BROMPTON LODGE, 980 - 1050 DANDENONG – HASTINGS ROAD & ADJOINING PROPERTIES CRANBOURNE SOUTH:

FLORA AND FAUNA ASSESSMENT

Urban Development Investments Australia Pty Ltd

C/- Watsons Pty Ltd

BL&A Brett Lane & Associates Pty. Ltd.
Ecological Research & Management
Suite 5 61 - 63 Camberwell Road, Hawthorn, VIC 3123
P.O. Box 337, Camberwell, VIC 3124
Ph. (03) 9815 2111
Fax. (03) 9815 2685

May 2014

Report No. 7051 (7.0)

CONTENTS

TABLES

FIGURES

APPENDICES

1. EXECUTIVE SUMMARY

Watsons Pty Ltd engaged Brett Lane & Associates Pty. Ltd. (BL&A) on behalf of Urban Development Investments Australia Pty Ltd to conduct a flora and fauna assessment for a 113 hectare area of land bounded by Cranbourne–Frankston Road, Ballarto Road (not yet constructed) and Dandenong–Hastings Road, Cranbourne South (herein referred to as the study area). This land was subject to a "Logical Inclusions" process that resulted in it being included in the Urban Growth Zone in June 2012.

This report is based, in part, upon the assessment results for part of the study area set out in a previous report (BL&A 2007) but includes updated findings from additional surveys undertaken on 4th July 2011 and the 28th and 30th April 2014. The Ballarto Road reserve and properties at 735, 765 and 785 Cranbourne-Frankston Road were assessed separately on 26th September 2012. All of these findings are combined within this current report.

The study area was dominated by introduced pasture grasses such as Toowoomba Canary Grass and Yorkshire Fog. Planted vegetation such as Southern Blue Gum, Southern Mahogany, Spotted Gum and Giant Honey Myrtle were recorded along fence lines and around dwellings.

Numerous small remnant patches of low quality indigenous vegetation were recorded within the study area. Canopy trees in these patches were Coast Manna Gums, Swamp Gum and/or Black Sheoak. Scattered indigenous trees such as Coast Manna Gum, Swamp Gum, River Red-gum and Drooping Sheoak were recorded in the north-eastern and western parts of the site. The following native vegetation was recorded during the assessment:

- 3.940 hectares of Grassy Woodland (EVC 175) across 32 habitat zones; and
- 144 scattered trees.

No rare or threatened flora, fauna or ecological communities were recorded in the study area during this investigation, nor were any considered likely to occur due to the lack of suitable habitat.

It is understood however that Dwarf Galaxias, a threatened fish species, was recorded in aquatic habitat within the study area in 2011 (McGuckin 2011). It is understood that the implications of the occurrence of this species has been dealt with as part of a separate assessment and that a Conservation Management Plan relating to this species has since been prepared (McGuckin 2013). The implications of state and federal legislation relating to the occurrence of this species within the study area are therefore not discussed further in this report.

One EPBC Act listed fauna species, the Southern Brown Bandicoot was initially considered to have potential to occur based on the close proximity of known populations. However, based on the isolation of habitat, as well as the low quality nature of the vegetation present within the study area, it is considered that the species is unlikely to occur.

<u>Impacts on native vegetation</u>

The proposed development will involve the subdivision of land and development for mostly residential use. This will include the development of roads and restructuring of drainage lines across the study area. This will result in the loss of all native vegetation and fauna habitat in the study area.

As such, the current development footprint will result in the loss of 14.070 hectares of native vegetation comprising:

- The loss of **3.940 hectares of native vegetation from remnant patches**; and
- The loss of **144 scattered trees**. Scattered tree losses have been converted to an hectare extent of loss by multiplying the number of trees (144) by a standard area of 0.070 hectares; equating to an area loss of 10.130 hectares.

Additionally, a proportion the native vegetation proposed for removal supports important habitat for two Victorian rare and threatened species, Swamp Everlasting and Grey Billy-buttons. *It should be noted that it is highly unlikely that the above species would be resident in the study area, given the highly modified state of potential habitat there.*

As a proportion of the native vegetation proposed for removal is located in Location Risk Category C, the proposal will be assessed under the ***high risk*** **pathway** and both *general* and *specific* offsets apply to any approved native vegetation removal.

Based on the application of the relevant risk factors in accordance with the *Biodiversity Assessment Guidelines*, the proposed development will therefore result in the loss of:

- **0.341** *general* biodiversity equivalence units (BEUs);
- **1.037** *specific* biodiversity equivalence units (BEUs) comprising habitat for Swamp Everlasting; and
- **0.703** *specific* biodiversity equivalence units (BEUs) comprising habitat for Grey Billy-Buttons.

<u>Implications for the development</u>

For the development proposal, a planning permit under Clause 52.16 of the Casey Planning Scheme would be required for the removal of remnant native vegetation. Moreover, the development would trigger a referral to the Department of the Environment and Primary Industries (DEPI) as it meets the specified criteria.

A summary of the required offset targets to compensate for the proposed losses of native vegetation are listed as follows:

- **0.512 general biodiversity equivalence units.** This offset must be located within the Port Phillip and Westernport Catchment Management Authority area or the Casey council area and must have a minimum strategic biodiversity score of 0.187.
- **2.074 specific biodiversity equivalence units for Swamp Everlasting.**
- **1.406 specific biodiversity equivalence units for Grey Billy-buttons.**

The offset targets for the current proposal cannot be achieved within the study area given the above requirements. As such, it is recommended that suitable offsets be sourced through a third party offset provider.

A referral under the EPBC Act is not considered to be required for the impacts on flora, fauna and/or ecological communities considered in this investigation.

A permit under the FFG Act is not considered to be required for the impacts on flora, fauna and/or ecological communities considered in this investigation.

A Referral to the state Minister for Planning is unlikely to be required under the *Environment Effects Act 1978* for the aspects covered by the current investigation.

2. INTRODUCTION

Watsons Pty Ltd engaged Brett Lane & Associates Pty. Ltd. (BL&A) on behalf of Urban Development Investments Australia Pty Ltd to conduct a flora and fauna assessment of a 113 hectare area of land in Cranbourne South.

This included the following:

- A section of the road reserve for the unconstructed Ballarto Road, between Pearcedale Road and Dandenong-Hastings Road;
- Private property at:
    - 980, 1000, 1020 and 1050 Dandenong-Hastings Road
    - Private property at 655, 735, 765 and 785 Cranbourne-Frankston Road.

Lot 1 TP395573 of 1050 Dandenong-Hastings Road comprises the Carpenter property. The remaining properties on Dandenong-Hastings Road as well as Lot 1 TP529244, Lot 2 TP133266 and Lot 1 TP133266 of 655 Cranbourne-Frankston Road together comprise the Brompton Lodge property.

This report is based, in part, upon the assessment results for part of the study area set out in a previous report (BL&A 2007) but includes updated findings from additional surveys undertaken on 4th July 2011 and the 28th and 30th April 2014. The Ballarto Road reserve and properties at 735, 765 and 785 Cranbourne-Frankston Road were assessed separately on 26th September 2012. All of these findings are combined within this current report.

This investigation was commissioned to provide information on the extent and condition of native vegetation in the study area according to Victoria's *Biodiversity assessment guidelines* (DEPI 2013a), as well as any potential impacts on flora and fauna matters listed under the state *Flora and Fauna Guarantee Act 1988* (FFG Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This report outlines any implications under relevant national, state and local legislation and policy frameworks.

Specifically, the scope of the investigation included:

- A review of existing information on flora and fauna of the area (e.g. DEPI Flora Information System and Atlas of Victorian Wildlife; EPBC Act Protected Matters Search Tool);
- Site surveys, involving:
    - Characterisation and mapping of remnant native vegetation on the site;
    - Assessment of native vegetation in accordance with Victoria's *Biodiversity assessment guidelines* (including habitat hectare assessment and/or scattered tree assessment);
    - Assessment of the nature and quality of native fauna habitat;
    - Assessment of the likelihood of occurrence of threatened flora and fauna in the area; and
    - Compilation of flora and fauna species lists for the site.
- Preparation of maps showing the results of the assessment.

This report is divided into the following sections:

Section 3 describes the sources of information, including the methods used for the field survey.

Section 4 provides the legislative background including details of all relevant Commonwealth, State and local legislation and policies.

Section 5 presents the assessment results, including details of the native vegetation, flora and fauna of the study area.

Section 6 discusses the proposed impacts of the project and details the implications of the findings under the relevant legislation and policy.

This investigation was undertaken by a team from BL&A, comprising Khalid Al-Dabbagh (Ecologist), Tricia Wevill (Botanist), Rachel Omodei (Botanist), Peter Lansley (Zoologist), Brett Macdonald (Senior Ecologist), Davide Coppolino (Senior Ecologist), Lachlan Marshall (Senior Ecologist), Justin Sullivan (Senior Ecologist), Alan Brennan (Senior Ecologist & Project Manager) and Brett Lane (Principal Consultant).

3. SOURCES OF INFORMATION

3.1. Existing information

Existing information used for this investigation is described below. Note that 'study area' refers to the following land at Cranbourne South:

- An unconstructed section of Ballarto Road reserve, between Pearcedale Road and Dandenong-Hastings Road;
- Private property at:
    - 980, 1000, 1020 and 1050 Dandenong-Hastings Road; and
    - Private property at 655, 735, 765 and 785 Cranbourne-Frankston Road.

The residences present and their immediate surrounds (gardens) were not assessed in detail as they supported no native vegetation or habitat.

3.1.1. Existing documentation

The following existing documentation relating to the study area was reviewed:

- Casey Planning Scheme (DTPLI 2014); and
- Flora and fauna assessment of the study area carried out by Brett Lane & Associates in 2007 (BL&A 2007).

This report is based, in part, upon the assessment results for part of the study area set out in a previous report (BL&A 2007), but includes updated findings from additional surveys undertaken since then. Updated information on threatened species records and legislation have been utilised to ensure this investigation has been carried out in accordance with current legislation and guidelines.

3.1.2. Location and extent risk

The likely risk-based pathway for assessment of any proposed vegetation removal relies on the 'location risk' and 'extent risk' determined with the assistance of the online Native Vegetation Information Management system (NVIM) administered by the Department of Environment and Primary Industries (DEPI 2014).

NVIM online mapping was viewed to determine the mapped location risk of the study area and to gain a preliminary indication of the extent risk, described in Section 4.1.2.

3.1.3. Native vegetation

Pre-1750 (pre-European settlement) vegetation mapping administered by DEPI was reviewed to determine the type of native vegetation likely to occur in the study area and surrounds. Information on Ecological Vegetation Classes was obtained from published EVC benchmarks. These sources included:

- Relevant EVC benchmarks for the Gippsland Plain bioregion[1] (DSE 2011a; DSE 2012a); and
- Biodiversity Interactive Maps (DSE 2011b; DSE 2012b).

[1] A bioregion is defined as "a geographic region that captures the patterns of ecological characteristics in the landscape, providing a natural framework for recognising and responding to biodiversity values". In general bioregions reflect underlying environmental features of the landscape (DNRE 1997).

3.1.4. Listed matters

Existing flora and fauna species records and information about the potential occurrence of listed matters was obtained from an area termed the 'search region', defined here as an area with a radius of ten kilometres from the approximate centre point of the study areas (coordinates: latitude 38˚ 07' 36" S and longitude 145˚ 14' 04" E).

A list of the flora and fauna species recorded in the search region was obtained from the Viridans Flora Information System (FIS (VBD 2011a; 2012a) and Atlas of Victorian Wildlife (AVW) (VBD 2011b; 2012b), databases administered by DEPI.

The list of communities on the FFG Act Threatened List (DEPI 2013b) was reviewed to ascertain whether any Victorian listed ecological communities were likely to occur in the study area.

The online EPBC Act Protected Matters Search Tool (Department of the Environment 2012) was consulted to determine whether nationally listed species or communities potentially occurred in the search region based on habitat modelling.

3.2. Field methodology

- The initial field assessment of the Brompton Lodge and Carpenter properties was conducted on the 29th March 2007.
- A further brief field assessment of this property was carried out on the 4th July 2011. This second assessment aimed to ensure previously mapped vegetation still existed on site and to determine if more vegetation was present on site than that previously mapped.
- A further botanical and zoological assessment on additional areas of land outside the initial study area was conducted on the 26th September 2012.
- In order to comply with the methodology prescribed in Victoria's *Biodiversity assessment guidelines* (DEPI 2013a), a final flora assessment was carried out on the 28th and 30th April 2014.

During these assessments, the study area and areas supporting remnant native vegetation and/or fauna habitat were surveyed on foot. Areas where threatened species were deemed to potentially occur were examined in greater detail.

Sites in the study area found to support native vegetation and/or habitat for rare or threatened flora and/or fauna were mapped. Mapping was undertaken through a combination of aerial photograph interpretation and ground-truthing using a hand held GPS (accurate to approximately five metres).

3.2.1. Native vegetation

Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses'. The *Biodiversity assessment guidelines* define native vegetation as belonging to two categories (DEPI 2013a):

- Remnant patch; or
- Scattered trees.

The definitions of these categories are provided below, along with the prescribed DEPI methods to assess them.

Remnant patch

A remnant patch of native vegetation is either:

- An area of native vegetation where at least 25 per cent of the total perennial understorey plant cover is native; and/or
- Any area with three or more native canopy trees[2] where the canopy foliage cover[3] is at least 20 per cent of the area.

Remnant patch condition is assessed using the habitat hectare method (Parkes *et al*. 2003; DSE 2004) whereby components of native vegetation (e.g. tree canopy, understorey and ground cover) are assessed against an EVC benchmark. The score effectively measures the percentage resemblance of the vegetation to its original condition.

The NVIM system (DEPI 2014) provides modelled condition scores for native vegetation to be used in certain circumstances (Section 4.1.2). All wetlands mapped on DEPI's native vegetation layer are treated as a remnant patch.

The condition score assists in defining the biodiversity equivalence score (described in Section 4.1.2) of the native vegetation and the offset targets if removal of native vegetation is approved.

Scattered trees

The *Biodiversity assessment guidelines* define scattered trees as a native canopy tree[2] that does not form part of a remnant patch of native vegetation.

Scattered trees are counted, the species identified and their DBH (diameter at breast height or 1.3 metres above ground) measured or estimated.

3.2.2. Flora species and habitats

Records of flora species were made in conjunction with sampling methods used to undertake habitat hectare assessments of native vegetation, described above. Specimens requiring identification using laboratory techniques were collected.

The potential for habitats to support listed flora species was assessed based on the criteria outlined below:

- The presence of suitable habitat for flora species such as soil type, floristic associations and landscape context; and
- The level of disturbance of suitable habitats by anthropogenic disturbances and invasions by pest plants and animals.

3.2.3. Fauna species and habitats

The techniques below were used to detect fauna species utilising the study area.

- Incidental searches for mammal scats, tracks and signs (e.g. diggings, signs of feeding and nests/burrows).
- Turning over logs and other ground debris for reptiles, frogs and mammals.

---

[2] A canopy tree is a reproductively mature tree that is greater than 3 metres in height and is normally found in the upper layer of the relevant vegetation type.
[3] Foliage cover is the proportion of the ground that is shaded by vegetation foliage when lit from directly above.

- Bird observation during the day.
- General searches for reptiles and frogs; including identification of frog calls in seasonally wet areas.

The quality of fauna habitats and their potential to support listed species was assessed based on the criteria detailed below. These are based on habitat components that include old-growth trees, fallen timber, leaf litter, surface rocks. Three quality categories were used, as described below:

High: The majority of fauna habitat components are present and habitat linkages to other remnant ecosystems in the landscape are intact.

Moderate: The majority of fauna habitat components are present but habitat linkages to other remnant ecosystems in the landscape are absent; or

The majority of habitat components are absent but habitat linkages to other remnant ecosystems in the landscape are intact.

Low: The majority of fauna habitat components are absent and habitat linkages to other remnant ecosystems in the landscape are absent.

3.2.4. Threatened ecological communities

The study area was assessed against identification criteria and condition thresholds for relevant listed ecological communities found to potentially occur in the study area.

3.3. Limitations of field assessment

Where feasible, all efforts are made to schedule flora and fauna field surveys in optimal weather conditions and times of year. Nevertheless, field surveys usually fail to record all species present for various reasons, including the seasonal absence of some species and short survey duration. Rare or cryptic species are often missed in short surveys.

Detailed flora surveying was carried out in autumn and winter, when many annual and spring-emergent plant species may have been absent or in the senescent stage of their life-cycle and lacking essential identification characteristics. At the time of the survey native grasses (annual and perennial species) had finished flowering and setting seed. Most grass species were identified to species level, however a few specimens held little fruiting material suitable for identification to species level (e.g. several *Austrodanthonia* species). This is not considered to be a major limitation for the assessment. The timing of the survey and condition of vegetation was otherwise considered suitable to ascertain the extent and quality of native vegetation.

The fauna assessment was undertaken in autumn and spring, during mild weather conditions. These conditions were suitable for detecting species likely to occur on the site.

As the primary purpose of the investigation was to assess the extent and quality of native vegetation and fauna habitats in the study area and any potential impacts, the review of existing information, combined with the field survey were sufficient to complete this aspect of the assessment.

Wherever appropriate, a precautionary approach has been adopted in the discussion of implications. That is, where insufficient evidence is available on the occurrence or likelihood of occurrence of a species, it is assumed that it could be in an area of suitable habitat. The implications under legislation and policy are considered accordingly.

3.4. Determination of impact extent

The impact area described in Section 6.1 and mapped biodiversity values were overlapped using GIS to determine the extent of proposed impacts upon the biodiversity values within the study area. DEPI guidelines to determine whether a scattered tree is lost or retained when it occurs near proposed development works are presented in Appendix 5. These guidelines were applied to determine impacts to scattered trees.

4. LEGISLATIVE BACKGROUND

4.1. Planning and Environment Act 1987

Victoria's planning schemes are constituted under the *Planning and Environment Act 1987*. This section discusses planning provisions in the local planning scheme applicable to flora and fauna.

4.1.1. Local provisions

Overlays

The study area is subject to two overlays in the Casey Planning Scheme, neither of which are relevant to this assessment and therefore are not discussed in this report.

4.1.2. State provisions

Destruction, lopping or removal of native vegetation on land which, together with all contiguous land in one ownership, has an area of 0.4 hectares or more requires a planning permit under Clause 52.17 of all Victorian Planning Schemes. This includes the removal of dead trees with a DBH (diameter at breast height or 1.3 metres) of 40 centimetres or more and any individual scattered native plants.

In May 2013 the Victorian Government announced the outcome of a major review of Victoria's native vegetation permitted clearing regulations. On 20th December 2013 a planning scheme amendment was gazetted to implement a number of reforms to Victoria's native vegetation permitted clearing regulations, particularly Clauses 12.01 (Biodiversity), 52.16 (Native vegetation precinct plan) and 52.17 (Native vegetation). As part of these reforms the previously incorporated document *Victoria's Native Vegetation – a Framework for Action* was replaced by a new incorporated online tool and document, described below.

Before issuing a planning permit, Responsible Authorities are obligated to refer to Clause 12.01 (Biodiversity) in the Planning Scheme. This refers in turn to the following online tool and document, both incorporated into the Victoria Planning Provisions and all planning schemes in Victoria:

- The Native Vegetation Information Management (NVIM) system (DEPI 2014); and
- *Permitted clearing of native vegetation – Biodiversity assessment guidelines* (DEPI 2013a).

These are discussed below.

Native Vegetation Information Management system (NVIM)

The online Native Vegetation Information Management system (NVIM) is an interactive mapping tool, incorporated in the planning scheme, which provides some of the information required to accompany a permit to remove native vegetation. It does not replace the application process.

The information provided by NVIM can include the following (described in more detail below):

- The *location risk* of the native vegetation;
- The *condition* of the native vegetation – used for the low-risk assessment pathway only;

- The *strategic biodiversity score* of the native vegetation proposed to be removed; and
- The *native vegetation offset* requirement – used for the low risk assessment pathway only.

Biodiversity assessment guidelines

Guidelines objective

As set out in *Permitted clearing of native vegetation – Biodiversity assessment guidelines* ('the Guidelines') the objective for permitted clearing of native vegetation in Victoria is 'No net loss in the contribution made by native vegetation to Victoria's biodiversity'. The key strategies for ensuring this outcome when considering an application to remove native vegetation are:

- Avoiding the removal of native vegetation that makes a significant contribution to Victoria's biodiversity;
- Minimising impacts on Victoria's biodiversity from the removal of native vegetation; and
- Where native vegetation is permitted to be removed, ensuring it is offset in a manner that makes an equivalent contribution to Victoria's biodiversity made by the native vegetation to be removed.

