	Circumference (cm)	Habitat zone/EVC	Tree protection zone (m)	Other attributes	Status
12	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	120	376.9911	7/Wet Forest	14.4		Retain
13	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	>90	282.7433	7/Wet Forest	10.8		Retain
14	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	>90	282.7433	7/Wet Forest	10.8		Retain
15	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	>90	282.7433	7/Wet Forest	10.8		Retain
16	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	>90	282.7433	7/Wet Forest	10.8		Retain
17	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	>90	282.7433	7/Wet Forest	10.8		Retain
18	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	>90	282.7433	7/Wet Forest	10.8		Retain
19	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	>90	282.7433	7/Wet Forest	10.8		Retain
20	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	>90	282.7433	7/Wet Forest	10.8		Retain
21	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	>90	282.7433	7/Wet Forest	10.8		Retain
22	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	>90	282.7433	7/Wet Forest	10.8		Retain
23	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	>90	282.7433	7/Wet Forest	10.8		Retain

Tree #	Scientific name	Common name	DBH (cm)	Circumference (cm)	Habitat zone/EVC	Tree protection zone (m)	Other attributes	Status
	<i>globulus</i>							
24	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	>90	282.7433	7/Wet Forest	10.8		Retain
25	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	>90	282.7433	7/Wet Forest	10.8		Retain
26	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	>90	282.7433	7/Wet Forest	10.8		Retain
27	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	102	320.4425	8/Wet Forest	12.24		Retain
28	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	106	333.0088	8/Wet Forest	12.72		Retain
29	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	95	298.4513	8/Wet Forest	11.4		Retain
30	<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	94	295.3097	8/Wet Forest	11.28		Retain

Appendix 5 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: 12/12/2019
Time of issue: 3:27 pm