Note: if native vegetation does not meet the definition of either a remnant patch or scattered trees, the Guidelines are not required to be applied.

Risk-based assessment pathways

The first step in determining the type of assessment required for any site in Victoria is to determine the risk to biodiversity associated with the proposed native vegetation removal and therefore the risk-based assessment pathway for the proposed native vegetation removal. There are three risk-based pathways for assessing an application to remove native vegetation, below.

- Low risk
- Moderate risk
- High risk

This risk-based assessment pathway is determined by two factors, outlined below.

Extent risk – the area in hectares proposed to be removed *or* the number of scattered trees. *Note:* extent risk also includes any native vegetation clearing for which permission has been granted in the last five years.

Location risk – the likelihood that removing native vegetation in a location will have an impact on the persistence of a rare or threatened species classified into three categories: Location A, Location B and Location C.

The risk-based pathway for assessing an application to remove native vegetation is determined by the following matrices for remnant patches and scattered trees:

Extent (remnant patches)	Location A	Location B	Location C
< 0.5 hectares	Low	Low	High
≥ 0.5 hectares and < 1 hectare	Low	Moderate	High
≥ 1 hectare	Moderate	High	High
Extent (scattered trees)	**Location A**	**Location B**	**Location C**
< 15 scattered trees	Low	Moderate	High
≥ 15 scattered trees	Moderate	High	High

Notes: All native vegetation within any subdivision plot of less than 0.4 hectares is deemed to be lost; For applications with combined removal of both remnant patch and scattered trees, the extent of the scattered trees is converted to an area by assigning a standard area of 0.071 hectares per tree – the total extent is then used to determine the risk-based pathway.

The presence of any Location B or Location C risk categories within an area of proposed native vegetation removal means this whole area of removal is considered to belong to that category for the purpose of determining the risk-based assessment pathway.

Strategic biodiversity score

The strategic biodiversity score generated by NVIM acts as a measure of the site's importance for Victoria's biodiversity relative to other locations across the landscape. It is calculated based on a weighted average of scores across an area of native vegetation proposed for removal on a site.

Habitat importance

Habitat importance mapping produced by DEPI is based on one or a combination of habitat importance models, habitat distribution models or site record data. It identifies the following:

- *Habitat importance for dispersed species* – based on habitat distribution models and assigned a habitat importance score ranging from 0 to 1; and
- *Highly localised habitats* – considered to be equally important for a particular species and assigned a habitat importance score of 1.

Habitat importance mapping is used to determine the type of offset required under the moderate and high risk assessment pathways.

Biodiversity equivalence

Biodiversity equivalence scores are used to quantify losses in the contribution to Victoria's biodiversity from removing native vegetation and gains in this contribution from a native vegetation offset.

There are two types of biodiversity equivalence scores depending on whether or not the site makes a contribution to the habitat of a Victorian rare or threatened species.

- A *general* biodiversity equivalence score is a measure of the contribution native vegetation on a site makes to Victoria's biodiversity overall and applies when no habitat importance scores are applicable according to the equation:

General biodiversity equivalence score =
habitat hectares x strategic biodiversity score

- A *specific* biodiversity equivalence score is a measure of the contribution that native vegetation on a site makes to the habitat of a particular rare or threatened species – calculated for each such species for which the site provides important habitat (using habitat importance scores provided by DEPI) according to the equation:

Specific biodiversity equivalence score =
habitat hectares x habitat importance score

Offset requirements

A native vegetation offset is required for the approved removal of native vegetation. Offsets conform to one of two types and each type incorporates a risk factor to address the risk of offset failing:

- A *general* offset applies if the removal of native vegetation impacts Victoria's overall biodiversity and has an offset risk factor of 1.5 applied according to the equation:

General risk-adjusted offset requirement =
general biodiversity equivalence score (clearing site) x 1.5

- A *specific* offset applies if the native vegetation makes a significant impact to habitat for a rare or threatened species determined by a *specific-general offset test*. It applies to each species impacted and has an offset risk factor of 2 applied according to the equation:

Specific risk-adjusted offset requirement =
specific biodiversity equivalence score (clearing site) x 2

Note: if native vegetation does not meet the definition of either a remnant patch or scattered trees an offset is not required.

DEPI referral criteria

Clause 66.02 of the planning scheme determines the role of DEPI in the assessment of native vegetation removal permit applications. If an application is referred, DEPI may make certain recommendations to the responsible authority in relation to the permit application. An application to remove native vegetation must be referred to DEPI in the following circumstances:

- Applications where the native vegetation to be removed is 0.5 hectares or more;
- All applications in the high risk-based pathway;
- Applications where a property vegetation plan applies to the site; and
- Applications on Crown land which is occupied or managed by the responsible authority.

Summary of the assessment process

The assessment process, decision guidelines and offset requirements for approved native vegetation removal are outlined in Table 1.

Table 1: Summary of the assessment process and offset requirements

Risk-based pathway	Assessment quantum inputs	Decision guidelines	Offset requirements
Low	▪ Habitat hectares* (NVIM) ▪ Strategic biodiversity score (NVIM) ▪ General biodiversity equivalence score	An application for removal cannot be refused on biodiversity grounds (unless it is not in accordance with any property vegetation plan that applies to the site). *Note: this guideline also applies to native vegetation that does not meet the definition of either a remnant patch or scattered trees.*	General offset applies: ▪ General offset = general biodiversity equivalence score (clearing site) x 1.5 ▪ Offset must be located in the same CMA^ or Local Government Area as the removal ▪ Offset must have a strategic biodiversity score at least 80% of the native vegetation removed ▪ Offset must be secured before the removal of native vegetation
Moderate	▪ Habitat hectares* (site assessment) ▪ Strategic biodiversity score (NVIM) ▪ Habitat importance scores for each Victorian rare and threatened species ▪ Specific biodiversity equivalence score for each rare and threatened species *OR* ▪ *General* biodiversity equivalence score if no habitat importance scores apply	The responsible authority will consider: ▪ The strategic biodiversity score and habitat importance score of the native vegetation proposed to be removed ▪ Any property vegetation plan that applies to the site ▪ Whether reasonable steps have been taken to ensure that impacts of the proposed removal of native vegetation on biodiversity have been minimised with regard to the contribution to biodiversity made by the native vegetation to be removed and the native vegetation to be retained ▪ Whether an offset has been identified that meets the requirements ▪ The need to remove native vegetation to create defendable space to reduce the risk of bushfire	If the specific biodiversity equivalence scores for any rare and threatened species fails the specific-general offset test, then a general offset applies (as above) Otherwise, a specific offset applies for <u>each</u> rare and threatened species: ▪ Specific offset = specific biodiversity equivalence score (clearing site) x 2 ▪ Offset must be located in the same species habitat anywhere in Victoria as determined by DEPI habitat importance mapping ▪ When a specific offset is required for multiple species, the offset site must satisfy the specific offset requirements for all of these species or multiple offset sites may be used ▪ Offset must be secured before the removal of native vegetation
High		In addition to the considerations for the moderate pathway (above) the responsible authority will determine whether the native vegetation to be removed makes a significant contribution to Victoria's biodiversity. This includes considering: ▪ Impacts on important habitat for rare or threatened species, particularly highly localised habitat ▪ Proportional impacts on remaining habitat for rare or threatened species ▪ If the removal of the native vegetation will contribute to a cumulative impact that is a significant threat to the persistence of a rare or threatened species ▪ The availability of, and potential for, gain from offsets	

*** Habitat hectares = condition score (out of 1) x extent (hectares)**

^ Catchment Management Authority

Note: All applications must provide information about the vegetation to be removed such as location and address of the property, description of the vegetation, maps and recent dated photographs.

4.2. EPBC Act

The *Environment Protection and Biodiversity Conservation Act 1999* protects a number of threatened species and ecological communities that are considered to be of national conservation significance. Any significant impacts on these species require the approval of the Australian Minister for the Environment.

If there is a possibility of a significant impact on nationally threatened species or communities or listed migratory species, a Referral under the EPBC Act should be considered. The Minister will decide after 20 business days whether the project will be a 'controlled action' under the EPBC Act, in which case it cannot be undertaken without the approval of the Minister. This approval depends on a further assessment and approval process (lasting between three and nine months, depending on the level of assessment).

4.3. FFG Act

The Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) lists threatened and protected species and ecological communities (DEPI 2013b, DEPI 2013c). Any removal of threatened flora species or communities (or protected flora) listed under the FFG Act from public land requires a Protected Flora Licence or Permit under the Act, obtained from DEPI.

The FFG Act does not apply to private land.

4.4. EE Act

The "Ministerial Guidelines for Assessment of Environmental Effects under the *Environment Effects Act 1978"* (DSE 2006), identifies the following criteria related to flora and fauna which assist in determining whether a Referral to the State Minister for Planning is required:

- Potential clearing of ten hectares or more of native vegetation from an area that is of an EVC identified as endangered by the Department of Environment and Primary Industries (DEPI 2013b);
- Potential long-term loss of a significant proportion (1 to 5% depending upon conservation status of species concerned) of known remaining habitat or population of a threatened species in Victoria;
- Potential long-term change to a wetland's ecological character, where that wetland is Ramsar listed, or listed in 'A Directory of Important Wetlands in Australia';
- Potential major effects upon the biodiversity of aquatic ecosystems over the long term;
- Potential significant effects on matters listed under the *Flora and Fauna Guarantee Act 1988*.

One or a combination of these criteria may trigger a requirement for a Referral to the Victorian Minister for Planning who will determine if an EES is required.

5. ASSESSMENT RESULTS

5.1. Site assessment

5.1.1. Site description

The study area for this investigation is approximately 113 hectares of private land and public road reserve located at Cranbourne South (Figure 1). It occurs approximately 4.5 kilometres south-west of Cranbourne and 42 kilometres south-east of Melbourne. It is bordered by Ranfurlie Golf Course and a turf farm (to the north), Dandenong-Hastings Road (to the west) and Cranbourne-Frankston Road (to the south-east).

The study area supported boggy, black clays on lower ground (including drainage areas and ephemeral floodplains) to sandy loam soils on small, often abrupt rises (i.e. dunes), distributed across much of the study area. A series of constructed drainage channels dissected the study area.

With the exception of a few small pockets of native vegetation (described below), the study area supported previously cleared, introduced pasture (e.g. Toowoomba Canary Grass and Yorkshire Fog). Planted vegetation such as Southern Blue-gum, Southern Mahogany, Spotted Gum and Giant Honey-myrtle was recorded along fence lines and around dwellings.

The recorded native vegetation comprised the following:

- Small, isolated patches of fairly poor quality Grassy Woodland in the central, western and south-eastern parts of the study area. This vegetation was dominated by Coast Manna-gum, Swamp Gum and/or Black Sheoak over a weedy understorey comprising some indigenous elements (e.g. introduced Sallow Wattle, Blackberry and indigenous Swamp Paperbark, Austral Bracken, Blackwood, Mat Rushes, wallaby grasses, sedges, rushes and Weeping Grass).
- Re-colonising stands of Swamp Paperbark along some constructed drainage channels, fence lines and planted windrows.
- Scattered indigenous trees, namely Coast Manna Gum, Swamp Gum, River Red-gum and Black Sheoak which were scattered and clustered in the northern, western and north-eastern parts of the study area. A large number of these scattered trees occurred amongst treelines dominated by other planted non-native species.

Other indigenous flora, such as Blackwoods, grasses, rushes and forbs, occurred as scattered understorey plants in some parts of the study area.

Much of the vegetation previously recorded in the study area was deemed to be 'Modified Degraded Treeless Vegetation' under the repealed Framework. These areas are currently deemed to be remnant patches of native vegetation under the Guidelines. Two areas of native vegetation were previously recorded as 'artificial substrate' under the repealed Framework. These areas are also currently deemed to be remnant patches of native vegetation under the Guidelines.

The site was rather isolated from large patches of remnant vegetation in the region. It is largely surrounded by cleared land used for agriculture, a golf course and partly cleared low density residential blocks. Nearby reserves include the Royal Botanic Gardens, Cranbourne (approximately 1.4 km south-east at the closest point), Pines Flora and Fauna Reserve (3.7 km north-west) and Langwarrin Flora and Fauna Reserve (5.3 km

south-west). Another nearby moderately-sized DEPI biosite is the Cranbourne Woodland, 1.1 kilometres to the east. All biosites are separated from the study area by residential and/or cleared land; there is little connectivity in remnant habitats.

The study site is currently used for stock (horse and cattle) grazing and a chicken farm. Surrounding land predominantly supports rural residential housing and a plant nursery to the north. Ranfurlie Golf Course lies immediately to the north-east.

The study area lies within the Gippsland Plain bioregion and falls within the Port Phillip and Westernport catchment. It is currently zoned Urban Growth Zone (UGZ) in the Casey Planning Scheme. No overlays relevant to this investigation cover the study area.

5.1.2. Remnant patches

Pre–European EVC mapping (DSE 2012b) indicates that the study area and surrounds would have supported Grassy Woodland (EVC 175), Heathy Woodland (EVC 48) and Plains Woodland / Plains Grassland Mosaic (EVC 693) prior to European settlement based on modelling of factors including rainfall, aspect, soils and remaining vegetation.

Evidence on site, including floristic composition and soil characteristics, suggested that Grassy Woodland (EVC 175) was present in small isolated pockets within the study area (Figure 1).

Grassy Woodland (EVC 175) of the Gippsland Plain bioregion is described in the relevant EVC benchmark as "a variable open eucalypt woodland to 15 metres tall or occasionally Sheoak woodland to 10 metres tall over a diverse ground layer of grasses and herbs. The shrub component is usually sparse. It occurs on sites with moderate fertility on gentle slopes or undulating hills on a range of geologies" (Appendix 7).

A total of 32 remnant patches (referred to herein as habitat zones) comprising the abovementioned EVC were identified in the study area (Table 2). The habitat hectare assessment results for these habitat zones are provided in Table 3 More detailed habitat scoring results are presented in Appendix 1.

All native vegetation recorded in the study area is shown in Figure 1 and in more detail in Figures 2 to 6.

Table 2: Description of habitat zones in the study area

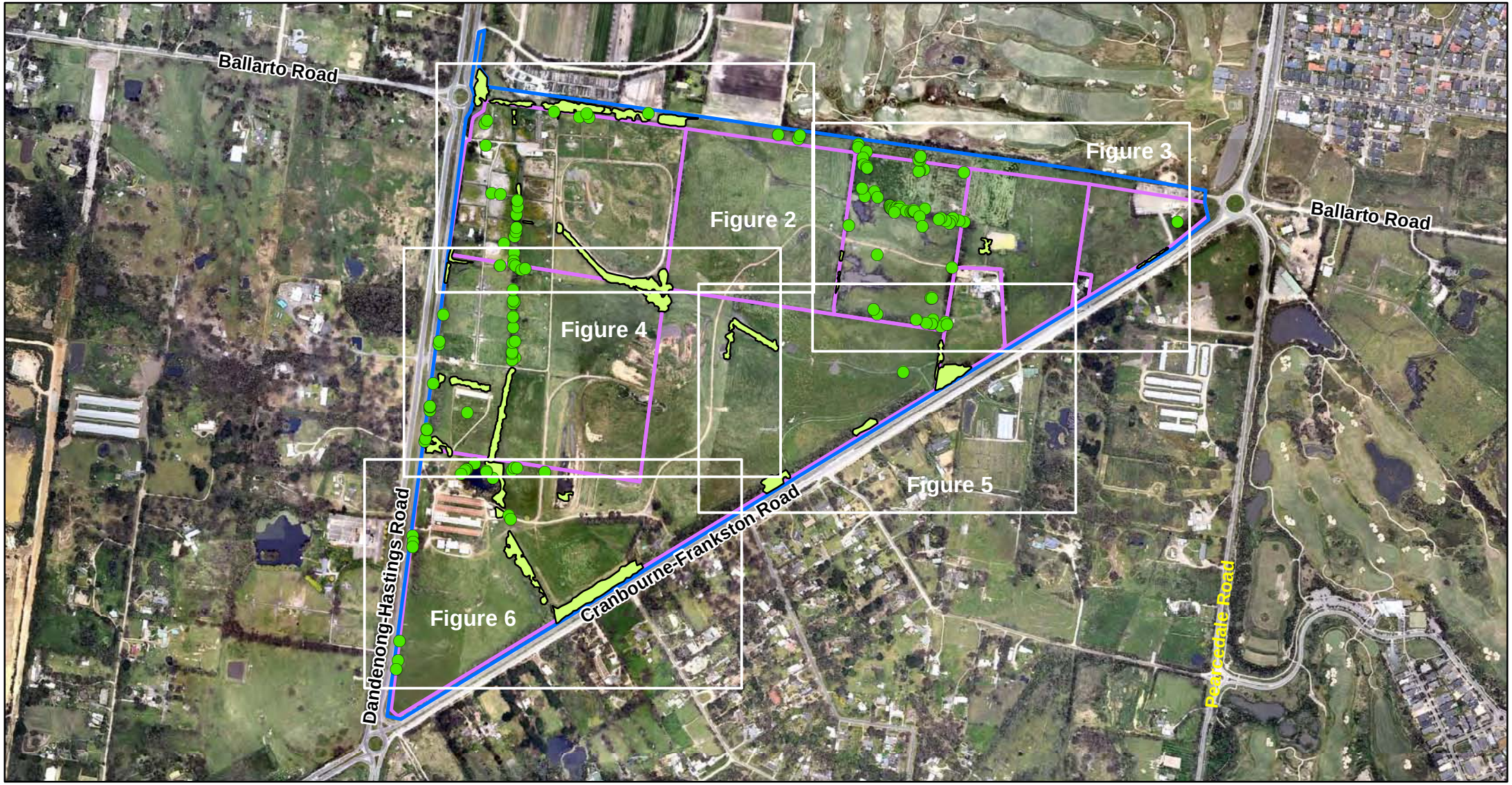
Habitat Zone	EVC	Description
A, D, F, G, K, L and Q, W, X	Grassy Woodland (EVC 175)	Modified vegetation, dominated by recruiting indigenous Swamp Paperbark. Little to no other indigenous species present; low organic litter cover dominated by introduced species; mature planted non-indigenous vegetation such as Giant Honey-myrtle and Southern Mahogany present.
B	Grassy Woodland (EVC 175)	Low canopy cover of indigenous Swamp Gum, with understorey dominated by Swamp Paperbark and Austral Bracken; some logs but no large old trees present; low organic litter cover dominated by introduced species; mature planted non-indigenous vegetation such as Giant Honey-myrtle and Southern Mahogany present.

Habitat Zone	EVC	Description
E	Grassy Woodland (EVC 175)	Previously mapped as scattered trees, this zone surrounds a small pond. This zone comprises: low canopy cover of indigenous Swamp Gum trees; high understorey cover of recruiting Swamp Paperbark; no large old trees present; low indigenous understorey diversity; low organic matter, dominated by indigenous vegetation.
H	Grassy Woodland (EVC 175)	Small linear patch of indigenous vegetation located on the roadside; moderate to low canopy cover of indigenous Swamp Gum in moderate health; no large old trees present; understorey of indigenous recruiting Swamp Paperbark; high weed cover of high threat pasture grass species; logs absent; organic litter dominated by introduced species.
I	Grassy Woodland (EVC 175)	Small patch within private property, extending into the public roadside; low canopy cover of indigenous Coast Manna Gum, with moderate to high cover of immature trees; no large old trees present; high understorey cover of indigenous Swamp Paperbark, with some Blackwood and Austral Bracken also present; high weed cover of high threat pasture grass species; no logs present; low organic litter cover, dominated by introduced species.
J	Grassy Woodland (EVC 175)	Small patch with moderate canopy cover of Coast Manna Gum; no large old trees present; no indigenous understorey vegetation; high weed cover dominated by introduced pasture weeds; no logs present; low organic litter cover, dominated by introduced species.
M	Grassy Woodland (EVC 175)	Fairly sparse stand of Swamp Paperbark amongst introduced creepers and Blackberry.
N	Grassy Woodland (EVC 175)	Small patch of Common Reed and *Typha* that has recolonised an abandoned sand quarry. No canopy, large old trees or logs present.
O, P, T, U	Grassy Woodland (EVC 175)	Small patch of low Swamp Paperbarks growing amongst mostly introduced ground flora (e.g. grasses and forbes). No canopy, large old trees or logs present.
R	Grassy Woodland (EVC 175)	A few unhealthy canopy Swamp Gums over a mostly weedy understorey with Swamp Paperbark, Austral Bracken and Black Wattle. Small logs present.
S	Grassy Woodland (EVC 175)	Small stand of fairly young River Red-gums over a dense understory of introduced grasses and forbs within a shallow formed drainage channel.
V	Grassy Woodland (EVC 175)	Small stand of Common Reed amongst introduced grasses and forbs within a shallow formed drainage channel. No canopy, large old trees or logs present.

Habitat Zone	EVC	Description
Y	Grassy Woodland (EVC 175)	Dense stand of Swamp Paperbark that has recolonised a man-made drainage channel within the Cranbourne-Frankston Road reserve.
AA	Grassy Woodland (EVC 175)	Moderate to low canopy cover of indigenous Coast Manna Gum and Black Sheoak in moderate health; no large old trees present; low diversity of indigenous understorey plants, including Wattle Mat-rush, Wallaby Grass and Thatch Saw Sedge; high cover of weeds, dominated by pasture weeds; indigenous recruitment present; logs present; organic litter dominated by introduced species.
BB	Grassy Woodland (EVC 175)	Moderate to high canopy cover of indigenous Coast Manna Gum and Black Sheoak in moderate health; no large old trees present; low diversity of indigenous understorey plants, including Wattle Mat-rush, Wallaby Grass, Thatch Saw Sedge and Tall Sedge; high cover of weeds, dominated by pasture weeds; logs present and organic; litter dominated by introduced species.
AAA	Grassy Woodland (EVC 175)	Sparse canopy of mostly Coast Manna-gum (moderate health); large old trees absent; understorey of low to moderate health and diversity; moderate to high weed cover; moderate cover of logs; high organic litter cover; very little recruitment observed.
BBB	Grassy Woodland (EVC 175)	Canopy and large old trees absent; understorey of low quality and diversity; high weed and organic litter cover; some logs and recruitment observed.
CCC & FFF	Grassy Woodland (EVC 175)	Canopy, large old trees and logs absent; understorey of very low quality and diversity; high weed cover; moderate to high organic litter cover; recruitment recorded from one species.
DDD	Grassy Woodland (EVC 175)	Moderate canopy cover (moderate health) dominated by Swamp Gum; one dead large old tree and some logs present; understorey of low quality and diversity; high weed cover; moderate organic litter cover; some recruitment observed.
EEE	Grassy Woodland (EVC 175)	Relatively dense canopy co-dominated by Swamp Gum, Narrow-leaf Peppermint and Coast Manna-gum (good health); four large old trees present (good health); understorey of low quality and diversity; very few logs recorded; very low organic litter; no recruitment observed.

Table 3: Habitat hectare assessment results

Habitat Zone	EVC	Area (ha)	Condition score (out of 100)
A	Grassy Woodland (EVC 175)	0.279	14
B	Grassy Woodland (EVC 175)	0.516	15
D	Grassy Woodland (EVC 175)	0.142	14
E	Grassy Woodland (EVC 175)	0.176	17
F	Grassy Woodland (EVC 175)	0.273	14
G	Grassy Woodland (EVC 175)	0.114	14
H	Grassy Woodland (EVC 175)	0.029	18
I	Grassy Woodland (EVC 175)	0.104	14
J	Grassy Woodland (EVC 175)	0.054	13
K	Grassy Woodland (EVC 175)	0.468	14
L	Grassy Woodland (EVC 175)	0.169	14
M	Grassy Woodland (EVC 175)	0.031	9
N	Grassy Woodland (EVC 175)	0.039	13
O	Grassy Woodland (EVC 175)	0.016	14
P	Grassy Woodland (EVC 175)	0.013	14
Q	Grassy Woodland (EVC 175)	0.062	14
R	Grassy Woodland (EVC 175)	0.075	21
S	Grassy Woodland (EVC 175)	0.026	24
T	Grassy Woodland (EVC 175)	0.021	9
U	Grassy Woodland (EVC 175)	0.034	9
V	Grassy Woodland (EVC 175)	0.008	11
W	Grassy Woodland (EVC 175)	0.041	9
X	Grassy Woodland (EVC 175)	0.028	9
Y	Grassy Woodland (EVC 175)	0.035	9
AA	Grassy Woodland (EVC 175)	0.166	20
BB	Grassy Woodland (EVC 175)	0.062	22
AAA	Grassy Woodland (EVC 175)	0.225	31
BBB	Grassy Woodland (EVC 175)	0.159	13
CCC	Grassy Woodland (EVC 175)	0.081	15
DDD	Grassy Woodland (EVC 175)	0.224	21
EEE	Grassy Woodland (EVC 175)	0.138	24
FFF	Grassy Woodland (EVC 175)	0.131	14
	Total	3.940	



Legend

- Study Area
- Property Boundaries
- Native Vegetation
- Trees

Metres

0 150 300 600

Figure 1: Study area and native vegetation - Overview

Project: Cranbourne-Frankston Road, Cranbourne West

Client: Watsons Pty Ltd

Project No.: 7051	Date: 29/05/2014	Created By: D. Coppolino / M. Ghasemi

BL&A Brett Lane & Associates Pty. Ltd.
Ecological Research & Management
Experience Knowledge Solutions
Suite 5, 61 - 63 Camberwell Road
Hawthorn East ,VIC 3123
PO Box 337, Camberwell, VIC 3124, Australia
Ph (03) 9815 2111 / Fax (03) 9815 2685
enquiries@ecologicalresearch.com.au
www.ecologicalresearch.com.au

N

Legend

- Study Area
- Property Boundaries
- Native Vegetation
- Trees
- 18 Tree Numbers
- E Habitat Zones

0 50 100 200 Metres

Figure 2: Study area and native vegetation - Detailed

Project: Cranbourne-Frankston Road, Cranbourne West

Client: Watsons Pty Ltd

Project No.: 7051	Date: 29/05/2014	Created By: D. Coppolino / M. Ghasemi

BL&A Brett Lane & Associates Pty. Ltd.
Ecological Research & Management
Experience Knowledge Solutions
Suite 5, 61 - 63 Camberwell Road
Hawthorn East ,VIC 3123
PO Box 337, Camberwell, VIC 3124, Australia
Ph (03) 9815 2111 / Fax (03) 9815 2685
enquiries@ecologicalresearch.com.au
www.ecologicalresearch.com.au

N

Legend

- Study Area
- Property Boundaries
- Native Vegetation
- Trees
- 18 Tree Numbers
- E Habitat Zones

Metres
0 50 100 200

Figure 3: Study area and native vegetation - Detailed

Project: Cranbourne-Frankston Road, Cranbourne West

Client: Watsons Pty Ltd

Project No.: 7051	Date: 29/05/2014	Created By: D. Coppolino / M. Ghasemi

BL&A Brett Lane & Associates Pty. Ltd.
Ecological Research & Management
Experience Knowledge Solutions
Suite 5, 61 - 63 Camberwell Road
Hawthorn East, VIC 3123
PO Box 337, Camberwell, VIC 3124, Australia
Ph (03) 9815 2111 / Fax (03) 9815 2685
enquiries@ecologicalresearch.com.au
www.ecologicalresearch.com.au

N

Legend

- Study Area
- Property Boundaries
- Native Vegetation
- Trees
- 18 Tree Numbers
- E Habitat Zones

0 50 100 200 Metres

Figure 4: Study area and native vegetation - Detailed

Project: Cranbourne-Frankston Road, Cranbourne West

Client: Watsons Pty Ltd

Project No.: 7051	Date: 29/05/2014	Created By: D. Coppolino / M. Ghasemi

BL&A Brett Lane & Associates Pty. Ltd.
Ecological Research & Management
Experience Knowledge Solutions
Suite 5, 61 - 63 Camberwell Road, Hawthorn East, VIC 3123
PO Box 337, Camberwell, VIC 3124, Australia
Ph (03) 9815 2111 / Fax (03) 9815 2685
enquiries@ecologicalresearch.com.au
www.ecologicalresearch.com.au

N

Legend

- Study Area
- Property Boundaries
- Native Vegetation
- Trees
- 18 Tree Numbers
- E Habitat Zones

Metres
0 50 100 200

Figure 5: Study area and native vegetation - Detailed

Project: Cranbourne-Frankston Road, Cranbourne West

Client: Watsons Pty Ltd

Project No.: 7051	Date: 29/05/2014	Created By: D. Coppolino / M. Ghasemi

BL&A Brett Lane & Associates Pty. Ltd.
Ecological Research & Management
Experience Knowledge Solutions
Suite 5, 61 - 63 Camberwell Road, Hawthorn East, VIC 3123
PO Box 337, Camberwell, VIC 3124, Australia
Ph (03) 9815 2111 / Fax (03) 9815 2685
enquiries@ecologicalresearch.com.au
www.ecologicalresearch.com.au

N

Legend

- Study Area
- Property Boundaries
- Native Vegetation
- Trees
- 18 Tree Numbers
- E Habitat Zones

0 50 100 200 Metres

Figure 6: Study area and native vegetation - Detailed

Project: Cranbourne-Frankston Road, Cranbourne West

Client: Watsons Pty Ltd

Project No.: 7051	Date: 29/05/2014	Created By: D. Coppolino / M. Ghasemi

BL&A Brett Lane & Associates Pty. Ltd.
Ecological Research & Management
Experience Knowledge Solutions
Suite 5, 61 - 63 Camberwell Road
Hawthorn East ,VIC 3123
PO Box 337, Camberwell, VIC 3124, Australia
Ph (03) 9815 2111 / Fax (03) 9815 2685
enquiries@ecologicalresearch.com.au
www.ecologicalresearch.com.au

N

5.1.3. Scattered trees

Scattered trees recorded in the study area would have once comprised the canopy component of Grassy Woodland (EVC 175). 144 scattered trees occurred in the study area ranging in DBH (diameter at breast height) from eight to 126 centimetres. Details of the scattered trees recorded are listed in Appendix 2.

24% of eucalypt scattered trees were above 70 centimetres DBH, and 13% of sheoak scattered trees were above 40 centimetres DBH, the benchmark minimum DBH's for large trees in the pre-existing Grassy Woodland (EVC 175). Several of these trees contained hollows.

5.1.4. Flora species

During the habitat hectare assessments 146 plant species were recorded. Of these, 46 (32%) were indigenous and 100 (68%) were introduced or non-indigenous native in origin (Appendix 3).

FIS records (VBD 2011a; 2012a) and the EPBC Protected Matters Search Tool (Department of the Environment 2013) indicated that within the search region there were records of, or there occurred potential suitable habitat for, 11 species listed under the Commonwealth EPBC Act and 11 listed under the state *Flora and Fauna Guarantee Act 1988* (FFG Act), including eight listed under both Acts. No flora species listed under either the EPBC Act or the FFG Act were recorded during any of the field surveys.

The likelihood of occurrence in the study area of species listed under the EPBC Act and FFG Act is addressed in Table 4. Species considered 'likely to occur' are those that have a very high chance of being in the study area based on numerous records in the search region and suitable habitat in the study area. Species considered to have the 'potential to occur' are those where suitable habitat exists, but recent records are scarce.

This analysis indicates that none of the flora species listed in Table 4 are likely to occur or have the potential to occur in the study area due to a lack of suitable habitat.

Table 4: Listed flora species from the search region and likelihood of occurrence in the study area

Common Name	Scientific Name	Conservation Status		Habitat	Likelihood of occurrence
		EPBC	FFG		
Clover Glycine	*Glycine latrobeana*	V	L	Grasslands and grassy woodlands (Jeanes 1996).	Suitable habitat present but degraded and highly modified – **Unlikely to occur.**
Cream Spider-orchid	*Caladenia fragrantissima subsp. orientalis*	E	L	Heathlands and heathy woodlands on or near the coast in southern Gippsland (Entwisle 1994).	No suitable habitat present – **Unlikely to occur.**
Frankston Spider-orchid	*Caladenia robinsonii*	E	L	Only one remaining population near Rosebud. Grows in tall heathland dominated by *Lepidosperma laevigatum and Acacia sophorae* on low (grey) sandy ridges (Entwisle 1994).	No suitable habitat present – **Unlikely to occur.**
Grey Billy-buttons	*Craspedia canens*		L	Lowland grasslands, often on swamp fringes. Current records occur between Cranbourne and Traralgon (Everett 1999).	No suitable habitat present – **Unlikely to occur.**
Maroon Leek-orchid	*Prasophyllum frenchii*	E	L	Favouring heathland and grassland on black clays (Bates 1994).	No suitable habitat present – **Unlikely to occur.**
Matted Flax-lily	*Dianella amoena*	E	L	Lowland grassland and grassy woodlands on very well-drained to seasonally waterlogged fertile soils (Carr & Horsfall 1995).	No suitable habitat present – **Unlikely to occur.**
Metallic Sun-orchid	*Thelymitra epipactoides*	E	L	Coastal and inland in fertile loams, scrubby heaths or near swampy depressions (Weber & Entwisle 1994).	No suitable habitat present – **Unlikely to occur.**
Purple Blown-grass	*Lachnagrostis punicea subsp. filifolia*		L	Scattered in the SW of VIC, away from the coast. Occurs on seasonally wet, heavy clay soils (Walsh 1994).	No suitable habitat present – **Unlikely to occur.**
Purple Diuris	*Diuris punctata var. punctata*		L	Lowland native grasslands, grassy woodlands, heathy woodlands and open heathlands, usually on fertile, loamy soils and including periodically inundated areas (DSE 2004).	Suitable habitat present but degraded and highly modified – **Unlikely to occur.**
Purple Eyebright	*Euphrasia collina subsp. muelleri*	E	L	Heathlands and heathy woodlands on Mornington Peninsular and near Jamieson (Barker 1999).	No suitable habitat present – **Unlikely to occur.**
River Swamp Wallaby-grass	*Amphibromus fluitans*	V		Wetlands and permanent swamps (Walsh 1994).	No suitable habitat present – **Unlikely to occur.**
Small Snake-orchid	*Diuris pedunculata s.s.*	E		Prefers moist areas (Rouse 2003) and has been found growing in open areas of dry sclerophyll forests with grassy understories, in riparian forests (including gallery rainforests), swamp forests, in sub-alpine grasslands and herbfields (Quinn et al. 1995).	Suitable habitat present but degraded and highly modified – **Unlikely to occur.**
Swamp Everlasting	*Xerochrysum palustre*	V	L	Lowland swamps, usually on cracking clays (Flann 1999).	No suitable habitat present – **Unlikely to occur.**
Swamp Fireweed	*Senecio psilocarpus*	V		Herb-rich winter-wet swamps on volcanic clays or peaty soils (Walsh 1999).	No suitable habitat present – **Unlikely to occur.**

Notes: C = Critically Endangered; E = Endangered; V = Vulnerable; L = Listed as threatened under FFG Act

5.1.5. Fauna habitats

The study area supports the following habitat types:

- Native treed vegetation;
- Grazing paddocks; and
- Aquatic habitat.

Native Treed Vegetation: This habitat consists of small patches of remnant native vegetation scattered within the study area, and planted non-indigenous native trees with an exotic grassy ground cover. It comprises a small proportion of the site. This habitat was isolated and surrounded by existing houses and roads, and lacked any significant linkages to any larger patches of native remnant forest or woodland in the region. It was therefore not considered to form part of a wildlife corridor for native fauna. However; vegetation on site acts as a steppingstone between larger patches of significant vegetation.

The site has several windbreaks and roadside linear strips of vegetation. Roadside vegetation occurs along both the Westernport Highway and the Cranbourne–Frankston Road along with the Western Section of Ballarto Road within the study area. Several of the tree lines that exist within the study are comprise a number of scattered indigenous eucalypts. This habitat is considered to be low to medium quality habitat for fauna. Mobile and common local fauna could utilise the mature eucalypts for foraging, shelter and roosting. The study area boundary along Ballarto Road and the Ranfurleigh Golf Course contains a corridor of native tree plantings providing minor habitat.

Grazing paddocks: The majority of land on the site is cleared and covered mainly by exotic grasses, and a low density of scattered native and non-indigenous eucalypts, wattles and sheoaks. The scattered eucalypt trees are isolated from the patches of vegetation but are likely to provide some habitat for small numbers of birds and tree-dwelling mammals. This habitat generally lacked structural diversity, but the scattered trees are likely to provide movement opportunities at a landscape scale for more mobile fauna species, such as birds. Overall, this habitat is considered to be of low quality.

Aquatic habitat: The study area itself did not include wetlands; however a number of dams had been constructed to collect water for the chicken farm operation and for stock watering. The largest of these dams is located near the farms main chicken sheds and it is surrounded by a dense growth of trees, shrubs and weeds. This dam and its surroundings attracted a large number of the fauna species recorded on the site. The other dams are holes in the ground left from previous soil extraction and are currently filled with water used for stock watering. These dams lack vegetation and have bare edges. The dams in general are considered to be low to medium habitat quality for terrestrial fauna.

5.1.6. Fauna species

During the field assessment 48 fauna species were recorded. This included 42 bird (six introduced), four mammal (three introduced), one reptile and one frog species (Appendix 4).

No listed threatened fauna species were recorded in the study area during this investigation. It is understood however that Dwarf Galaxias, a threatened fish species, was recorded in aquatic habitat within the study area in 2011 (McGuckin 2011). It is

understood that the implications of the occurrence of this species have been dealt with as part of a separate assessment and that a Conservation Management Plan relating to this species has since been prepared (McGuckin 2013). The implications of state and federal legislation relating to the occurrence of this species within the study area are therefore not discussed further in this report.

The review of existing information indicated that 33 fauna species listed under the FFG Act and the EPBC Act have previously been recorded within the search region or for which potential habitat occurs. The likelihood of occurrence of these species in the study area was assessed and the results are presented in Table 5.

Species considered 'likely to occur' are those that have a very high chance of being in the study area given the existence of numerous records in the search region and suitable habitat in the study area. Using the precautionary approach, species considered to have the 'potential to occur' are those where suitable habitat exists, but recent records are scarce.

This assessment of potential occurrence of listed fauna species excludes:

- Marine mammals, given that the study area is inland
- Migratory oceanic bird species (such as albatrosses and petrels) and migratory shorebirds given that the study area is inland.