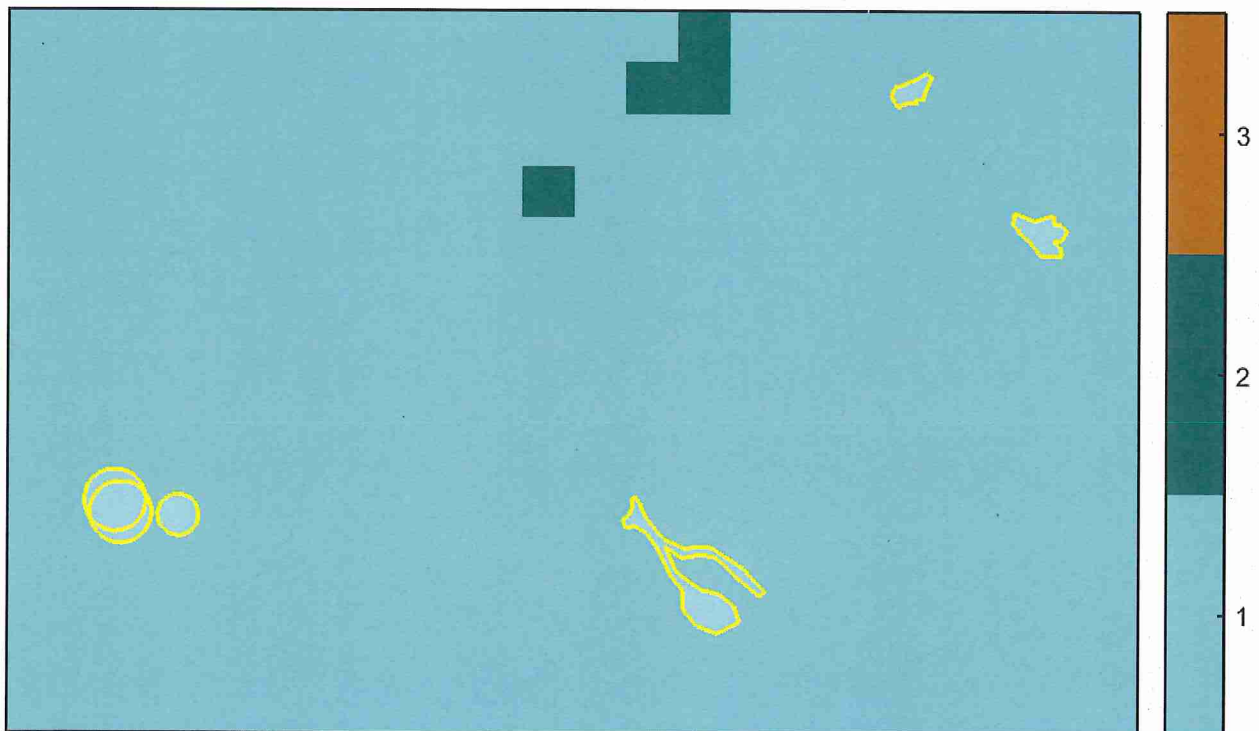
Report ID: BIO_2019_148

Project ID 30972_VegClearing_20191211

Assessment pathway

Assessment pathway	Intermediate Assessment Pathway
Extent including past and proposed	0.261 ha
Extent of past removal	0.000 ha
Extent of proposed removal	0.261 ha
No. Large trees proposed to be removed	2
Location category of proposed removal	Location 1 The native vegetation is not in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map), sensitive wetland or coastal area. Removal of less than 0.5 hectares in this location will not have a significant impact on any habitat for a rare or threatened species

1. Location map



Offset requirements if a permit is granted

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

General offset amount¹	0.066 general habitat units
Vicinity	Corangamite Catchment Management Authority (CMA) or Colac Otway Shire Council
Minimum strategic biodiversity value score ²	0.359
Large trees	2 large 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 general offset amount required is the sum of all general habitat units in Appendix 1.

² Minimum strategic biodiversity score is 80 per cent of the weighted average score across habitat zones where a general offset is required

Next steps

Any proposal to remove native vegetation must meet the application requirements of the Intermediate Assessment Pathway and it will be assessed under the Intermediate Assessment Pathway.

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

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

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

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

Additional application requirements must be met including:

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

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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

All zones require a general offset, the general habitat units each 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

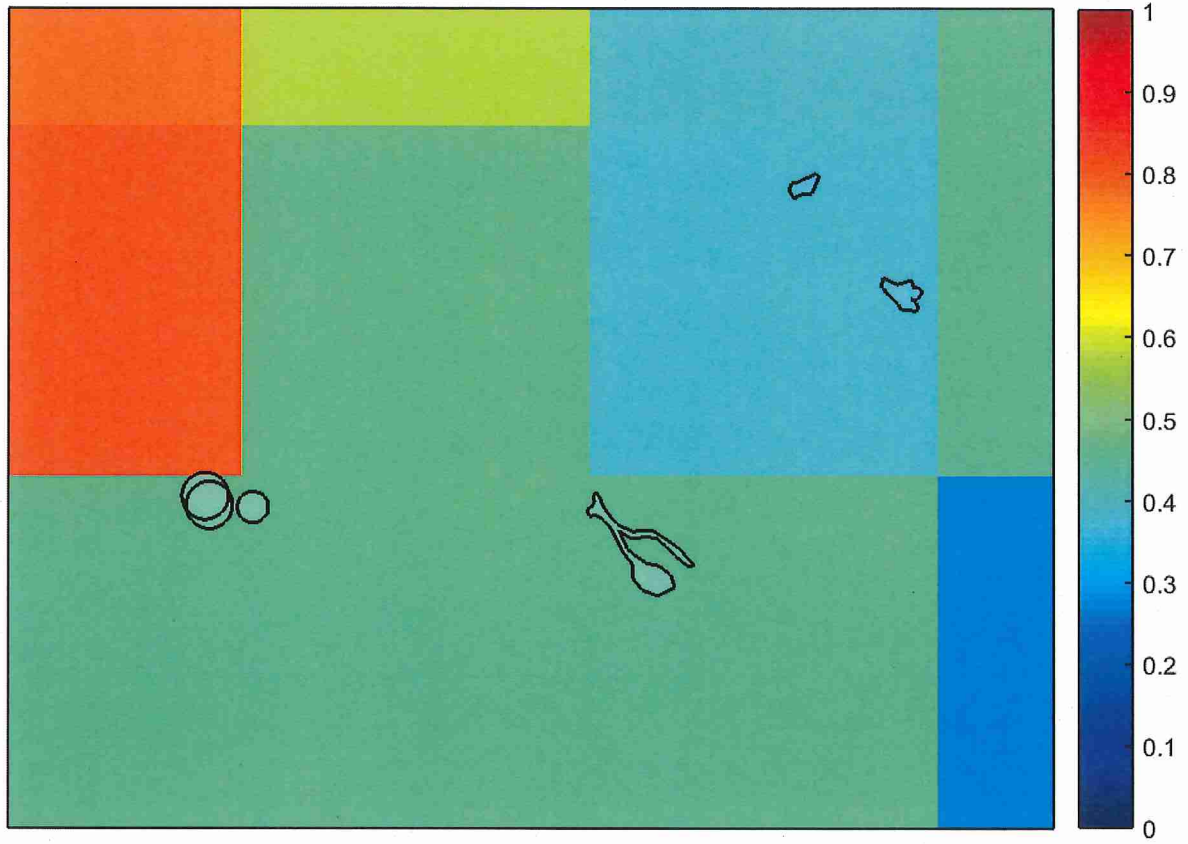
Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
1-A	Patch	otp_0053	Vulnerable	0	no	0.130	0.032	0.032	0.380		0.004	General
1-B	Patch	otp_0053	Vulnerable	0	no	0.130	0.016	0.016	0.380		0.002	General
1-C	Patch	otp_0053	Vulnerable	0	no	0.330	0.091	0.091	0.460		0.033	General
2-A	Scattered Tree	otr_0030	Least Concern	1	no	0.200	0.070	0.045	0.460		0.010	General
2-B	Scattered Tree	otr_0030	Least Concern	1	no	0.200	0.070	0.045	0.481		0.010	General
2-C	Scattered Tree	otr_0030	Least Concern	0	no	0.200	0.031	0.031	0.460		0.007	General