Table 5: Listed fauna species from the search region and likelihood of occurrence in the study area (excluding fish)

Common Name	Scientific Name	Conservation Status		Habitat	Number of Records	Year of Last Record	Likelihood of Occurrence
		EPBC	FFG				
Birds							
Australasian Bittern	*Botaurus poiciloptilus*	EN	L	Usually inhabits permanent freshwater wetlands with tall dense vegetation, particularly those dominated by sedges, rush, reeds or cutting grass (Marchant and Higgins 1990).	19	2006	No suitable habitat. **Unlikely to occur.**
Australian Painted Snipe	*Rostratula australis*	VU, M (CAMBA)	L	Shallow freshwater or brackish swamps, usually inland and often ephemeral, with emergent vegetation such as River Red Gum and Lignum and muddy margins (Garnett and Crowley 2000).	4	2000	No suitable habitat. **Unlikely to occur.**
Baillon's Crake	*Porzana pusilla palustris*		L	Ephemeral and permanent wetlands usually fresh or brackish, such as swamps, creeks and lakes, with dense vegetation and abundant floating plants, but also in open waters with clumped vegetation (Marchant and Higgins 1993).	13	2007	No suitable habitat. **Unlikely to occur.**
Blue-billed Duck	*Oxyura australis*		L	Terrestrial freshwater and brackish wetlands, preferring deep permanent, well vegetated water bodies (Marchant and Higgins 1990).	70	2007	Habitat suboptimal (farm dams). **Unlikely to occur regularly.**
Chestnut-rumped Heathwren	*Hylacola pyrrhopygia*		L	Dense heathland and dense understorey or ground-layer in sclerophyll forests and woodlands; also in Box-ironbark forests (Higgins and Peter 2002; Tzaros 2005).	4	2003	No suitable habitat. **Unlikely to occur.**
Eastern Great Egret	*Ardea modesta*	M (JAMBA, CAMBA)	L	Variety of wetlands including estuaries and intertidal mudflats; various permanent and ephemeral freshwater, brackish and saline wetlands; shallows of deep permanent lakes (Marchant and Higgins 1990).	39	2006	Habitat exists, although poor quality (farm dam). **Unlikely to occur regularly.**
Freckled Duck	*Stictonetta naevosa*		L	Terrestrial wetlands; prefer fresh, densely vegetated waters, particularly floodwater swamps and creeks vegetated with lignum or cane grass (Marchant and Higgins 1990).	9	2005	No suitable habitat. **Unlikely to occur.**
Grey Goshawk	*Accipiter novaehollandiae novaehollandiae*		L	Inhabit rainforests, open forests, swamp forests, woodlands and plantations; most abundant where forest or woodland provide cover for hunting from perches; some movement to open farmland and urban areas outside breeding season (Marchant and Higgins 1993).	4	1990	No suitable habitat. **Unlikely to occur.**
Grey-crowned Babbler	*Pomatostomus temporalis temporalis*		L	Inhabits dry woodlands and forests with a shrub layer and a groundcover of leaf litter and fallen timber. In Victoria it is found in woodlands and forests with box-ironbark eucalypt associations and River Red Gums, including narrow remnants along roadsides and streams (Higgins and Peter 2002; Tzaros 2005).	2	1988	No suitable habitat. **Unlikely to occur.**
Hooded Robin	*Melanodryas cucullata cucullata*		L	Mostly in lightly timbered woodlands dominated by acacias or eucalypts, often with pockets of saplings or taller shrubs, an open shrubby understorey, sparse grasses and patches of bare ground and leaf-litter, with scattered fallen timber (Higgins and Peter 2002; Tzaros 2005).	6	2008	No suitable habitat. **Unlikely to occur.**
Intermediate Egret	*Ardea intermedia*		L	Mainly in inland freshwater wetlands; occasionally visit coastal wetlands and forages amongst aquatic vegetation in shallow water and requires trees for roosting and nesting. Often occurs in wetlands that contain vegetation, including *Typha* (Marchant and Higgins 1990).	3	2001	No suitable habitat. **Unlikely to occur.**
Lewin's Rail	*Lewinia pectoralis pectoralis*		L	Occurs in a variety of densely vegetated wetland habitats, fresh or saline and usually with areas of standing water; requires shallow water areas to forage in (Marchant and Higgins 1993).	4	2007	No suitable habitat. **Unlikely to occur.**
Little Bittern	*Ixobrychus minutus dubius*		L	Inhabits terrestrial wetlands, in dense emergent vegetation in freshwater swamps, lakes and watercourses (Marchant and Higgins 1990).	2	2002	No suitable habitat. **Unlikely to occur.**

Common Name	Scientific Name	Conservation Status		Habitat	Number of Records	Year of Last Record	Likelihood of Occurrence
		EPBC	FFG				
Little Egret	*Egretta garzetta nigripes*		L	It occurs in a range of coastal and terrestrial wetlands, including freshwater wetlands with vegetation such as Typha and requires trees for roosting and nesting (Marchant and Higgins 1990).	8	2008	No suitable habitat. **Unlikely to occur.**
Magpie Goose (reintroduced)	*Anseranas semipalmata*		L	Terrestrial and aquatic habitats, but activities cantered on wetlands, mainly those on floodplains of rivers (Marchant and Higgins 1990).	2	2001	No suitable habitat. **Unlikely to occur.**
Orange-bellied Parrot	*Neophema chrysogaster*	EN	L	Inhabits natural saltmarshes dominated by Beaded Glasswort and Shrubby Glasswort as well as associated grassy or weedy pastures (Commonwealth of Australia 2005).	1	1964	No suitable habitat. **Unlikely to occur.**
Painted Honeyeater	*Grantiella picta*		L	Strongly associated with its main food plant mistletoe, particularly around the margins of dry open box and ironbark forests and woodlands (Higgins *et al.* 2001; Tzaros 2005).	1	1981	No suitable habitat. **Unlikely to occur.**
Powerful Owl	*Ninox strenua*		L	Open and tall wet sclerophyll forests with sheltered gullies and old growth forest with dense understorey. They are also found in dry forests with box and ironbark eucalypts and River Red Gum. Large old trees with hollows are required by this species for nesting (Higgins 1999; Soderquist *et al.* 2002).	3	2004	No suitable habitat. **Unlikely to occur.**
Regent Honeyeater	*Anthochaera phrygia*	EN, M (JAMBA)	L	Mainly dry scrleophyll forests and box-ironbark woodlands with copious flowering eucalypts and/or mistletoes, usually near rivers and creeks on inland slopes of the Great Dividing Range. It can also occur in small remnant patches or isolated clumps of mature flowering trees in farmland, coastal or urban areas (Higgins et al. 2001).	None	None	No suitable habitat. **Unlikely to occur.**
Swift Parrot	*Lathamus discolor*	EN	L	Prefers a narrow range of eucalypts in Victoria, including White Box, Red Ironbark and Yellow Gum as well as River Red Gum when this species supports abundant 'lerp' (Emison *et al.* 1987; Higgins 1999; Kennedy and Tzaros 2005).	3	1988	Habitat suboptimal (flowering eucalypts). **Unlikely to occur regularly.**
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	M (CAMBA)	L	Maritime habitats, terrestrial large wetlands and coastal lands of tropical and temperate Australia and offshore islands, ranging far inland only over large rivers and wetlands (Marchant and Higgins 1993).	6	2008	No suitable habitat. **Unlikely to occur.**
Wood Sandpiper	*Tringa glareola*	M (JAMBA, CAMBA, ROKAMBA, Bonn)		Inhabits well vegetated, shallow, freshwater wetlands, such as swamps, lakes, pools, and waterholes; typically with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reed (Higgins and Davies 1996).	12	2006	No suitable habitat. **Unlikely to occur.**
Mammals							
Grey-headed Flying-fox	*Pteropus poliocephalus*	VU	L	Roosts in riverine habitat in Melbourne and forages widely in flowering eucalypts and fruit trees (Menkhorst 1995).	None	None	Limited extent of suitable habitat (flowering eucalypts), but no historical records and distant from roost site (>40 km). **Unlikely to occur regularly.**
Long -nosed Potoroo	*Potorous tridactylus tridactylus*	VU	L	In Victoria coastal heathy woodland; In Tasmainia moist forest with dense shrub layer; in the north edge of rainforest (Menkhorst 1995).	1	1928	No suitable habitat. **Unlikely to occur.**
New Holland Mouse	*Pseudomys novaehollandiae*	VU	L	Coastal heath and scrub, heathy woodland, open forest and vegetated sand-dunes (Menkhorst 1995).	10	1984	No suitable habitat. **Unlikely to occur.**
Smoky Mouse	*Pseudomys fumeus*	EN	L	Coastal heath, heathy woodland, sub-alpine heath, dry forest and gullies in wet forest (Menkhorst 1995).	None	None	No suitable habitat. **Unlikely to occur.**
Southern Brown Bandicoot	*Isoodon obseulus obesulus*	EN	L	Heathy forest, woodland, coastal scrub and heathland (Menkhorst 1995).	79	2008	Study area is in close proximity to known populations. **Potential to occur.**

Common Name	Scientific Name	Conservation Status		Habitat	Number of Records	Year of Last Record	Likelihood of Occurrence
		EPBC	FFG				
Spot-tailed Quoll	*Dasyurus maculatus maculatus*	EN	L	Rainforest, wet and dry forest, coastal heath and scrub and River Red-gum woodlands along inland rivers (Menkhorst 1995).	None	None	No suitable habitat. **Unlikely to occur.**
Swamp Antechinus	*Antechinus minimus maritimus*		L	Dense wet heath, tussock grassland, sedgeland heathy woodland and coastal heath and scrub (Menkhorst 1995).	1	2007	No suitable habitat. **Unlikely to occur.**
Reptiles							
Swamp Skink	*Egernia coventryi*		L	Wetlands including swamp margins, lakes, rivers, creeks and even tidal salt marshes, often associated with tea-tree thickets (Wilson and Swan 2003).	15	2008	No suitable habitat. **Unlikely to occur.**
Amphibians							
Growling Grass Frog	*Litoria raniformis*	VU	L	Permanent, still or slow flowing water with fringing and emergent vegetation in streams, swamps, lagoons and artificial wetlands such as farm dams and abandoned quarries (Clemann and Gillespie 2004).	2	1981	Habitat suboptimal (unvegetated farm dams) and poorly linked with suitable movement corridors. **Unlikely to occur.**
Invertebrates							
Golden Sun Moth	*Synemon plana*	CE	L	Areas that are, or have been native grasslands or grassy woodlands. It is known to inhabit degraded grasslands with introduced grasses being dominant, with a preference for the native wallaby grass being present (DEWHA 2009).	2	undated	No suitable habitat. **Unlikely to occur.**
Large Ant Blue	*Acrodipsas brisbanensis*		L	Poorly known and patchy; inhabits native vegetation (often in or near hills) in association with Coconut Ant *Papyrius nitidus* (Jelinek and White 2003). This species is a 'Hill-topper', a behaviour whereby males tend to congregate on the summit of specific peaks, allowing unfertilised females to readily locate them (DSE 2003).	2	1941	No suitable habitat. **Unlikely to occur.**

Notes: CE = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Lower risk, near threatened; DD = data deficient; L = Listed as threatened under FFG Act; M = Listed migratory species; (JAMBA) = Japan-Australia Migratory Bird Agreement; (CAMBA) = China-Australia Migratory Bird Agreement; (ROKAMBA) = Republic of Korea- Australia Migratory Bird Agreement; (Bonn) = Bonn Convention

Birds

No listed non-migratory bird species are considered to have the potential to occur in the study area.

Migratory Birds

One listed migratory species, the Latham's Snipe, was considered likely to occur occasionally in small numbers. Based on the relevant guidelines, the proposed development would not result in a significant impact on this species.

Mammals

One listed mammal species is considered to have the potential to occur in the study area. The likelihood of occurrence in the study area and vulnerability of this species to possible impacts from the proposed development is discussed below.

- Southern Brown Bandicoot

  This species occurs along the coast along the length of Victoria in Heathy forest, woodland, coastal scrub, swamp scrub and heathland. Known stable populations of the species exist within the Cranbourne Botanical gardens directly east of the study area. Connectivity for the species occurs through the reserve for Ballarto Road and private property in the east which possesses suitable habitat albeit patchy on the subject property.

  While some connectivity exists along Ballarto Road, the Cranbourne-Frankston Road acts as a strong barrier in the movement of the species in the local region. Therefore, based on the isolation of habitat on site, as well as the low quality nature of the vegetation present within the study area, it is considered that the species is unlikely to occur.

  This is supported by the State Governments Southern Brown Bandicoot Sub Regional Strategy that does not designate the study area as providing core habitat or an important habitat corridor for the species.

Reptiles

No listed reptile species are considered to have the potential to occur in the study area.

Frogs

No listed frog species are considered to have the potential to occur in the study area.

Invertebrates

No listed invertebrate species are considered to have the potential to occur in the study area.

5.1.7. Listed ecological communities

No ecological communities listed under the FFG Act and the EPBC Act were identified in the study area.

6. IMPACTS AND REGULATORY IMPLICATIONS

6.1. Proposed development

The proposed development will involve the subdivision of land and development for mostly residential use. This will include the development of roads and restructuring of drainage lines across the study area. This will result in the loss of all native vegetation and fauna habitat in the study area.

6.2. Impacts to native vegetation under state provisions

6.2.1. Risk-based assessment pathway for the site

Location risk

The area of proposed native vegetation removal contained mapped areas of the following *location risk* categories:

- Location Risk A – covering the majority of this area; and
- Location Risk C – associated with highly localised habitat for Swamp Everlasting and Grey Billy-buttons in the western part of the study area.

Extent risk

The current development footprint will result in the loss of 14.070 hectares of native vegetation comprising:

- The loss of **3.940 hectares of native vegetation from remnant patches**; and
- The loss of **144 scattered trees**. Scattered tree losses have been converted to an hectare extent of loss by DEPI Transitional Support (See Appendix 8) by multiplying the number of trees by a standard area of 0.070 hectares; equating to an area loss of 10.130 hectares.

It is understood that no native vegetation has been approved for removal on the property within the last five years.

Risk-based assessment pathway

Based on the details above and the criteria outlined in Section 4.1.2 , the proposal will be assessed under the **high** risk assessment pathway and general and specific offsets apply to any approved native vegetation removal.

6.2.2. Strategic biodiversity score

The average weighted strategic biodiversity score across the native vegetation proposed to be removed was found to be 0.241, as determined by DEPI Transition Support and presented in Appendix 8.

6.2.3. Important habitat

The current development footprint will result in the removal of important habitat for two Victorian rare and threatened species, Swamp Everlasting and Grey Billy-buttons, as determined by DEPI Transition Support and presented in Appendix 8.

It should be noted that the likelihood of Swamp Everlasting and Grey Billy-buttons to occur in the study area was considered to be highly unlikely, given the highly modified state of potential habitat for these species.

6.2.4. Losses in Biodiversity Equivalence Units (BEUs)

As the project will be assessed under the high risk pathway, losses in both *general* and *specific* Biodiversity Equivalence Units (BEUs) apply.

The general biodiversity equivalence score is calculated by multiplying the losses from remnant patches and scattered trees in *habitat hectares* by the strategic biodiversity score.

The specific biodiversity equivalence score is calculated by multiplying the losses from remnant patches and scattered trees in *habitat hectares* by the habitat importance score for the relevant threatened species habitat modelled in the area.

As such, the proposed development will result in the loss of:

- 0.341 *general* biodiversity equivalence units (BEUs);
- 1.037 *specific* biodiversity equivalence units (BEUs) comprising habitat for Swamp Everlasting; and
- 0.703 *specific* biodiversity equivalence units (BEUs) comprising habitat for Grey Billy-Buttons.

6.3. Implications for the proposed development

6.3.1. Planning and Environment Act 1987

6.3.1.1. Local Provisions

No local provisions in the Casey Planning Scheme are relevant to this investigation.

6.3.1.2. State provisions

Under Clause 52.16-4, Table of Exemptions, a permit is not required to remove, destroy or lop native vegetation to the minimum extent necessary if the vegetation is regrowth. This regrowth must have naturally established or regenerated on land lawfully cleared of naturally established native vegetation. This applies to the site for Austral Bracken (*Pteridium esculentum*). Areas of Bracken over a weedy pasture grass understorey were present north of Habitat Zones K and AA, near the horse trotting training track. No other indigenous species were recorded in these areas of Austral Bracken. Provided that the previous clearing was undertaken lawfully and the other criteria above are met, a permit would not be required to remove the areas of Austral Bracken.

Furthermore, the Table of Exemptions includes planted vegetation such as the Southern Mahogany, Spotted Gum and Giant Honey Myrtle which has been planted across the property. Under this exemption, a permit would not be required for removal of these species.

A planning permit under Clause 52.16 of the Casey Planning Scheme is required for the removal of native vegetation in the study area.

The current proposal **would** trigger a referral to DEPI as it meets the criteria specified in Section 4.1.2.

Offset requirements

Offsets required to compensate for the proposed removal of native vegetation from the study area have been determined by DEPI Transitional Support and are provided in Appendix 8. General offsets are calculated by multiplying the loss in general BEUs by a risk factor of 1.5. Specific offsets are calculated by multiplying the loss in specific BEUs by a risk factor of 2. A summary of the required offsets are listed as follows:

- **0.512 general biodiversity equivalence units.** This offset must be located within the Port Phillip and Westernport Catchment Management Authority area or the Casey council area and must have a minimum strategic biodiversity score of 0.187.
- **2.074 specific biodiversity equivalence units for Swamp Everlasting.**
- **1.406 specific biodiversity equivalence units for Grey Billy-buttons.**

No offsets can occur within 150 metres of any dwellings and associated buildings on the subject land or adjoining properties covered by a BMO or within 50 metres of these structures on all other land occurring within Bushfire Prone Areas. Under the Guidelines *all* offsets must be secured prior to the removal of native vegetation.

The offset target for the current proposal cannot be achieved within the study area given the above requirements. As such, it is recommended that suitable offsets be sourced through a third party offset provider.

6.3.2. EPBC Act

Threatened ecological communities

No EPBC Act listed ecological communities were recorded or considered likely to occur.

Threatened flora species

No EPBC Act listed flora species were recorded or considered likely to occur.

Threatened fauna species

One EPBC Act listed fauna species, the Southern Brown Bandicoot was initially considered to have potential to occur based on the close proximity of known populations. However, based on the isolation of habitat, as well as the low quality nature of the vegetation present within the study area, it is considered that the species is unlikely to occur.

No other EPBC Act listed threatened fauna species were recorded and none were considered likely to occur.

One listed migratory species, the Latham's Snipe, was considered likely to occur occasionally in small numbers. Based on the relevant guidelines, the proposed development would not result in a significant impact on this species.

Conclusion

A referral under the EPBC Act is not considered to be required for the impacts on flora, fauna and/or ecological communities considered in this investigation.

6.3.3. FFG Act

The roadsides adjacent to the property along Westernport Highway and Cranbourne – Frankston Road were assessed in the 2011 field assessment and no FFG Act listed flora species were recorded or are considered likely to occur.

Threatened ecological communities

No FFG Act listed ecological communities were recorded or considered likely to occur.

Threatened/protected flora species

No FFG Act listed flora species were recorded or considered likely to occur.

Threatened fauna species

No FFG Act listed terrestrial fauna species were recorded and none were considered likely to occur.

Conclusion

A permit under the FFG Act is not considered to be required for the impacts on flora, fauna and/or ecological communities considered in this investigation.

6.3.4. EE Act

A Referral to the state Minister for Planning is unlikely to be required under the EE Act for the aspects covered by the current investigation.

6.4. Recommendations for mitigation

Best-practice development and construction recommendations are provided in Appendix 6. These should be considered to ensure impacts are minimised to flora and/or fauna, and native vegetation.

7. REFERENCES

Barker, WR 1999, 'Scrophulariaceae', in NG Walsh & TJ Entwisle (eds), Flora of Victoria - Volume 4: Dicotyledons Cornaceae to Asteraceae, Inkata Press, Melbourne, pp. 483-528.

Bates, RJ 1994, 'Prasophyllum', in NG Walsh & TJ Entwisle (eds), Flora of Victoria - Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons, Inkata Press, Melbourne, pp. 869-886.

BL&A 2007, *955 Cranbourne–Frankston Road, Cranbourne West; Flora and Fauna Assessment*, Brett Lane & Associates Pty Ltd, Carlton North, Victoria.

Cadwallader, PL & Backhouse, GN 1983, *A Guide to the Freshwater Fish of Victoria*. F.D. Atkinson Government Printer, Melbourne.

Carr, GW and Horsfall, PF 1995, 'Studies in Phormiaceae (Lilaceae) 1: New Species and Combinations in Dianella Lam. Ex Juss.', Muelleria: an Australia Journal of Botany Vol 8 pp. 365 – 378, National Herbarium of Victoria.

Clemann N and Gillespie GR 2004. 'Recovery Plan for *Litoria raniformis* 2004 – 2008. Department of Environment and Heritage, Canberra.

Cogger, H 2000, *Reptiles and Amphibians of Australia,* Reed Books, Australia.

Commonwealth of Australia 2005 Orange-bellied Parrot Recovery Plan. Commonwealth

Department of Environment and Primary Industries (DEPI) 2014, *Native Vegetation Information Management system*, Department of Environment and Primary Industries, East Melbourne, Victoria, viewed 20th May 2014, <http://www.depi.vic.gov.au>

Department of Environment and Primary Industries 2013a, *Permitted clearing of native vegetation: Biodiversity assessment guidelines* (dated September 2013), Department of Environment and Primary Industries, East Melbourne, Victoria.

Department of Environment and Primary Industries 2013b, *Flora and Fauna Guarantee Threatened List 2013*, Department of Environment and Primary Industries, East Melbourne, Victoria, viewed 27th April 2014, <http://www.depi.vic.gov.au

Department of Environment and Primary Industries 2013c, *Flora and Fauna Guarantee Act 1988 - Protected Flora List June 2013*, Department of Environment and Primary Industries (then DSE), East Melbourne, Victoria, viewed 27th April 2014, <http://www.depi.vic.gov.au

Department of Environment, Water, Heritage and the Arts (DEWHA) 2009, 'Background Paper to EPBC Act Policy Statement 3.12 – Nationally Threatened Species and Ecological Communities. Significant Impact Guidelines for the Critically Endangered Golden Sun Moth (*Synemon plana*)'.

Department of Natural Resources and Environment 1997, *Victoria's Biodiversity – Our Living Wealth*. Department of Natural Resources and Environment, Victoria.

Department of Natural Resources and Environment 2002, *Victoria's Native Vegetation Management – a Framework for Action*, Department of Natural Resources and Environment, Victoria.

Department of Sustainability and Environment 2003, Action Statement – Large Ant-blue Butterfly, Department of Sustainability and Environment, East Melbourne, Victoria.

Department of Sustainability and Environment 2004, *Native Vegetation: sustaining a living landscape, Vegetation Quality Assessment Manual – guidelines for applying the Habitat Hectare scoring method (Version 1.3)*. Department of Sustainability

Department of Sustainability and Environment 2006, *Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act 1978,* Department of Sustainability and Environment, East Melbourne, Victoria.

Department of Sustainability and Environment 2011a, *Ecological Vegetation Class (EVC) Benchmarks by Bioregion*, Department of Sustainability and Environment, East Melbourne, Victoria, viewed 28th June 2011, <http://www.dse.vic.gov.au>.

Department of Sustainability and Environment 2011b, *Biodiversity Interactive Map 2.0*. Department of Sustainability and Environment, East Melbourne, Victoria, viewed 28th June 2011, <http://www.dse.vic.gov.au>.

Department of Sustainability and Environment 2012a, *Ecological Vegetation Class (EVC) Benchmarks by Bioregion*, Department of Sustainability and Environment, East Melbourne, Victoria, viewed 28th September 2012, <http://www.dse.vic.gov.au>.

Department of Sustainability and Environment 2012b, *Biodiversity Interactive Map 2.0*. Department of Sustainability and Environment, East Melbourne, Victoria, viewed 28th September 2012, <http://www.dse.vic.gov.au>.

Department of the Environment 2012, *EPBC Act Protected Matters Search Tool*. Department of the Environment, Canberra, viewed 27th April 2014, <http://www.environment.gov.au >

Department of Transport, Planning and Local Infrastructure (DTPLI) 2014, *Planning Schemes Online – Casey Planning Scheme*, DTPLI, Melbourne, viewed 14th April 2014, < http://planningschemes.dpcd.vic.gov.au/schemes/casey>

DSE 2004. Action Statement No. 200 - Purple Diuris Diuris punctata var. punctata. Department of Sustainability and Environment, East Melbourne.

Emison, WB, Beardsell, CM, Norman, FI Loyn, RH, & Bennett, SC 1987, *Atlas of Victorian Birds*. Department of Conservation, Forests and Lands & Royal Australasian Ornithologists Union, Melbourne.

Emison, WB, Beardsell, CM, Norman, FI Loyn, RH, & Bennett, SC 1987, *Atlas of Victorian Birds*. Department of Conservation, Forests and Lands & Royal Australasian Ornithologists Union, Melbourne.

Entwisle, TJ 1994, 'Orchidaceae', in NG Walsh & TJ Entwisle (eds), Flora of Victoria - Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons, Inkata Press, Melbourne, pp. 740-901.

Everett, J 1999, 'Craspedia', in NG Walsh & TJ Entwisle (eds), Flora of Victoria - Volume 4: Dicotyledons Cornaceae to Asteraceae, Inkata Press, Melbourne, pp. 758-764.

Flann, C 1999, 'Bracteantha', in NG Walsh & TJ Entwisle (eds), Flora of Victoria - Volume 4: Dicotyledons Cornaceae to Asteraceae, Inkata Press, Melbourne, pp. 749-752.

Garnett, ST & Crowley, GM 2000, *The Action Plan for Australian Birds*. Environment Australia, Canberra.

Higgins, PJ & Davies, SJJF (eds) 1996, *Handbook of Australian, New Zealand & Antarctic Birds,* Volume 3 Snipe to Pigeons, Oxford University Press, Melbourne.

Higgins, PJ & Peter, JM (eds) 2002, *Handbook of Australian, New Zealand and Antarctic Birds*, Volume 6: Pardalotes to Shrike-thrushes, Oxford University Press, Melbourne.

Higgins, PJ (ed) 1999, *Handbook of Australian, New Zealand and Antarctic Birds*, Volume 4: Parrots to Dollarbird, Oxford University Press, Melbourne.

Higgins, PJ, Peter, JM & Steele, WK (eds) 2001, *Handbook of Australian, New Zealand and Antarctic Birds*, Volume 5: Tyrant-flycatchers to Chats, Oxford University Press, Melbourne.

Jeanes, JA 1996, 'Fabaceae', in NG Walsh & TJ Entwisle (eds), Flora of Victoria - Volume 3: Dicotyledons Winteraceae to Myrtaceae, Inkata Press, Melbourne, pp. 663-829.

Kennedy, SJ & Tzaros, CL 2005, 'Foraging ecology of the Swift Parrot *Lathamus discolor* in the Box-ironbark forests and woodlands of Victoria', *Pacific Conservation Biology* 11, 158 – 173.

Marchant, S & Higgins, PJ (eds) 1990, *Handbook of Australian, New Zealand and Antarctic Birds,* Volume 1: Ratites to Ducks', Oxford University Press, Melbourne.

Marchant, S & Higgins, PJ (eds) 1993, *Handbook of Australian, New Zealand and Antarctic Birds, Volume 2*, Raptors to Lapwings, Oxford University Press, Melbourne.

McGuckin J. 2011, *Fish survey of Brompton Lodge Precinct, Cranbourne South*, Streamline Research Pty. Ltd.

McGuckin, J. 2013, *Conservation Management Plan for the Dwarf Galaxias (Galaxiella pusilla) for the development of Brompton Lodge, Cranbourne South*, Streamline Research Pty. Ltd.

Menkhorst, P 1995, *Mammals of Victoria*, Oxford University Press, Melbourne.

Naarding, J.A. 1983. Latham's Snipe in Southern Australia. Wildlife Division Technical Report 83/1. Tasmania National Parks and Wildlife Service.

Parkes, D, Newell, G, & Cheal, D 2003, 'Assessing the Quality of Native Vegetation: The 'habitat hectares' approach'. *Ecological Management and Restoration*, vol. 4, supplement, pp. 29-38.

Port Phillip and Westernport Catchment Management Authority 2006, *Port Phillip and Western Port Native Vegetation Plan*, Port Phillip and Westernport Catchment Management Authority, Frankston, Victoria.

Quinn, F., J.B. Williams, C.L. Gross & J. Bruhl 1995. Report on rare and threatened plants of north-eastern New South Wales. Armidale: University of New England.

Rouse, D.T. 2003, Discovery of Diuris pedunculata R.Br. in Victoria. The Orchadian. 14(6):256-259.

Soderquist, TR, Lowe, KW, Loyn, RH & Price R 2002, Habitat quality in Powerful Owl (*Ninox strenua*) territories in the Box-Ironbark forest of Victoria, Australia.' In, I

Newton, R Kavanagh, J Olsen and I Taylor (eds), *Ecology and Conservation of Owls,* CSIRO Publishing, Melbourne, pp. 91-99.

Tzaros, C 2005, *Wildlife of the Box-Ironbark Country*. CSIRO Publishing, Melbourne.

Viridans Biological Databases 2011a, Victorian Flora Information System, Viridans Pty. Ltd., Bentleigh East, Victoria.

Viridans Biological Databases 2011b, Atlas of Victorian Wildlife, Viridans Pty. Ltd., Bentleigh East, Victoria.

Viridans Biological Databases 2012a, Victorian Flora Information System, Viridans Pty. Ltd., Bentleigh East, Victoria.

Viridans Biological Databases 2012b, Atlas of Victorian Wildlife, Viridans Pty. Ltd., Bentleigh East, Victoria.

Walsh, NG 1994, 'Poaceae', in NG Walsh & TJ Entwisle (eds), Flora of Victoria - Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons, Inkata Press, Melbourne, pp. 356-627.

Walsh, NG 1999, 'Senecio', in NG Walsh & TJ Entwisle (eds), Flora of Victoria - Volume 4: Dicotyledons Cornaceae to Asteraceae, Inkata Press, Melbourne, pp. 941-965.

Weber, JZ & Entwisle, TJ 1994, 'Thelymitra', in NG Walsh & TJ Entwisle (eds), Flora of Victoria - Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons, Inkata Press, Melbourne, pp. 840-854.

Wilson, S & Swan G 2003, *A Complete Guide to Reptiles of Australia*. Reed New Holland, Sydney.

Appendix 1: Detailed habitat hectare assessment results

Habitat Zone			A	B	D	E	F	G	H	I	J	K
Bioregion			GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
EVC Number			175	175	175	175	175	175	175	175	175	175
Total area of Habitat Zone (ha)			0.279	0.516	0.142	0.176	0.273	0.114	0.029	0.104	0.054	0.468
Site Condition	Large Old Trees	/10	0	0	0	0	0	0	0	0	0	0
	Tree Canopy Cover	/5	0	4	0	4	0	0	4	4	4	0
	Lack of Weeds	/15	0	0	0	0	0	0	0	0	0	0
	Understorey	/25	5	5	5	5	5	5	5	5	5	5
	Recruitment	/10	5	0	5	3	5	5	5	3	0	5
	Organic Matter	/5	2	2	2	3	2	2	2	0	2	2
	Logs	/5	0	2	0	0	0	0	0	0	0	0
	Site Condition subtotal		*12*	*13*	*12*	*15*	*12*	*12*	*16*	*12*	*11*	*12*
Landscape Context	Patch Size	/10	1	1	1	1	1	1	1	1	1	1
	Neighbourhood	/10	0	0	0	0	0	0	0	0	0	0
	Distance to Core	/5	1	1	1	1	1	1	1	1	1	1
Landscape context subtotal		/25	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Total Habitat Score		**/100**	**14**	**15**	**14**	**17**	**14**	**14**	**18**	**14**	**13**	**14**
Habitat score out of 1			0.14	0.15	0.14	0.17	0.14	0.14	0.18	0.14	0.13	0.14
Habitat Hectares in Habitat Zone#			**0.039**	**0.077**	**0.020**	**0.030**	**0.038**	**0.016**	**0.005**	**0.015**	**0.007**	**0.066**
Area of Habitat Zone to be removed (ha)			0.279	0.516	0.142	0.176	0.273	0.114	0.029	0.104	0.054	0.468
Habitat Hectares to be removed#			**0.039**	**0.077**	**0.020**	**0.030**	**0.038**	**0.016**	**0.005**	**0.015**	**0.007**	**0.066**

= Habitat hectares = habitat score (out of 1) x area in zone.

Habitat Zone			L	M	N	O	P	Q	R	S	T	U
Bioregion			GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
EVC Number			175	175	175	175	175	175	175	175	175	175
Total area of Habitat Zone (ha)			0.169	0.031	0.039	0.016	0.013	0.062	0.075	0.026	0.021	0.034
Site Condition	Large Old Trees	/10	0	0	0	0	0	0	0	10	0	0
	Tree Canopy Cover	/5	0	0	0	0	0	0	1	5	0	0
	Lack of Weeds	/15	0	0	4	0	0	0	2	0	0	0
	Understorey	/25	5	5	5	5	5	5	5	5	5	5
	Recruitment	/10	5	0	0	5	5	5	0	0	0	0
	Organic Matter	/5	2	0	0	0	0	0	5	0	0	0
	Logs	/5	0	0	0	0	0	0	4	0	0	0
	Site Condition subtotal		*12*	*5*	*9*	*10*	*10*	*10*	*17*	*20*	*5*	*5*
Landscape Context	Patch Size	/10	1	4^	4^	4^	4^	4^	4^	4^	4^	4^
	Neighbourhood	/10	0									
	Distance to Core	/5	1									
Landscape context subtotal		/25	*2*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*
Total Habitat Score		**/100**	**14**	**9**	**13**	**14**	**14**	**14**	**21**	**24**	**9**	**9**
Habitat score out of 1			0.14	0.09	0.13	0.14	0.14	0.14	0.21	0.24	0.09	0.09
Habitat Hectares in Habitat Zone#			**0.024**	**0.003**	**0.005**	**0.002**	**0.002**	**0.009**	**0.016**	**0.006**	**0.002**	**0.003**
Area of Habitat Zone to be removed (ha)			0.169	0.031	0.039	0.016	0.013	0.062	0.075	0.026	0.021	0.034
Habitat Hectares to be removed#			**0.024**	**0.003**	**0.005**	**0.002**	**0.002**	**0.009**	**0.016**	**0.006**	**0.002**	**0.003**

= Habitat hectares = habitat score (out of 1) x area in zone; ^ = Based on DEPIs Biodiversity Interactive Mapping Landscape Score.

Habitat Zone			V	W	X	Y	AA	BB	AAA	BBB	CCC	DDD
Bioregion			GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
EVC Number			175	175	175	175	175	175	175	175	175	175
Total area of Habitat Zone (ha)			0.008	0.041	0.028	0.035	0.166	0.062	0.225	0.159	0.081	0.224
Site Condition	Large Old Trees	/10	0	0	0	0	0	0	0	0	0	2
	Tree Canopy Cover	/5	0	0	0	0	2	4	2	0	0	4
	Lack of Weeds	/15	2	0	0	0	4	4	4	0	0	0
	Understorey	/25	5	5	5	5	5	5	15	5	5	5
	Recruitment	/10	0	0	0	0	3	3	3	3	5	3
	Organic Matter	/5	0	0	0	0	2	2	3	3	3	3
	Logs	/5	0	0	0	0	2	2	2	0	0	2
	Site Condition subtotal		*7*	*5*	*5*	*5*	*18*	*20*	*29*	*11*	*13*	*19*
Landscape Context	Patch Size	/10	4^	4^	4^	4^	1	1	1	1	1	1
	Neighbourhood	/10					0	0	0	0	0	0
	Distance to Core	/5					1	1	1	1	1	1
Landscape context subtotal		/25	*4*	*4*	*4*	*4*	*2*	*2*	*2*	*2*	*2*	*2*
Total Habitat Score		**/100**	**11**	**9**	**9**	**9**	**20**	**22**	**31**	**13**	**15**	**21**
Habitat score out of 1			0.11	0.09	0.09	0.09	0.20	0.22	0.31	0.13	0.15	0.21
Habitat Hectares in Habitat Zone#			**0.001**	**0.004**	**0.003**	**0.003**	**0.033**	**0.014**	**0.070**	**0.021**	**0.012**	**0.047**
Area of Habitat Zone to be removed (ha)			0.008	0.041	0.028	0.035	0.166	0.062	0.225	0.159	0.081	0.224
Habitat Hectares to be removed#			**0.001**	**0.004**	**0.003**	**0.003**	**0.033**	**0.014**	**0.070**	**0.021**	**0.012**	**0.047**

= Habitat hectares = habitat score (out of 1) x area in zone; ^ = Based on DEPIs Biodiversity Interactive Mapping Landscape Score.

Habitat Zone			EEE	FFF
Bioregion			GW	GW
EVC Number			175	175
Total area of Habitat Zone (ha)			0.138	0.131
Site Condition	Large Old Trees	/10	10	0
	Tree Canopy Cover	/5	3	0
	Lack of Weeds	/15	2	0
	Understorey	/25	5	5
	Recruitment	/10	0	3
	Organic Matter	/5	0	4
	Logs	/5	2	0
	Site Condition subtotal		*22*	*12*
Landscape Context	Patch Size	/10	1	1
	Neighbourhood	/10	0	0
	Distance to Core	/5	1	1
Landscape context subtotal		/25	*2*	*2*
Total Habitat Score		**/100**	**24**	**14**
Habitat score out of 1			0.24	0.14
Habitat Hectares in Habitat Zone#			**0.033**	**0.018**
Area of Habitat Zone to be removed (ha)			0.138	0.131
Habitat Hectares to be removed#			**0.033**	**0.018**

= Habitat hectares = habitat score (out of 1) x area in zone.

Appendix 2: Scattered trees in the study area

Tree No.	Species	DBH	Notes	Remove/Retain
1	River Red Gum	79		Remove
2	Swamp Gum	51		Remove
3	Swamp Gum	71		Remove
4	Swamp Gum	35		Remove
5	Coast Manna-gum	111		Remove
6	Rough barked Manna Gum	94		Remove
7	Swamp Gum	26		Remove
8	Black Sheoak	32		Remove
9	Black Sheoak	47		Remove
10	Black Sheoak	35		Remove
11	Black Sheoak	31		Remove
12	Black Sheoak	31		Remove
13	Black Sheoak	15		Remove
14	Black Sheoak	20		Remove
15	Black Sheoak	28		Remove
16	Rough barked Manna Gum	70		Remove
17	Rough barked Manna Gum	75		Remove
18	Rough barked Manna Gum	32		Remove
19	Rough barked Manna Gum	30		Remove
20	Rough barked Manna Gum	56		Remove
21	Swamp Gum	30		Remove
22	Rough barked Manna Gum	42		Remove
23	Rough barked Manna Gum	30		Remove
24	Swamp Gum	48		Remove
25	River Red-gum	67		Remove
26	Swamp Gum	35		Remove
27	Swamp Gum	69		Remove
28	Coast Manna-gum	61		Remove
29	Swamp Gum	25		Remove
30	Swamp Gum	30		Remove
31	Swamp Gum	40		Remove
32	Coast Manna-gum	85		Remove
33	Coast Manna-gum	25		Remove
34	Swamp Gum	51		Remove
35	Mealy Stringybark	54		Remove
36	Coast Manna-gum	72		Remove
37	Coast Manna-gum	23		Remove
38	Coast Manna-gum	69		Remove

Tree No.	Species	DBH	Notes	Remove/Retain
39	Coast Manna-gum	44		Remove
40	Coast Manna-gum	80		Remove
41	Mealy Stringybark	41		Remove
42	Coast Manna-gum	30		Remove
43	Coast Manna-gum	15		Remove
44	Mealy Stringybark	10		Remove
45	Coast Manna-gum	37		Remove
46	Coast Manna-gum	43		Remove
47	Coast Manna-gum	23		Remove
48	Coast Manna-gum	44	Dead	Remove
49	Coast Manna-gum	28		Remove
50	Coast Manna-gum	59		Remove
51	Narrow-leaved Peppermint	13		Remove
52	Narrow-leaved Peppermint	17		Remove
53	Narrow-leaved Peppermint	10		Remove
54	Narrow-leaved Peppermint	8		Remove
55	Narrow-leaved Peppermint	12		Remove
56	Narrow-leaved Peppermint	11		Remove
57	Narrow-leaved Peppermint	12		Remove
58	Mealy Stringybark	22		Remove
59	Coast Manna-gum	9		Remove
60	Mealy Stringybark	47		Remove
61	Coast Manna-gum	36		Remove
62	Mealy Stringybark	24		Remove
63	Narrow-leaved Peppermint	8		Remove
64	Swamp Gum	26		Remove
65	Mealy Stringybark	63		Remove
66	Mealy Stringybark	22		Remove
67	Coast Manna-gum	26		Remove
68	Coast Manna-gum	38		Remove
69	Narrow-leaved Peppermint	14		Remove
70	Mealy Stringybark	37		Remove
71	Coast Manna-gum	20		Remove
72	Coast Manna-gum	10		Remove
73	Mealy Stringybark	49	Dead	Remove
74	Coast Manna-gum	54		Remove
75	Coast Manna-gum	90		Remove
76	Coast Manna-gum	40	Dead	Remove
77	Coast Manna-gum	33		Remove
78	Coast Manna-gum	59		Remove

Tree No.	Species	DBH	Notes	Remove/Retain
79	Mealy Stringybark	37		Remove
80	Swamp Gum	40		Remove
81	Swamp Gum	40		Remove
82	Swamp Gum	57		Remove
83	Coast Manna-gum	50	DBH estimated	Remove
84	Coast Manna-gum	65	DBH estimated	Remove
85	Coast Manna-gum	70	DBH estimated	Remove
86	Coast Manna-gum	35	DBH estimated	Remove
87	Coast Manna-gum	35	DBH estimated	Remove
88	Coast Manna-gum	85	DBH estimated	Remove
89	Coast Manna-gum	35		Remove
90	Coast Manna-gum	37		Remove
91	Coast Manna-gum	36		Remove
92	Coast Manna-gum	45		Remove
93	Coast Manna-gum	85		Remove
94	Mealy Stringybark	57		Remove
95	Mealy Stringybark	45		Remove
96	Mealy Stringybark	32		Remove
97	Mealy Stringybark	66		Remove
98	Mealy Stringybark	44		Remove
99	Mealy Stringybark	50		Remove
100	Swamp Gum	46		Remove
101	Coast Manna-gum	90	Dead	Remove
102	Coast Manna-gum	103		Remove
103	Coast Manna-gum	50	Dead	Remove
104	Coast Manna-gum	76		Remove
105	Coast Manna-gum	70		Remove
106	Coast Manna-gum	62		Remove
107	Coast Manna-gum	56		Remove
108	Coast Manna-gum	79		Remove
109	Coast Manna-gum	60	DBH estimated	Remove
110	Coast Manna-gum	74		Remove
111	Coast Manna-gum	45		Remove
112	Coast Manna-gum	103		Remove
113	Swamp Gum	78		Remove
114	Coast Manna-gum	80		Remove
115	Coast Manna-gum	126		Remove
116	Coast Manna-gum	96	Dead	Remove
117	Coast Manna-gum	85		Remove
118	Coast Manna-gum	83		Remove