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

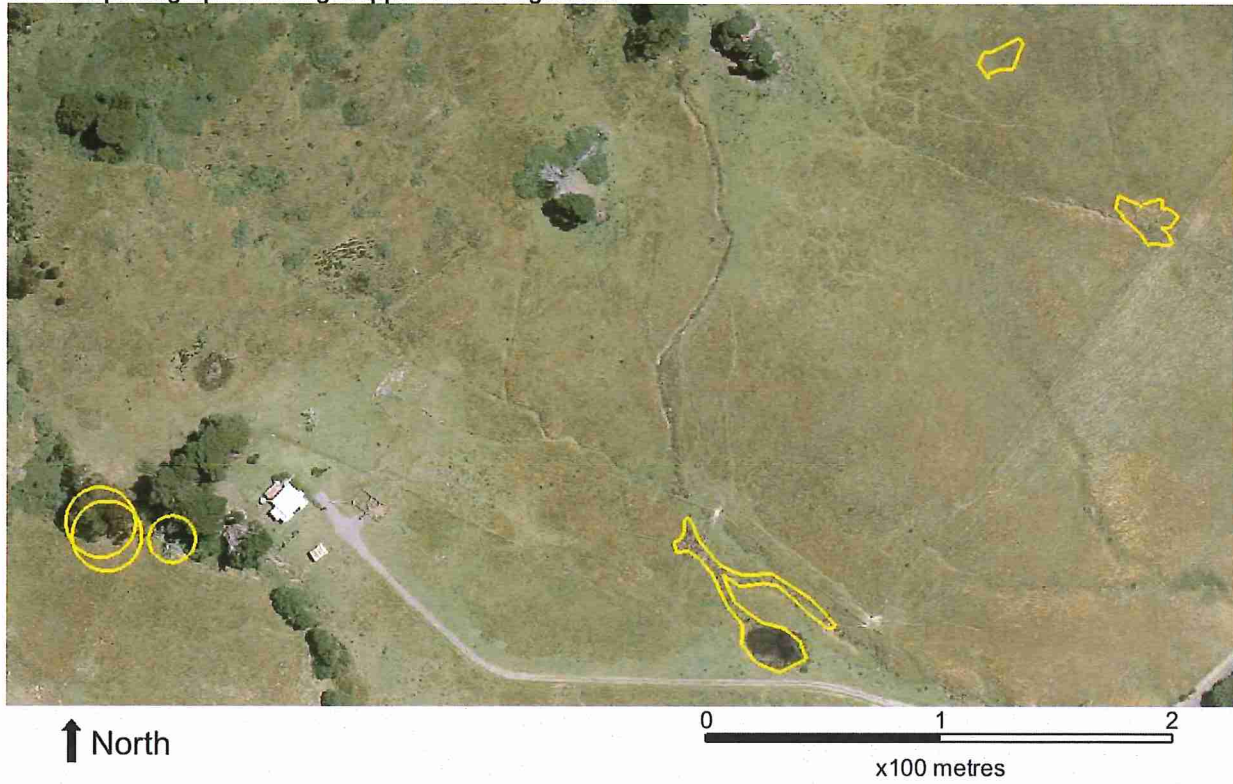
This is not applicable in the Intermediate Assessment Pathway.

Appendix 3 – Images of mapped native vegetation

2. Strategic biodiversity values map



3. Aerial photograph showing mapped native vegetation



4. Map of the property in context



Yellow boundaries denote areas of proposed native vegetation removal.