Tree No.	Species	DBH	Notes	Remove/Retain
119	Coast Manna-gum	111		Remove
120	Coast Manna-gum	48		Remove
121	Coast Manna-gum	68	Dead	Remove
122	Coast Manna-gum	96		Remove
123	Coast Manna-gum	64		Remove
124	Coast Manna-gum	69	Dead	Remove
125	Coast Manna-gum	50		Remove
126	Coast Manna-gum	44	Dead	Remove
127	Coast Manna-gum	48	Dead	Remove
128	Coast Manna-gum	45		Remove
129	Coast Manna-gum	49	Dead	Remove
130	Coast Manna-gum	43	Dead	Remove
131	Coast Manna-gum	59	Dead	Remove
132	Swamp Gum	70	Dead	Remove
133	Swamp Gum	80		Remove
134	Swamp Gum	44		Remove
135	Swamp Gum	23		Remove
136	Swamp Gum	68		Remove
137	Swamp Gum	50		Remove
138	Swamp Gum	37		Remove
139	Coast Manna-gum	29		Remove
140	Swamp Gum	62		Remove
141	River Red-gum	85		Remove
142	Coast Manna-gum	34		Remove
143	Coast Manna-gum	23		Remove
144	Swamp Gum	75		Remove

Notes: DBH = Diameter at breast height (130 cm from the ground)

Appendix 3: Flora species recorded in the study area and threatened species known (or with the potential) to occur in the search region

Origin	Common Name	Scientific Name	Family Name	Conservation status			Recorded
				EPBC	FFG	DEPI	
*	African Box-thorn	*Lycium ferocissimum*	Solanaceae				X
*	Alligator Weed	*Alternanthera philoxeroides*	Amaranthaceae				X
*	Amaranth	*Amaranthus spp.*	Amaranthaceae				X
*	Angled Onion	*Allium triquetrum*	Alliaceae				X
	Annual Bitter-cress	*Cardamine paucijuga s.s.*	Brassicaceae			v	
	Annual Fireweed	*Senecio glomeratus subsp. longifructus*	Asteraceae			r	
	Annual Fireweed	*Senecio glomeratus*	Asteraceae				X
*	Annual Meadow-grass	*Poa annua*	Poaceae				X
*	Annual Veldt-grass	*Ehrharta longiflora*	Poaceae				X
*	Artichoke Thistle	*Cynara cardunculus*	Asteraceae				X
	Austral Bracken	*Pteridium esculentum*	Dennstaedtiaceae				X
	Austral Trefoil	*Lotus australis var. australis*	Fabaceae			k	
	Australian Sheep's Burr	*Acaena ovina*	Rosaceae				X
*	Barley-grass	*Hordeum leporinum*	Poaceae				X
	Basalt Tussock-grass	*Poa labillardierei var. (Volcanic Plains)*	Poaceae			k	
*	Bastard's Fumitory	*Fumaria bastardii*	Fumariaceae				X
	Bidgee-widgee	*Acaena novae-zelandiae*	Rosaceae				X
*	Black Nightshade	*Solanum nigrum s.s.*	Solanaceae				X
	Black Sheoke	*Allocasuarina littoralis*	Casuarinaceae				X
	Black Wattle	*Acacia mearnsii*	Mimosaceae				X
*	Blackberry	*Rubus fruticosus spp. agg.*	Rosaceae				X
	Blackwood	*Acacia melanoxylon*	Mimosaceae				X

Origin	Common Name	Scientific Name	Family Name	Conservation status			Recorded
				EPBC	FFG	DEPI	
#	Blue Gum	*Eucalyptus globulus*	Myrtaceae				X
*	Bluebell Creeper	*Billardiera heterophylla*	Pittosporaceae				X
	Blunt Pondweed	*Potamogeton ochreatus*	Potamogetonaceae				X
Pl	Bog Gum	*Eucalyptus kitsoniana*	Myrtaceae			r	X
#Pl	Bottlebrush	*Callistemon ssp.*	Myrtaceae				X
	Bracken	*Pteridium esculentum*	Dennstaedtiaceae				X
*	Bridal Creeper	*Asparagus asparagoides*	Asparagaceae				X
	Bronze Bird-orchid	*Chiloglottis X pescottiana*	Orchidaceae			r	
	Broom Spurge	*Amperea xiphoclada var. xiphoclada*	Euphorbiaceae				X
*	Canary Grass	*Phalaris spp.*	Poaceae				X
*	Cape Wattle	*Paraserianthes lophantha subsp. lophantha*	Mimosaceae				X
*	Cape Weed	*Arctotheca calendula*	Asteraceae				X
*	Cat's Ear	*Hypochoeris radicata*	Asteraceae				X
	Cherry Ballart	*Exocarpos cupressiformis*	Santalaceae				X
*	Cleavers	*Galium aparine*	Rubiaceae				X
*	Clover	*Trifolium spp.*	Fabaceae				X
	Clover Glycine	*Glycine latrobeana*	Fabaceae	V	f	v	
*	Clustered Dock	*Rumex conglomeratus*	Polygonaceae				X
	Clustered Lily	*Thelionema umbellatum*	Hemerocallidaceae			r	
	Cluster-headed Mat-rush	*Lomandra longifolia subsp. exilis*	Xanthorrhoeaceae				X
	Coast Fescue	*Austrofestuca littoralis*	Poaceae			r	
	Coast Manna-gum	*Eucalyptus viminalis subsp. pryoriana*	Myrtaceae				X
	Coast Tea – tree	*Leptospermum laevigatum*	Myrtaceae				X
#	Coast Wattle	*Acacia longifolia subsp. sophorae*	Mimosaceae				X

Origin	Common Name	Scientific Name	Family Name	Conservation status			Recorded
				EPBC	FFG	DEPI	
*	Cocksfoot	*Dactylis glomerata*	Poaceae				X
	Common Apple-berry	*Billardiera mutabilis*	Pittosporaceae				X
*	Common Mouse-ear Chickweed	*Cerastium glomeratum s.l.*	Caryophyllaceae				X
	Common Raspwort	*Gonocarpus tetragynus*	Haloragaceae				X
*	Common Sow-thistle	*Sonchus oleraceus*	Asteraceae				X
	Common Spike-sedge	*Eleocharis acuta*	Cyperaceae				X
*	Common Vetch	*Vicia sativa subsp. sativa*	Fabaceae				X
*	Couch	*Cynodon dactylon var. dactylon*	Poaceae				X
	Cream Spider-orchid	*Caladenia fragrantissima subsp. orientalis*	Orchidaceae	f	E	e	
	Cryptic Pink-fingers	*Caladenia mentiens*	Orchidaceae			k	
*	Curled Dock	*Rumex crispus*	Polygonaceae				X
*	Cut-leaf Crane's-bill	*Geranium dissectum*	Geraniaceae				X
*	Dandelion	*Taraxacum spp.*	Asteraceae				X
*	Desert Ash	*Fraxinus angustifolia*	Oleaceae				X
*	Dove's Foot	*Geranium molle*	Geraniaceae				X
*	Drain Flat-sedge	*Cyperus eragrostis*	Cyperaceae				X
Pl	Drooping Sheoak	*Allocasuarina verticillata*	Casuarinaceae				X
	Dune Poa	*Poa poiformis var. ramifer*	Poaceae			r	
	Eastern Spider-orchid	*Caladenia orientalis*	Orchidaceae	E	f	e	
	Fen Sedge	*Carex gaudichaudiana*	Cyperaceae				X
*	Flax leaf Broom	*Genista linifolia*	Fabaceae				X
#	Floating Bladderwort	*Utricularia gibba*	Lentibulariaceae			v	
	Floating Bur-reed	*Sparganium subglobosum*	Sparganiaceae			k	

Origin	Common Name	Scientific Name	Family Name	Conservation status			Recorded
				EPBC	FFG	DEPI	
#PI	Flowering Gum	*Corymbia ficifolia*	Myrtaceae				X
	Frankston Spider-orchid	*Caladenia robinsonii*	Orchidaceae	E	f	e	
	Fringed Helmet-orchid	*Corybas fimbriatus*	Orchidaceae			r	
	Fringed Midge-orchid	*Corunastylis ciliata*	Orchidaceae			k	
#PI	Giant Honey-myrtle	*Melaleuca armillaris subsp. armillaris*	Myrtaceae			r	X
#	Gold Dust Wattle	*Acacia pycnantha*	Mimosaceae				X
*	Gorse	*Ulex europaeus*	Fabaceae				X
	Grampians Thryptomene	*Thryptomene calycina*	Myrtaceae			r	
	Granite Greenhood	*Pterostylis tunstallii*	Orchidaceae			v	
*	Greater Plantain	*Plantago major*	Plantaginaceae				X
	Green Leek-orchid	*Prasophyllum lindleyanum*	Orchidaceae			v	
	Green Scentbark	*Eucalyptus fulgens*	Myrtaceae			r	
	Grey Billy-buttons	*Craspedia canens*	Asteraceae		f	e	
	Grey Spike-sedge	*Eleocharis macbarronii*	Cyperaceae			k	
*	Hair Grass	*Aira spp.*	Poaceae				X
*	Hawthorn	*Crataegus monogyna*	Rosaceae				X
	Hedge Wattle	*Acacia paradoxa*	Mimosaceae				X
*	Horehound	*Marrubium vulgare*	Lamiaceae				X
	Kangaroo Apple	*Solanum aviculare*	Solanaceae				X
*	Kikuyu	*Cenchrus clandestinus*	Poaceae				X
	Lacey River Buttercup	*Ranunculus amplus*	Ranunculaceae			r	
*	Large Quaking-grass	*Briza maxima*	Poaceae				X
	Large River Buttercup	*Ranunculus papulentus*	Ranunculaceae			k	
	Lightwood	*Acacia implexa*	Mimosaceae				X

Origin	Common Name	Scientific Name	Family Name	Conservation status			Recorded
				EPBC	FFG	DEPI	
	Lizard Orchid	*Burnettia cuneata*	Orchidaceae			r	
*	Mallow of Nice	*Malva nicaeensis*	Malvaceae				X
PI	Manna Gum	*Eucalyptus viminalis subsp. viminalis*	Myrtaceae				X
	Maroon Leek-orchid	*Prasophyllum frenchii*	Orchidaceae	E	f	e	
	Matted Flax-lily	*Dianella amoena*	Hemerocallidaceae	E	f	e	
*	Meadow Fox-tail	*Alopecurus pratensis*	Poaceae				X
	Mealy Stringybark	*Eucalyptus cephalocarpa s.s.*	Myrtaceae				X
*	Mediterranean Barley-grass	*Hordeum hystrix*	Poaceae				X
	Mentone Greenhood	*Pterostylis X toveyana*	Orchidaceae			v	
	Metallic Sun-orchid	*Thelymitra epipactoides*	Orchidaceae	E	f	e	
*	Mirror Bush	*Coprosma repens*	Rubiaceae				X
*	Monterey Cypress	*Cupressus macrocarpa*	Cupressaceae				X
*	Montpellier Broom	*Genista monspessulana*	Fabaceae				X
	Mud Dock	*Rumex bidens*	Polygonaceae				X
	Naked Sun-orchid	*Thelymitra circumsepta*	Orchidaceae			v	
	Narrow-leaf Peppermint	*Eucalyptus radiata subsp. radiata*	Myrtaceae				X
PI	Narrow-leaf Wattle	*Acacia mucronata subsp. longifolia*	Mimosaceae				X
*	Onion Grass	*Romulea rosea*	Iridaceae				X
	Orange-tip Finger-orchid	*Caladenia aurantiaca*	Orchidaceae			r	
	Pale Flax-lily	*Dianella longifolia s.l.*	Hemerocallidaceae				X
	Pale Grass-lily	*Caesia parviflora var. minor*	Hemerocallidaceae			k	
	Pale Rush	*Juncus pallidus*	Juncaceae				x
	Pale Swamp Everlasting	*Coronidium scorpioides 'aff. rutidolepis (Lowland Swamp*	Asteraceae			v	

Origin	Common Name	Scientific Name	Family Name	Conservation status			Recorded
				EPBC	FFG	DEPI	
*	Pale Wood-sorrel	*Oxalis incarnata*	Oxalidaceae				X
*	Panic Veldt-grass	*Ehrharta erecta var. erecta*	Poaceae				X
	Perennial Blown-grass	*Lachnagrostis perennis spp. agg.*	Poaceae			k	
*	Perennial Rye-grass	*Lolium perenne*	Poaceae				X
*	Perennial Veldt-grass	*Ehrharta calycina*	Poaceae				X
	Plains Joyweed	*Alternanthera sp. 1 (Plains)*	Amaranthaceae			k	
	Plains Yam-daisy	*Microseris scapigera s.s.*	Asteraceae			v	
	Powelltown Correa	*Correa reflexa var. lobata*	Rutaceae			r	
	Prawn Greenhood	*Pterostylis pedoglossa*	Orchidaceae			v	
	Prickly Moses	*Acacia verticillata*	Mimosaceae				X
	Prickly Tea-tree	*Leptospermum continentale*	Myrtaceae				X
*	Privet	*Ligustrum spp.*	Oleaceae				X
*	Prunus	*Prunus spp.*	Rosaceae				X
	Purple Blown-grass	*Lachnagrostis punicea subsp. filifolia*	Poaceae		f	r	
	Purple Diuris	*Diuris punctata var. punctata*	Orchidaceae		f	v	
	Purple Eyebright	*Euphrasia collina subsp. muelleri*	Orobanchaceae	E	f	e	
*	Radiata Pine	*Pinus radiata*	Pinaceae				X
*	Red salvia	*Salvia coccinea*	Lamiaceae				X
	Red-fruit Saw-sedge	*Gahnia sieberiana*	Cyperaceae				X
*	Red-ink Weed	*Phytolacca octandra*	Phytolaccaceae				X
*	Ribwort	*Plantago lanceolata*	Plantaginaceae				X
Pl	River Red-gum	*Eucalyptus camaldulensis*	Myrtaceae				X
	River Swamp Wallaby-grass	*Amphibromus fluitans*	Poaceae	V			
*	Rough Sow-thistle	*Sonchus asper s.s.*	Asteraceae				X

Origin	Common Name	Scientific Name	Family Name	Conservation status			Recorded
				EPBC	FFG	DEPI	
	Rush	*Juncus sp.*	Juncaceae				x
*	Rye Grass	*Lolium spp.*	Poaceae				X
#	Sallow Wattle	*Acacia longifolia subsp. longifolia*	Mimosaceae				X
*	Scotch Thistle	*Onopordum acanthium*	Asteraceae				X
*	Sharp Buttercup	*Ranunculus muricatus*	Ranunculaceae				X
*	Sheep Sorrel	*Acetosella vulgaris*	Polygonaceae				X
Pl	Sheoak	*Allocasuarina spp.*	Casuarinaceae				X
Pl	Silver Banksia	*Banksia marginata*	Proteaceae				X
	Silver Wattle	*Acacia dealbata*	Mimosaceae				X
	Slender Knotweed	*Persicaria decipiens*	Polygonaceae				X
	Small Grass-tree	*Xanthorrhoea minor subsp. lutea*	Xanthorrhoeaceae				X
*	Small Nettle	*Urtica urens*	Urticaceae				X
	Small Snake-orchid	*Diuris subalpina*	Orchidaceae	E		e	
	Small-leaved Clematis	*Clematis microphylla*	Ranunculaceae				X
#	Smooth Nardoo	*Marsilea mutica*	Marsileaceae			k	
	Smooth Willow-herb	*Epilobium billardierianum subsp. billardierianum*	Onagraceae				X
	Soft Crane's-bill	*Geranium potentilloides*	Geraniaceae				X
*	Soursob	*Oxalis pes-caprae*	Oxalidaceae				X
#Pl	Southern Blue-gum	*Eucalyptus globulus*	Myrtaceae				X
	Southern Bristle-sedge	*Chorizandra australis*	Cyperaceae			k	
#Pl	Southern Mahogany	*Eucalyptus botryoides*	Myrtaceae				X
	Spear Grass	*Austrostipa spp.*	Poaceae				X
*	Spear Thistle	*Cirsium vulgare*	Asteraceae				X
	Spiny-headed Mat-rush	*Lomandra longifolia subsp. longifolia*	Xanthorrhoeaceae				X

Origin	Common Name	Scientific Name	Family Name	Conservation status			Recorded
				EPBC	FFG	DEPI	
#	Spotted Gum	*Corymbia maculata*	Myrtaceae			v	X
#	Sticky Wattle	*Acacia howittii*	Mimosaceae			r	
	Studley Park Gum	*Eucalyptus X studleyensis*	Myrtaceae			e	
*	Sugar Gum	*Eucalyptus cladocalyx*	Myrtaceae				X
	Swamp Everlasting	*Xerochrysum palustre*	Asteraceae	V	f	v	
	Swamp Fireweed	*Senecio psilocarpus*	Asteraceae	V		v	
	Swamp Gum	*Eucalyptus ovata*	Myrtaceae				X
#	Swamp Paperbark	*Melaleuca ericifolia*	Myrtaceae				X
*	Sweet Briar	*Rosa rubiginosa*	Rosaceae				X
#	Sweet Pittosporum	*Pittosporum undulatum*	Pittosporaceae				X
*	Sweet Vernal-grass	*Anthoxanthum odoratum*	Poaceae				X
	Tall Sedge	*Carex appressa*	Cyperaceae				X
	Thatch Saw-sedge	*Gahnia radula*	Cyperaceae				X
*	Tiny Flat-sedge	*Isolepis levynsiana*	Cyperaceae				X
*	Tiny Vetch	*Vicia hirsuta*	Fabaceae				X
	Toad Rush	*Juncus bufonius*	Juncaceae				X
*	Toowoomba Canary-grass	*Phalaris aquatica*	Poaceae				X
*	Tree Lucerne	*Chamaecytisus palmensis*	Fabaceae				X
*	Turnip	*Brassica spp.*	Brassicaceae				X
	Upright Panic	*Entolasia stricta*	Poaceae			k	
	Wallaby Grass	*Rytidosperma spp.*	Poaceae				X
*	Wandering Jew	*Tradescantia fluminensis*	Commelinaceae				X
	Wattle Mat-rush	*Lomandra filiformis subsp. filiformis*	Xanthorrhoeaceae				X
	Weeping Grass	*Microlaena stipoides var. stipoides*	Poaceae				X

Origin	Common Name	Scientific Name	Family Name	Conservation status			Recorded
				EPBC	FFG	DEPI	
*	Weeping Willow	*Salix babylonica s.l.*	Salicaceae				X
*	White Clover	*Trifolium repens var. repens*	Fabaceae				X
*	White Turnip	*Brassica rapa*	Brassicaceae				X
*	Wild Oat	*Avena fatua*	Poaceae				X
*	Willow	*Salix spp.*	Salicaceae				X
*	Willow Myrtle	*Agonis flexuosa*	Myrtaceae				X
*	Wood Sorrel	*Oxalis spp.*	Oxalidaceae				X
	Woolly Waterlily	*Philydrum lanuginosum*	Philydraceae			v	
	Yarra Gum	*Eucalyptus yarraensis*	Myrtaceae			r	
	Yellow Hakea	*Hakea nodosa*	Proteaceae				X
*	Yorkshire Fog	*Holcus lanatus*	Poaceae				X

***** = introduced species; **#** = native species occurring outside of natural range; **Pl** = planted; **L** = listed as threatened; **EPBC** = status under EPBC Act; **DEPI** = status under DEPI's Advisory List; **C** = critically endangered; **E, e** = endangered; **V, v** = vulnerable; **R, r** = rare; **k** = insufficiently known

Appendix 4: Vertebrate terrestrial fauna species that occur or are likely to occur in the study area (excluding fish)

Origin	Common Name	Scientific Name	Conservation Status			Recorded
			EPBC	FFG	DEPI	
	Australasian Pipit	*Anthus novaeseelandiae*				X
	Australasian Shoveler	*Anas rhynchotis*			VU	
	Australian Magpie	*Gymnorhina tibicen*				X
	Australian Pelican	*Pelecanus conspicillatus*				X
	Australian White Ibis	*Threskiornis molucca*				X
	Australian Wood Duck	*Chenonetta jubata*				X
	Azure Kingfisher	*Alcedo azurea*			NT	
	Brown Thornbill	*Acanthiza pusilla*				X
	Brown Thornbill	*Acanthiza pusilla*				X
	Brown Toadlet	*Pseudophryne bibronii*		L	EN	
	Chestnut Teal	*Anas castanea*				X
*	Common Blackbird	*Turdus merula*				X
	Common Bronzewing	*Phaps chalcoptera*				X
	Common Froglet	*Crinia signifera*				X
*	Common Myna	*Acridotheres tristis*				X
	Common Ringtail Possum	*Pseudocheirus peregrinus*				X
*	Common Starling	*Sturnus vulgaris*				X
	Crested Pigeon	*Ocyphaps lophotes*				X
	Damselfly	*Hemiphlebia mirabilis*		L	EN	
	Eastern Great Egret	*Ardea modesta*		L	VU	
	Eastern Rosella	*Platycercus eximius*				X
*	European Rabbit	*Oryctolagus cuniculus*				X

Origin	Common Name	Scientific Name	Conservation Status			Recorded
			EPBC	FFG	DEPI	
	Flame Robin	*Petroica phoenicea*				X
	Galah	*Eolophus roseicapilla*				X
	Grey Fantail	*Rhipidura albiscarpa*				X
	Grey Shrike-thrush	*Colluricincla harmonica*				X
	Hardhead	*Aythya australis*			VU	
*	House Mouse	*Mus musculus*				X
*	House Sparrow	*Passer domesticus*				X
	Latham's Snipe	*Gallinago hardwickii*			NT	
	Lewin's Rail	*Lewinia pectoralis*		L	VU	
	Little Bittern	*Ixobrychus minutus*		L	EN	
	Little Raven	*Corvus mellori*				X
	Little Wattlebird	*Anthochaera chrysoptera*				X
	Long-billed Corella	*Cacatua tenuirostris*				X
	Magpie Goose	*Anseranas semipalmata*		L	NT	
	Magpie-lark	*Grallina cyanoleuca*				X
	Masked Lapwing	*Vanellus miles*				X
	Murray Spiny Cray	*Euastacus armatus*		L	DD	
	Musk Duck	*Biziura lobata*			VU	
	Nankeen Night Heron	*Nycticorax caledonicus*			NT	
	New Holland Honeyeater	*Phylidonyris novaehollandiae*				X
	Noisy Miner	*Manorina melanocephala*				X
	Pacific Black Duck	*Anas superciliosa*				X
	Pied Cormorant	*Phalacrocorax varius*			NT	

Origin	Common Name	Scientific Name	Conservation Status			Recorded
			EPBC	FFG	DEPI	
	Powerful Owl	*Ninox strenua*		L	VU	
*	Red Fox	*Vulpes vulpes*				X
	Red Wattlebird	*Anthochaera carunculata*				X
	Red-browed Finch	*Neochmia temporalis*				X
	Red-rumped Parrot	*Psephotus haematonotus*				X
	Regent Honeyeater	*Anthochaera phrygia*	EN	L	CE	
	River Blackfish	*Gadopsis marmoratus*			DD	X
*	Rock Dove	*Columba livia*				X
	Royal Spoonbill	*Platalea regia*			VU	
	Silvereye	*Zosterops lateralis*				X
	Southern Brown Bandicoot	*Isoodon obseulus obesulus*	EN	L	NT	
	Spot-tailed Quoll	*Dasyurus maculatus*	EN	L	EN	
	Spotted Pardalote	*Pardalotus punctatus*				X
	Spotted Quail-thrush	*Cinclosoma punctatum*			NT	
*	Spotted Turtle-Dove	*Streptopelia chinensis*				X
	Straw-necked Ibis	*Threskiornis spinicollis*				X
	Striated Pardalote	*Pardalotus striatus*				X
	Striped Legless Lizard	*Delma impar*	VU	L	EN	
	Sulphur-crested Cockatoo	*Cacatua galerita*				X
	Superb Fairy-wren	*Malurus cyaneus*				X
	Unidentified grass skink	*Pseudemoia sp.*				X
	Welcome Swallow	*Hirundo neoxena*				X
	White-browed Scrubwren	*Sericornis frontalis*				X

Origin	Common Name	Scientific Name	Conservation Status			Recorded
			EPBC	FFG	DEPI	
	White-plumed Honeyeater	*Lichenostomus penicillatus*				X
	Willie Wagtail	*Rhipidura leucophrys*				X

DEPI – Status from DEPI Advisory List; **EPBC** – Status under EPBC Act; **FFG** – Status under FFG Act; **CE** – Critically endangered; **EN** – Endangered; **VU**– Vulnerable; **NT** – Lower risk near threatened; **DD** = data deficient; **L** – Listed under FFG Act; ***** = introduced species; **X** = recorded; **Cmp** = composite species.

Appendix 5: Guidelines for impacts to trees

DEPI guidelines (DSE 2010) provide definitions regarding tree retention and losses. These are outlined below, and it is considered that they should be applied to scattered trees and edges of treed remnant patches when determining the proximity of development to retained native vegetation.

Any tree is deemed lost when:

- Earthworks encroach on more than 10% of its Tree Retention Zone (TRZ) during construction activities. Tree Retention Zones:
    - Are defined as the area from the respective tree within a radius of 12 times the DBH of the respective tree, including the area above and below ground, notwithstanding it can be a minimum of two metres and a maximum of 15 metres radius around the respective tree
    - Extend at least one metre outside the crown projection, if the tree is a Tree Fern (DSE 2010)
    - Must be securely fenced off with high-visibility temporary fencing and appropriately signed as “Tree Retention Zone – keep out”
- Directional drilling within its TRZ occurs at less than 600 millimetres below the surface, or is not confirmed to be appropriate (including considerations concerning bore hole width) by a qualified arborist
- Lopping removes more than 1/3 of its crown
- Its trunk is damaged
- It is likely to pose a risk to safety or property as a result of the proposed development/works (e.g. a dwelling is proposed to be constructed near a tree that a qualified arborist has deemed likely to pose a risk to the dwelling)

Appendix 6: General development recommendations

Consideration should be given to including the measures described below in a construction and operational environmental management plan for the project.

Pre-construction:

- Avoid disturbing the intact native vegetation and scattered trees where feasible.
- Avoid removal of large, hollow-bearing indigenous trees where feasible.
- In accordance with the *Catchment and Land Protection Act 1994*, the noxious weed species listed below, which were recorded in the study area, must be controlled using precision methods that minimise off-target kills (e.g. spot spraying).
    - African Box-thorn;
    - Scotch Thistle;
    - Sweet Briar;
    - Blackberry; and
    - Willow.
- Construction contractors should be inducted into an environmental management program for construction works.
- All environmental controls should be checked for compliance on a regular basis.

Construction phase:

- Any tree pruning should be undertaken by an experienced arborist to prevent disease or unnecessary damage to the tree or disturbance to understorey vegetation during tree trimming.
- Any stockpiling should occur outside of environmentally sensitive areas.
- All machinery should enter and exit works sites along defined routes that do not impact on native vegetation or cause soil disturbance and weed spread.
- All machinery brought on site should be weed and pathogen free.
- All machinery wash down, lay down and personnel rest areas should be defined and located in disturbed areas.

Post-construction phase:

- The use of local indigenous plant species, of local genetic provenance, should be considered in the landscaping of any development on the site. Locally indigenous species generally have low water-use requirements, high survival rates and provide habitat to local fauna species.

Appendix 7: EVC Benchmarks

- EVC 175 – **Gippsland Plain**

Department of Sustainability and Environment

EVC/Bioregion Benchmark for Vegetation Quality Assessment

Gippsland Plain bioregion

EVC 175: Grassy Woodland

Description:
A variable open eucalypt woodland to 15 m tall or occasionally Sheoak woodland to 10 m tall over a diverse ground layer of grasses and herbs. The shrub component is usually sparse. It occurs on sites with moderate fertility on gentle slopes or undulating hills on a range of geologies.

Large trees:

Species	DBH(cm)	#/ha
Eucalyptus spp.	70 cm	15 / ha
Allocasuarina spp.	40 cm	

Tree Canopy Cover:

%cover	Character Species	Common Name
15%	*Eucalyptus radiata* s.l.	Narrow-leaf Peppermint
	Allocasuarina verticillata	Drooping Sheoak

Understorey:

Life form	#Spp	%Cover	LF code
Immature Canopy Tree		5%	IT
Understorey Tree or Large Shrub	2	10%	T
Medium Shrub	6	15%	MS
Small Shrub	2	5%	SS
Prostrate Shrub	2	1%	PS
Large Herb	2	5%	LH
Medium Herb	8	10%	MH
Small or Prostrate Herb	3	5%	SH
Large Tufted Graminoid	2	10%	LTG
Large Non-tufted Graminoid	1	10%	LNG
Medium to Small Tufted Graminoid	6	20%	MTG
Medium to Tiny Non-tufted Graminoid	2	10%	MNG
Ground Fern	1	5%	GF
Scrambler or Climber	2	5%	SC
Bryophytes/Lichens	na	10%	BL

EVC 175: Grassy Woodland - Gippsland Plain bioregion

LF Code	Species typical of at least part of EVC range	Common Name
T	*Acacia mearnsii*	Black Wattle
T	*Allocasuarina littoralis*	Black Sheoak
T	*Exocarpos cupressiformis*	Cherry Ballart
MS	*Leptospermum continentale*	Prickly Tea-tree
MS	*Epacris impressa*	Common Heath
MS	*Cassinia aculeata*	Common Cassinia
MS	*Acacia paradoxa*	Hedge Wattle
SS	*Pimelea humilis*	Common Rice-flower
SS	*Hibbertia riparia*	Erect Guinea-flower
PS	*Bossiaea prostrata*	Creeping Bossiaea
PS	*Astroloma humifusum*	Cranberry Heath
PS	*Acrotriche serrulata*	Honey-pots
LH	*Pterostylis longifolia* s.l.	Tall Greenhood
MH	*Gonocarpus tetragynus*	Common Raspwort
MH	*Drosera peltata* ssp. *auriculata*	Tall Sundew
SH	*Dichondra repens*	Kidney-weed
SH	*Opercularia varia*	Variable Stinkweed
SH	*Drosera whittakeri* ssp. *aberrans*	Scented Sundew
LTG	*Deyeuxia quadriseta*	Reed Bent-grass
LTG	*Xanthorrhoea minor* ssp. *lutea*	Small Grass-tree
LTG	*Lomandra longifolia*	Spiny-headed Mat-rush
LNG	*Gahnia radula*	Thatch Saw-sedge
MTG	*Lomandra filiformis*	Wattle Mat-rush
MTG	*Themeda triandra*	Kangaroo Grass
MTG	*Poa sieberiana*	Grey Tussock-grass
MTG	*Lepidosperma laterale*	Variable Sword-sedge
MNG	*Microlaena stipoides* var. *stipoides*	Weeping Grass
GF	*Pteridium esculentum*	Austral Bracken
SC	*Comesperma volubile*	Love Creeper
SC	*Billardiera scandens*	Common Apple-berry

Recruitment:
Continuous

Organic Litter:
20 % cover

Logs:
15 m/0.1 ha.

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
T	*Pinus radiata*	Radiata Pine	high	high
T	*Pittosporum undulatum*	Sweet Pittosporum	high	high
MS	*Chrysanthemoides monilifera*	Boneseed	high	high
MH	*Hypochoeris radicata*	Cat's Ear	high	low
MTG	*Anthoxanthum odoratum*	Sweet Vernal-grass	high	high
MTG	*Briza maxima*	Large Quaking-grass	high	low

Published by the Victorian Government Department of Sustainability and Environment April 2004

www.dse.vic.gov.au

Appendix 8: Biodiversity assessment report (DEPI)

Biodiversity impact and offset requirements report

This report provides additional biodiversity information for moderate and high risk-based pathway applications for permits to remove native vegetation under clause 52.16 or 52.17 of the planning schemes in Victoria

Date of issue: **13 May 2014**

Time of issue: **11:30 am**

Project ID	BLA_7051_BROMPTON

Summary of marked native vegetation

Risk-based pathway	**High**
Total extent	14.070 ha
Remnant patches	3.940 ha
Scattered trees	144 trees
Location risk	C

Strategic biodiversity score of all marked native vegetation	0.241

Offset requirements if a permit is granted

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

Offset type	**General offset**
General offset amount (general biodiversity equivalence units)	0.512 general units
General offset attributes	
Vicinity	Port Phillip and Westernport Catchment Management Authority (CMA) **or** the Local Municipal District where clearing takes place
Minimum strategic biodiversity score	0.187[1]
Offset type	**Specific offset(s)**
Specific offset amount (specific biodiversity equivalence units) and attributes	2.074 specific units of habitat for Swamp Everlasting 1.406 specific units of habitat for Grey Billy-buttons

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

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

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

Next steps

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

If you wish to remove the marked native vegetation you are required to apply for a permit from your local council.
The biodiversity assessment report from NVIM and this biodiversity impact and offset report should be submitted with your application for a permit to remove native vegetation you plan to remove, lop or destroy.

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

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

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

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

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

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

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

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

For more information contact the DEPI Customer Service Centre 136 186

Appendix 1 – Biodiversity impact of removal of native vegetation

Habitat hectares

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

Habitat zone	Site assessed condition score	Extent (ha)	Habitat hectares
T	0.090	0.021	0.002
U	0.090	0.034	0.003
V	0.110	0.008	0.001
S	0.240	0.026	0.006
W	0.090	0.041	0.004
P	0.140	0.013	0.002
O	0.140	0.016	0.002
Q	0.140	0.062	0.009
N	0.130	0.039	0.005
L	0.140	0.169	0.024
BB	0.220	0.062	0.014
D	0.140	0.142	0.020
J	0.130	0.054	0.007
AA	0.200	0.166	0.033
K	0.140	0.468	0.066
B	0.150	0.516	0.077
A	0.140	0.279	0.039
F	0.140	0.273	0.038
G	0.140	0.114	0.016
I	0.140	0.104	0.015
X	0.090	0.028	0.003
H	0.180	0.029	0.005
Y	0.090	0.035	0.003
E	0.170	0.176	0.030
M	0.090	0.031	0.003
R	0.210	0.075	0.016
BBB	0.130	0.159	0.021
CCC	0.150	0.081	0.012
EEE	0.240	0.139	0.033

Habitat zone	Site assessed condition score	Extent (ha)	Habitat hectares
DDD	0.210	0.224	0.047
FFF	0.140	0.131	0.018
AAA	0.310	0.225	0.070
1	0.200	0.070	0.014
2	0.200	0.070	0.014
3	0.200	0.070	0.014
4	0.200	0.070	0.014
5	0.200	0.070	0.014
6	0.200	0.070	0.014
7	0.200	0.070	0.014
8	0.200	0.070	0.014
9	0.200	0.070	0.014
10	0.200	0.070	0.014
11	0.200	0.070	0.014
12	0.200	0.070	0.014
13	0.200	0.070	0.014
14	0.200	0.070	0.014
15	0.200	0.070	0.014
16	0.200	0.070	0.014
17	0.200	0.070	0.014
18	0.200	0.070	0.014
19	0.200	0.070	0.014
20	0.200	0.070	0.014
21	0.200	0.070	0.014
22	0.200	0.070	0.014
23	0.200	0.070	0.014
24	0.200	0.070	0.014
25	0.200	0.070	0.014
26	0.200	0.070	0.014
27	0.200	0.070	0.014
28	0.200	0.070	0.014
29	0.200	0.070	0.014
30	0.200	0.070	0.014

Habitat zone	Site assessed condition score	Extent (ha)	Habitat hectares
31	0.200	0.070	0.014
32	0.200	0.070	0.014
33	0.200	0.070	0.014
34	0.200	0.070	0.014
35	0.200	0.070	0.014
36	0.200	0.070	0.014
37	0.200	0.070	0.014
38	0.200	0.070	0.014
39	0.200	0.070	0.014
40	0.200	0.070	0.014
41	0.200	0.070	0.014
42	0.200	0.070	0.014
43	0.200	0.070	0.014
44	0.200	0.070	0.014
45	0.200	0.070	0.014
46	0.200	0.070	0.014
47	0.200	0.070	0.014
48	0.200	0.070	0.014
49	0.200	0.070	0.014
50	0.200	0.070	0.014
51	0.200	0.070	0.014
52	0.200	0.070	0.014
53	0.200	0.070	0.014
54	0.200	0.070	0.014
55	0.200	0.070	0.014
56	0.200	0.070	0.014
57	0.200	0.070	0.014
58	0.200	0.070	0.014
59	0.200	0.070	0.014
60	0.200	0.070	0.014
61	0.200	0.070	0.014
62	0.200	0.070	0.014
63	0.200	0.070	0.014

Habitat zone	Site assessed condition score	Extent (ha)	Habitat hectares
64	0.200	0.070	0.014
65	0.200	0.070	0.014
66	0.200	0.070	0.014
67	0.200	0.070	0.014
68	0.200	0.070	0.014
69	0.200	0.070	0.014
70	0.200	0.070	0.014
71	0.200	0.070	0.014
72	0.200	0.070	0.014
73	0.200	0.070	0.014
74	0.200	0.070	0.014
75	0.200	0.070	0.014
76	0.200	0.070	0.014
77	0.200	0.070	0.014
78	0.200	0.070	0.014
79	0.200	0.070	0.014
80	0.200	0.070	0.014
81	0.200	0.070	0.014
82	0.200	0.070	0.014
83	0.200	0.070	0.014
84	0.200	0.070	0.014
85	0.200	0.070	0.014
86	0.200	0.070	0.014
87	0.200	0.070	0.014
88	0.200	0.070	0.014
89	0.200	0.070	0.014
90	0.200	0.070	0.014
91	0.200	0.070	0.014
92	0.200	0.070	0.014
93	0.200	0.070	0.014
94	0.200	0.070	0.014
95	0.200	0.070	0.014
96	0.200	0.070	0.014

Habitat zone	Site assessed condition score	Extent (ha)	Habitat hectares
97	0.200	0.070	0.014
98	0.200	0.070	0.014
99	0.200	0.070	0.014
100	0.200	0.070	0.014
101	0.200	0.070	0.014
102	0.200	0.070	0.014
103	0.200	0.070	0.014
104	0.200	0.070	0.014
105	0.200	0.070	0.014
106	0.200	0.070	0.014
107	0.200	0.070	0.014
108	0.200	0.070	0.014
109	0.200	0.070	0.014
110	0.200	0.070	0.014
111	0.200	0.070	0.014
112	0.200	0.070	0.014
113	0.200	0.070	0.014
114	0.200	0.070	0.014
115	0.200	0.070	0.014
116	0.200	0.070	0.014
117	0.200	0.070	0.014
118	0.200	0.070	0.014
119	0.200	0.070	0.014
120	0.200	0.070	0.014
121	0.200	0.070	0.014
122	0.200	0.070	0.014
123	0.200	0.070	0.014
124	0.200	0.070	0.014
125	0.200	0.070	0.014
126	0.200	0.070	0.014
127	0.200	0.070	0.014
128	0.200	0.070	0.014
129	0.200	0.070	0.014

Habitat zone	Site assessed condition score	Extent (ha)	Habitat hectares
130	0.200	0.070	0.014
131	0.200	0.070	0.014
132	0.200	0.070	0.014
133	0.200	0.070	0.014
134	0.200	0.070	0.014
135	0.200	0.070	0.014
136	0.200	0.070	0.014
137	0.200	0.070	0.014
138	0.200	0.070	0.014
139	0.200	0.070	0.014
140	0.200	0.070	0.014
141	0.200	0.070	0.014
142	0.200	0.070	0.014
143	0.200	0.070	0.014
144	0.200	0.070	0.014
TOTAL			**2.668**

Impacts on rare or threatened species habitat above specific offset threshold

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

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

Species number	Species common name	Species scientific name	Species type	Area of mapped habitat (ha)	Proportional impact (%)
503763	Swamp Everlasting	Xerochrysum palustre	Highly localised	5.636	0.072
504643	Grey Billy-buttons	Craspedia canens	Dispersed	6.455	0.033

Clearing site biodiversity equivalence score(s)

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

Habitat zone	Habitat hectares	Habitat for rare or threatened species				Specific biodiversity equivalence score (SBES)
		Species number	Species common name	Species scientific name	Habitat importance score	
T	0.002	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.002
		504643	Grey Billy-buttons	Craspedia canens	0.590	0.001
U	0.003	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.003
		504643	Grey Billy-buttons	Craspedia canens	0.602	0.002
V	0.001	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.001
		504643	Grey Billy-buttons	Craspedia canens	0.620	0.001
S	0.006	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.006
		504643	Grey Billy-buttons	Craspedia canens	0.570	0.004
W	0.004	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.004
		504643	Grey Billy-buttons	Craspedia canens	0.600	0.002
L	0.024	504643	Grey Billy-buttons	Craspedia canens	0.570	0.013
BB	0.014	504643	Grey Billy-buttons	Craspedia canens	0.570	0.008
AA	0.033	504643	Grey Billy-buttons	Craspedia canens	0.566	0.019
K	0.066	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.066
		504643	Grey Billy-buttons	Craspedia canens	0.567	0.037
A	0.039	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.039
		504643	Grey Billy-buttons	Craspedia canens	0.590	0.023
F	0.038	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.038
		504643	Grey Billy-buttons	Craspedia canens	0.605	0.023
G	0.016	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.016
		504643	Grey Billy-buttons	Craspedia canens	0.590	0.009
I	0.015	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.015
		504643	Grey Billy-buttons	Craspedia canens	0.490	0.007
H	0.005	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.005

Habitat zone	Habitat hectares	Habitat for rare or threatened species				Specific biodiversity equivalence score (SBES)
		Species number	Species common name	Species scientific name	Habitat importance score	
		504643	Grey Billy-buttons	Craspedia canens	0.602	0.003
E	0.030	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.030
		504643	Grey Billy-buttons	Craspedia canens	0.619	0.019
M	0.003	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.003
		504643	Grey Billy-buttons	Craspedia canens	0.600	0.002
CCC	0.012	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.012
		504643	Grey Billy-buttons	Craspedia canens	0.590	0.007
EEE	0.033	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.033
		504643	Grey Billy-buttons	Craspedia canens	0.590	0.020
DDD	0.047	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.047
		504643	Grey Billy-buttons	Craspedia canens	0.597	0.028
1	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.600	0.008
2	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.630	0.009
3	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.630	0.009
4	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.630	0.009
5	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.607	0.009
6	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.600	0.008
7	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.600	0.008
31	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.600	0.008

Habitat zone	Habitat hectares	Habitat for rare or threatened species				Specific biodiversity equivalence score (SBES)
		Species number	Species common name	Species scientific name	Habitat importance score	
33	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.598	0.008
34	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.590	0.008
38	0.014	504643	Grey Billy-buttons	Craspedia canens	0.520	0.007
39	0.014	504643	Grey Billy-buttons	Craspedia canens	0.531	0.007
40	0.014	504643	Grey Billy-buttons	Craspedia canens	0.535	0.008
41	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.630	0.009
42	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.626	0.009
43	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.625	0.009
44	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.610	0.009
45	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.610	0.009
46	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.610	0.009
47	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.610	0.009
48	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.610	0.009
49	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.600	0.008
101	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.470	0.007

Habitat zone	Habitat hectares	Habitat for rare or threatened species				Specific biodiversity equivalence score (SBES)
		Species number	Species common name	Species scientific name	Habitat importance score	
102	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.470	0.007
103	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.470	0.007
104	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.470	0.007
105	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.470	0.007
112	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.648	0.009
113	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.600	0.008
114	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.600	0.008
115	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.600	0.008
116	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.600	0.008
117	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.600	0.008
118	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.600	0.008
120	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.619	0.009
121	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.620	0.009
122	0.014	503763	Swamp Everlasting	Xerochrysum	1.000	0.014

Habitat zone	Habitat hectares	Habitat for rare or threatened species				Specific biodiversity equivalence score (SBES)
		Species number	Species common name	Species scientific name	Habitat importance score	
				palustre		
		504643	Grey Billy-buttons	Craspedia canens	0.620	0.009
123	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.620	0.009
124	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.620	0.009
125	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.612	0.009
126	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.602	0.008
127	0.014	504643	Grey Billy-buttons	Craspedia canens	0.600	0.008
128	0.014	504643	Grey Billy-buttons	Craspedia canens	0.600	0.008
129	0.014	504643	Grey Billy-buttons	Craspedia canens	0.570	0.008
132	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.590	0.008
133	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.590	0.008
134	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.593	0.008
135	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.596	0.008
136	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.618	0.009
137	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.620	0.009
138	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.620	0.009
139	0.014	503763	Swamp Everlasting	Xerochrysum	1.000	0.014

Habitat zone	Habitat hectares	Habitat for rare or threatened species				Specific biodiversity equivalence score (SBES)
		Species number	Species common name	Species scientific name	Habitat importance score	
				palustre		
		504643	Grey Billy-buttons	Craspedia canens	0.620	0.009
140	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.620	0.009
141	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.620	0.009
142	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.620	0.009
143	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.620	0.009
144	0.014	503763	Swamp Everlasting	Xerochrysum palustre	1.000	0.014
		504643	Grey Billy-buttons	Craspedia canens	0.592	0.008

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

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

Habitat zone	Habitat hectares	Strategic biodiversity score	General biodiversity equivalence score (GBES)
P	0.002	0.209	0.000
O	0.002	0.195	0.000
Q	0.009	0.195	0.002
N	0.005	0.237	0.001
D	0.020	0.250	0.005
J	0.007	0.200	0.001
B	0.077	0.295	0.023
X	0.003	0.245	0.001
Y	0.003	0.239	0.001
R	0.016	0.196	0.003
BBB	0.021	0.289	0.006
FFF	0.018	0.259	0.005

Habitat zone	Habitat hectares	Strategic biodiversity score	General biodiversity equivalence score (GBES)
AAA	0.070	0.196	0.014
8	0.014	0.234	0.003
9	0.014	0.244	0.003
10	0.014	0.244	0.003
11	0.014	0.244	0.003
12	0.014	0.258	0.004
13	0.014	0.259	0.004
14	0.014	0.266	0.004
15	0.014	0.267	0.004
16	0.014	0.254	0.004
17	0.014	0.241	0.003
18	0.014	0.249	0.004
19	0.014	0.243	0.003
20	0.014	0.283	0.004
21	0.014	0.283	0.004
22	0.014	0.284	0.004
23	0.014	0.279	0.004
24	0.014	0.259	0.004
25	0.014	0.255	0.004
26	0.014	0.252	0.004
27	0.014	0.223	0.003
28	0.014	0.210	0.003
29	0.014	0.243	0.003
30	0.014	0.242	0.003
32	0.014	0.191	0.003
35	0.014	0.192	0.003
36	0.014	0.292	0.004
37	0.014	0.267	0.004
50	0.014	0.189	0.003
51	0.014	0.192	0.003
52	0.014	0.191	0.003
53	0.014	0.224	0.003
54	0.014	0.217	0.003

Habitat zone	Habitat hectares	Strategic biodiversity score	General biodiversity equivalence score (GBES)
55	0.014	0.217	0.003
56	0.014	0.217	0.003
57	0.014	0.217	0.003
58	0.014	0.217	0.003
59	0.014	0.218	0.003
60	0.014	0.220	0.003
61	0.014	0.222	0.003
62	0.014	0.223	0.003
63	0.014	0.229	0.003
64	0.014	0.229	0.003
65	0.014	0.229	0.003
66	0.014	0.229	0.003
67	0.014	0.229	0.003
68	0.014	0.229	0.003
69	0.014	0.229	0.003
70	0.014	0.229	0.003
71	0.014	0.229	0.003
72	0.014	0.229	0.003
73	0.014	0.229	0.003
74	0.014	0.229	0.003
75	0.014	0.229	0.003
76	0.014	0.229	0.003
77	0.014	0.226	0.003
78	0.014	0.224	0.003
79	0.014	0.223	0.003
80	0.014	0.223	0.003
81	0.014	0.223	0.003
82	0.014	0.223	0.003
83	0.014	0.223	0.003
84	0.014	0.222	0.003
85	0.014	0.229	0.003
86	0.014	0.196	0.003
87	0.014	0.191	0.003

Habitat zone	Habitat hectares	Strategic biodiversity score	General biodiversity equivalence score (GBES)
88	0.014	0.188	0.003
89	0.014	0.188	0.003
90	0.014	0.188	0.003
91	0.014	0.188	0.003
92	0.014	0.188	0.003
93	0.014	0.186	0.003
94	0.014	0.187	0.003
95	0.014	0.188	0.003
96	0.014	0.188	0.003
97	0.014	0.188	0.003
98	0.014	0.195	0.003
99	0.014	0.194	0.003
100	0.014	0.195	0.003
106	0.014	0.247	0.003
107	0.014	0.247	0.003
108	0.014	0.247	0.003
109	0.014	0.247	0.003
110	0.014	0.246	0.003
111	0.014	0.216	0.003
119	0.014	0.275	0.004
130	0.014	0.283	0.004
131	0.014	0.283	0.004

Mapped rare or threatened species' habitats on site

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

Species number	Species common name	Species scientific name
10012	King Quail	Coturnix chinensis victoriae
10045	Lewin's Rail	Lewinia pectoralis pectoralis
10050	Baillon's Crake	Porzana pusilla palustris
10170	Australian Painted Snipe	Rostratula benghalensis australis
10186	Intermediate Egret	Ardea intermedia
10187	Eastern Great Egret	Ardea modesta
10195	Little Bittern	Ixobrychus minutus dubius
10197	Australasian Bittern	Botaurus poiciloptilus
10212	Australasian Shoveler	Anas rhynchotis
10215	Hardhead	Aythya australis
10216	Blue-billed Duck	Oxyura australis
10217	Musk Duck	Biziura lobata
10220	Grey Goshawk	Accipiter novaehollandiae novaehollandiae
10226	White-bellied Sea-Eagle	Haliaeetus leucogaster
10230	Square-tailed Kite	Lophoictinia isura
10238	Black Falcon	Falco subniger
10246	Barking Owl	Ninox connivens connivens
10248	Powerful Owl	Ninox strenua
10498	Chestnut-rumped Heathwren	Calamanthus pyrrhopygius
10598	Painted Honeyeater	Grantiella picta
11061	Common Dunnart	Sminthopsis murina murina
11280	Grey-headed Flying-fox	Pteropus poliocephalus
12283	Lace Monitor	Varanus varius
12407	Swamp Skink	Lissolepis coventryi
12683	Glossy Grass Skink	Pseudemoia rawlinsoni
13117	Brown Toadlet	Pseudophryne bibronii
13125	Southern Toadlet	Pseudophryne semimarmorata
13207	Growling Grass Frog	Litoria raniformis
4701	Dwarf Galaxias	Galaxiella pusilla

Species number	Species common name	Species scientific name
500044	Sticky Wattle	Acacia howittii
501084	Purple Diuris	Diuris punctata var. punctata
501295	Spotted Gum	Corymbia maculata
501326	Yarra Gum	Eucalyptus yarraensis
501456	Clover Glycine	Glycine latrobeana
502145	Giant Honey-myrtle	Melaleuca armillaris subsp. armillaris
502702	Green Leek-orchid	Prasophyllum lindleyanum
502709	Maroon Leek-orchid	Prasophyllum frenchii
502800	Sharp Greenhood	Pterostylis X ingens
504491	Southern Blue-gum	Eucalyptus globulus subsp. globulus
504655	Pale Swamp Everlasting	Coronidium scorpioides 'aff. rutidolepis (Lowland Swamps)' variant
505337	Austral Crane's-bill	Geranium solanderi var. solanderi s.s.

Appendix 2 – Offset requirements detail

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

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

Offsets also have required attributes:

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

The offset requirements for your proposal are as follows:

Offset type	Clearing site biodiversity equivalence score	Risk multiplier	Offset requirements	
			Offset amount (biodiversity equivalence units)	Offset attributes
Specific	1.037 SBES	2	2.074 specific units	Offset must provide habitat for *503763, Swamp Everlasting, Xerochrysum palustre*
Specific	0.703 SBES	2	1.406 specific units	Offset must provide habitat for *504643, Grey Billy-buttons, Craspedia canens*
General	0.341 GBES	1.5	0.512 general units	Offset must be within Port Phillip and Westernport CMA **or** the same Municipal District as the vegetation removal Offset must have a minimum strategic biodiversity score of 0.187

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

Appendix 3 – Images of marked native vegetation

Image 1. Native vegetation location risk map

Image 2. Strategic biodiversity score map

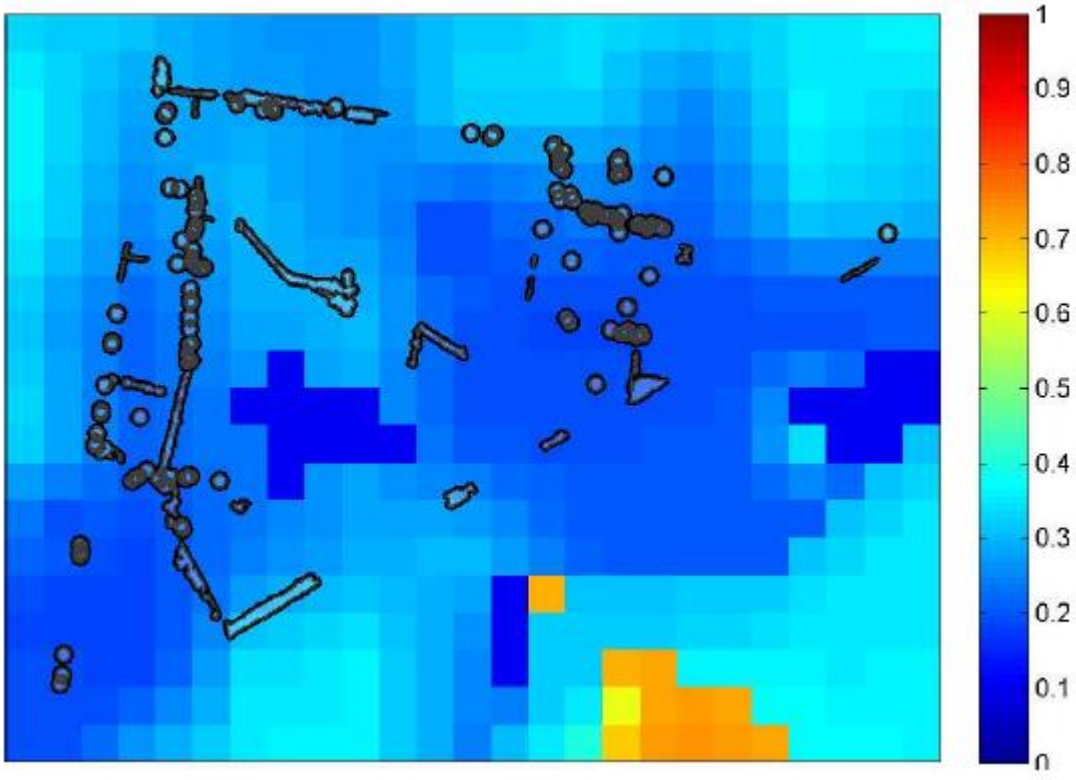


Image 3. Aerial photograph showing marked native vegetation

Image 4. Habitat importance map - 503763, Swamp Everlasting, Xerochrysum palustre

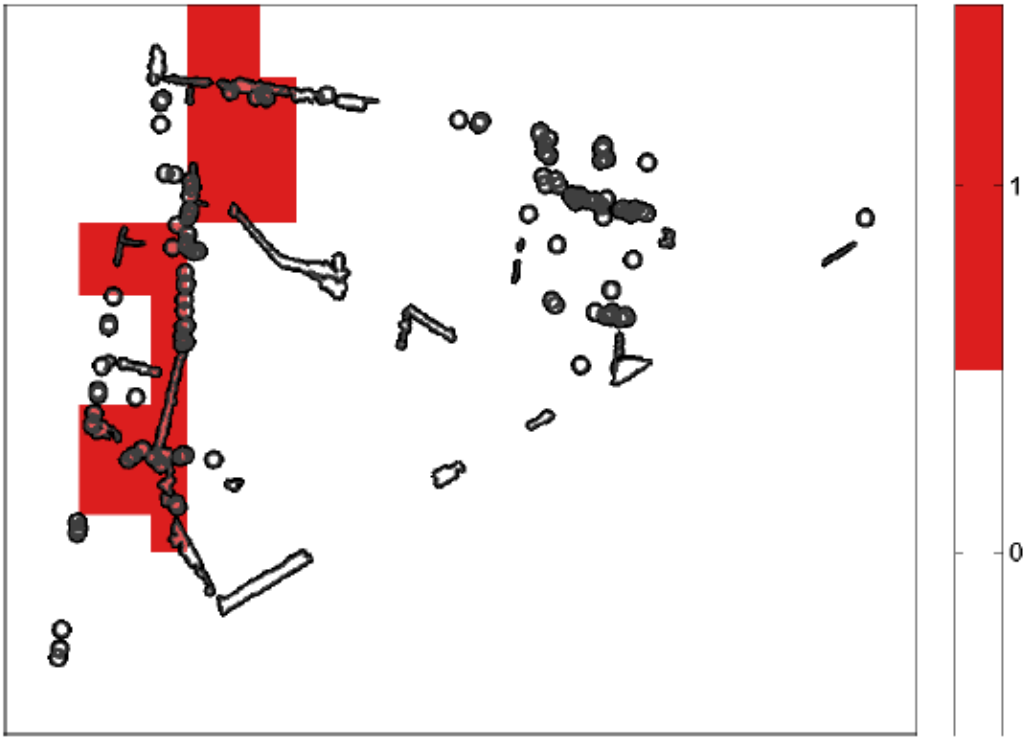
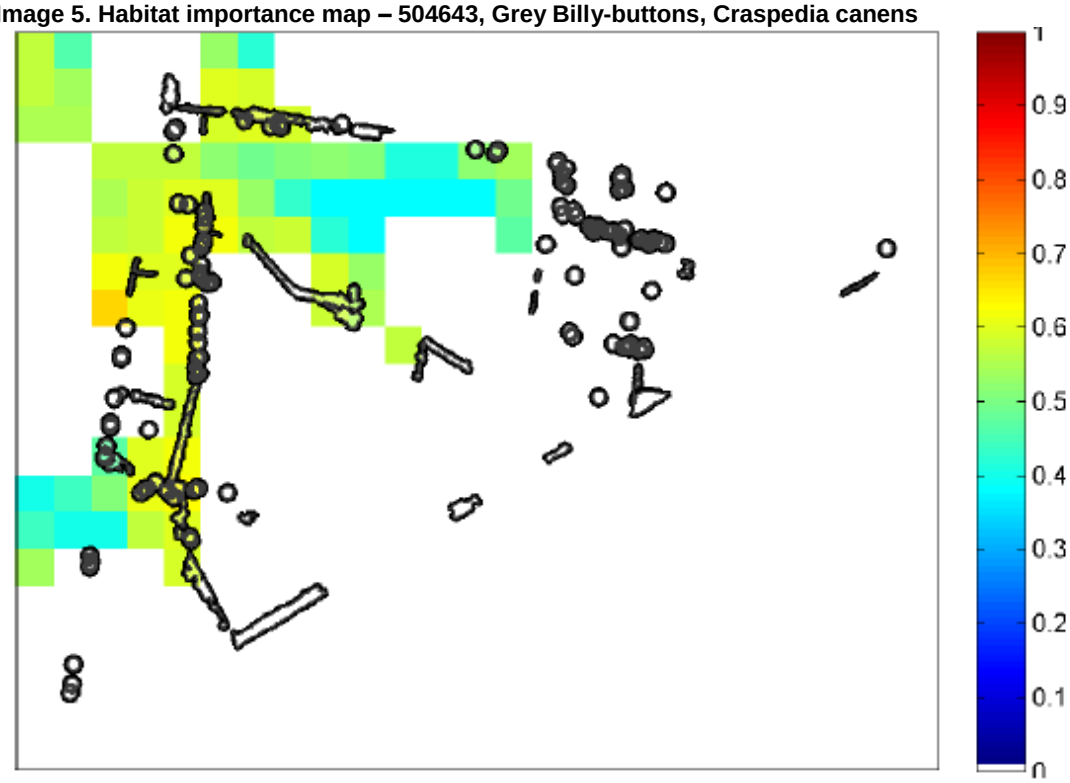


Image 5. Habitat importance map – 504643, Grey Billy-buttons, Craspedia canens



Glossary

Condition score

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

Dispersed habitat

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

General biodiversity equivalence score

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

$$\boldsymbol{General\ biodiversity\ equivalence\ score} = \boldsymbol{habitat\ hectares} \times \boldsymbol{strategic\ biodiversity\ score}$$

General offset amount

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

$$\boldsymbol{Risk\ adjusted\ general\ biodiversity\ equivalence\ score} = \boldsymbol{general\ biodiversity\ equivalence\ score\ clearing} \times \mathbf{1.5}$$

General offset attributes

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

Habitat hectares

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

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

Habitat importance score

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

Habitat zone

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

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

Highly localised habitat

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

Minimum strategic biodiversity score

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

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

Offset risk factor

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

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

$$\boldsymbol{Risk\ factor\ for\ general\ offsets = 1.5}$$

$$\boldsymbol{Risk\ factor\ for\ specific\ offset = 2}$$

Offset type

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

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

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

Proportional impact on species

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

Specific offset amount

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

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

Specific offset attributes

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

Specific biodiversity equivalence score

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

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

Strategic biodiversity score

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

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

Total extent (hectares) for calculating habitat hectares

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

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

Vicinity

The vicinity is an attribute for a general offset.

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